Natural Language Analyses Reveal Religious Niches in 24,479 American Sermons

Matthew I. Billet[1*], Friedrich M. Götz[2], Andrés Gvirtz[3*], Stephanie R. Kramer[4], & Ara Norenzayan[2]

[1] Department of Psychology, University of California, Irvine, USA

[2] Department of Psychology, University of British Columbia, CANADA

[3] King's Business School, King's College London, UNITED KINGDOM

[4] Pew Research Center, USA

Abstract word count: 150

Article word count (excluding tables, figures, references): 3,864

Methods word count: 1,463

Reference count: 86

Acknowledgements: Thanks to Azim Shariff and Will M. Jettinghoff for providing valuable feedback on earlier iterations of this project.

* Corresponding authors:

Matthew I. Billet, Department of Psychology, University of California, Irvine, USA, mbillet@uci.edu

Andrés Gvirtz, King's Business School, King's College London, UNITED KINGDOM, andres.gvirtz@kcl.ac.uk

Abstract

Religious sermons are one of the oldest and most widespread forms of mass communication. In the U.S. alone, 100 million people listen to them every week. How do religious organisations differentiate their sermons to compete in the religious marketplace? To answer this, we analysed 24,479 sermon transcripts across 4,925 Christian churches, 1,358 U.S. counties and 6 denominations through bottom-up topic modelling, top-down dictionaries, and variance decomposition analyses. Across thematic focus, moral foundations, personal values, and emotional tone, most differentiation arose between churches, with smaller effects between denominations, and minimal variation between counties. Churches differentiated their sermons across several dimensions, including the use of high-arousal positive emotions and traditional moral values. Denominations differed in their endorsement of liberal versus conservative values and ritual content. Our findings suggest that churches and denominations differentiate their messages to serve distinct niches in America's religious marketplace, offering new insights into the cultural dynamics of religion.

Natural Language Analyses Reveal Religious Niches in 24,479 American Sermons

Nearly 100 million Americans attend church every week and most are there to hear the sermon (The Gallup Organization, 2023). To put that figure into context, Sunday Afternoon Football, another iconic American national ritual, attracts 24.3 million viewers a week (Reynolds, 2025). Network television broadcasters choose to air football because viewers want to watch football. Likewise, religious organisations produce sermons that congregants want to attend, and if they fail to do so, the organisation will go under (Miller, 2002). And just as different networks will air different programs to appeal to different niches of viewers, religious organisations will also find ways to differentiate their sermons and specialise to serve distinct niches (Chesnut, 2004; Iyer, 2016; Mixon & Upadhyaya, 2018). In this way, religious organisations are engaged in market competition for religious congregants, just like TV networks are engaged in market competition for viewers (Iannaccone, 1991; Stark & Finke, 2000; Stark & Iannaccone, 1994).

Sermons are as old as Christianity, the largest world religion with a global population of 2.3 billion, and have been pivotal in the development of the faith. Some of the earliest and most prominent examples include Jesus' Sermon on the Mount, Apostle Peter's Sermon on Pentecost, and Paul's Areopagus Sermon delivered in Athens. Sermons are still a major cultural product, attracting congregants to Christian religious organisations today. Indeed, 75% of adults who regularly attend service cite sermons as a major factor in why they attend service, making it the number one cited reason, followed by programs for children (64%), outreach and volunteer opportunities (59%), and social activities (49%; The Gallup Organization, 2023). Studies conducted in a variety of religious and cultural contexts suggest that sermons have profound effects on congregants, informing which social issues people talk about (Aksoy, 2023), shifting attitudes towards outgroup members (Blair et al., 2021), and even increasing adherence to health behaviours (Trinitapoli, 2009). What is said in sermons

in America also matters for the rest of the world. For instance, it is hard to understand U.S. foreign policy decisions without appreciating the influential role of American Evangelical Christianity in politics (McAlister, 2019). In short, what is said in sermons matters: for the success of religious organisations, for the congregants who are directly exposed, and for other people around the world who are indirectly impacted.

Yet, the scientific study of sermons has been historically limited by the difficulties associated with analysing textual data at scale. Most extant scientific studies provide highly detailed manually coded investigations of only small sermon corpora, typically less than 150 sermons (Freeburg & Roland, 2015; Hobbs, 2020; McClendon & Riedl, 2015; Stokes & Schewe, 2016; Vermeer, 2015). The few studies that have analysed larger corpora with the advantage of natural language processing methods have focused on singular themes of interest, such as agency ascriptions to male versus female characters by pastors of different genders (Agersnap et al., 2020) or denominational differences in moral language (Frimer, 2020). Some studies have adopted a geographical lens seeking to understand how the location of churches—as a proxy of their local socio-political context—shapes which themes are discussed in sermons (Alper et al., 2020; Gilliland, 2023). For example, researchers have observed that churches in politically liberal neighbourhoods tend to deliver sermons with more political content on issues of religious importance, such as abortion and homosexuality (Boussalis et al., 2021), and sermons from neighbourhoods with fewer White residents more often feature themes related to welfare and civil rights (Guhin et al., 2023).

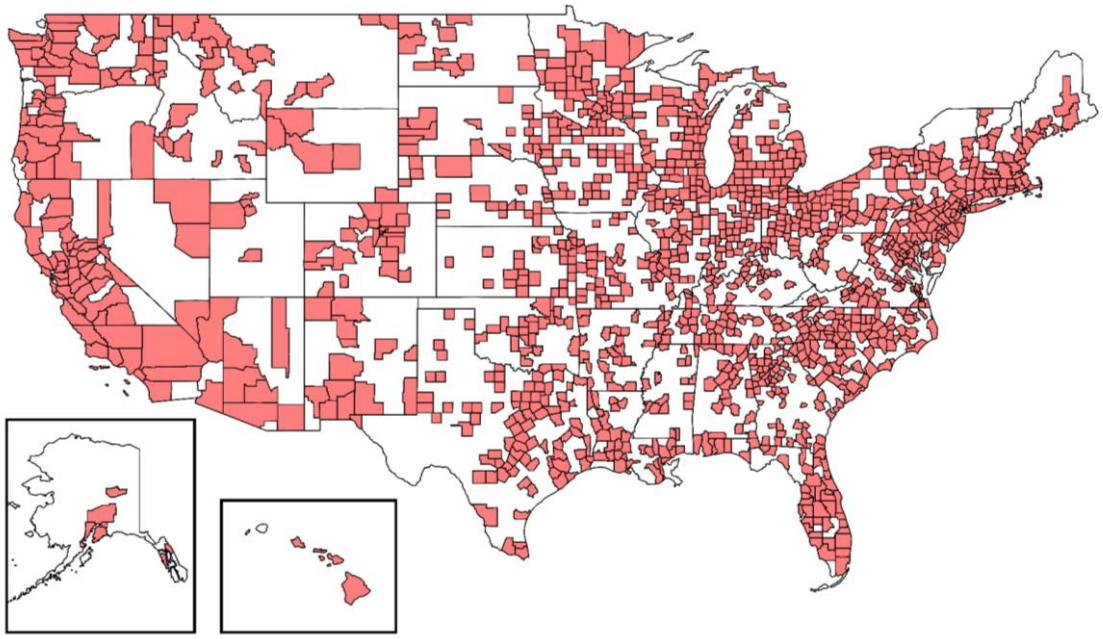
Collectively, these studies provide preliminary evidence that sermon content may be tailored to appeal to congregant preferences, which can differ at multiple levels of analysis, including between churches, denominations, and geographical regions. A large-scale analysis of sermons that considers multiple levels of analysis simultaneously, however, has the potential to reveal the content driving the formation of religious niches that unite and divide

Christan Americans across churches, denominations, and geographical regions. The present study addresses this knowledge gap by using natural language processing methods as a window into the psychological and social patterns of religious organisations (Eichstaedt et al., 2021; Feuerriegel et al., 2025; Jackson et al., 2022).

The study analyses a database of 24,479 sermon transcripts delivered between May 12, 2019 and November 8, 2020 spanning 4,925 churches in 1,358 counties across 50 U.S. states (plus the District of Columbia) and 6 Christian denominations (i.e., Catholic, Mainline Protestant, Evangelical Protestant, Historically Black Protestant, Orthodox, and Other / Non-Denominational Christian; Pew Research Center, 2019). The database is orders of magnitude larger than those analysed in most extant studies, with uniquely comprehensive geographical coverage (Figure 1). The analytic approach consisted of two steps. First, natural language processing methods paint a comprehensive picture of what is said in American sermons. In addition to the top-down methods (i.e., dictionary methods) used in most extant studies, our analysis also incorporates bottom-up methods (i.e., topic modelling) to identify prominent thematic foci of each sermon. Second, variance decomposition analysis illuminates how sermon content identified in the first analytic step varies across churches, denominations, and counties. The analysis reveals niches in religious sermon content, which in part reflect niches in congregant preferences driving the cultural evolution of Christianity in the United States.

