Perspective

Perspective: Global country-by-country response of public interest in the environment to the papal encyclical, *Laudato Si’*

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ABSTRACT

Environmental issues are strongly influenced by their human dimensions, so understanding this relationship is important for effective conservation. This study investigates changes in public interest in the environment after the release of *Laudato Si’*. Comparisons between searches for church-related and environmental topics before and after its release demonstrate significantly raised public interest in both areas, especially in Catholic countries. There were important differences between developed countries and countries with other economic classifications. After decades of declining interest in the environment, *Laudato Si’* may be catalyzing societal transformation similar to that performed by the 1969 encyclical *Humanae Vitae*. Regulation of abortion in the U.S.A. went from a non-political issue in 1969 to a primary dividing line between the political parties in 1976. Two years after release of *Laudato Si’*, the Catholic Church had implemented a long-term sustainability plan for what could grow into a major Catholic environmental movement, similar to the anti-abortion movement. The results within suggest public interest in the environment may already be growing as a result. No previous environmental movement has benefitted from this kind of support, and this provides reason for hope that environmental progress is just around the corner.

1. Introduction

Psalm 24:1 “The Earth is the Lord’s and all that it holds.”

What if the number of environmentalists grew by 15–20% of the global and 25% of the U.S. populations and these groups were actively pushing environmental agendas? Even growth half of that would be politically significant, potentially leading to major changes in the political landscape. Is a shift in global opinion of this dynamic probable? Possible? A few years ago, most would say no. But recent events in the Roman Catholic Church may be making it reality. Understanding how religion-driven awareness campaigns influence public interest and potentially public policy is important for environmental policy makers (Bennett et al., 2017) and this particular instance has drawn global interest and massive media attention that can be observed and analyzed via internet-based monitoring (Soriano-Redondo et al., 2017; McCallum and Bury, 2013).

*Laudato Si’* (Francis, 2015) is a landmark papal encyclical letter released May 24, 2015 that calls all members of the Roman Catholic Church to gain awareness of and take responsibility for their natural environment. Previously, perceptions suggested an inverse relationship between Christian biblical orientation and concern for the environment (Kearns, 1996; Kearns, 1997; Lieberman, 2012), so this encyclical appeared to be a significant shift. However, Catholic teachings are more environmentally friendly than other Christian denominations (Guth et al., 1995; Schultz, 2001; Hamlin and McGreevy, 2006; Marlett, 2007), with the rationale based on Psalm 24:1 (quoted above; Carolan, 2011). Questions persist about what impact this new church teaching could have on environmental policy and politics on a global scale (Ceballos, 2016; Raven, 2016; Silecchia, 2016; Tucker and Grim, 2016), especially in light of impending climate change (Houghton and Callander, 1992; Morrison et al., 2015), biodiversity declines (Ceballos et al., 2015; McCallum, 2015) and growing environmental indifference (McCallum and Bury, 2013; Andrew et al., 2016). There has also been much misinformation about the importance of this encyclical and whether it holds the shroud of infallibility. This reactive and adaptive response to environmental issues by the Roman Catholic Church is an important human dimension because it positions our value of nature within religious doctrines (Kim, 1999; Morris and Cramer, 2009), potentially leading to stronger drive for action on these problems (Agliardo, 2013; Lorenzen, 2012).

Like *Pacem in Terris* (John, 1963), *Laudato Si’* was addressed to Catholics and non-Catholics alike (Francis, 2015). Numerous non-Catholic religious groups have endorsed this writing (DeWitt, 2016; Narbona, 2016; Anonymous, 2015a, 2015b), including Judaism and many protestant denominations (Brown and McNiell, 2015). Further, numerous religious leaders (e.g. the Dalai Lama, etc.) posted support via twitter and other social media (Anonymous, 2015a, 2015b; Martin, 2015; Welby, 2015).

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Official statements on the environment have been released by numerous Christian, Hindu, Islamic, Buddhist, and Jewish leaders (http://www.greenfaith.org/religious-teachings). Roughly 85% of world’s people are affiliated with a religion (Nizwili, 2019; Maoz and Henderson, 2013), and that is projected to grow through 2050 (Hackett et al., 2015).

