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SCHREYER HONORS COLLEGE

DEPARTMENT OF POLITICAL SCIENCE

Abortion Activists, Worldviews, and Attitude Expression: A Twitter Analysis

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SPRING 2021

A thesis  
submitted in partial fulfillment  
of the requirements  
for baccalaureate degrees  
in Social Data Analytics and Political Science  
with honors in Social Data Analytics

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## ABSTRACT

Why do activists who support abortion express their attitudes differently than activists who do not? And do these differences in attitude expression translate to modern forms of communication, namely social media? This analysis investigates abortion attitude expression on Twitter, using 2,100 tweets scraped from six different abortion-related activist groups, three pro-life and three pro-choice. Abortion is a morality policy, which has a higher salience among individuals, particularly activists (Mooney 676). Opinions on such morality policies are shaped based on people's worldviews, which are sets of values that are unchanging and central to their identities (Luker 158). Other studies on abortion attitude expression have shown that these contrasting worldviews motivate pro-life and pro-choice activists to convey their messages differently. This project builds on these studies by determining if social media shows these same discrepancies and therefore serves as evidence for these worldviews.

I found that both pro-life and pro-choice tweets were educational when describing their stance. However, pro-life activists used more emotional appeals, negative sentiment, and inflammatory language. Meanwhile, pro-choice tweets use more words when describing their point of view. Clearly, pro-life and pro-choice activists tweet differently. Across organizations that are on the same side of the issue, however, the tweets were similar in terms of these characteristics. These two central findings are evidence for these theoretical explanations of the abortion issue, because activists on different sides of the issue have different worldviews, while activists on the same side have similar worldviews.

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## ACKNOWLEDGEMENTS

I would first like to thank my thesis advisor, Dr. Michael Berkman for helping me through this entire process and all the challenges that accompanied it. His patience and willingness to help me through the many obstacles that arose made this project possible. I would also like to thank Dr. Marie Hojnacki for keeping me on top of deadlines and ensuring I would complete every step in a timely manner. Additionally, I would like to thank Penn State College of the Liberal Arts and Penn State Schreyer Honors College for providing me with an education I would not find elsewhere. Moreover, I would like to express my thanks to Dr. Jeremy Ladd and the Penn State College of Information Sciences and Technology for serving as technical resources for this project. Finally, I would like to thank my family and friends for supporting me throughout my academic career and always believing in me.

## Chapter 1

### Introduction

It is a freezing January day, and the streets of Washington D.C. are overtaken by torrents of pink hats and matching protest signs, only to be flooded the next day with posters of babies and religious figures. While these marches seem dissimilar, they actually represent two stances on the same issue: abortion. Abortion is one of the most polarizing and politicized issues in our society. Rooted in differences in fundamental worldviews, the two sides of the debate have yet to settle their disagreements. Abortion was decriminalized during the 1973 *Roe v. Wade* court ruling, which instigated a movement to overturn this ruling and criminalize abortions again (Karrer 548).

This legalization was when the contrasting worldviews became clear. While pro-choice activists recognize this decision as a stride towards freedom for women (Luker 118), pro-life activists believe this ruling compromises the moral values necessary for human existence (Luker 129). Court rulings have favored the pro-life side as well. In fact, in 1989, the *Webster v. Reproductive Health Services* decision countered *Roe*, giving states the right to restrict abortions (Tonn 265). For decades now, there has been much discord between pro-life and pro-choice individuals. Recognizing this disagreement prompts our investigation into how both sides of the issue think about the world, the role of the woman, and morality. Once we see the contrasting worldviews, it introduces a pressing question: do pro-life and pro-choice activists differ in how they openly express their attitudes? If so, how? And do these differences in attitude expression serve as evidence for the worldviews identified in previous literature? Analyzing the strategies

to express these attitudes will further our understanding of the differences between the two perspectives, and why these sides disagree.

For decades, pro-life and pro-choice activists have been vocal about their beliefs. One's stance on abortion is an integral part to her identity (Kaposy 89) and an attack on her stance is an attack on her entire worldview (Luker 158). These activists feel so strongly about their beliefs that they have needed to amplify their voices. Over time, they established an increasing number of organizations that represent the pro-life and pro-choice sides. In these organizations, groups of activists collectively express their stances on abortion, grounded in their common worldviews. Previous work has examined the sentiments and strategies these groups employ to endorse their arguments. The pro-life side has felt marginalized by the legalization of abortion and angered by how this legalization defies what they see as long-standing moral principles. Therefore, this side exhibits more negative attitudes and emotional sentiments when expressing their attitudes (Hopkins et al. 397). Meanwhile, pro-choice groups see the need to endorse more modern ideas of a woman and her role in society. These people are motivated to educate the masses on why the government should not have the legal right to control a woman's body (Karlán & Ortiz 872). Among the public, there is consensus that pro-life and pro-choice groups have distinct worldviews, messages, and techniques to spread these ideas. However, it is unclear whether this discrepancy translates to social media.

I argue that in a social media context, attitude expression on abortion may not manifest itself in the same way it would at a protest, for example. Organizations have ways to convey their attitudes in person, including physical signs, organized marches, and sponsored events. However, they need to translate these messages to a statement in writing with a limited number of characters. The emotions that abortion evokes, and the central role abortion has to one's



identity will likely motivate social media activity on this issue (Chen et al. 446). Social media is different from other ways these groups represent their beliefs. It is low cost, updated constantly, and less overt than protests which provides a new environment for political discourse (Conway et al. 366). Social media is also contemporary; there are fewer studies on political behavior on these platforms and none on abortion attitude expression. My approach builds on other studies of abortion attitudes by exploring them in this arena among groups who normally use more visible methods of communicating their beliefs. Social media is a widely used manifestation of worldviews that reaches global audiences. Many individuals place emphasis on their online presence and how well their social media accounts capture their attitudes and values. These platforms can serve as evidence for these worldviews and therefore are worth investigating.

To explore my question of interest, I scrape Twitter data surrounding significant political events, particularly related to abortion. While there are many social media platforms, Twitter has emerged as a primary outlet for political discourse (Park 1642). There also have been techniques that researchers have previously used including opinion mining, political orientation detection, and sarcasm detection (Kannangara 752). Knowing that Twitter has previously been used to study public opinion, I know it provides insight into political discussion surrounding an issue like abortion. I also know that publicized groups have verified pages with tweets from real people, rather than bots. In this study, I will sample tweets from six organizations: Planned Parenthood, NARAL Pro-Choice America, and National Abortion Federation on the pro-choice side and National Right to Life Committee, March for Life, and Live Action on the pro-life side.

My analysis illustrates how pro-life and pro-choice activists in corresponding organizations express their attitudes differently on social media. Expanding on prior work, my study will show how social media for attitude expression highlights differences between pro-life

and pro-choice activists not seen through other forms of communication. My work will also demonstrate whether worldviews are evident through social media activity on abortion. The worldviews, sentiments, and strategies of attitude expression have been studied in prior studies, but my research will examine these ideas expressed in a more contemporary way not seen in prior research.

## Chapter 2

### Literature Review

#### Attitude Expression and Social Media

Attitude differences have become even more apparent as the political climate becomes more polarized and more forms of communication exist. Attitudes stem from individual values. Individuals' values are guides "with which to measure the morality or social appropriateness of behaviors or outcomes" (Henry & Reyna 276). The relationship between values and attitudes are especially important when it comes to forming and assessing political behaviors. Many individuals will criticize political stances that serve as "violations" of their values, while supporting those that align with them (Henry & Reyna 280). Additionally, these violations increase individuals' propensities to express their attitudes (Henry & Reyna 296). Attitude expression is also particularly significant when it involves an issue that concerns morality, particularly the moral foundations of care, fairness, loyalty, and authority. While liberal and left-leaning activists are more likely to express attitudes that emphasize care and fairness, conservative activists will express attitudes concerning loyalty (Kraft 1030). Political issues that concern these values, therefore, will likely motivate individuals to express their attitudes.

People have expressed their attitudes in numerous ways across time. In the current political era, many activists express their attitudes over social media, a common arena for political discourse. For moral issues in particular, the combination of emotions and personal attitudes are more likely to motivate social media activity (Chen et al. 446). While individuals express political attitudes for a vast range of political issues, it is moral issues that most directly

instigate outward attitude expression. This expression is likely to prevail on Twitter, a platform commonly used for expressing political beliefs.