Figure 1.

Counties represented in the final sermon dataset.



Note. Counties represented: 1,358 out of 3,244 (86% population coverage).

Results

Natural Language Processing: What is said in American Christian sermons?

Topic modelling results (bottom-up text analysis)

Table 1 presents the most representative words for each topic (frequent and exclusive words, Roberts et al., 2019), along with representative quotes, and the assigned topic labels. Four categories of topics could be discerned related to (1) personal and social themes [topical content], (2) biblical scripture and stories [scriptural content], (3) ritual, prayer, and liturgy [liturgical content], and (4) language related to the format of the sermon (i.e., digital versus in-person) [miscellaneous].

Topic prevalence estimates correspond to the average estimated proportion of words in each sermon attributable to a topic. Topical, scriptural, and liturgical content accounted for 34.8%, 29.9%, and 18.8% of words in the average sermon, respectively. Topical content included instruction pertaining to one's relationships (5.5%) and family (2.9%), as well as

broader themes, like intellectual discourse (4.2%) and discussions about the church community (4.1%). Scriptural content included the central New Testament stories of Jesus and his disciples (an estimated 18.4% of each sermon), as well as secondary Christian texts, like the Old Testament (2.5%) and apocalyptic scripture (3.0%). Liturgical content included charismatic preaching (Luhrmann, 2020; Luhrmann et al., 2021), which involves sensing the presence of the Holy Spirit, healing, and speaking in tongues (6.5%) and esoteric and spiritual practices that are not traditionally Christian, like guided meditations (4.8%). Finally, the model captured miscellaneous linguistic artefacts related to the format of the sermons (16.4% of the average sermon). These linguistic artefacts captured verbal disfluencies common to live digital broadcasts (11.1%) and content related to announcements given to the congregation (5.3%).

Table 1.

Description and prevalence of sermon content themes identified via topic modelling.

Topic Label	Representative Words	Sample quote	Mean	SD
Topical Sermon Content			**34.8%**	**6.1**
Forgiveness & Relationships	forgive/hurt/anger/wrong/forgiveness	*"forgive each other just as the Lord has forgiven you"*	5.5%	7.4
Gratitude	thank/prayer/sing/thio/praise	*"Everybody Praise the Lord!"*	5.3%	7.3
Sin & Redemption	paul/sin/righteousness/salvation/grace	*"Two words for all of history: sin and reconciliation"*	5.2%	8.1
Intellectual Discourse	catholic/moral/religion/argument/theology	*"Why do you believe in objective moral values?"*	4.2%	6.2
Church Community	church/mission/ministry/community/pastor	*"The local church has fallen on hard times"*	4.1%	6.2
Love	love/relationship/commandment/neighbor/kindness	*"Only those who love themselves are able to love others"*	3.0%	4.8
Family	mom/mother/husband/parent/mothers	*"The responsibility of being a wife and mother"*	2.9%	5.8
Relationship with God	baptize/spirit/baptism/holy/act	*"What was the purpose of this baptism in the spirit?"*	2.4%	4.5
Resist Temptation	david/battle/samuel/satan/fight	*"The challenges we must overcome if we're fighting giants"*	2.2%	4.7
Scriptural Sermon Content			**29.9%**	**6.0**
Thomas	believe/thomas/doubt/jesus/john	*"Thomas speaks words we dare not say. Unless I see I will not believe"*	4.6%	6.7
Resurrection	resurrection/tomb/easter/dead/rise	*"Resurrection is a way of living. Resurrection is a life that we can begin to live today"*	3.7%	7.9
Stories of Water	storm/jonah/trial/fear/circumstance	*"You are either in a storm or about to go into one"*	3.6%	5.6
Crucifixion	pilot/palm/donkey/crowd/jerusalem	*"Jesus comes riding into Jerusalem to bring peace"*	3.1%	7.7
Apocalyptic Scripture	revelation/daniel/profit/nation/throne	*"Revelation is not about the future, it's about God"*	3.0%	6.0
Jesus as Shepherd	shepherd/sheep/worry/path/voice	*"Jesus is a shepherd"*	2.9%	4.9
Last Supper	cup/table/bread/meal/wash	*"Remember that communion started with a Passover meal"*	2.5%	5.2
Old Testament	moses/abraham/egypt/jacob/joshua	*"the Lord spoke to Moses saying, send men to spy out the land of Canaan"*	2.5%	5.8
Stories of Money	parable/money/vineyard/talent/seed	*"In the context of this parable, what does it mean to be talented"*	2.4%	5.0
Jesus' Miracles	peter/fish/simon/boat/peters	*"Jesus said, you have no fish?"*	1.6%	5.1
Liturgical Sermon Content			**18.8%**	**8.8**
Charismatic Preaching	somebody/tonight/gotta/hey/hallelujah	*"God wants to do a miracle tonight"*	6.5%	10.7
Catholic Mass	mercy/saint/almighty/peace/grant	*"Almighty God have mercy on us. Forgive us our sins and bring us to everlasting life"*	4.8%	11.3
Esoteric Spirituality	divine/space/energy/experience/create	*"Today's meditation is on activating the creative spirit"*	4.8%	8.4
Orthodox Vespers	darkness/light/adam/unto/thou	*"Recalling your creation delivered from Adam's curse, we sing Almighty Lord"*	2.7%	4.9
Miscellaneous			**16.4%**	**8.4**
Digital Broadcasts	okay/guy/like/stuff/right	*"Okay, we're doing it digitally"*	11.1%	10.3
Announcements	black/university/york/american/graduate	*"welcome to the community concert benefiting feeding America"*	5.3%	6.6

Dictionary word count results (top-down text analysis)

Table 2 presents a summary of the percentage of words in the average sermon dedicated to each dictionary content category. When it came to moral foundations language (Frimer et al., 2019; Graham et al., 2013), words related to the virtues of sanctity were the most prevalent, accounting for 7.7% of words in the average sermon. These words were relatively frequent compared to the other categories because religious themes relate most to sanctity (i.e., the most frequent words in this category were god/jesus/lord). Words denoting the virtues of care were the next most frequent (love/help/child; *M* = 1.7%), followed by the virtues of authority (father/worship/honour; *M* = 1.1%). Words denoting the vices of disobedience as the opposite of authority (refuse/transgression/chaos; *M* = 0.01%), disloyalty as the opposite of loyalty (enemy/rebellion/rebel; *M* = 0.1%), and injustice as the opposite of fairness (steal/betray/thief; *M* = 0.1%) were most infrequently used.

Words related to personal values showed a similar pattern (Ponizovskiy et al., 2020; Schwartz, 1992). Tradition, which included many religion-related words (i.e., god/jesus/christ), was invoked most frequently (*M* = 6.1%). Benevolence words were next most frequent (love/need/father; *M* = 2.6%), followed by self-direction (think/spirit/mind; *M* = 2.0%). The least-frequently talked about values were hedonism (joy/rest/play; *M* = 0.5%), stimulation (different/opportunity/struggle; *M* = 0.5%), and security (save/salvation/order; *M* = 0.6%).

Emotional intensity (Mohammad, 2017) was greatest for words related to trust (god/good/love; *M* = 8.6), joy (god/jesus/good; *M* = 8.1), and anticipation (god/good/time; *M* = 4.6). Emotional intensity was weakest for words related to disgust (sin/death/lord; *M* = 1.1), surprise (good/death/start; *M* = 1.3), and anger (sin/death/cross; *M* = 1.5). (The dictionary coding scheme allowed for multi-valence words, resulting in highly frequent emotion words contributing strongly to multiple emotion categories. Additional analyses excluding words

with high scores in multiple emotion categories showed similar results to the analyses presented in the next section [Table S3].)

Table 2.

Means and standard deviations for the percentage of words in a sermon dedicated to each dictionary content category.

Morals	Mean	*SD*	Values	Mean	*SD*	Emotions	Mean	*SD*
Sanctity virtue	*7.7*	*2.9*	Tradition	*6.1*	*2.2*	Trust	*8.6*	*1.9*
Care virtue	*1.7*	*1.2*	Benevolence	*2.6*	*1.4*	Joy	*8.1*	*2.0*
Authority virtue	*1.1*	*0.8*	Self-direction	*2.0*	*0.9*	Anticipation	*4.6*	*1.0*
Loyalty virtue	*0.8*	*0.6*	Universalism	*1.2*	*0.7*	Fear	*2.4*	*1.0*
Care vice	*0.5*	*0.5*	Power	*0.9*	*0.6*	Sadness	*1.9*	*1.0*
Sanctity vice	*0.5*	*0.5*	Achievement	*0.8*	*0.5*	Anger	*1.5*	*0.8*
Fairness virtue	*0.3*	*0.3*	Conformity	*0.7*	*0.5*	Surprise	*1.3*	*0.4*
Fairness vice	*0.1*	*0.2*	Security	*0.6*	*0.4*	Disgust	*1.1*	*0.6*
Loyalty vice	*0.1*	*0.1*	Stimulation	*0.5*	*0.3*			
Authority vice	*0.0*	*0.1*	Hedonism	*0.5*	*0.4*			

Note. Means for Morals (Frimer et al., 2019) and Values dictionaries (Ponizovskiy et al., 2020) reflect the average percentage of words in each sermon dedicated to each category (after stopword removal; ranging from 0 to 100). Means for Emotions dictionary (Mohammad, 2017) reflect the average emotion intensity in each sermon dedicated to each category (emotion word intensity ranges from 0 to 100).