*Laudato Si’* outlines many current environmental problems (e.g., climate change, biodiversity, etc.) and the repercussions for humanity if allowed to continue. Then, it presents the Church’s position that all Catholics must become aware of these problems and adhere to environmentally responsible behaviors. Finally, it explains the theological support for the Church’s position on the environment (and other issues) to justify why these actions are taken and how it has relevance to Catholic life. *Laudato Si’* also addresses non-Catholics and calls them to gain awareness of the dangers of environmental degradation and respond. Consequently, there is significant expectation that this encyclical will serve as a catalyst for societal transformation in regard to the environment within and beyond the Roman Catholic Church (Bartosch et al., 2018). But ultimately, the widest circulating question may be “Will it matter?” (Lavelle, 2015a; Michelson, 2015).

If *Laudato Si’* will start a new environmental movement is an intriguing question with repercussions for environmental policy throughout the world. Catholics represent ~16% (n = 1.2 billion) of the global 7.5 billion human population (Berger, 1999; BBC, 2013; Worldometers, 2017). They are distributed as follows: Latin America = 40%, Europe = 23.7%, Africa = 15.2%, Asia = 11.7%, North America = 7.3% (22% of U.S. Citizens), and Oceania = 0.8%. Further, the Holy See’s diplomatic exchange is especially strong in modern times. Full diplomatic exchange occurs between at least 166 governments compared to only 26 in 1919 (Berger, 1999). Therefore, adoption of environmental views can lead to influence of the Church on national and international environmental policy. As the largest Christian denomination globally and in many countries (e.g., United States, France, etc.), increased interest in the environment by Catholics should stimulate expansion in environmental policies because improved environmental

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**Fig. 1.** a. Normalized mean (+/− SE) monthly web searches for 17 keywords in 113 different countries and jurisdictions. Searches were made using the Google search engine and obtained using Google Keyword Planner in October 2015.  
  b. Annual mean (+/− SE) scaled proportional search volume for three terms related to *Laudato Si’* from 2012 to 2017.  
  c. Mean (+/− SE) scaled proportional search volume for 14 environmental topics across 149 countries.  
  d. Influence of economic status on changes in environmental interest (mean +/− SE) after the release of *Laudato Si’*.  

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interest furthers environmental policy (Pulia, 2008). But, two years after its release did Laudato Si’ stimulate interest in the environment in the first place? Herein, I use internet query data to explore this question.

2. Materials and methods

Internet activity for each of 14 previously identified environmentally-related key terms/topics (i.e., biodiversity, environment, conservation, ecology, extinction, endangered species, fisheries, wildlife, climate change, global warming, invasive species, habitat fragmentation, pollution, and sustainability; McCallum and Bury, 2013; McCallum and Bury, 2014; Andrew et al., 2016) and the topics “Pope Francis,” “encyclical,” and “Laudato Si’” were examined. These environmental terms were previously demonstrated to be dependable indicators of environmental interest (opt. cite). We used the topic rather than the term presented by Google Trends because this option includes obvious misspellings, related terms, and terms in other languages (i.e., not English). Inserted return!

I obtained the monthly estimated query data spanning September 2013 – August 2015 for 118 countries from Google Keyword Planner (Appendix 1). These data are close estimations of the absolute number of times internet users typed terms into the Google Search interface. I attempted to repeat this in October 2016, but Google changed how it reports this data, which made it unusable. In this context, keyword data were used to quantify the immediate response of the public to the release of Laudato Si’.

Multiple linear regression and analysis of variance were used to compare internet query behavior before and after the release of the encyclical. Global public interest was calculated by averaging or adding country-by-country keyword data rather than using the global setting on Google
Keyword Planner. This was done because of the uncertainty associated with how Google produced results for the Global setting output.