Twitter, originally designed for interpersonal communication among family and friends, has become a common platform for political discourse. Over time, Twitter has evolved into “a tool of exchange and discussion of current issues that occur in a society,” especially concerning polarized political issues (Park 1642). Twitter has been a platform that many politicians and activists alike have adopted for putting forth their agenda due to its “low-cost nature, [its] need for regular updates, and [its] avoidance of potential backlash” (Conway et al. 366). With the growth of big data and modern technology, researchers also can easily detect ideology and sentiment across tweets as well. Mathematical modeling has allowed for comprehensive Twitter mining, including opinion mining, political orientation detection, and sarcasm detection (Kannangara 752). Twitter mining is a relatively new method of analysis, especially regarding political behavior. This study strives to conduct such an analysis on the abortion debate, and how activists on both sides of the issue outwardly express their stance.

### **Emergence of Abortion as a Political Issue**

A woman’s right to an abortion has been one of the most contested political issues in the U.S. as early as the 19th century. Abortions were criminalized in all states between 1821 and 1880 (Haugeberg 415). Prior to the 1960s, most women would carry babies to term and relinquish the babies for adoption without thinking about the prospect of abortion (Heinemann 281). However, as early as the 1940s, states have given physicians the right to perform abortions when medically necessary (Haugeberg 415). This freedom gave rise to illegal abortions, where

nearly 1.2 million were performed annually in the 1960s (Haugeberg 416). A greater stride towards abortion access occurred in the 1965 *Griswold v. Connecticut* ruling, overturning a ban on the sale of contraceptives (Karrer 531). Following these new freedoms came the right-to-life movement across the U.S., which was further energized with the *Roe v. Wade* ruling in 1973 (Karrer 548). The 1973 *Roe v. Wade* court decision granted women unlimited access to abortions during the first two trimesters of a pregnancy (Karrer 548). However, as early as the Reagan administration, government officials sought to deny women that right (Heinemann 282). In 1989, following the *Webster v. Reproductive Health Services* decision, state governments subsequently had the right to restrict legal abortions (Tonn 265). After this ruling, abortion became a further polarized and politicized issue, especially when individual states had power to restrict abortion rights.

Even prior to both the *Roe* and *Webster* rulings, people have held attitudes on abortions but only more recently has the issue become more salient and politicized, particularly along party lines. The rise of the pro-choice movement came from the stripping away of the “man’s world” ideology, especially with women taking on “male” professions in the 1940s and 1950s (Luker 123). Additionally, views on the economic value of children declined over the years, where children had less economic value when they were expected to spend more time in school than in labor (Luker 124-25). Following these attitudes and societal shifts came strides towards abortion legalization, which stemmed from the new attitudes of many that women “had the right to use abortion to control their own lives” (Luker 118). Yet in conjunction with these changes came the salience of pro-life attitudes. Pro-life activists emerged when they saw threats to their traditional and long-held beliefs. After the *Griswold* decision in 1965, abortion received more media attention which gave rise to Catholic anti-abortion groups (Karrer 531). The right-to-life

movement prevailed even more following the legalization of abortion-on-demand in California in 1971; abortion “was now emphatically a public and moral issue of nationwide concern” (Luker 127). The pro-life side of the issue rose due to the pro-choice “victories” for legalizing abortion. Once pro-life activists saw the push for a “rational” treatment of abortion, they saw threats to “values that were part of the ordinary fabric of social life” (Luker 129). This discord has converted abortion into a political issue, with two sides at-odds with one another.

### **Abortion Attitudes**

Abortion is, by nature, an issue that sparks discussion and, naturally, controversy. It is distinct from other political issues because it constitutes morality policy, which causes a higher degree of polarization among the public and less action by policymakers (Mooney 675). Abortion is also more salient among individuals so naturally there is more debate about it (Mooney 676). Attitudes on abortion stem from various worldviews which frame how individuals see the issue. The two opposing sides have contrasting views on the role of the woman. Pro-life activists see that motherhood is the most important and fulfilling role a woman can have (Luker 160). Conversely, pro-choice advocates believe motherhood is one of many roles that a woman can play in her lifetime. They think it is foolish to believe a woman can only be a mother (Luker 176). Additionally, the pro-life and pro-choice stances have contradicting views on the roles that men and women serve. Pro-life advocates believe that men and women are intrinsically different and therefore have different roles to play in their lives (Emerson 42) and “everyone loses when traditional roles are lost” (Luker 163).

While Mooney's work shows general agreement that abortion concerns morality, the two sides of the issue do not see morality in the same way. Pro-life activists see that "goodness is best achieved in the context of others" (Emerson 42) and religion provides answers on how to guide goodness (Emerson 43). However, pro-choice activists contend that no act is intrinsically right or wrong; it is up to the individual's moral principles (Luker 183). These disparities in worldviews provide the foundation for contrasting and mutually exclusive attitudes, which, in turn, are expressed differently. Therefore, there should be clear dissimilarities in pro-life and pro-choice tweets expressed on social platforms.

The abortion debate is also one of the most contested political debates and many expect that the two opposing sides will remain in deadlock. In fact, some argue that an individual's view on abortion "is often central and indispensable to one's cultural identity" (Kaposy 89). This issue is also one of the most difficult to resolve because it is a matter of personal conscience (Kaposy 92). Peter Seipel expands on Kaposy's work by exploring whether there is such "common ground" to possibly resolve this debate. He suggests that activists must not only share the same convictions but also the same amount of emphasis on those convictions which he believes is doubtful (Seipel 522). This finding suggests that the worldviews Luker discusses are likely mutually exclusive. In fact, Luker mentions that disagreements in this issue makes individuals feel as though their "entire world view is under assault" which is why this debate has been so difficult to resolve (Luker 158). As previous research indicates, there is very little agreement across the two sides. Expression of such attitudes, therefore, should include strong word choice and emotions.

### **How Pro-Life and Pro-Choice Activists Differ**

Emotions play a significant role in the abortion debate. Evangelos Ntontis and Nick Hopkins indicated that anti-abortion activists discuss their attitudes with primarily negative emotions (Ntontis & Hopkins 672). The only “positive” emotion they detected among these activists was only positive at face value; “it is taken as diagnostic of a psychological problem” among those who support a woman’s right to an abortion (Ntontis & Hopkins 674). Anuradha Kumar’s work agrees with that of Ntontis and Hopkins, stating that pro-life activists refer to abortion as surgery, “framing it as a disgusting procedure, and portraying abortion providers and clinic workers as doing “dirty” work” (Kumar 533). Kumar concluded that disgust is the emotion that is most central to pro-life activists (Kumar 534). There is general agreement that pro-life activists are more “emotional” and “outspoken.” This difference has to do with the ability of these activists to make any meaningful policy change. Anti-abortion activists need to make their voices heard when they are “so few in number, and so marginal to any meaningful social policy discussion” (Hopkins et al. 397). Therefore, there will likely be more “angry” and “inflammatory” language among pro-life tweets.

Not only are there emotional differences among pro-life and pro-choice activists; there are also linguistic differences. The clearest disparity between the two sides is how they refer to the unborn. In activists’ general rhetoric, “opponents and supporters almost exclusively used the words ‘baby’ and ‘fetus,’ respectively” (Simon & Jerit 255). This discrepancy emerges from differences in the deeply held worldviews that Luker discussed. Pro-life activists call the unborn child a baby because “[t]he embryo is a human and alive” (Luker 174) while pro-choice activists believe “there is a distinction between an embryo and a child” (Luker 184). However, an interesting finding is that pro-life activists also emphasize women’s health and safety in their



framing and word choice, as much as they do the “life” of the unborn child (Mucciaroni et al. 182). With contrasting worldviews and general agreement that pro-life and pro-choice activists frame their arguments differently, there will likely be varying word choice across tweets.

While both pro-life and pro-choice activists aim to advance their arguments, they apply different strategies to achieve this goal. In other words, their forms of attitude expression serve distinct purposes that differ from each other. Pro-choice activists defend their viewpoint by framing their perspective as an issue of female justice, which is a far less emotional approach. The pro-choice perspective is more novel; it challenges the deeply held and longstanding belief in the sacredness of embryonic life (Luker 130). The argument most central to pro-choice activists is that the government does not have the legal right to control the decision to terminate a pregnancy (Karlan & Ortiz 872). Additionally, the right to an abortion is an important facet of feminism, where abortion bans are infringements on a woman’s personal liberties (Karlan & Ortiz 876). Pro-choice activists have different motives when endorsing their views because they “press for a more ‘rational’ treatment of abortion” (Luker 129). Therefore, it is evident that these activists are less likely to implement emotional appeals; instead, they seek to educate the public on the legality, fairness, and logic of the right to an abortion.