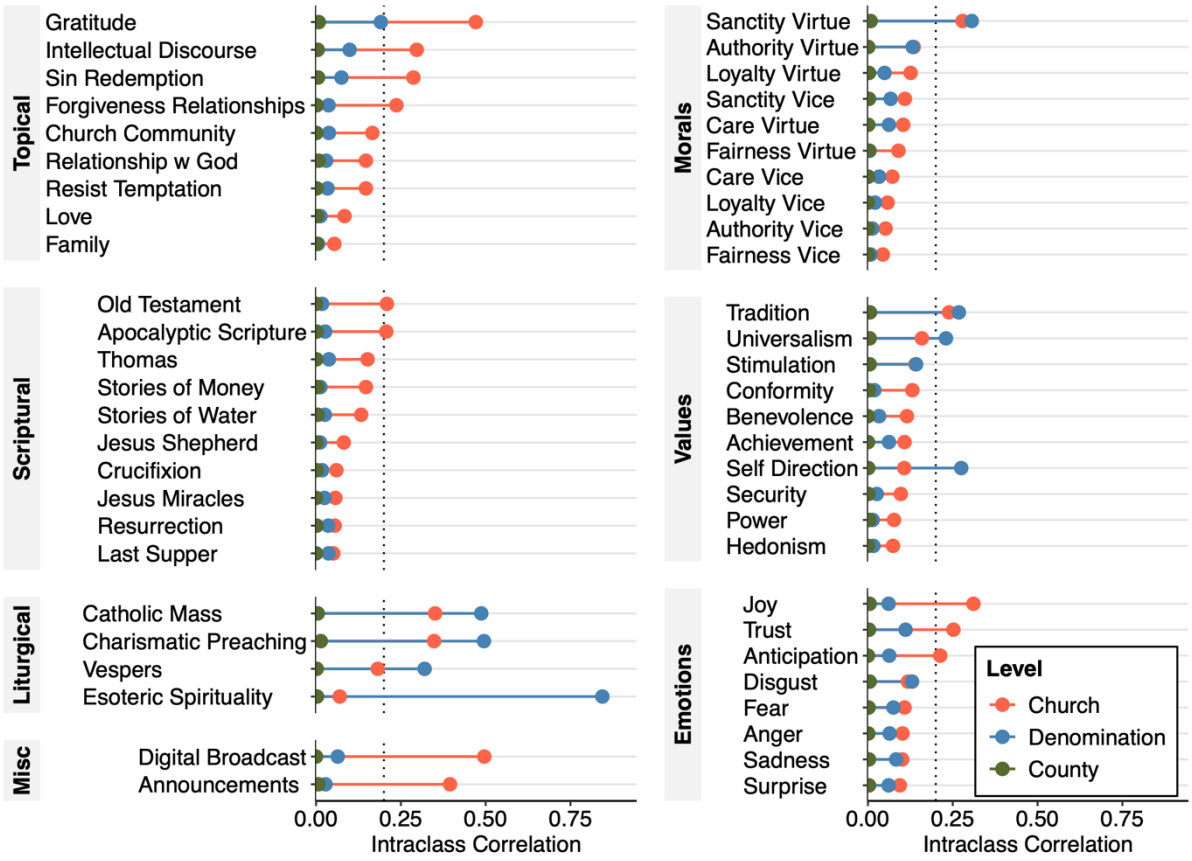
Variance Decomposition: How do sermon contents vary as a function of church, denomination, and location?

Taking the mean intraclass correlation coefficients (*ICC*) across all sermon content features provides an overall estimate of how much variance in religious sermons can be attributed to each level of analysis (Boing et al., 2020). Results show most explainable variance in sermon content is attributable to differences between individual churches (mean *ICC* = 0.16, corresponding to 16% of variance that can be accounted for by differences between individual churches), followed by differences between denominations (mean *ICC* = 0.10), while essentially no variance can be attributed to differences between counties where the sermon was delivered (mean *ICC* = 0.003). (Additional models adding random factors for state and census region, which may capture geographical clustering at higher levels of

analysis, showed similarly low estimates for geographic variance [Table S4].) Inspecting the *ICC* for each sermon content feature provides a better picture of *how exactly* sermons are being differentiated across levels of analysis (Figure 2).

Figure 2.

Intraclass correlation coefficients for each sermon content feature at each level of religious organisation.



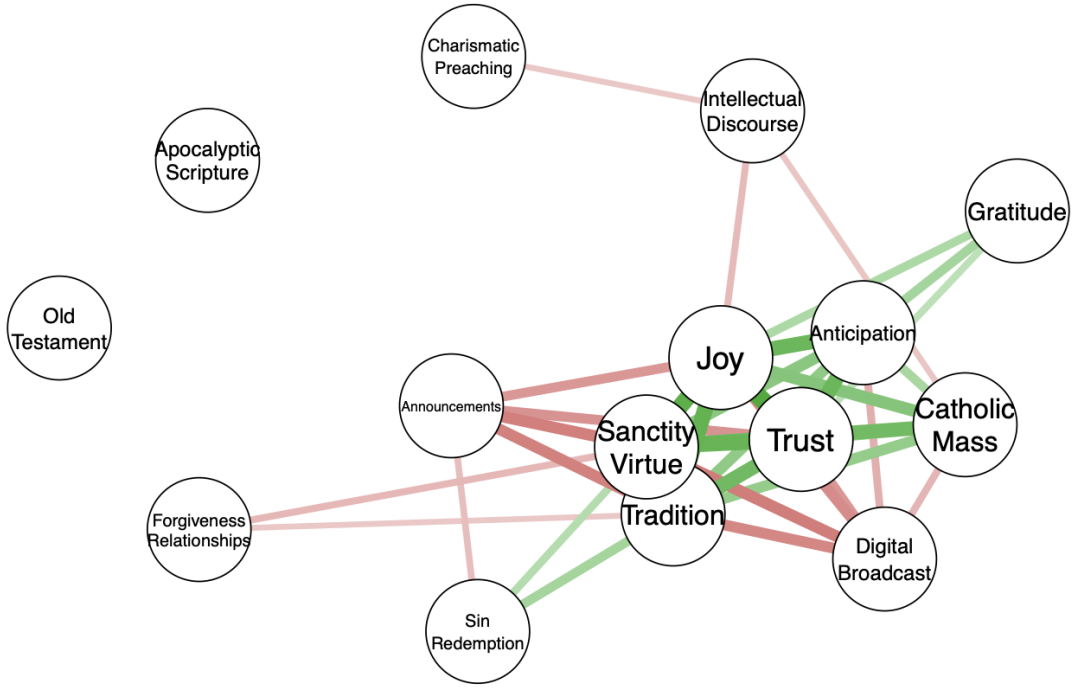
Note. The x-axis corresponds to the intraclass correlation (*ICC*), which indicates the amount of variance in each sermon content feature independently attributable to each level of analysis (church, denomination, county). A large *ICC* value indicates that the sermon content feature has a high ratio of between-group variance to within-group variance, suggesting it differentiates the sermons between groups (i.e., it is distinctive of a given church, denomination, or county). Intraclass correlation (*ICC*) values are derived from intercept-only mixed-effects models predicting each sermon content feature from random intercepts nested at the level of church, denomination, and county. The most variance in sermon content is explained at the level of churches, followed by denominations, with nearly no variance independently explainable at the level of counties. A vertical dotted line marks *ICC* = 0.20, which is used as the threshold for a meaningful effect in this study (for details and justification see Methods).

Variance in sermon contents across churches

Churches differentiated their sermons across a broad set of content features. Ten topics, three emotions, one moral foundation, and one personal value showed *ICC* estimates greater than 0.20 at this level of analysis, which we interpret as a meaningful amount of variance attributable at the level of churches (see Methods for details regarding the choice of *ICC* threshold). Since these distinctive sermon content features may conceptually overlap or covary in their usage, we decided to visualise their intercorrelations to gain a clearer picture of how sermons differed across churches (Figure 3; Table S7 shows the correlation matrix that underlies this figure; Figure S7 visualises the complete set of sermon content features).