Then, I collected the scaled proportional search data from Google Trends for April 2012 – June 2017. Topics that Google Trends classified as “insufficient search volume” or that reported fewer than 10 searches per week for a given country were excluded from that jurisdiction’s data set. Use of topics instead of terms returns results that include an array of languages, terms, and misspellings (per Google Trends Help Center), they provide more thorough and deeper understanding of the public’s interest, and eliminate confusion arising by incomplete or incorrect translations to different languages when using terms (for translation issues see Troumbis, 2017 and Diemer, 2011). A general linear model with a Tukey means comparison test was used to analyze this data. Data were also compared based on the economic status of each country.

I used Google Ngram viewer to examine the occurrence in books of topics related to multiple encyclicals with global scope. This was used to infer how interest in the respective topics changed in response to previous encyclicals. Google Ngram viewer encompasses books published from 1900 through 2008, so responses to Laudato Si’ are not available.

To infer whether results were due to interest specifically in Laudato Si’, or simply interest in news items, I collected comparative scaled proportional search volume from Google Trends for “The Sixth Extinction: An Unnatural History” (February 11, 2014, Pulitzer Prize 2015), the IPCC 5th Assessment Report (September 27, 2013), Global Environmental Outlook 5 (January 12, 2012), and the encyclicals Humanae Vitae (July 25, 1968), Laudato Si’ (May 24, 2015), and Lumen Fidei (June 29, 2013). The Global Environmental Outlook 5 had very low to no search volume, so it was dropped. These data were collected for the period January 1, 2011 – March 16, 2019. The United States was queried because it has among the top five largest populations of Catholics in the world (CIA, 2015). Then, data were downloaded for the three countries that ranked in the top five for raw population of Catholics and top 20 by percentage. These were Mexico, Italy, and the Philippines. Finally, data were downloaded for the top five countries based on percentage of the population that was Catholic and returned search volume from Google Trends. These were Paraguay, Portugal, Croatia, Poland and Ireland.

Fig. 2. a. Changes in keyword searches (mean +/− SE) for terms related to the environment and the Catholic Church after release of Laudato Si’.

b. Changes in keyword searches (mean +/− SE) for terms related to the Catholic Church after release of Laudato Si’. The United States and India are not included.

c. Changes in combined keyword searches (mean +/− SE) for terms related to the environment and the Catholic Church after release of Laudato Si’. The United States and India are not included.
Comparisons of the five publications were made among Catholic-dominated countries that also contained one of 35 biodiversity hotspots (Myers et al., 2000). Mexico, Paraguay, Italy, the Philippines, and Croatia had already been collected above, so I downloaded data with sufficient search volume for Puerto Rico, Dominican Republic, Australia, Spain, Brazil, Argentina, Bolivia, Peru, Ecuador, Venezuela, Colombia, and the Democratic Republic of the Congo. Other countries with hotspots either did not have sufficient search volume or had very low Catholic populations. I also downloaded search volume for California and Oregon. I also examined the search behavior for environmental and Catholic topics in relation to hotspots.

3. Results

Environmental keywords and topics were queried widely around the globe; whereas, *Laudato Si’,* Pope Francis and encyclical had more limited reach. Query data was recovered for 81–87 (68.6–73.7%) countries per term for which data were available via Google Keyword Tool from September 2013 – August 2015. Google Trends provided query data for 31–209 (14.6–98.5%) countries/term from 2012 to 2017. Google Keyword Planner revealed no difference in usage among countries of the three church-related terms compared to environmental terms. However, Google Trends revealed that “encyclical” and “Laudato Si” were queried in about a quarter of countries; whereas, “Pope Francis” was queried sufficiently to return search volume in 149/212 countries from 2012 to 2017. Conversely, of the environmental topics only three were not used by at least half of the countries tracked by Google Trends from 2012 to 2017.