The pro-life side of the issue tends to implement strategies to appeal to emotions to push their argument. Imagery is prevalent across pro-life activist groups. A predominant image in the pro-life argument is an image of the fetus (Hopkins et al. 396). This side of the debate seeks to employ emotional appeals that emphasize the “personhood” of the unborn baby (Hopkins et al. 397). Many pro-life activist groups advocate against abortion by employing images of the fetus as a baby, suggesting “that abortion is a violent choice” involving the murder of a baby (Halva-Neubauer & Zeigler 109). While their arguments mainly appeal to feelings and personal sense of

morality, pro-life activists also employ tactics that appear educational at face value. They seek to demonstrate that the woman and unborn baby have an intimate connection, attempting to depict abortion as a women's issue while also further appealing to emotions (Halva-Neubauer & Ziegler 110). Pro-life activists clearly seek to appeal to the emotions of others and pro-life tweets are likely to serve a similar purpose.

### **Abortion Attitudes and Twitter**

When individuals hold strong attitudes, as Mooney and Luker have explained, they are likely to express them on a platform like Twitter. Abortion is likely the subject of much of the political discourse on Twitter. Luker and Emerson's insights into abortion demonstrate that pro-life and pro-choice activists have contrasting and deeply held values and concepts of morality which Kaposy mentions how integral abortion attitudes are to one's cultural identity. These characteristics render abortion a topic where people outwardly express their beliefs. Across the literature, there are clear differences in the emotions, word choice, and strategies to endorse beliefs between those who are pro-life and those who are pro-choice. This research provides a frontier for further research; people on the two sides of the abortion issue must express their attitudes differently, especially on a platform like Twitter.

## Chapter 3

### Theoretical Approach

Abortion has been discussed and debated for many decades, so there is much research that analyzes attitudes on the different sides of the debate. This work suggests that attitudes on the two sides of the issue reflect differences in inherent values, worldviews, emotions, forms of attitude expression, and purpose of these attitudes on the two sides of the issue. However, previous literature does not delve into how these distinctions translate to the dialogue on Twitter. As a more modern tool for attitude expression, this analysis will examine how activists on both sides of this issue tweet differently. I am interested in whether these same disparities exist on a social media platform and how the different viewpoints are conveyed on Twitter.

There is general agreement that Twitter is a common outlet for activists to express their political attitudes. Originally a social platform for keeping in contact with friends, Twitter evolved into a tool for critiquing current issues in society (Park 1642). With the rise of modern technology, Twitter has become a popular environment for political activists and activist organizations to express their stances. It is a convenient resource for them to endorse their beliefs because it provides a low-cost, regularly updated platform for communication (Conway et al. 366). Political debate has become so prevalent on Twitter that some researchers have already conducted analyses on the types of political language used, including opinion mining, political orientation detection, and sarcasm detection (Kannangara 752). Prior work suggests that activists are using Twitter for polarizing and relevant political issues, which includes abortion.

## The Purpose of Tweets on Abortion

As Luker's work demonstrates, the two viewpoints of the abortion debate are rooted in contrasting and mutually exclusive worldviews. Across the literature, there is also consensus that pro-life and pro-choice activists have different purposes when advancing their arguments. While Kumar's work shows that emotional appeals are central to pro-life activists, pro-choice activists will use an educational approach that is not angry in nature. Pro-life activists do not need to educate the public because their beliefs are from longstanding norms (Kumar 531). The pro-choice perspective, however, is a newer idea, defying many traditional views on the role of the woman. Because it challenges the deeply held belief in the sacredness of embryonic life (Luker 130), pro-choice activists are required to "teach" their pro-life counterparts about their views on the issue. Mainly, their position is an issue of legality and justice for women, due to the concept of justice between the sexes that Luker discusses (Luker 176). As Karlan and Ortiz discussed, pro-choice advocates believe that it is not legal for the government to have access to women's bodies in that way (Karlan & Ortiz 872) and criminalizing abortions compromises personal liberties of women (Karlan & Ortiz 876). Pro-choice activists, therefore, need to educate those with pro-life attitudes on these ideas, which challenge many older ideas.

***H1: Pro-choice activists are more likely to post tweets that are educational in nature than their pro-life counterparts.***

Pro-life activists recognize abortion as an issue of morality and will take a contrasting approach to push their own arguments. The literature generally agrees that emotional appeals are central to the pro-life argument. As Luker's concepts of worldviews suggest, pro-life activists see abortion as an issue of morality that defies divine law (Luker 174). Therefore, we can

assume that these activists will strive to “moralize” the population through appealing to emotions (Wisneski & Skitka 140). The pro-life argument seeks to emphasize the personhood of the unborn baby and therefore many activists will use images of the fetus as a baby (Hopkins et al. 397). They also aim to help others empathize with the baby and realize that abortion is a violent choice (Halva-Neubauer & Zeigler 109). The use of imagery and emphasis on the fetus as a “baby” and therefore a valued person are emotional appeals that these advocates employ. They also frame abortion as a women’s issue, suggesting that aborting a baby deprives a woman of an intimate connection (Halva-Neubauer & Zeigler 110). These types of appeals are key to advancing the pro-life argument and there are unlikely to be pro-choice tweets that implement similar strategies.

***H2: Pro-life activists are more likely to make use of emotional appeals in their tweets than pro-choice activists.***

Although educational and emotional appeals seem antithetical, they are not mutually exclusive. In other words, a tweet can be both educational and emotional. Tweets that serve both purposes are generally assumed to appeal to both those who think about abortion as a rational and scientific issue and those who see abortion as a compassion issue. Anti-abortion activists have a worldview that is two-fold; they see abortions as a rejection of God’s teachings of morality (Luker 190) and a denial of the biology that a fetus and a person are interchangeable (Luker 184). Additionally, pro-life activists are in a more difficult position from a legal standpoint; since the *Roe* decision, legislators have been less likely to criminalize abortion again (Hopkins et al. 397). These ideas suggest that pro-life activists will need to convey messages that serve a dual purpose.

*H3: Pro-life activists are more likely to write tweets that are both educational and emotional in nature than their pro-choice counterparts.*

### **Abortion Activists and Word Choice**

In all forms of attitude expression, pro-life and pro-choice activists use different terminology to underscore the key points of their worldviews. The most obvious example of this phenomenon is the use of the word “baby” versus “fetus,” from pro-life versus pro-choice activists, respectively. That trend will likely continue on a platform like Twitter. However, the emotions behind their tweets may be dissimilar as well. Pro-life activists and pro-choice activists do not have the same ability to make meaningful policy change. Due to the current legality of abortion, pro-life activists need to amplify their own stance more, so they are more passionate when doing so (Hopkins et al. 397). Additionally, pro-life activists use language that is predominantly negative when endorsing their viewpoints, with disgust as the primary emotion (Kumar 533). Disgust, as researchers have concluded, is a technique these activists use to make others question their morals (Wisneski & Skitka 140). In general, pro-life activists stigmatize abortion, viewing women who have abortions as “dirty” and recognizing it as a violation of social norms (Patev et al. 88). On a platform like Twitter, we can expect that angry language is more common among pro-life activists. Inflammatory language, as Kumar points out, is language that incites anger and hatred “that emerges when social taboos or social norms...are violated” (Kumar 531). In this analysis, I will be detecting anger that results from this type of disgust, which I will classify as “inflammatory” language.

***H4: Pro-life activists are more likely to use inflammatory language in their tweets than their pro-choice counterparts.***

Quantitatively, pro-life and pro-choice tweets are likely to show variation in terms of word count. Tweets with more words are likely trying to explain an idea more, so we can expect that one side of the issue may be more likely to explain and justify their point of view. As Kumar discusses, pro-choice attitudes are deviations from values and ideas that people have held for centuries (Kumar 531). In fact, the idea of a working woman who may need to terminate a pregnancy did not emerge until the 1960s; only then did women begin to question what “work” means in their lives (Luker 117). This challenge to old values only emerged within the last century, so it will take more explanation to justify why we should defy traditional beliefs. Therefore, pro-choice activists will have a greater need to justify and explain these new ideas, requiring more words.

***H5: Pro-choice activists are more likely to use more words in their tweets than pro-life activists.***

### **Twitter Behavior Across Organizations**

Abortion has become such a popular movement that there are many activist organizations to endorse the pro-life and the pro-choice sides. Since abortion is an example of a morality policy, it motivates a great deal of agenda-setting and the formation of interest groups (Mooney 679). Across activists who participate in activist organizations, there is agreement that abortion has a similar degree of salience (Kaysen & Stake 2379). Additionally, activists on the same side of the issue share similar values (Kaysen & Stake 2390). Not only do abortion activist groups

have fervent beliefs, they are also prevalent. Ever since the 1973 *Roe* decision, there has been significant growth in these types of organizations (Fried 10). In recent years, these groups have resorted to Twitter and employ techniques to disseminate their messages to larger masses of people (Han et al. 393). Commonalities in worldviews, salience of abortion, and need to spread their beliefs to large groups of people suggests different activist groups have the same motives.