Figure 3.

Bivariate correlations between sermon content variables that differentiate churches.



Note. Sermon content features are averaged at the level of the church, which is represented by nodes. Residuals of the church-level mean for each variable, controlling for the effect of denomination, are then correlated. Strength of correlation is visualised as line thickness. Direction of correlation is visualised as line colour (green = positive; red = negative). Correlations below 0.20 are hidden for clarity. A central complex of nodes is revealed, which corresponds to high arousal positive emotionality (i.e., joy, anticipation, trust) combined with traditional morals and values (i.e., sanctity virtue, tradition). This node complex is highly negatively correlated with linguistic markers of digital service broadcasts, suggesting that churches offering in-person and digital services produce distinct sermon contents.

Clusters in sermon content features were revealed that may reflect church-level niches. Specifically, variables indicating high arousal positive emotionality (i.e., anticipation, joy, trust) and traditional morals and values (i.e., sanctity virtue, tradition) represented a central cluster of variables. This central cluster correlated with other sermon content features. For instance, churches delivering sermons that included more words related to Catholic Mass tended to include more words related to high arousal positive emotionality (r's = 0.36, 0.34, 0.27 for anticipation, joy, trust, respectively, all p's < 0.001) and traditional morals and values (r's = 0.60, 0.44 for sanctity virtue and tradition, respectively, all p's < 0.001). In contrast, churches delivering sermons that included more words related to digital broadcasts tended to include fewer words related to high arousal positive emotionality (r's = -0.30, -0.43, -0.38 for anticipation, joy, trust, respectively, all p's < 0.001) and traditional morals and values (r's = -0.48, -0.45 for sanctity virtue and tradition, respectively, all p's < 0.001). A similar pattern of negative correlations was found between this central cluster and words related to church announcements (r's ranged from -0.25 – -0.48, p's < 0.001). To a lesser extent, this central cluster positively correlated with gratitude (r's ranged from 0.12 – 0.37, p's < 0.001) and sin and redemption (r's ranged from 0.05 – 0.37, p's < 0.001), and negatively correlated with forgiveness and relationships (r's ranged from -0.11 – -0.26, p's < 0.001) and intellectual discourse (r's ranged from 0.04 – -0.26, p's <0.01). Independent of this central emotional-moral cluster, churches also differentiated themselves in terms of biblical corpora (Old Testament / Apocalyptic Scripture) and charismatic preaching.

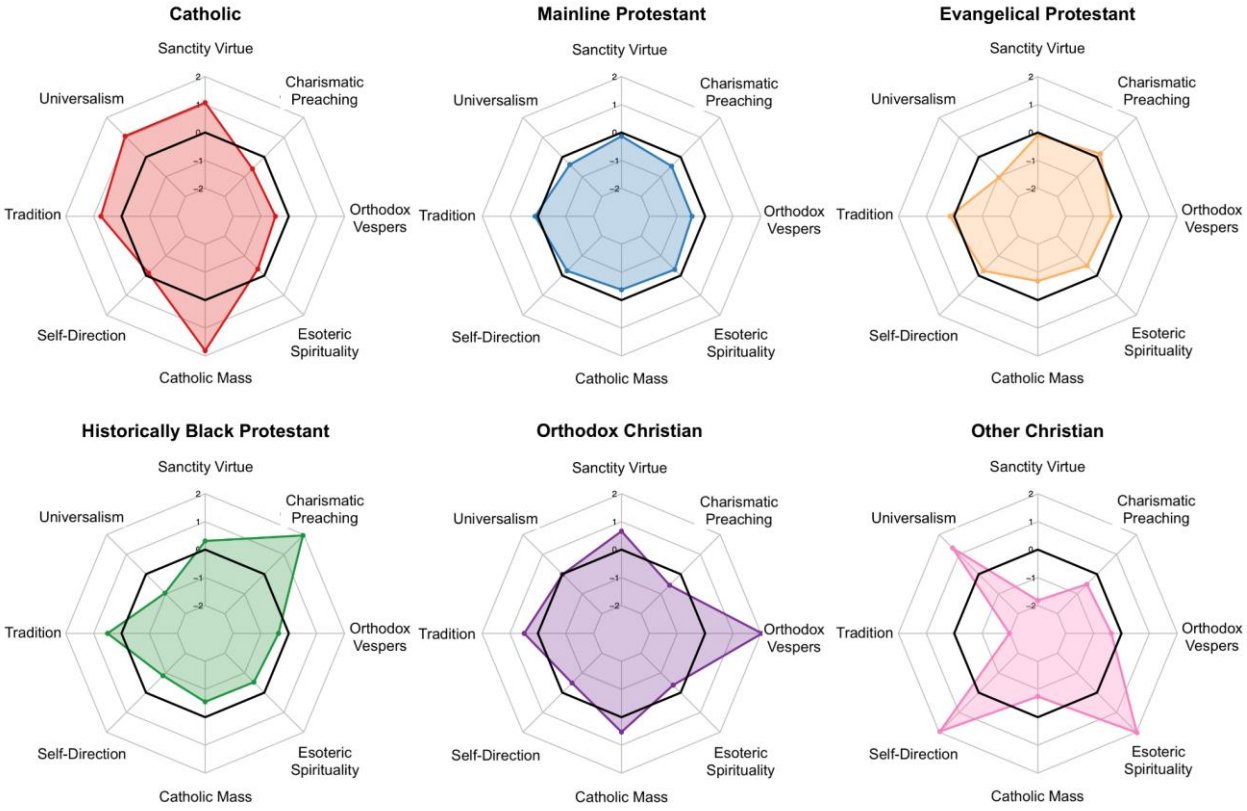
Variance in sermon contents across denominations

Denominations independently accounted for sermon differentiation on eight sermon content features, with *ICC* estimates greater than 0.20. Some of these features overlapped with features that differentiated churches (sanctity virtue, tradition, Catholic Mass, charismatic preaching), while other features uniquely differentiated denominations (Orthodox

Vespers, universalism, self-direction, esoteric spirituality). We computed the standardised relative usage of each of the eight denominationally distinctive sermon content features by standardising the mean values across denominations (after first getting the mean values for each church, so each church would be weighted evenly despite differing numbers of sermons). Figure 4 plots these standardised values for each denomination, revealing niches at the denomination level.

Figure 4.

Radar plot of sermon content features that differentiate denominations.



Note. Sermon content features averaged within church, then averaged within denomination. *Z*-scores from denomination averages are plotted on the radar plots. A bold line indicates a *z*-score of 0. Positive *z*-scores indicate the denomination preferentially uses the sermon content feature. Negative *z*-scores indicate the denomination uses the sermon content feature to a lesser extent than other denominations. Only the content features with a denomination-level *ICC* > 0.20 (i.e., only those features for which meaningful variance in usage can be attributed to denominational differences) are visualised.

Denominations appeared to differ in terms of ritual practices and moral values. In terms of ritual practices, Catholic sermons were distinctive in language denoting the Mass service (z = 1.81, 21% of words in the average sermon); Historically Black Protestant sermons in charismatic preaching (z = 1.96, 24% of words); Orthodox sermons in the Vespers prayers (z = 2.04, 9% of words); and Other non-denominational sermons in esoteric spirituality (z = 2.03, 38% of words). In terms of moral values, Catholic sermons emphasized the virtues of sanctity (z = 1.07, 9% of words), universalism (z = 1.06, 2% of words), and tradition (z = 0.74, 7% of words); Evangelical Protestant sermons de-emphasized universalism (z = -1.03, 1% of words); Historically Black Protestant sermons emphasized tradition (z = 0.50, 6% of words) and de-emphasized universalism (z = -0.93, 1% of words) and self-direction (z = -0.86, 2% of words); Orthodox sermons emphasized the virtues of sanctity (z = 0.66, 9% of words); and Other non-denominational sermons emphasized self-direction (z = 1.97, 3% of words) and universalism (z = 1.33, 2% of words) and de-emphasized tradition (z = -1.98, 3% of words) and the virtues of sanctity (z = -1.82, 4% of words).

General Discussion

This study analysed a corpus of 24,479 sermon transcripts from Christian religious services across the United States to reveal niches in religious sermon content driven by sermon differentiation at the level of church, denomination, and geographical region. A combination of bottom-up and top-down natural language processing methods extracted quantitative variables capturing the thematic, moral, value, and emotion content of each sermon transcript. Variance decomposition analysis showed that sermon differentiation was driven primarily by differences between churches and secondarily by differences between denominations. While denominations form systematic spatial clusters across the United States (e.g., high concentration of Mainline Protestant churches in the Northeast and

Midwest, high concentration of Historically-Black Protestant Churches in the South, high concentration of Catholic churches in New England and California; Crawford, 2005), geographical regions accounted for practically zero variance in religious sermons once accounting for church and denomination.