3.1. Short-term response with Google Keyword Planner

Use of keywords related to the environment versus the Pope and *Laudato Si’* changed after the encyclical’s release ($F_{6, 46.102} = 6636, P < 0.001$). Many more searches for the church-related terms occurred in the three months following the release of *Laudato Si’* than at any other time from September 2013 – September 2015 (Fig. 1a). As a group, searches for “Pope Francis,” “encyclical,” and “Laudato Si” were much higher relative to environmental terms after the release ($t = 21.34, P < 0.001$). Global results were strongly influenced by query activity in India and the United States (Fig. 2a). Responses by other nations varied ($t = -16.03, P < 0.001$). The mean keyword searches for terms related to the Catholic Church rose noticeably in 19 Nations, but fell in Canada, Ireland, and the United Kingdom (Fig. 2b).

Although public interest in the papal keywords exploded after release of *Laudato Si’* ($F_{1, 8130} = 268.01, P < 0.001$), queries for environmental terms fell ($F_{1, 37969} = 4.62, P = 0.032$) relative to before its release. However, keyword searches for environmental terms in its three months following the release of *Laudato Si’* (mean = 926, SE = 100) were still higher than the same three month period the
previous year (mean = 726, SE = 83) ($F_{1, 9494} = 3.99, P = 0.046$). Use of environmental keywords rose in seven, but fell in 11 countries (Fig. 2c). The use of environmental and church-related keywords during the three months following release of *Laudato Si'* did not appreciably change in the remaining countries.

3.2. Extended response with Google Trends

Scaled proportional search volume from Google Trends revealed significant changes in search volume rank ($F_{4, 484,515} = 11,858, P < 0.001$) during the two year period after release of the encyclical ($t = −8.08, P < 0.001$), differences among countries ($t = 31.24, P < 0.001$), between Catholic and environmental topics ($t = −185.27, P < 0.001$), and revealed interactions between Catholic and environmental topics ($t = 27.36, P < 0.001$). The search volume for the three topics related to *Laudato Si'* was much larger after its release than it was prior and slowly decayed through 2017 (Fig. 1b). Search activity grew for Catholic topics in 106/149 (71.1%) countries (Fig. 3a). Mean scaled proportional search volume for environmental topics rose in 84/212 (39.6%) countries investigated (Fig. 1c).

Economic classification (United Nations, 2018; International Monetary Fund, 2018; World Bank, 2018) influenced interest in the environment ($F_{423} = 3.97, P < 0.008$). Developed nations queried environmental topics more actively than “least developed” ($t = 3.40, P = 0.004$) (Fig. 3b). Environmental interest grew in developed nations after release of *Laudato Si'* ($t = 2.84, P = 0.024$). Interest did not improve in other economic classifications (Fig. 1d). Interest in some developed countries (e.g., United States, Australia, Russia, Germany, etc.) fell after release. Among the “Group of Eight” (G8), who accounted for 50.1% of the 2012 global nominal GDP, proportional search volume fell for five members. However, only five of the 23 members (in 2015) of the European Union went down. Two of the three G8 members that had elevated proportional search volume (Italy and France vs. the United Kingdom) have exceptionally high Roman Catholic populations, and were part of the European Union in 2015. The percentage of the population that used the internet was highly correlated with economic classification ($r = 0.277, P < 0.001$). As this percentage increased, internet activity increased ($r^2 = 0.110, t = 2.61, P = 0.009$).

3.3. Responses to previous encyclicals Google Ngram Viewer

Many encyclicals published since 1900 were focused on esoteric topics of Church law or focused on small geographic regions, so they did not elicit much response by book authors. However, *Divini Redemptoris* (1937, topic = Bolshevism), *Mit Brennender Sorge* (1937, topic Nazi antisemitism),
Sumi Pontificatus (1939, Topic: Racism, cultural superiority, Marxism, and totalitarianism), Ecclesiam Suam (1964, Topic: Marxism, social justice, worker solidarity), and Humanae Vitae (1968, birth control and abortion) were addressed to wider audiences and intended to have impact on the Global community of Roman Catholics. All five encyclicals were immediately followed by abrupt spikes and sustained growth of appearances in books lasting from 10 to 90 years after release (Appendix A).