***H6: Different activist groups on the same side of the issue are likely to exhibit similar purposes, sentiment, and word count.***

### **Other Explanations & Unobservable Variables**

Most of the literature demonstrates that pro-life and pro-choice activists express their attitudes differently, but this outward expression may not be the same on a social media platform. This analysis will build on much of this previous research by studying a new environment where these activists share their viewpoints. Many of these hypotheses assume that on Twitter, differences between outward expression of pro-life and pro-choice attitudes are the same as they are through other mediums of communication. However, other findings may emerge since this platform has not been used to compare abortion attitudes. Unobservable variables, including demographic variation among activists, location of activists, and the types of preexisting content on Twitter may influence variation in pro-life and pro-choice tweets. For example, certain activist groups may be more likely to use Twitter. People in certain areas also might have better access to Twitter, so the tweets may not represent the U.S. population. These phenomena are impossible to fully account for but important to consider when explaining the variation between pro-life and pro-choice tweets.



Based on existing research and the conclusions drawn from them, we can expect that differences in abortion stance result in differences in outward expression of such beliefs. Whether activists are pro-life or pro-choice influences how much inflammatory language they use when expressing their beliefs, how they convey their messages, and what appeals they implement. Previous research explores belief systems underlying the pro-life and pro-choice stances as well as how they articulate these beliefs. Additional researchers also conduct sentiment analyses on political Twitter data. However, no study combines these two areas of research and investigates how activists outwardly express abortion attitudes on Twitter. Prior research has introduced this new area of study and possible conjectures about what we may find, but this study will combine concepts outlined in these previous studies.

## Chapter 4

### Research Design

#### Testing My Hypotheses

This study involves the collection and analysis of Twitter data to measure how pro-life and pro-choice activists differ in their outward expression of attitudes. I studied the individual tweets in terms of their purpose, sentiment, likelihood of using inflammatory language, and word count. Since Twitter data are raw and do not have any values attached to them, I employed a content analysis where I manually coded the tweets based on my variables of interest. I converted my hypotheses into six variables: stance on the abortion issue, whether the tweet is educational, whether the tweet is emotional, whether the tweet exhibits a positive or negative sentiment, whether the tweet is inflammatory, and the word count of the tweet.

I coded most variables as binary variables so I can see whether pro-life or pro-choice activists are more likely to tweet a certain way and whether that way is consistent with the theories and worldviews discussed in the previous sections. In other words, pro-life and pro-choice activists are expected to vary in their likelihood of having tweets with a certain trait. Binary variables make it easy to calculate likelihood; a tweet either is or is not educational, emotional, or inflammatory and cannot have both a positive and negative sentiment. I will also correlate word count with stance on the issue which is the only numerical value in my dataset.

This analysis has multiple dependent variables and only one independent variable. While the independent variable is stance on abortion, the dependent variables are whether the tweet is educational, whether the tweet is emotional, sentiment of the tweet, whether the tweet is inflammatory, and word count of the tweet. These dependent variables are independent of one

another and therefore will be studied independently. Since this study explores mainly categorical variables, chi-squared and logistic regression tests are most appropriate. I will perform separate chi-squared and logistic regression tests on the independent variable with each dependent variable individually. The chi-squared tests will give some preliminary insight into whether the pairings of variables are related, and logistic regression will determine the strength and direction of the relationships.

My approach has various strengths and limitations. The data are sampled directly from Twitter, which is exactly how I am measuring my dependent variable. I also built the database from scratch so I will not have to account for missing values and the data exist in the exact format I need for my analysis. The data are also coded based on a human reader which eliminates the flaws in a machine learning algorithm. Additionally, since the data are collected from verified Twitter accounts, there will not be any fake accounts or bots that will need to be filtered out. This approach also uses a type of data not included in other studies of abortion attitudes.

There are limitations to this research design. Since a human reader coded the tweets, there is subjectivity. If someone else had coded the tweets, the analysis could yield different results so it is important to have very clear coding criteria. The sample also is not representative of all abortion activists because it is limited to six activist groups. A smaller sample was necessary because of the limitations of Twitter scraping but the results may be less generalizable. The ability to only scrape large amounts of tweets from particular users is a limitation that compromises the external validity of the measures. However, based on the time and technology constraints, this approach was most suitable for studying abortion attitudes on Twitter.

## **Scope**

The Twitter dataset consists of 2,100 tweets gathered from six different organizations with a clear stance on abortion. However, the unit of analysis will be the individual tweets, rather than the organizations. The aim of this research is not to compare activist organizations but rather see social media activity from pro-life and pro-choice activists at large. I scraped Twitter data from six organizations rather than thousands of different activists due to the technological limitations. It was not possible to gather large amounts of Twitter data on the topic of abortion from many different activists, so I had to choose specific users to amass many tweets on abortion. This study looks at a certain number of tweets from each organization rather than a certain time period. While the time periods vary for each organization, they generally range from 2019 to 2021.

## **Sampling**

To compare the outward attitude expression of pro-life and pro-choice activists, this analysis will examine Twitter data from six prominent abortion-related organizations. I will study Planned Parenthood, NARAL, and National Abortion Federation on the pro-choice side and National Right to Life Committee, March for Life, and Live Action on the pro-life side. I selected these organizations based on their prevalence in the abortion and anti-abortion movements. Among pro-choice interest groups, Planned Parenthood is the largest provider of reproductive services in the United States, NARAL is among the largest non-profit organizations in the pro-choice movement with over 2.5 million activists, and National Abortion Federation is one of the largest professional organizations of abortion providers. On the pro-life side, National

Right to Life Committee is the oldest and largest anti-abortion organization in the United States, March for Life is a large anti-abortion rally that has been held annually since the one-year anniversary of the *Roe v. Wade* ruling, and Live Action is one of the leading pro-life and human rights organizations in the United States.

This study requires a large amount of Twitter data so my results can be generalizable to the larger Twitter community. However, the Twitter API has limitations that restricted what types of tweets I could collect. If I gathered my data solely based on the keyword “abortion,” I would only be able to collect 200 tweets which is too few to make accurate conclusions. It also does not guarantee I will get an equal ratio of pro-life and pro-choice tweets, which is necessary for this analysis. When collecting Twitter data from specific users, however, it is possible to do 16 collections of 200 tweets, totaling 3,200 tweets per user. In this analysis, I followed that procedure, compiling the 3,200 most recent tweets from these six organizations for a total of 19,200 tweets. I also was able to ensure that I had an equal number of tweets from both sides of the issue by sampling from three pro-life and three pro-choice groups. From each organization’s 3,200 tweets, I randomly sampled 350, totaling 2,100 abortion-related tweets. While there are separate organizations included in this study, this study will analyze all pro-life and all pro-choice tweets together, representing activists on both sides.

## **Operationalization**

### *Purpose*

Purpose is broken into two variables: educational and emotional. I chose these variables based on the previous literature; A tweet can be educational, emotional, both, or neither.

Measuring purpose involves the human reading and manual coding of a tweet based on what the user is trying to accomplish with the message. Both variables are binary; tweets either are or are not educational or emotional. Educational and emotional tweets encourage other users to adopt the worldview of pro-life or pro-choice activists and therefore see that a side of the issue is “right” or “wrong” but take different approaches. Educational tweets present “logic” and “facts” to make one stance seem more rational than the other. Emotional tweets, on the other hand, question the values and morals of users or encourage feelings of empathy for people who may be suffering because of whether abortion is legal. A clear coding scheme for purpose is crucial for maximizing reliability because manually coding the tweets introduces a degree of subjectivity. This measure is the most valid way to assess whether these attitudes are consistent with theories on abortion worldviews and attitudes. Only through directly reading the tweets can we assess whether the Twitter behavior is consistent with previous theories.

### *Language*

Language is the type of word choice employed in the tweets that conveys and evokes certain feelings on the issue. As suggested by the literature, the type of language used is a result of the worldviews of the activists and how those worldviews operate in society. In this analysis, I break down language into sentiment and use of inflammatory language. Sentiment can either be positive, negative, or neutral. A positive sentiment endorses or celebrates a particular idea or event. A tweet with a positive sentiment also may show satisfaction with the current state or direction of the abortion issue. Conversely, a negative sentiment refutes, criticizes, or shows disapproval of an idea or event. Inflammatory language is a particular type of language that incites feelings of anger. Language that is inflammatory almost always has a negative sentiment but uses stronger language that will villainize the opposing side or alarm users about the dangers

of supporting other viewpoints. Part of my analysis of language will include whether one side is likely to incorporate such language into their tweets and how it may support theories identified by previous researchers. A clear coding scheme is essential for language as well to ensure the reliability of the measure and eliminate the subjectivity. Since these components of language are important in the abortion debate, this is a valid way of testing my hypotheses since these traits can only be found through direct reading of the tweets.