The sermon content features that differentiated churches revealed some identifiable niches. One niche was represented by a cluster of sermon content features representing high arousal positive emotionality and traditional morals and values. This cluster of features was more prevalent amongst churches with more words denoting Catholic Mass, gratitude, and sin and redemption, and was less prevalent amongst churches with more denoting digital broadcasts, announcements, forgiveness and relationships, and intellectual discourse. Other niches were represented by differences in the use of biblical corpora (i.e., Old Testament, apocalyptic scripture) and charismatic preaching. Denominations differentiated themselves through denomination-specific rituals (i.e., Mass, Vespers, charismatic preaching, esoteric spirituality) and through emphasising traditional-hierarchical moral values (i.e., sanctity, tradition) or individualistic moral values (i.e., self-direction, universalism). These findings demonstrate that religious product differentiation is occurring at multiple levels of analysis and provide insights into the religious niches this process may be creating in American Christianity.

Cultural evolution (e.g., Norenzayan et al., 2016; Jackson et al., 2021) and religious economy approaches (e.g., Iannaccone, 1998; Iyer, 2016) both stress that the products that religious organisations offer to their members are central to the cultural dynamics of religion—its survival, transmission, and consequences for individuals and societies. These products include anything that postulates a reward to members or offers a reward at a cost, including group membership status, religious doctrine, spiritual guidance, or—most relevant to our current study—religious services (Miller, 2002). An emerging science of religious

products is shedding light on key questions, such as: what content-features determine the transmissibility of religious doctrine (Barrett, 2008; Norenzayan et al., 2006)? Or: what psycho-physiological mechanisms link religious ritual to prosociality (Whitehouse & Lanman, 2014; Xygalatas et al., 2013)? In this study, we drew on large-scale data of a religious product of central importance to the lives of over one hundred million Americans—sermons—to investigate religious niche formation. This approach revealed fault lines along which religious niches may be forming (e.g., high arousal positive emotion, traditional moral values, liturgical practices) and the extent to which churches, denominations, and geographic regions differ along these fault lines.

For a small number of sermon content features (i.e., sanctity virtue, tradition, Catholic Mass, charismatic preaching), both church and denomination independently accounted for meaningful variance, suggesting that differentiation occurred at both levels simultaneously—why? This could reflect a dynamic market segmentation process, in which denominational drift—prototypically away from strictness to compete with secular products—creates opportunities for churches to splinter and capture the more traditional segment of the congregation (Miller, 2002). Since disaffiliating with the parent denomination is risky (i.e., the church is forfeiting a degree of legitimacy afforded by the affiliation), churches may first segment within the denomination, reasserting the traditional historical doctrine. Indeed, tradition and sanctity are the two content features (besides liturgical practices, which can also be viewed as "traditional practice") that show this dual differentiation at the church and denomination level. Future studies using a sample of sermons across a longer timespan would be informative in capturing the dynamic process of denominational drift and its consequences for churches.

A second curious finding concerned geography. Given previous studies showing that sermons respond to local socio-political context (Alper et al., 2020; Boussalis et al., 2021;

Gilliland, 2023; Guhin et al., 2023), why did geographical regions account for practically zero variance in sermon content? One explanation is that geography does not exert a direct causal effect on sermon content, but influences the spatial distribution of churches and denominations, which in turn affect religious product differentiation. Denominations are not evenly distributed across America (Crawford, 2005), in part reflecting clusters of underlying preferences in religious congregants who select the denominations with which to affiliate (Public Religion Research Institute, 2020). Our analysis inspects the independent effect of geography after controlling for church and denomination, finding no effect for geography. Additional analyses that do not control for the effect of church and denomination instead find that geography accounts for more variance in sermon content (the mean *ICC* for counties across all sermon content features increased 28-fold from 0.003 to 0.081; Table S5). This pattern of results is consistent with a full mediation of the effects of geography by church and denomination, although future research specifically designed to assess mediation is needed to formally corroborate this empirically.

Another explanation is also possible: Geography does not matter for religious sermon content as it does for other domains of religion, like missionary activity and religious conversion (e.g., Nunn, 2010), exposure to shock events and religiosity (e.g., Bentzen, 2019; Henrich et al., 2019), regional hegemony and religious strictness (e.g., Iannaccone, 1994), and connection with nature as a source of spiritual fulfilment (e.g., Billet et al., 2025; Ferguson & Tamburello, 2015). Americans are highly residentially mobile (27% were born in a state in which they do not currently reside; Ren, 2011), traversing the vast geography of the United States and bringing their religious sensibilities along with them. In such a sociocultural context, churches may serve as cultural microcosms that transcend geographical space, offering congregants familiar stories, morals, values, emotions, and rituals (Cohen, 2009; Cohen & Varnum, 2016; White et al., 2021). In this sense, churches within a given

denomination, like national chain stores, may provide familiar environments that quell the anxiety of being in a new place (Oishi et al., 2012; Oishi & Talhelm, 2012). If true, we *would* expect little geographical variation in sermon content because sermons act to suppress cultural differences across space. Future research might compare the influence of geography in America to less residentially mobile countries with similar religious markets to further evaluate this claim.

The focus of this study has been on differences between sermons, but it is worth noting that most sermon content features did not differentiate religious organisations. For instance, all denominations showed nearly identical rank-ordering frequency of morals, values, and emotions (Table S7). Likewise, only high arousal positive emotions and traditional moral values seemed to differentiate sermons—the overwhelming majority of morals, values, and emotions did not differ substantially across churches, denominations, and regions. This observation begs for further investigation because it is not clear why religious organisations would only "specialise" in a small slice of the possible morals, values, and emotions. One possibility is that—mirroring contemporary American society at large (Finkel et al., 2020; Iyengar et al., 2019)—religious rifts occur generally along the dimension of traditionalism-liberalism. If true, this fault line would dominate the opportunity space for religious organisations to build a distinct brand personality that represents and institutionalises a clearly defined set of values and beliefs (Aaker, 1997; Aaker et al., 2001). Another possibility is that there are general expectations in the American population about the genre of Christian sermons, which constrain the contents of sermons. A less interesting but likely possibility is that our sample of churches does not represent the deviant or trailblazing churches that do attempt to innovate on the genre of sermon.

This study is limited in other ways that must be mentioned. While the data may speak to an underlying process of sermon differentiation, the observational nature of the data

precludes causal inferences. A second limitation concerns generalisability to other countries, religions, and historical times (Atari et al., 2025). Within the global context, the United States occupies the far end of the WEIRD psychological spectrum (Muthukrishna et al., 2020), and stands out with its high economic inequality, high residential mobility, extreme individualism, and religious freedom combined with traditionalism. In contrast, in Turkey, for example, where a central government-sanctioned authority writes Friday *Khutbas* (i.e., the primary form of religious address in the Islamic tradition; Aksoy, 2023), sermons are less likely to demonstrate the degree of church individuality identified here. Finally, our sample includes only religious organisations that upload their sermons to their websites, which may not be fully representative of all churches in the United States. Specifically, our results may not generalise to counties in the Midwest, the region most underrepresented in our sample. Consequently, our sample of counties—while similar in terms of age, gender, race, marital status, and proportion of religious adherents—tended to have larger populations, higher educational attainment, and lower proportions of Republican voters compared to the total set of U.S. counties (see Table S8 for details).

Despite these limitations, the present study provides a unique portrait of the many faces of the American Christian church. By comparing this portrait to those from other religions, countries, and historical times, future research can offer a richer understanding of the factors that shape the world's religious diversity.

Materials and Methods

Data

The sermon transcript corpus was collected and validated by Pew Research Center as part of the two-wave digital pulpit project (Pew Research Center, 2019, 2021). The first wave of data included 42,911 total transcripts, and the second wave included 12,832 total transcripts. In addition to the sermon transcription, metadata were also provided for each

sermon, including a sermon unique identifier (only for wave one), a church unique identifier, church denomination code, date delivered, and longitude and latitude of the church. The raw dataset included sermons from the following denomination codes: Evangelical Protestant (*n*=19,908), Mainline Protestant (*n*=10,644), Other (*n*=9,867), Catholic (*n*=3,188), Historically Black Protestant (*n*=2,247), Other Faiths (*n*=1,521), Orthodox Christian (*n*=1,024), Other Christian (*n*=926), Mormon (*n*=64), Jewish (*n*=47), Buddhist (*n*=13), Hindu (*n*=13), Jehovah's Witness (*n*=2), and 5,039 sermons had no denomination code.