3.4. Was interest due to newsworthiness, the Pope's popularity, or specific to Laudato Si'?

United States data demonstrated large peaks upon release for all publications except “The Sixth Extinction.” The latter peaked upon winning the Pulitzer Prize in 2015. Laudato Si’ had the highest average monthly and annual rank for scaled proportion search volume (Fig. 4).

Fig. 3. a. Mean (+/− SE) scaled proportional search volume for terms related to Laudato Si’.
b. Mean (+/− SE) scaled proportional search volume for 14 environmental topics across 2012 countries.
Fig. 3. (continued)
The three countries with the highest number and proportion of Catholics responded with an abrupt uptick for *Laudato Si’* (Fig. 5). This peak dwarfed the uptick for Francis’ only other encyclical *Lumen Fidei*. Remarkably, the 1969 encyclical *Humanae Vitae* had higher search volume than the IPCC 5th Assessment Report. The Sixth Mass Extinction did not receive much attention. It also had higher volume than *Lumen Fidei* except during the peak upon of the 2013 encyclical. Search Volume for *Laudato Si’* remained elevated and higher than for any of the other documents. The same basic pattern was observed for 18 countries that have large Catholic populations and possess biodiversity hotspots in their borders (Fig. 5). The response to *Laudato Si’* of Latin American (South and Central America) but not African countries with biodiversity hotspots responded positively to the proportion of their population that was Catholic (Fig. 6). In African countries, larger populations of priests led to mildly higher search volume ($Y = 0.002x - 2.43; r^2 = 0.105, s = 7.29, P = 0.070$). Catholic population was not a good predictor of interest ($F = 0.959, P = 0.335$). Although incorporation of Catholic population, Priest population and their interaction strengthened the influence of priests on public interest ($r^2 = 0.214, s = 7.07, F = 2.54, P = 0.077$).

4. Discussion

Attention to the environment in Catholic teachings is not new (John Paul II, 1990; Rychlak, 2008; Jerie, 2010; Silecchia, 2015; Silecchia, 2003), but its emphasis has strengthened as environmental problems have become more serious. Pope Leo (1891) mandated in his encyclical *Rerum Novarum* that the Earth must be sustained for the good of all, and rebuked abuse or misuse of the environment (Rychlak, 2008). *Rerum Novarum* is a foundational text for Catholic social teaching. John (1963) addressed the Catholic and non-Catholic world when he advised of the impending global threat of environmental deterioration. Paul (1971) referred to the ecological concern of becoming a victim of environmental degradation by humans. John Paul (1979) condemned consumption lacking concern for the environment, and elaborated that there is a “moral requirement” to safeguard the environment because of its connection to human society. Benedict XVI (2007) proposed there were “structural causes of dysfunctions of the world economy” that endanger the environment, again reiterating that human existence depends on nature. In fact, Roman Catholics in the United States steered a brief environmental movement in the early 1900s that may have led in part to environmentalism of the 1960s (Hamlin and McGreevy, 2006; Marlett, 2007; Allitt, 1998; Bovée, 2010; Witte, 1948). However, the game changer this time is that care for the environment was named a spiritual and corporal work of mercy after publication of *Laudato Si’* (Harris, 2016). The works of mercy constitute a central theme of how Catholics should treat others (Delany, 1911). By definition (John Paul, 2003), inclusion of the environment in this framework obligates Catholics to care for the environment.

This drives widespread hopes and expectations that *Laudato Si’* will catalyze societal transformation in regard to the environment (Bartosch et al., 2018; Nature, 2015). The release of *Laudato Si’* had global reach and led to growth in environmental interest (Nature, 2015). Keyword use and proportional search volume immediately responded to the release of...
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Laudato Si’, which confirmed many people were aware of the encyclical and responded by searching for related information, perhaps downloading and reading the document itself. The variation in response among countries of differing economic development may reflect a combination of education, availability of the internet, and the exposure to news media (Blum, 1987). The developed world, in general, has better access to news media (Wu, 2003; Besley and Persson, 2014) and internet (Guillen and Suarez, 2005; Chinn and Fairlie, 2007) than other countries. Therefore, diffusion of ideas occurs more rapidly in the developed world due to the manner in which this system works (Fig. 7). Normally, when interest is raised, individuals begin searching out more information from trusted sources. Individuals searching the internet in undeveloped countries are also under tighter financial and time constraints, leading to a trade-off where searches for the environment were likely replaced by searches for the environmentally-relevant encyclical. People in wealthy countries have much better internet access, so they could search for an array of encyclical-related subjects with which they lack familiarity.