#### *Word Count*

Accounting for the number of words used in a tweet assumes that one side will need to explain their point of view more. This idea is connected to Luker's suggestion that pro-choice activists have newer values and perspectives that will require further explanation. This variable is quantitative and provides a way of "measuring" the theories quantitatively that other literature has introduced. Through this variable, we will see if Twitter behavior of abortion activists is consistent with the abstract ideas raised about abortion-related worldviews. It also is a measure that does not have the same subjectivity of the other measures in the analysis. It is a reliable measure because it relies on a computerized system to count the words in a tweet. It is also valid because it is a quantifiable way to determine if Twitter activists need to explain their viewpoint more, a phenomenon discussed in previous work.

#### *Alternative Measures*

There are other possible ways of exploring Twitter data that I could have employed in this study. I could have explored more facets of the Twitter data in terms of how the tweets convey their stance on abortion but due to time constraints, I would have to study a lot fewer tweets yielding less generalizable results. I could have also incorporated other forms of media into my analysis including news articles or data from other social media outlets. However, this

design would create messy data that would be difficult to convert into a useful form. Twitter has an API that makes it easy to compile large amounts of data from the platform. I could have also gathered tweets based on the term “abortion.” However, the Twitter API only allows 200 of tweets to be gathered at a time based on keyword, some of which may be bots. Therefore, this research design is the most logical to follow when answering my research question.

### **Coding**

I built my own dataset around the 2,100 tweets that I scraped by manually coding them based on my variables of interest. I have six key variables I investigated: abortion stance, whether the tweet is educational, whether the tweet is emotional, sentiment, whether the tweet is inflammatory, and word count. Abortion stance is coded as a binary variable, with a 0 representing pro-choice and a 1 representing pro-life. The purpose of tweets is separated into two binary variables for educational and emotional since those categories are not mutually exclusive. Sentiment represents whether a tweet is positive or negative, with a 1 representing positive, a -1 representing negative, and a 0 representing neutral. The inflammatory variable is also binary, with a 1 signifying an inflammatory tweet. Word count is the only quantitative variable that totals the words in the tweet that was scraped.

It was important to have consistent criteria when coding the tweets based on these traits. This consistency is necessary to maximize the reliability of the coding scheme. When coding the purpose, I was able to identify similar types of tweets that were coded as educational, emotional, both, or neither. Educational tweets convey news in the abortion or anti-abortion movement, explain abortion stances in terms of “science” or “logic,” or discuss implications for



different policies, court rulings, or ideas. Emotional tweets evoke feelings of sympathy or empathy, pique personal values, or frame a side of the issue as more “just” or “moral.” Many emotional tweets suggest that whether abortion is legal or not will oppress a certain group. Tweets can be both educational and emotional; many of them conveyed logic and facts backed with why others should care or feel for a certain group. Tweets coded as neither educational or emotional were not relevant to my analysis; they discussed topics other than abortion and represent a very small portion of the data.

Sentiment represents a tweet that presents positive or negative information. A positive tweet endorses its own side without criticizing other viewpoints, praises an idea, or celebrates a particular event. It may communicate news as an educational tweet does, but it does so in a way that expresses that it is good news. Conversely, a negative tweet criticizes the opposing side, shows disapproval of events that are happening, or otherwise alarms the public that an idea, event, or stance is “bad” or “wrong.” Negative tweets can often convince individuals that the opposite stance on abortion is evil or immoral. Educational tweets can also be negative if they convey adverse reactions to events or ideas.

Inflammatory tweets use strong language to elicit anger or action against the other side. Almost all inflammatory tweets are negative even though not all negative tweets are inflammatory. They use strong language like “evil,” “cruel,” or “extremists” to describe the opposing side of the issue. They sometimes will try to instigate action, with statements like “all abortion clinics should be shut down” or “the pro-life movement should be killed.” However, inflammatory tweets do not need calls to action and not all tweets with calls to action are inflammatory. Inflammatory tweets use stronger language than regular negative tweets, striving to make the public angry at those who do or do not support abortion.

The table below shows the coding scheme I followed when manually coding the tweets based on these criteria. See Appendix for more examples of how I coded the tweets in the dataset.

**Table 1. Coding Scheme**

<b><u>Characteristic</u></b>	<b><u>Example</u></b>
Educational	@NARAL: “Only 14 states and DC have protected the right to access abortion. So what does that mean? If <i>Roe</i> was overturned, abortion access in over half the states in the country would be in serious jeopardy.”
Emotional	@March_for_Life: “For every child lost to abortion, there is a mother and father suffering.”
Positive	@PPFA: “Thanks to <i>Roe v. Wade</i> , we have the right to abortion. We are working toward a future where abortion is more than that — and equally accessible, so that everyone can take full control of their bodies. #RoeAnniversary”
Negative	@NARAL: “Abortion bans are about power. Abortion restrictions are about control. It’s about taking away our freedom to determine our lives and our futures. And we can’t let them have that power. #NoOn115 #ReproFreedomVoter”
Inflammatory	@LiveAction: “The media’s silence on the risks women face when they enter an abortion facility and the heinous violence committed against the children who die there is egregious.”

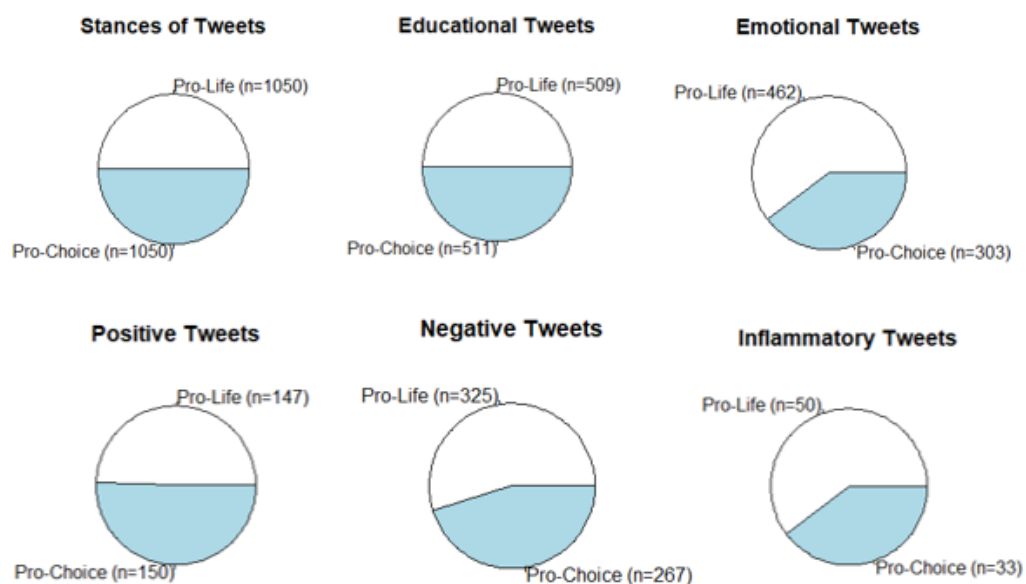
## Chapter 5

### Analysis

#### *Descriptive Statistics*

**Table 2. An Overview of the Data Collected Based on 2,100 Tweets**

Total number of tweets collected	2,100
Educational tweets	1,020
Emotional tweets	765
Positive tweets	297
Negative tweets	592
Inflammatory tweets	83



**Figure 1. Breakdown of Pro-Life and Pro-Choice Tweets**





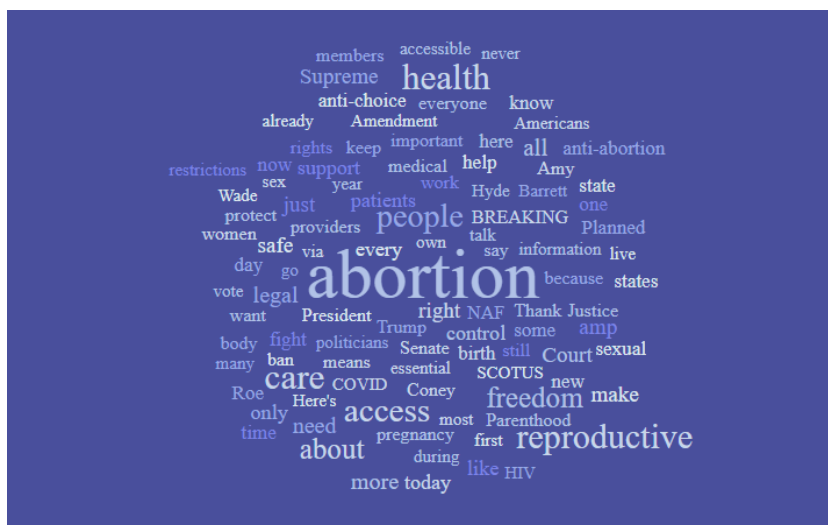


Figure 5. Pro-Choice Organization Word Frequencies

On the pro-life side, “abortion” was the most frequent word across all organizations. Unlike pro-choice organizations, words like “human,” “life,” and “baby” are more frequent, emphasizing the personhood of the unborn. Words like “kill” and “innocent” are also common and juxtaposed in many tweets, introducing abortion as an issue of morality rather than women’s rights. Another finding is that “pro-abortion” is common in pro-life tweets, while “anti-choice” is used in pro-choice tweets, suggesting how the opposing sides frame one another.