We took the following steps to clean the data (number of cases deleted shown in brackets): Sermons with duplicate identifiers [only in wave one] were deleted (*n*=4,412). Sermons from non-Christian faiths were deleted (*n*=15,412), as well as sermons from Mormon and Jehovah's Witness churches (*n*=66). Sermons identified as duplicates based on similar raw text, date delivered, church, and duration information were deleted (*n*=11,310). Additional manually identified gibberish transcriptions, duplicates, and non-English (i.e., Spanish) transcriptions were deleted (*n*=64). These exclusions affected each of the final remaining denominations to a similar extent, ranging from 26.4% exclusion (Historically Black Protestant) to 38.0% exclusion (Evangelical Protestant). The 24,479 sermons that were retained after all these steps had been conducted constitute our final sample and were used in all analyses reported in the present study.

The final sermon count by denomination was: Evangelical Protestant (*n*=12,345), Mainline Protestant (*n*=6,946), Catholic (*n*=2,182), Historically Black Protestant (*n*=1,654), Orthodox Christian (*n*=713), Other Christian (*n*=639). On average, each church had 4.97 sermons (*SD*=4.37), and each county had 3.63 churches (*SD*=5.31) and 18.03 sermons (*SD*=27.76). The final dataset contained sermons from 4,925 Christian churches, spanning 1,358 counties across 50 states plus the District of Columbia. The counties represented 86% of the population of the United States, approximately 288 million individuals (U.S. Census

Bureau, 2023). State-level population coverage varied from 47.1% in Wyoming to 100% in Delaware, D.C., and Rhode Island (M=81.17%, SD=14.15%)—replicating a pattern commonly observed in prior geo-psychological research in the United States (e.g., Ebert et al., 2019; Peters et al., 2023; Rentfrow et al., 2008).

Statistical Analysis

Natural Language Processing

We adopted a two-pronged natural language processing approach, using both bottom-up topic modelling and top-down dictionary-based word-counts (cf., Eichstaedt et al., 2021).

Topic Model Method. To summarise the content of the sermon corpus, we fit the data to a correlated topic model using the *stm R* package (Roberts et al., 2019). Given the vocabulary of each sermon and the number of topics as inputs, the model finds a probabilistic solution that describes the prevalence of topics in a sermon and the representativeness of words to a topic (Blei & Lafferty, 2007). This method produces a set of thematic topics based on clusters of commonly co-occurring words that describe a set of sermons in a qualitatively interpretable way.

Topic Model Selection Method. To determine an appropriate number of topics for the model, we assessed diagnostic criteria for models specifying 10 to 70 topics. We paid particular attention to optimising the trade-off between semantic coherence and exclusivity of words to topics (Roberts et al., 2019). Semantic coherence measures the frequency with which the most probable (i.e., representative) words for each topic co-occur in a document, and correlates well with human judgement of topic quality (Roberts et al., 2014). Exclusivity measures the extent to which topics share high-probability words. Balancing these metrics tends to produce highly interpretable and distinct topics (Roberts et al., 2019). Models specifying 10 to 25 topics showed the best balance between semantic coherence and exclusivity of words to each topic (Figures S1-2). To distinguish between these models, we

inspected the topic content qualitatively. An inspection of the representative topic words for each model suggested that the additional topics introduced in the 25-topic model described novel and substantive themes, rather than simply splitting themes into redundant topics (Table S1). Therefore, we settled on the 25-topic correlated topic model. Topics were labelled based on our reading of the representative words and the top five representative sermons for each topic.

Word Count Method. To assess the frequency of words denoting psychological constructs that were not captured by the topic modelling approach, we employed a dictionary-based word count method (Tausczik & Pennebaker, 2010). Dictionaries assessing morals, values, and emotions were accessed and implemented through the *lingmatch R* package (Iserman, 2023). The dictionaries are all open-source with freely available validation studies, which provide a number of advantages over traditional proprietary word count dictionaries.

The Moral Foundations Dictionary (MFD2; Frimer et al., 2019) extracted moral language based on the five categories of morals described by moral foundations theory: Authority, Care, Fairness, Loyalty, and Sanctity (Graham et al., 2009). Moral foundations are theorised to be based on psychological systems that are biologically evolved and culturally fine-tuned to respond to distinct adaptive challenges (Graham et al., 2013). Therefore, there are multiple moral foundations, and each foundation is a psychological orientation composed of attitudes, cognitions, values, emotions, and physiological reactions that can be represented in distinct linguistic styles. The MFD2 counts instances of positive (termed "virtue") and negative (termed "vice") words related to each moral foundation. The dictionary has been previously applied to small corpora of Christian sermons (Frimer, 2020; Graham et al., 2009).

The Personal Values Dictionary (PVD; Ponizovskiy et al., 2020) extracted value language based on Schwartz's (1992) ten universal values: Achievement, Benevolence, Conformity, Hedonism, Security, Self-Direction, Stimulation, Power, Tradition,

Universalism. Personal values are theorised to be culturally universal beliefs that refer to desirable goals that transcend any specific action or situation (Schwartz, 1992, 2012). Values form a circumplex, such that some values correspond to complementary motivational goals (e.g., achievement and self-direction), while others are in conflict (e.g., conformity and self-direction; Sagiv et al., 2017). The PVD counts words related to each personal value.

The Emotion Intensity Lexicon (Mohammad, 2017) extracted emotional sentiment intensity for eight emotion categories: Anger, Anticipation, Disgust, Fear, Joy, Sadness, Surprise, and Trust. Emotions describe short-term states associated with specific cognitive and physiological changes, physical gestures, and socially-agreed-upon labels that can be detected in natural language (Fiske et al., 2025; Sharp & Kidder, 2013). The dictionary provides emotion intensity ratings for over 5,000 common English words and common social media words. Human coding of word emotional intensity was crowd-sourced and validated against gold-standard ratings (Mohammad, 2017). Each word in the dictionary has a 0 to 100 intensity rating for each emotion category, allowing for multi-valence words.

Analysis was conducted on a cleaned corpus, using lemmatized text (i.e., grouping together different inflected forms of the same word, such as “saying”, “said”, and “say”), removed of numbers, punctuation, and stopwords (including custom stopwords that were mostly verbal disfluencies or regional vernacular, like “uh”, “um”, “yall”, “gonna”), which is standard practice in natural language processing (Eisenstein, 2019). Dictionary scores were divided by the total number of words in each sermon to control for sermon length. Figures S4 to S6 visualise the most common words captured by each dictionary category.

Variance decomposition analysis

To estimate the variance in sermon content features attributable to each level of religious organisation (i.e., church, denomination, region), we employed a variance decomposition analysis based on Boing et al. (2020). For each sermon content feature, an

intercept-only mixed-effects model with a random factor for church, denomination, and county was estimated. Each model produced intraclass correlation coefficients (*ICCs*) for each random factor, describing the proportion of total variance in a content feature that is independently explained by that factor. The *ICC* can vary between 0 and 1, and the magnitude can be interpreted similarly to a Pearson's correlation coefficient (Twisk, 2019). Scholars debate what a meaningful effect size is (Funder & Ozer, 2019; Götz et al., 2024), but $r = 0.20$ appears to be typical for psychological science (Bosco et al., 2015; Gignac & Szodorai, 2016; Richard et al., 2003) and has been identified as a medium effect with likely direct practical relevance (Funder & Ozer, 2019) in a recent revision of Cohen's classic (1988) benchmarks. We interpret effects below this cutoff as not meaningful for the purposes of the current study.

Data Accessibility

The authors do not own the rights to the raw dataset and are not at liberty to share the raw dataset, but data access inquiries can be made to Pew Research Center regarding the "digital pulpit project". An early preregistration (from which we departed considerably), as well as data summaries, data files, and analysis scripts that reproduce the analyses in the main article and the supplemental material are available on the Open Science Framework (https://osf.io/pbv34/?view_only=d8142d6569514757882312d4e9dbe4e4).