One of the most important diffusion mechanisms within the Church is communications from priests to parishioners. Latin American countries have larger populations of priests compared to countries in Africa (Cheney, 2005). Internet users comprise about 10% of both regions’ populations (https://www.internetworldstats.com). Response to Laudato Si’ was positively related to Catholic population in Latin America, but negatively related in Africa (Fig. 5). It is possible that the smaller population of priests in Africa compared to Latin America reduces transmittal of information about the encyclical to parishioners. As priest numbers are smaller, less information is communicated; fewer people hear about the encyclical, so they do not search out information on the web (Fig. 7). This suggests that countries in Latin America, where over 40% of the world’s Catholics live and numerous biodiversity hotspots exist, may take stronger stances and responsibility for environmental quality in their valuable ecoregions. However, Africa may experience a slower response due to the less effective transmittal to the parishioners of these new Church laws and theologies.

The G8 countries, such as the U.S.A. have exceptional media coverage, education, and internet access. This luxurious access allows extensive probing of topics for which interest has been raised, but their exceptional education and media coverage may reduce the need for extensive query of environmental topics, thus explaining unusual responses by some of these countries. The U.S.A. is a disappointing outlier on many societal challenges (Rubens, 2018), so it is not particularly surprising if it simply failed to respond. This also may relate directly to the proliferation of misinformation sites posing as trusted sources. Americans are more indoctrinated along party lines (Marris, 2018; Song and Conner, 2015), leading to either affirmation or denial of the importance of environmental problems. It also leads to focusing on the news sources that fit their political views, even if these transform into misinformation sources. This is potentially a key problem because many sources that were once trustworthy have quietly become suspect, unknown to many. Additionally, Americans are more susceptible to political confusion because many of the Church’s positions do not fit well with opposing party platforms (Smith, 2008). However, with Roman Catholics comprising about 25% of its population, history has shown it is not immune to long-term political influences of papal encyclicals. Generally, Catholics believe the Church is a trusted source of information, even for those topics that are not liturgically related. As information sources, encyclicals can be very influential.

Originally, encyclicals were directed to church leaders, but a growing number have forwarded the most important church teachings directly to all members of the church (Thurston, 1909; Fenton, 1949; Gibson, 2015). “These communications clarify, amplify, condemn, or promote issues in relation to Catholic faith,” Gibson (2015). All outline a current set of problems, the Church’s positions, and the theological support for how Catholics must respond or behave. Previous encyclicals have condemned abortion and birth control (Paul, 1969), Nazi anti-Semitism (Pius, 1937), racism and cultural superiority (Pius, 1939), Marxism (Pius, 1846; Pius, 1939; John Paul, 1981), totalitarianism (Pius, 1939), and many other issues. Encyclicals focused on these topics tend to precede large, sustained growth in attention from authors of books (Appendix A), an indirect proxy of public interest since authors write about what they think will interest prospective readers to ensure book sales. Meanwhile, when 10 terms related to each of 91 public awareness campaigns were queried in Google Trends, only Breast Cancer Awareness Month returned meaningful improvement in public interest within their targeted geographic regions (Unpublished data). Clearly, targeted encyclicals are taken much more seriously than other kinds of awareness campaigns. This suggests that increased commentary from religious figures like the Pope may be more effective at improving environmental problems than other forces. When the Church establishes a teaching,
despite frequent fallout (including entrenchment), the new doctrine gradually infiltrates every aspect of Catholic life (Massaro, 2015).