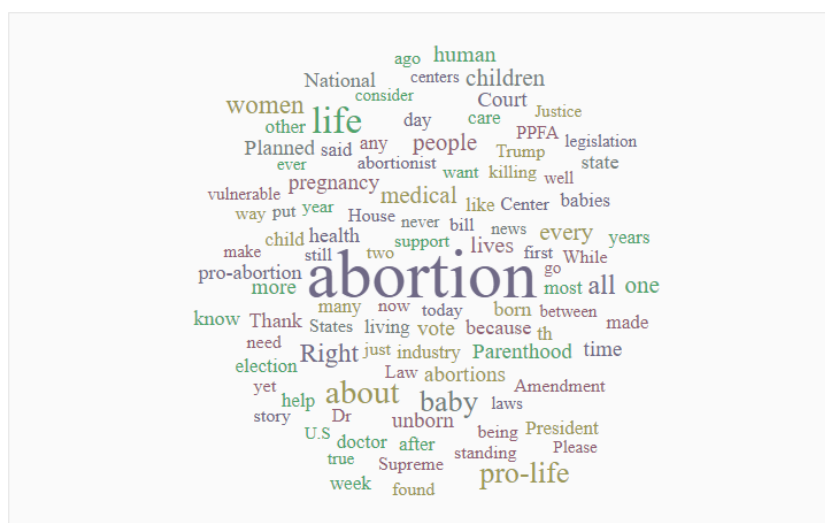


Figure 6. National Right to Life Committee Word Frequencies



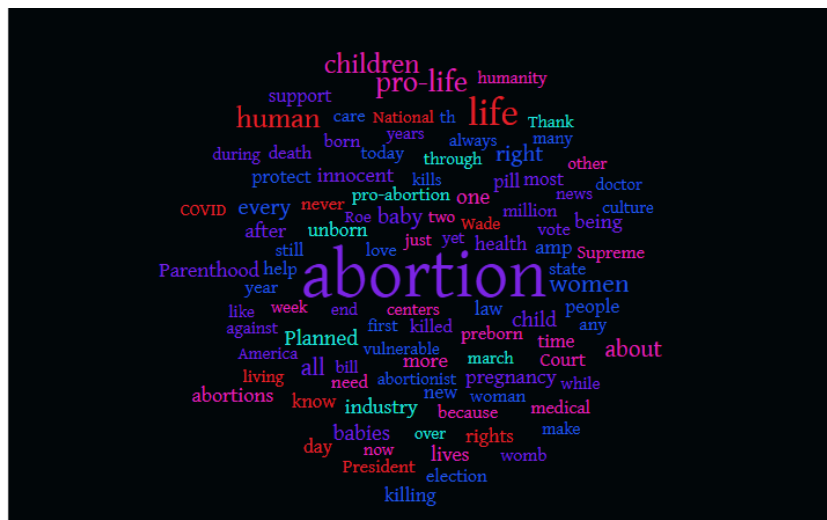


Figure 9. Pro-Life Organization Word Frequencies

### Analyses

This analysis deals with a single categorical independent variable and multiple dependent variables that will be studied individually, most of which are also categorical. First, I will run multiple chi-squared tests as a preliminary analysis. These tests will determine if stance on abortion is related to my dependent variables. I will then run multiple logistic regressions to determine the direction and magnitude of the relationship as well as the statistical significance.

Table 3. Chi-Squared Results

Variable	X-Squared	Degrees of Freedom	p-value
Educational	0.004369	1	0.9473
Emotional	53.012***	2	<0.0001
Sentiment	7.6914*	2	0.02137
Inflammatory Language	3.1013.	1	0.07823
Word Count	144.06***	37	<0.0001



The chi-squared tests demonstrate there are strong statistically significant relationships between emotional tweets and stance on abortion as well as word count and stance on abortion. Stance on abortion also has a relationship with sentiment and a possible relationship with inflammatory language. Educational tweets are the only variable that clearly have no relationship with stance on abortion, according to these results. The remaining variables, however, are worth investigating.

**Table 4. Logistic Regression Results**

Variable	Coefficient	Standard Error	t-value	p-value
Educational	-0.002395	0.021829	-0.11	0.913
Emotional	0.15280***	0.02079	7.349	<0.0001
Sentiment	-0.05751*	0.02781	-2.068	0.0388
Inflammatory Language	0.015995.	0.008536	1.874	0.0611
Word Count	-2.2152***	0.2118	-10.46	<0.0001

Consistent with the results from the chi-squared tests, emotional tweets and word count have the strongest statistical significance with stance on abortion. The negative relationship between stance and word count suggests that pro-life activists are less likely to use more words in their tweets. The relationship between stance and emotional is positive which demonstrates that pro-life activists are more likely to post emotional tweets. Sentiment also has a statistically significant relationship with stance and the direction indicates that pro-life activists are more likely to post negative tweets. Inflammatory language has a relationship that is borderline statistically significant, with pro-life activists showing a slightly higher likelihood of posting inflammatory tweets. Educational tweets have no relationship with stance on abortion.

**Table 5. Logistic Regression Results at the Organization Level**

Organization	Stance	Educational Coefficient	Emotional Coefficient	Sentiment Coefficient	Inflammatory Coefficient	Word Count Coefficient
Planned Parenthood	Pro-choice	-0.10476	-0.079048	0.14716	-0.02290	1.2029
NARAL	Pro-choice	0.06381	0.083810	-0.08211	0.03976	-0.8857
National Abortion Federation	Pro-choice	0.04095	-0.004762	-0.06211	-0.01738	-0.3171
NRLC	Pro-life	-0.0452240	-0.006134	0.006828	-0.03624	1.8238
March for Life	Pro-life	0.0004903	-0.031848	0.149685	-0.03909	-1.5676
Live Action	Pro-life	0.0448619	0.038091	-0.156962	0.07554	-0.2562

Since this analysis includes six different activist groups, I wanted to run additional regression tests to see if any individual organization on the pro-life or pro-choice side is significantly more likely to tweet a certain way than other groups on the same side of the issue. As my baseline for comparing the organizations, I generated two rows: one for mean pro-life values and one for mean pro-choice values for each of my variables. I then ran two logistic regressions comparing these activist groups: one comparing pro-life groups to the pro-life baseline and one comparing pro-choice groups to the pro-choice baseline. From these results, I was aiming to see if an individual organization had significantly different tweets from the other organizations on the same side of the issue. For every organization and every variable, there is a statistically insignificant relationship. This finding suggests that no organization's tweets significantly vary from the tweets of all organizations with their same beliefs.

## **Chapter 6**

### **Discussion**

The results demonstrate that pro-life and pro-choice activists tweet differently, though not in all of the ways I anticipated. The word clouds show that there are many similarities among the terms used for organizations who have the same stance. These similarities are evidence for the worldviews presented in previous literature. The sides have contrasting views of the role of the woman and the nature of the abortion issue. The variation in terminology used also introduces how we can expect that pro-life and pro-choice tweets convey different messages, which are seen through the ways in which the tweets are coded.

As expected, pro-life and pro-choice tweets vary in purpose though not exactly in the ways I originally predicted. Activists on both sides seek to “educate” the public about their viewpoint with no statistically significant variation. This finding refutes the hypothesis posed earlier, which states that pro-choice activists are more likely to post educational tweets. However, pro-life activists are far more likely to incorporate emotional appeals into their tweets. These results support the conjecture that pro-life activists feel a greater need to make others feel empathetic to the unborn. Additionally, pro-life activists are more likely to tweet using both educational and emotional appeals, supporting another one of my hypotheses. These relationships hint that because of the current legality of abortion, pro-life activists will have to attempt multiple appeals to make their voices heard.