References

Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research*, *34*(3), 347–356. https://doi.org/10.1177/002224379703400304

Aaker, J. L., Benet-Martínez, V., & Garolera, J. (2001). Consumption symbols as carriers of culture: A study of Japanese and Spanish brand personality constructs. *Journal of Personality and Social Psychology*, *81*(3), 492–508. https://doi.org/10.1037/0022-3514.81.3.492

Agersnap, A., Kristensen-McLachlan, R. D., Johansen, K. H., Schjødt, U., & Nielbo, K. L. (2020). Sermons as data: Introducing a corpus of 11,955 Danish sermons. *Journal of Cultural Analytics*, *5*(2), 1–27. https://doi.org/10.22148/001c.18238

Aksoy, O. (2023). Preaching to social media: Turkey's Friday Khutbas and their effects on Twitter. *Socius*, *9*, 1–14. https://doi.org/doi.org/10.1177/23780231231182909

Alper, S., Bayrak, F., Us, E. Ö., & Yilmaz, O. (2020). Do changes in threat salience predict the moral content of sermons? The case of Friday Khutbas in Turkey. *European Journal of Social Psychology*, *50*(3), 662–672. https://doi.org/10.1002/ejsp.2632

Atari, M., Henrich, J., & Schulz, J. (2025). The chronospatial revolution in psychology. *Nature Human Behaviour*, *9*(7), 1319–1327. https://doi.org/10.1038/s41562-025-02229-y

Barrett, J. (2008). Coding and quantifying counterintuitiveness in religious concepts: Theoretical and methodological reflections. *Method & Theory in the Study of Religion*, *20*(4), 308–338. https://doi.org/10.1163/157006808X371806

Bentzen, J. S. (2019). Acts of God? Religiosity and natural disasters across subnational world districts. *The Economic Journal*, *129*(622), 2295–2321. https://doi.org/10.1093/ej/uez008

Billet, M. I., Baimel, A., Schaller, M., & Norenzayan, A. (2025). Ecospirituality. *Current*

Directions in Psychological Science, *34*(2), 97–104. https://doi.org/10.1177/09637214241304326

Blair, G., Littman, R., Nugent, E. R., Wolfe, R., Bukar, M., Crisman, B., Etim, A., Hazlett, C., & Kim, J. (2021). Trusted authorities can change minds and shift norms during conflict. *Proceedings of the National Academy of Sciences*, *118*(42), e2105570118. https://doi.org/10.1073/pnas.2105570118

Blei, D. M., & Lafferty, J. D. (2007). A correlated topic model of Science. *The Annals of Applied Statistics*, *1*(1). https://doi.org/10.1214/07-AOAS114

Boing, A. F., Boing, A. C., Cordes, J., Kim, R., & Subramanian, S. V. (2020). Quantifying and explaining variation in life expectancy at census tract, county, and state levels in the United States. *Proceedings of the National Academy of Sciences*, *117*(30), 17688–17694. https://doi.org/10.1073/pnas.2003719117

Bosco, F. A., Aguinis, H., Singh, K., Field, J. G., & Pierce, C. A. (2015). Correlational effect size benchmarks. *Journal of Applied Psychology*, *100*, 431–449. https://doi.org/10.1037/a0038047

Boussalis, C., Coan, T. G., & Holman, M. R. (2021). Political speech in religious sermons. *Politics and Religion*, *14*(2), 241–268. https://doi.org/10.1017/S1755048320000334

Chesnut, R. A. (2004). Competitive spirits: Latin America's new religious economy. *Choice Reviews Online*. https://doi.org/10.5860/CHOICE.41-5242

Cohen, A. B. (2009). Many forms of culture. *American Psychologist*, *64*(3), 194–204. https://doi.org/10.1037/a0015308

Cohen, A. B., & Varnum, M. E. (2016). Beyond East vs. West: Social class, region, and religion as forms of culture. *Current Opinion in Psychology*, *8*, 5–9. https://doi.org/10.1016/j.copsyc.2015.09.006

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge.

Crawford, T. W. (2005). Stability and change on the American religious landscape: A centrographic analysis of major U.S. religious groups. *Journal of Cultural Geography*, *22*(2), 51–86. https://doi.org/10.1080/08873630509478239

Ebert, T., Götz, F. M., Obschonka, M., Zmigrod, L., & Rentfrow, P. J. (2019). Regional variation in courage and entrepreneurship: The contrasting role of courage for the emergence and survival of start-ups in the United States. *Journal of Personality*, *87*(5), 1039–1055. https://doi.org/10.1111/jopy.12454

Eichstaedt, J. C., Kern, M. L., Yaden, D. B., Schwartz, H. A., Giorgi, S., Park, G., Hagan, C. A., Tobolsky, V. A., Smith, L. K., Buffone, A., Iwry, J., Seligman, M. E. P., & Ungar, L. H. (2021). Closed- and open-vocabulary approaches to text analysis: A review, quantitative comparison, and recommendations. *Psychological Methods*, *26*(4), 398–427. https://doi.org/10.1037/met0000349

Eisenstein, J. (2019). *Introduction to natural language processing*. MIT press.

Ferguson, T. W., & Tamburello, J. A. (2015). The natural environment as a spiritual resource: A theory of regional variation in religious adherence. *Sociology of Religion*, *76*(3), 295–314. https://doi.org/10.1093/socrel/srv029

Feuerriegel, S., Maarouf, A., Bär, D., Geissler, D., Schweisthal, J., Pröllochs, N., Robertson, C. E., Rathje, S., Hartmann, J., Mohammad, S. M., Netzer, O., Siegel, A. A., Plank, B., & Van Bavel, J. J. (2025). Using natural language processing to analyse text data in behavioural science. *Nature Reviews Psychology*, *4*(2), 96–111. https://doi.org/10.1038/s44159-024-00392-z

Finkel, E. J., Bail, C. A., Cikara, M., Ditto, P. H., Iyengar, S., Klar, S., Mason, L., McGrath, M. C., Nyhan, B., Rand, D. G., Skitka, L. J., Tucker, J. A., Van Bavel, J. J., Wang, C. S., & Druckman, J. N. (2020). Political sectarianism in America. *Science*, *370*(6516), 533–536. https://doi.org/10.1126/science.abe1715

Fiske, A. P., Schubert, T. W., & Seibt, B. (2025). Seeking communal emotions in social practices that culturally evolved to evoke emotions: Worship, kitten videos, memorials, narratives of love, and more. *Annual Review of Psychology, 76*(1), 607–633. https://doi.org/10.1146/annurev-psych-020124-023338

Freeburg, D., & Roland, D. (2015). Goals and information behavior in religious sermons. *Interdisciplinary Journal of Research on Religion*, *11*, 1–19.

Frimer, J. A. (2020). Do liberals and conservatives use different moral languages? Two replications and six extensions of Graham, Haidt, and Nosek's (2009) moral text analysis. *Journal of Research in Personality*, *84*, 103906. https://doi.org/10.1016/j.jrp.2019.103906

Frimer, J. A., Boghrati, R., Haidt, J., Graham, J., & Dehgani, M. (2019). Moral foundations dictionary for linguistic analyses 2.0. *Unpublished Manuscript*.

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, *2*(2), 156–168. https://doi.org/10.1177/2515245919847202

Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences*, *102*, 74–78. https://doi.org/10.1016/j.paid.2016.06.069

Gilliland, C. C. (2023). "Too much to hope": Analyzing clergy rhetoric on white supremacy. *Journal for the Scientific Study of Religion*, *62*(S1), 68–87. https://doi.org/10.1111/jssr.12850

Götz, F. M., Gosling, S. D., & Rentfrow, P. J. (2024). Effect sizes and what to make of them. *Nature Human Behaviour*, *8*(5), 798–800. https://doi.org/10.1038/s41562-024-01858-z

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013).

Moral Foundations Theory. In *Advances in Experimental Social Psychology* (Vol. 47, pp. 55–130). Elsevier. https://doi.org/10.1016/B978-0-12-407236-7.00002-4

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, *96*(5), 1029–1046. https://doi.org/10.1037/a0015141

Guhin, J., Holman, M., Coan, T., & Boussalis, C. (2023). When to preach about poverty: How location, race, and ideology shape white evangelical sermons. *Journal for the Scientific Study of Religion*, *62*(2), 312–335. https://doi.org/10.1111/jssr.12822

Henrich, J., Bauer, M., Cassar, A., Chytilová, J., & Purzycki, B. G. (2019). War increases religiosity. *Nature Human Behaviour*, *3*(2), 129–135. https://doi.org/10.1038/s41562-018-0512-3

Hobbs, V. (2020). The discourse of divorce in conservative Christian sermons. *Critical Discourse Studies*, *17*(2), 193–210. https://doi.org/10.1080/17405904.2019.1665079

Iannaccone, L. R. (1991). The consequences of religious market structure: Adam Smith and the economics of religion. *Rationality and Society*, *3*(2), 156–177. https://doi.org/10.1177/1043463191003002002

Iannaccone, L. R. (1994). Why strict churches are strong. *American Journal of Sociology*. https://doi.org/10.1086/230409

Iannaccone, L. R. (1998). Introduction to the Economics of Religion. *Journal of Economic Literature*.

Iserman, M. (2023). *lingmatch: Linguistic matching and accommodation* [Manual]. https://CRAN.R-project.org/package=lingmatch

Iyengar, S., Lelkes, Y., Levendusky, M., Malhotra, N., & Westwood, S. J. (2019). The origins and consequences of affective polarization in the United States. *Annual Review of Political Science*, *22*(1), 129–146. https://doi.org/10.1146/annurev-polisci-

051117-073034

Iyer, S. (2016). The New Economics of Religion. *Journal of Economic Literature*, *54*(2), 395–441. https://doi.org/10.1257/jel.54.2.395

Jackson, J. C., Caluori, N., Gray, K., & Gelfand, M. (2021). The new science of religious change. *American Psychologist*, *76*(6), 838–850. https://doi.org/10.1037/amp0000818

Jackson, J. C., Watts, J., List, J.-M., Puryear, C., Drabble, R., & Lindquist, K. A. (2022). From text to thought: How analyzing language can advance psychological science. *Perspectives on Psychological Science*, *17*(3), 805–826. https://doi.org/10.1177/17456916211004899

Luhrmann, T. M. (2020). *How God becomes real: Kindling the presence of invisible others*. Princeton University Press.