There was also much American media attention to whether *Laudato Si'* was infallible, positioning this as a reason to ignore its teachings. Of course, encyclical declarations are not optional and define what the Church believes, regardless of their infallibility (Fenton, 1949; Gagnebet, 1968; Pius, 1863; Zoll, 2015). Their infallibility is largely irrelevant because their compliance is obligatory for church members (Fenton, 1949; Gagnebet, 1968; Pius, 1863; Zoll, 2015). Prior to Vatican I and II (Brandi, 1892), infallibility was not clearly understood (Tierney, 1972; Siecienski, 2017) and some believed it was universal (Lockwood, 2000). Since Vatican II, popes appear to follow John XXIII by avoiding ex cathedra statements (Sean, 2010). Infallible pronouncements such as *Humanae Vitae* (Paul, 1969) are reserved for doctrine that has been “called into question or doubted by a large number of Catholics” (Carr and Brom, 2004). Thus, lacking ex cathedra delivery indicates there is little to no question about this doctrine within the Church. Much American coverage also paired questions of infallibility with criticisms that the communication was “reaching into non-liturgical areas.” This is a particularly effective approach to sway Catholics from adopting its teachings. However, Catholics are conditioned to receiving important information from the Church in this manner and acting upon it, as previously seen with the Right-to-Life movement and *Humanae Vitae* (Paul, 1969; Karrer, 2011). Americans in particular are more indoctrinated along party lines (Marris, 2018), sometimes leading to either affirmation or denial of the importance of environmental problems. However, the Church has not made such strong declarations about social issues in decades, and Catholics generally believe the Church is the most trusted source, above the media and pundits.

The Right-to-Life movement portends what to expect from a Catholic-driven environmental movement. In the U.S., abortion regulation was neither a political nor partisan issue until five years after release of the encyclical *Humanae Vitae* (Paul, 1969) when it became a pivotal dividing line between the two parties (Baldassari and Gelman, 2008; Levendusky and Malhotra, 2017; Tarento, 2018). Just two years after the release of *Laudato Si’*, there are signals that interest in the environment may be growing for the first time in decades. These findings spell hope for the future. Previous work demonstrated decades of decay in interest about the environment at national (Wray-Lake et al., 2010; Martin et al., 2012; Andrew et al., 2016) and global scales (McCallum and Bury, 2013; Richards, 2013; McCallum and Bury, 2014). Many of our current environmental problems such as biodiversity declines (Ceballos et al., 2015; McCallum, 2015), pollution (Ebenstein, 2012), and climate change (Vavrus et al., 2008) are tied to industrialization. The developed world is generally more industrialized, and more strongly influences many current environmental problems than the underdeveloped world. Thus, the observed escalation of environmental interest among people in developed nations may foretell future advances in

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**Fig. 6.** Mean (+/− SE) ranked scaled proportional search volume for environmental terms by citizens of countries with biodiversity hotspots located in Latin America (top) and Africa (bottom).
environmental policy for those countries.

As a faith-driven environmental movement spear-headed by the largest Christian denomination, one must consider the implications for environmental politics and policy. Previous environmental movements have ebbed and waned over the decades (McCormick, 1991; Dunlap and Mertig, 2014), but resulted in significant environmental progress. They lacked unified organizational direction and schemata (McCormick, 1991) required for long-term ideological sustainability. Many ideas were nebulous and loosely related among people whose foundational definitions of environmental health varied widely (McCormick, 1991). So, as the social scares that triggered their mobilization (i.e., Silent Spring, the summer of 1988, hurricane Katrina) faded, so did their momentum (see Ungar, 1992). If the public perceives that a problem, including those of the environment, has resided or ended, it loses interest (Dunlap, 1995). However, the large, organized religions like the Roman Catholic Church mold societal culture within their membership (Geertz, 1966). Even those who no longer participate remain influenced to participate in Catholic political and social roles (Berger, 1999).

My results also suggest that response to Laudato Si’ is not typical of similar church or environmental news stories, nor is it likely simply a reflection this Pope’s popularity. It has a much stronger signal than the other news items of similar content and stature. Further, the Pope’s popularity probably contributes, but cannot be a strong factor because if it were, his earlier encyclical, Lumen Fedei, should demonstrate a similar response, but instead, its response is in line with a typical news item, and rapidly declines to below that of Humanae Vitae.