The results for sentiment are consistent with my hypotheses. Pro-life activists are more likely to exhibit a negative sentiment on Twitter. As previously stated, this result is likely related

to the current legality of abortion, which makes it harder for these activists to promote any policy change. Pro-life activists are also more likely to use inflammatory language, especially when portraying the nature of abortion. Overall, the language and sentiment of tweets align with much of the previous research on abortion worldviews and attitudes. Word count reinforced my hypothesis as well, where pro-choice activists will use more words to relay their ideas. Yet since neither side is more likely to post educational tweets, the results do not support that explanation.

When studying the organizations individually, the results show that compared to the overall pro-life and pro-choice means, no group tweets significantly differently among other activist groups on their same side of the issue. These results are consistent with my hypothesis, which states that pro-life and pro-choice organizations generally tweet similarly. This theory is founded in the idea that organizations hold similar worldviews, so they would generally express their attitudes in a comparable way.

## Chapter 7

### Conclusion

Overall, it is evident that pro-life and pro-choice activists use Twitter differently and the discrepancies across activists discussed in the literature translate to social media. The abstract ideas of worldviews, the current legal status of abortion, and the differences in attitude expression through other mediums all support these findings. Both sides are almost equally likely to educate the public on their attitudes, but pro-life activists are far more likely to infuse emotional appeals into their arguments. Additionally, pro-life activists are more likely to post tweets that serve to both educate and appeal to emotions. In terms of sentiment, pro-life activists are more likely to write negative messages and use inflammatory language, also consistent with what we anticipated. Pro-choice activists, however, are likely to write longer tweets than their pro-life counterparts. At the organization level, the logistic regressions yielded statistically insignificant results that were consistent with the original hypotheses. If organizations hold the same stance on the abortion issue, they will generally tweet similarly to convey these underlying attitudes. The lack of any significant findings is likely rooted in the worldviews discussed previously, where organizations with similar worldviews will express their attitudes in comparable ways.

The overarching differences between pro-life and pro-choice activists support much of the previous literature. The results are evidence for the abstract ideas of worldviews introduced in Luker's work. The word clouds, which displayed the most frequent terms, showed words like "human," "women," and "pregnancy" on the pro-life side. These words are consistent with Luker's idea that women should be expected to be mothers and that is the most important role a woman will serve (Luker 169). On the pro-choice side, terms like "access," "right," and

“sexual” appear more often, aligning with Luker’s ideas that to pro-choice activists, sex is secular (Luker 176) and women should be allowed to engage in these behaviors without worrying about the sacrifices of a child (Luker 181). The word choice of abortion activists reflects their deeply held worldviews, which translates to a social media platform like Twitter.

The other content in the tweets supports these worldviews as well. The negative sentiment and inflammatory language more common in pro-life tweets agree with Luker’s theories that pro-life activists see abortion as “wrongful” and harming families, which are inherently sacred (Luker 173). These ideas, in turn, would spark negative emotions, including anger. Similarly, pro-choice activists feel they must explain their perspective more, given that it challenges moral principles that have stood for centuries (Luker 185). The greater word count in pro-choice tweets justifies this phenomenon. The worldviews explored prior to this analysis are evident in activists’ Twitter behavior.

The conclusions of other analyses on abortion attitude expression are also consistent with my own conclusions. The negative sentiment and inflammatory language more evident in pro-life tweets match the conclusions of Hopkins and Ntontis as well as Kumar. They suggest that many pro-life activists have attitudes rooted in disgust and disdain for the act of abortion, which would translate to negative emotions (Kumar 534). My work reinforces their ideas by showing that these attitudes are clear on social media as well. Similarly, pro-life activists use emotional appeals more frequently in their tweets. Halva-Neubauer and Ziegler as well as Hopkins discuss how pro-life activists use imagery of mothers and fetuses, emphasizing the personhood of the unborn and the intimate connection between a mother and a baby. While these researchers were discussing other forms of abortion attitude expression, my work builds on their research by proving that this difference is evident on social media too. We inferred that pro-choice activists

are more likely to post educational tweets. This finding did not turn out to be true, but we can speculate that as Seipel pointed out, the two sides of the issue struggle to find common ground (Seipel 522). Therefore, both sides will need to “educate” the public on their stance in hopes that more people will adopt their side. Overall, my work built on that of previous researchers; it investigated a different platform and reaffirmed the arguments they made.

These conclusions underscore how Twitter is a popular arena for political debate. Abortion is a clear example of this notion, especially because moral issues have a high degree of salience (Mooney 676) and much room for discussion. Abortion activist groups turn to Twitter to keep users informed about their stance and can convey messages with a limited number of characters. The short posts still establish clear stances, emotions, and ideas about abortion, as the data suggest. Among the sample of tweets used in this analysis, clear patterns of attitude expression emerged. These findings render Twitter as much of a platform for political communication as any of the other mediums discussed in previous work.

While my conclusions agreed with previous work and most of my conjectures, there were limitations to this analysis. My analysis did not cover a large sample of Twitter data. I was limited to six specific abortion organizations, rather than the larger population of abortion activists on Twitter, due to time and technological constraints. Therefore, it is difficult to say how generalizable my results are. My dataset also only includes abortion interest groups, rather than individuals with strong abortion beliefs. Such large organizations may have regulations about what types of content that they can post. Therefore, they may limit the number of inflammatory messages they post, for example, due to their need to maintain a professional social media presence. Additionally, I coded the tweets manually so there is a degree of

subjectivity to my results. Since data scraping from social media is a relatively new research frontier, this study opens possibilities for future research.

Further research can examine abortion attitudes on other social media platforms. Facebook, Instagram, and YouTube all have APIs where researchers can extract user data. These sites are other ways to measure how activists express their attitudes online, where my results could possibly be generalized to other social media besides Twitter. With the rise of machine learning techniques, other research can develop predictors of whether a tweet is pro-life or pro-choice based on data from existing accounts. Machine learning eliminates the subjectivity of my research and can detect other ways of determining whether a tweet will be pro-life or pro-choice. With increased use of social media as a form of political discourse, more research can be done on how political attitudes translate to messages on these platforms.



## Appendix A

## Detailed Coding Scheme

Trait	Examples
<p><b>Educational:</b> These kinds of tweets seek to teach other people about a particular stance. They may convey news, state facts backed by biology, or heighten awareness about a belief system. They aim to convey information though they are not necessarily objective. Overall, these tweets strive to make logical and rational arguments about a side of the issue.</p>	<p>@PPFA: “State abortion restrictions are not the primary driver of declines in US abortion rate, but they do make it harder for the most marginalized individuals to access care”</p> <p>@NARAL: “Only 14 states and DC have protected the right to access abortion. So what does that mean? If <i>Roe</i> was overturned, abortion access in over half the states in the country would be in serious jeopardy.”</p> <p>@nrlc: “The stakes are higher than ever for the likes of @PPFA as roughly 40% of abortions are now chemically induced. TN took the first step to require that abortionists inform women, in person or over the phone, that ‘abortion reversal’ exists.”</p> <p>@LiveAction: “Biology 101: Sperm &amp; ovum are not humans. They can fuse to make a human. Abortion kills a unique human being with distinct DNA from her mother. Stay in class.”</p>
<p><b>Emotional:</b> These tweets tap into the feelings and values of others. They may attempt to make people feel empathy for the unborn or women without abortion access, suggest that a group is “deserving” of rights, tell personal accounts, or portray the opposing side as “evil.”</p>	<p>@PPFA: “Banning abortion is NOT what people in America want — and we will never stand for it. Together we stand, unified and defiant, to say: get your BANS OFF MY BODY.”</p> <p>@NARAL: “A third Trump Justice threatens reproductive rights, civil rights, voting rights, LGBTQ+ rights, immigrant rights—the list goes on. We can’t let Trump rush through the #SCOTUS nomination process. There should be no confirmation until after the inauguration. #LetThePeopleDecide.”</p> <p>@nrlc: “A nurse was misled into thinking she was assisting in a miscarriage but then found out that it was an elective abortion. Her superiors ‘callously refused to relieve her.’ Fearing retaliation, she went through with assisting the abortion &amp; was traumatized.”</p> <p>@March_for_Life: “For every child lost to abortion, there is a mother and father suffering.”</p>