Luhrmann, T. M., Weisman, K., Aulino, F., Brahinsky, J. D., Dulin, J. C., Dzokoto, V. A., Legare, C. H., Lifshitz, M., Ng, E., Ross-Zehnder, N., & Smith, R. E. (2021). Sensing the presence of gods and spirits across cultures and faiths. *Proceedings of the National Academy of Sciences*, *118*(5), e2016649118. https://doi.org/10.1073/pnas.2016649118

McAlister, M. (2018). *The kingdom of God has no borders: A global history of American evangelicals*. Oxford University Press.

McClendon, G. H., & Riedl, R. B. (2015). Individualism and empowerment in pentecostal sermons: New evidence from Nairobi, Kenya. *African Affairs*, *115*(458), 119–144. https://doi.org/10.1093/afraf/adv056

Miller, K. D. (2002). Competitive strategies of religious organizations. *Strategic Management Journal*, *23*(5), 435–456. https://doi.org/10.1002/smj.234

Mixon, F. G., & Upadhyaya, K. P. (2018). Quality choice and product differentiation in monopoly theory: An application to the Puritan Church. *Journal for the Scientific*

Study of Religion, *57*(1), 173–182. https://doi.org/10.1111/jssr.12494

Mohammad, S. M. (2017). Word affect intensities. *arXiv Preprint arXiv:1704.08798*.

Muthukrishna, M., Bell, A. V., Henrich, J., Curtin, C. M., Gedranovich, A., McInerney, J., & Thue, B. (2020). Beyond Western, educated, industrial, rich, and democratic (WEIRD) psychology: Measuring and mapping scales of cultural and psychological distance. *Psychological Science*, *31*(6), 678-701. https://doi.org/10.1177/0956797620916782

Norenzayan, A., Atran, S., Faulkner, J., & Schaller, M. (2006). Memory and mystery: The cultural selection of minimally counterintuitive narratives. *Cognitive Science*, *30*(3), 531–553. https://doi.org/10.1207/s15516709cog0000_68

Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2016). The cultural evolution of prosocial religions. *Behavioral and Brain Sciences*, *39*, 1–16. https://doi.org/10.1017/S0140525X14001356

Nunn, N. (2010). Religious conversion in colonial Africa. *American Economic Review*, *100*(2), 147–152. https://doi.org/10.1257/aer.100.2.147

Oishi, S., Miao, F. F., Koo, M., Kisling, J., & Ratliff, K. A. (2012). Residential mobility breeds familiarity-seeking. *Journal of Personality and Social Psychology*, *102*(1), 149–162. https://doi.org/10.1037/a0024949

Oishi, S., & Talhelm, T. (2012). Residential mobility: What psychological research reveals. *Current Directions in Psychological Science*, *21*(6), 425–430. https://doi.org/10.1177/0963721412460675

Peters, H., Götz, F. M., Ebert, T., Müller, S. R., Rentfrow, P. J., Gosling, S. D., Obschonka, M., Ames, D., Potter, J., & Matz, S. C. (2023). Regional personality differences predict variation in early COVID-19 infections and mobility patterns indicative of

social distancing. *Journal of Personality and Social Psychology*, *124*(4), 848–872. https://doi.org/10.1037/pspp0000439

Pew Research Center. (2019). *The digital pulpit: A nationwide analysis of online sermons*. https://www.pewresearch.org/wp-content/uploads/sites/20/2019/12/PF.12.16.19_sermons.analysis.report.pdf

Pew Research Center. (2021). *Pastors often discussed election, pandemic and racism in fall of 2020*. https://www.pewresearch.org/wp-content/uploads/sites/20/2021/07/PDL_07.08.21.Sermons.pdf#page=19.11

Ponizovskiy, V., Ardag, M., Grigoryan, L., Boyd, R., Dobewall, H., & Holtz, P. (2020). Development and validation of the personal values dictionary: A theory–driven tool for investigating references to basic human values in text. *European Journal of Personality*, *34*(5), 885–902.

Public Religion Research Institute. (2020). *The 2020 PRRI American Census of Religion*. https://www.prri.org/wp-content/uploads/2021/07/PRRI-Jul-2021-Religion.pdf

Ren, P. (2011). *Lifetime mobility in the United States: 2010* (No. ACSBR/10-07; American Community Survey Briefs, pp. 1–4). U.S. Census Bureau. https://www2.census.gov/library/publications/2011/acs/acsbr10-07.pdf

Rentfrow, P. J., Gosling, S. D., & Potter, J. (2008). A theory of the emergence, persistence, and expression of geographic variation in psychological characteristics. *Perspectives on Psychological Science*, *3*(5), 339–369. https://doi.org/10.1111/j.1745-6924.2008.00084.x

Reynolds, M. (2025, January 10). *NFL regular-season audience slips 2.2% as 3 packages lose viewers*. S&P Global. https://www.spglobal.com/market-intelligence/en/news-insights/articles/2025/1/nfl-regular-season-audience-slips-2-2-as-3-packages-lose-viewers-

87058254#:~:text=The%20league%20averaged%2017.5%20million,PLC%20and%20Adobe%20Analytics%20data

Richard, F. D., Bond, C. F., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, *7*, 331–363. https://doi.org/10.1037/1089-2680.7.4.331

Roberts, M. E., Stewart, B. M., & Tingley, D. (2019). stm: An R package for structural topic models. *Journal of Statistical Software*, *91*(2), 1–40. https://doi.org/10.18637/jss.v091.i02

Roberts, M. E., Stewart, B. M., Tingley, D., Lucas, C., Leder-Luis, J., Gadarian, S. K., Albertson, B., & Rand, D. G. (2014). Structural topic models for open-ended survey responses. *American Journal of Political Science*, *58*(4), 1064–1082. https://doi.org/10.1111/ajps.12103

Sagiv, L., Roccas, S., Cieciuch, J., & Schwartz, S. H. (2017). Personal values in human life. *Nature Human Behaviour*, *1*(9), 630–639. https://doi.org/10.1038/s41562-017-0185-3

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, *25*, 1–65. https://doi.org/10.1016/S0065-2601(08)60281-6

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture*, *2*(1). https://doi.org/10.9707/2307-0919.1116

Sharp, S., & Kidder, J. L. (2013). Emotions. In *Handbook of social psychology* (pp. 341–367). Springer.

Stark, R., & Finke, R. (2000). *Acts of faith: Explaining the human side of religion*. Univ of California Press.

Stark, R., & Iannaccone, L. R. (1994). A supply-side reinterpretation of the "secularization" of Europe. *Journal for the Scientific Study of Religion*, *33*(3), 230.

https://doi.org/10.2307/1386688

Stokes, E., & Schewe, R. (2016). Framing from the pulpit: A content analysis of American conservative evangelical protestant sermon rhetoric discussing LGBT couples and marriage. *Journal of Communication & Religion*, *39*(3), 59–75.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24–54. https://doi.org/10.1177/0261927X09351676

The Gallup Organization. (2023). *Religion*. Gallup News. https://news.gallup.com/poll/1690/Religion.aspx

Trinitapoli, J. (2009). Religious teachings and influences on the ABCs of HIV prevention in Malawi. *Social Science & Medicine*, *69*(2), 199–209. https://doi.org/10.1016/j.socscimed.2009.04.018

Twisk, J. W. R. (2019). *Applied Mixed Model Analysis: A Practical Guide* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/9781108635660

U.S. Census Bureau. (2023). *2018-2022 American Community Survey 5-Year Estimates*. https://www.census.gov/programs-surveys/acs/data.html

Vermeer, P. (2015). Church growth and appealing sermons: A case study of a Dutch megachurch. *Journal of Empirical Theology*, *28*(1), 1–22. https://doi.org/10.1163/15709256-12341322

White, C. J. M., Muthukrishna, M., & Norenzayan, A. (2021). Cultural similarity among coreligionists within and between countries. *Proceedings of the National Academy of Sciences*, *118*(37), e2109650118. https://doi.org/10.1073/pnas.2109650118

Whitehouse, H., & Lanman, J. A. (2014). The ties that bind us: Ritual, fusion, and identification. *Current Anthropology*, *55*(6), 674–695. https://doi.org/10.1086/678698

Xygalatas, D., Mitkidis, P., Fischer, R., Reddish, P., Skewes, J., Geertz, A. W., Roepstorff,

A., & Bulbulia, J. (2013). Extreme rituals promote prosociality. *Psychological Science*, *24*(8), 1602–1605. https://doi.org/10.1177/0956797612472910