This suggests Laudato Si’ could be a modern Silent Spring, with a caveat. Silent Spring was published in 1962, but excerpts in The New Yorker alone drove the movement and called attention to the book. Laudato Si’ has become a very popular topic in the media, with eleven popular news articles in the week of this writing. Well over 1000 scholarly articles have cited it. Further, unlike Silent Spring and other triggers like it, Laudato Si’ does not simply inform or raise awareness; it mandates for Catholics a fundamental morality about the environment that is linked to a cultural foundation of a widely-held religion. Waning is not an option for practicing Catholics. They can no longer wait and pray for divine intervention (Hope and Jones, 2014), but must take action. In fact, political activism by the Catholic Church is already well underway. Since November 2016, the U.S. Conference of Catholic Bishops (USCCB) has submitted eight letters and statements to the Trump administration and U.S. Congress, 1/3 of whom claims to be Catholic (Lavelle, 2015b), expressing dissatisfaction with environmental rollbacks (Roewe, 2017). Even more impressive, an unprecedented (for a papal encyclical) 61% of the U.S. bishops issued statements, homilies, or articles tied to the release of Laudato Si’. I observed that faculty searches for ecologists at Catholic colleges in the 2015–2016 school year were almost double that advertised in the previous five years combined (unpublished data). Finally, the USCCB’s Pastoral Letter on Stewardship United States Conference of Bishops (2017) instructs clergy of local parishes that stewardship of nature is a mandatory tenet of Catholic faith (available at: http://www.usccb.org/beliefs-and-teachings/what-we-believe/stewardship/index.cfm). In response, from 2016 to 2017 hundreds of deacons and priests received specialized training in green studies, the Society of Jesus released a free online environmental science e-textbook titled “Healing Earth,” and every diocese in America is developing “Laudato Si’ action plans” to address our currently unfolding environmental
dilemmas (Roberts, 2018). This powerful theology on the environment should gain traction with Catholics and mass-attending non-Catholics (i.e., attending non-Catholic spouses, etc.) alike via regular, continuous and perpetual reinforcement and promotion from the Church. This is further supported by the fact that search volume for *Humanae Vitae* remains relatively high in Catholic countries nearly half a century after its release (Fig. 5). The sustained uptick in search volume for *Laudato Si’* hints it may similarly endure.

No environmental movement has benefited from a religious mandate, let alone a long-term plan for sustainability or support from an institution with the resources, reach, and global recognition that has the Roman Catholic Church (Tarlton, 2012; Hanson, 2014). This is why many believe it will be a “catalyst for societal transformation” (Bartosch et al., 2018). Will environmental concern follow abortion’s pattern and become a second major dividing line in American politics? What about in other countries? These questions and my findings should serve warning for politicians with anti-environmental positions and offer much hope for concerned environmentalists San Martín (2015), especially in light of the March 15, 2019 (first Friday of Lent) global Youth Climate Strikes in over 100 countries to protest inaction on global warming (Mac Donald, 2019; Remedios, 2019; Taylor et al., 2019) and willingness among Catholics to participate (Remedios, 2019; Brady, 2019; Generation of *Laudato Si’* http://laudatosigeneration.org).

5. Conclusions

The response of public interest in the environment to the release of *Laudato Si’* is complicated by many factors. However, it is clear that distinct differences exist in how developed and developing nations responded. Initial indicators suggest that public interest has reversed the previous declining trend. Most awareness campaigns like these do not sustain for more than a few months; however, there is evidence that the impacts of this effort continue to elicit growth in some regions. The most similar previous effort of this kind was the Church’s release of *Humanae Vitae*, which led ultimately to the Pro-Life movement. There is reason for believe that a similar response targeting the environment is developing.

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Appendix A. Appearance of keywords in books spanning 1900 to 2008 in relation to the release of five key encyclicals and four relevant historical events. (Note to reviewer: six panels)