<p><b>Both Educational and Emotional:</b>          These tweets convey news, ideas, or facts but do so in a way that is not objective. They use logical ideas to evoke a particular emotion or tap into feelings of others as a reaction to a particular event or idea. These types of tweets generally back assertions with saying why others should care.</p>	<p>@PPFA: “Abortion later in pregnancy is extremely rare: Most abortions happen before 21 weeks. Someone who needs an abortion later in pregnancy deserves our compassion and support.”</p> <p>@NatAbortionFed: “There is no equality if women cannot control if, when, and how they become pregnant or whether or not to remain pregnant. Women must be able to make their own reproductive decisions and have the ability to act on those decisions.          #womensequalityday #NationalWomensEqualityDay”</p> <p>@March_for_Life: “Thanks science for letting us know for certain that a unique, irreplaceable human is created at the moment of conception. #prolifeisproscience”</p> <p>@LiveAction: “Forceps are used in abortions to grasp, crush, and pull a child's body apart. It's time to end the brutality. It's time to end abortion”</p>
<p><b>Positive Sentiment:</b>          These types of tweets endorse a side of the issue in a way that praises it. They may celebrate an event in the news with words like “Good news!”, suggest you are “doing good” by supporting a side of abortion, or motivate others to support a belief system or organization. In general, positive tweets emphasize an idea without criticizing other ideas.</p>	<p>@PPFA: “Thanks to Roe v. Wade, we have the right to abortion. We are working toward a future where abortion is more than that — and equally accessible, so that everyone can take full control of their bodies.          #RoeAnniversary”</p> <p>@NARAL: “What are you looking forward to in 2021? We'll start. We're looking forward to expanding reproductive freedom federally.”</p> <p>@nrlc: “What's it like to be a pro-life advocate voting in a battleground state?” It means that, when you finally cast that vote, you feel a sense of honor, knowing that you have done your part to help preserve the American dream for the most vulnerable among us.”</p> <p>@LiveAction: “Good news! A notorious Florida abortionist James Scott Pendergraft appears to be liquidating his chain of abortion businesses.”</p>
<p><b>Negative Sentiment:</b>          Negative tweets criticize ideas, show negative reactions to events, or alarm the public about an idea that is “wrong” or “immoral.” They convey events with words like “unfortunately” or “shameful.” These types of tweets push forth an agenda by framing the opposing side as “bad.”</p>	<p>@NARAL: “Abortion bans are about power. Abortion restrictions are about control. It's about taking away our freedom to determine our lives and our futures. And we can't let them have that power. #NoOn115 #ReproFreedomVoter”</p> <p>@NatAbortionFed: “It is unconscionable that TX Governor Abbott is forcing health care providers to go to court to provide essential health care to their patients during a pandemic. #AbortionIsEssentialHealthCare”</p>

	<p>@March_for_Life: “Massachusetts is putting the safety of minors at risks as it lowers the age of legally obtaining abortion without parental consent to 16.”</p> <p>@LiveAction: “Shameful. Hollywood celebrities are raising \$ for abortion businesses to stay open &amp; continue taking innocent lives during #COVID19.”</p>
<p><b>Inflammatory</b> Inflammatory tweets are often (although not always) negative. They strive to elicit strong emotions or reactions, typically anger. They will use more alarming words like “evil” or “extremist.” At times, they may try to spur action with statements like “Shut down all abortion clinics!” or “Remove Trump from office!” The word choice in these types of tweets aim to make others “angry” about an idea.</p>	<p>@NARAL: “Your very powerlessness is the point. The cruelty is the fringe benefit.” Amy Coney Barrett is being rushed onto the Supreme Court—even after she refused to say if needing abortion care could be punished by DEATH. The cruelty is the point.”</p> <p>@NatAbortionFed: “Abortion is time-sensitive, essential health care that cannot be deferred just so a politician can score political points with their extremist base. We are proud of our members who are taking on these cruel and illogical restrictions. #AbortionIsEssentialHealthCare #COVID19”</p> <p>@nrlc: “The entire abortion industry must know that when they treat a born-alive human person as medical waste, a source for organ harvesting, or a creature who may be subjected to lethal violence with impunity, they will do so at grave legal peril. The #BornAliveAct would do just that.”</p> <p>@LiveAction: “We are defending human life. You’re supporting the killing of babies. The onus is on you to somehow defend that evil.”</p>
<p><b>None of These Traits (Coded as all 0s)</b> Some tweets may discuss abortion-related topics but do not contain any traits relevant to the study. They may promote an event, thank an activist, or celebrate a holiday relevant to abortion. However, they do not use any techniques to put forth an agenda and therefore were not important to this analysis.</p>	<p>@PPFA: “We’re coming at you live tonight from the NYC premiere of ‘Ours to Tell,’ our new short film with @AbortionStories, about four people living full and empowered lives because they had the freedom to access abortion. #OursToTell”</p> <p>@NatAbortionFed: “NAF will be out there tomorrow supporting our Louisiana members and the constitutional right to abortion. Join us! #MyRightMyDecision”</p> <p>@nrlc: “Congratulations @UnplannedMovie and @_AshleyBratcher for willing the award for best movie for mature audiences! #jobwelldone”</p> <p>@March_for_Life: “Happy birthday to our good friend and pro-life champion @cateici, president of @AUL! Thanks for another year of defending the most vulnerable among us.”</p>

**Off-Topic (Coded as all 0s):**

These kinds of tweets talk about a topic other than abortion. They may discuss elections, birth control, sexual assault, politicians, or euthanasia but never directly discuss the topic of abortion.

@PPFA: “Dealing with the aftermath of sexual assault can be overwhelming. Talking about trauma isn’t the same for everyone. Many people find it helps them heal. Others say it can feel like the trauma is happening all over again. It can take a lot of time—even years—to feel safe again.”

@NARAL: “Kamala Harris is a powerful, driven, ambitious woman. And she’s going to be our next vice president. But what does that mean for the future of representation in politics?”

@nrlc: “Every major disability advocacy organization in the United States that has taken a position on assisted suicide opposes it. There are compelling reasons why, and legislators and the public can learn from listening to disabled voices on this issue.”

@LiveAction: “New Zealand threatens its most vulnerable citizens with the legalization of euthanasia. The slaughter of the suffering should be outlawed.”

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## ACADEMIC VITA

### EDUCATION

**The Pennsylvania State University – Schreyer Honors College**, University Park, PA (May 2021)  
B.S., Social Data Analytics and B.A., Political Science  
College of the Liberal Arts Scholarship – Paterno Fellows Program (Four Years, Full Tuition)

### RELEVANT COURSEWORK

Data Science Through Statistical Reasoning and Computation; Emerging Trends in Data Science; Research Design for Social Data Analytics; Intermediate Programming; Object-Oriented Programming; Quantitative Political Analysis; Discrete Mathematics for Computer Science; Machine Learning; Analysis of Political Attitudes; Analytical Political Economy; Visual Analytics; Elementary Probability; Data Privacy & Security

### TECHNICAL SKILLS

Languages: Python, R, SQL, Java, XML  
Software: RStudio, MS Visio, MS SQL Server 2014 Management Studio

### RELEVANT EXPERIENCE

**Research Assistant** — *Penn State Department of Political Science* June 2020-August 2020

- Assisted a PhD. Candidate remotely to develop a supervised machine learning classifier using Twitter data
- Manually coded over 5,000 tweets based on whether they contained violent political rhetoric
- Collaborated with another undergraduate student to establish inter-coder reliability across our coding decisions

**Consumer Data Analytics Intern** — *The Hershey Company*, Hershey, PA May 2020-August 2020

- Internship program was canceled due to the COVID-19 pandemic

**Marketing Intern** — *Promotion In Motion Inc.*, Allendale, NJ June 2019-August 2019

- Conducted data-driven research to analyze the U.S. and Canadian consumer market pertaining to the Welch's Fruit Snacks brand
- Synthesized research, made findings, and proposed recommendations about the American and Canadian consumers
- Formally presented research to the company's marketing team and vice president

### CAMPUS ENGAGEMENT

**Club Officer** — *Penn State Club Track & Field* August 2017-present

- Elected to the officer board as Webmaster for the 2019-20 and 2020-21 academic years
- Ran 400m and 800m events for the team that won the 2018 National Intercollegiate Running Club Association National Championship, placing in the Women's 4x400m relay

**Volunteer** — *Penn State Dance Marathon (THON)* August 2017-present

- Helped organize and participate in fundraising events through Penn State Club Track & Field, Penn State CHAARG, and Atlas Benefitting THON to help raise over \$10 million for pediatric cancer research; Atlas Benefitting THON raised over \$90,000 alone for pediatric cancer research, the fifth-highest among all special interest organizations

**Content Creator** — *Penn State Odyssey* August 2017-August 2019

- Wrote weekly articles that were published to the Penn State Community of the online magazine *Odyssey*
- Received over 300,000 hits on the article "10 Things The Girl Who Has Never Had a Boyfriend is Sick of Hearing From You;" authored six other articles that went viral

**General Member** — *Penn State CHAARG* August 2018-May 2019

- Collaborated with fellow members to organize events that promote female health, fitness, and empowerment