



Full Length Article

Do liberals and conservatives use different moral languages? Two replications and six extensions of Graham, Haidt, and Nosek's (2009) moral text analysis [☆]

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ABSTRACT

Do liberals and conservatives tend to use different moral languages? The *Moral Foundations Hypothesis* states that liberals rely more on foundations of care/harm and fairness/cheating whereas conservatives rely more on loyalty/betrayal, authority/subversion, and purity/degradation in their moral functioning. In support, Graham, Haidt, and Nosek (2009; Study 4) showed that sermons delivered by liberal and conservative pastors differed as predicted in their moral word usage, except for the loyalty foundation. I present two high-powered replication studies in religious contexts and six extension studies in politics, the media, and organizations to test ideological differences in moral language usage. On average, replication success rate was 30% and effect sizes were 38 times smaller than those in the original study. A meta-analysis ($N = 303,680$) found that compared to liberals, conservatives used more authority $r = 0.05$, 95% confidence interval = $[0.02, 0.09]$ and purity words, $r = 0.14$ $[0.09, 0.19]$, fewer loyalty words, $r = -0.08$ $[-0.10, -0.05]$, and no more or less harm, $r = 0.00$ $[-0.02, 0.02]$, or fairness words, $r = -0.03$ $[-0.06, 0.01]$.

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1. Introduction

Why do liberals and conservatives have such difficulty relating to one another? An influential proposition, advanced in Moral Foundations Theory (e.g., Graham, Haidt, & Nosek, 2009; Haidt, 2012), is that liberals' and conservatives' moralities are built upon qualitatively different foundations. The *moral foundations hypothesis* (MFH) is that liberals' morality is primarily built on the foundations of harm/care and fairness/cheating whereas conservatives' morality is based in these foundations to a lesser degree while drawing more from foundations of loyalty/betrayal, authority/subversion, and purity/degradation (henceforth called *harm*, *fairness*, *loyalty*, *authority*, and *purity*, respectively). MFT has been groundbreaking in the way it expanded the moral domain to consider the roles of loyalty, authority, and purity; these moral concerns had received relatively little attention in moral psychology compared to harm and fairness. MFT was also groundbreaking for proposing a theory of moral development that integrated both

nativism (the foundations are innate) and constructivism (they are elaborated through cultural learning).

Evidence for the MFH has come in many forms. For example, liberals and conservatives self-report that they use the foundations as predicted by the MFH. The focus of the present investigation is language: Do liberals and conservative use different moral languages? It is important to know whether liberals and conservatives differ in their moral languages because "words do the work of politics" (Graham et al., 2009; p.1038). Language is a primary mechanism by which people learn about and convince others of their beliefs and opinions (Lakoff, 2004; Luntz, 2007), and thus plays an important role in maintaining a shared sense of reality (Echterhoff, Higgins, & Levine, 2009) which binds together members of moral communities. The present article presents 2 replication studies and 6 extensions that test whether liberals and conservatives use different moral languages.

1.1. Two kinds of pluralism

Moral Foundations Theory is pluralistic in two ways. First, "foundations are not [just] values" (Graham et al., 2009, p.1031). Instead, foundations are *psychologically pluralistic* in that each foundation is made up of attitudes, cognitions, values, emotions,

[☆] **Open Science Practices:** The data for these studies is publicly available at <https://osf.io/9a6fg/>.

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physiological reactions, and linguistic styles (Graham et al., 2013). The theory is also pluralistic in the sense that there is not just one moral foundation—there are five or possibly more. To illustrate the point, Haidt and Joseph (2012) suggested that moral foundations are analogous to distinct taste receptors (for salt, sourness, sweetness, etc.) insofar as they are irreducibly pluralistic innate modules. Each moral foundation is an “evolved psychological mechanism” that become elaborated and revised through cultural leaning (Graham et al., 2009, p.1031).

According to the theory, foundational differences materialize not only between countries but also within countries, such as in Culture Wars between liberals and conservatives. This is because liberals tend to have an optimistic view of human nature (Sowell, 2002), which posits that only freedom and liberty are needed to bring out the best in people. Liberals thus rely on the “individualizing” foundations of harm/care and fairness/cheating as a basis of their morality. Conservatives’ more pessimistic view of human nature (Sowell, 2002) prescribes the need for social constraints, institutions, social structure, and order to rein in inherently selfish tendencies and thus make civil society possible; in this way, the “binding” foundations of loyalty, authority, and purity also play a prime role in conservative morality (see Graham et al., 2009; p.1029). During the developmental period, exposure to practices, lessons, and stories elaborate the various psychological components of different foundations within the moral minds of young liberals and conservatives, rendering them markedly different by adulthood. This might explain why liberals and conservatives might communicate using different moral languages.

1.2. Evidence

What is the evidence that adult liberals and conservatives default to different moral languages? In the seminal empirical article on the topic and precedent for the current investigation, Graham et al. (2009) reported four studies, the first three of which relied on self-report methods and are thus tangential to the present question concerning language. In the crucial Study 4, they showed that the sermons of liberal and conservative pastors varied in their moral languages. For foundations of harm, fairness, authority, and purity, the effects were supportive of the MFH: liberals used more harm and fairness, and less authority and purity language than conservatives. However, liberals also used loyalty words more frequently than conservatives, a finding not predicted by the MFH. It is this particular study and this set of linguistic analyses that the present paper aims to replicate and extend.

Given the extensive support for the MFH coming from other methods (e.g., self-report), it remains unclear why liberals might use more loyalty words than conservatives, rather than vice versa. Graham et al. (2009) attempted to somewhat diminish the significance of this disconfirming finding. Their argument was based on the premise that word frequencies cannot assess whether a speaker has a positive or negative *attitude* toward a foundation. To illustrate the critique, consider the hypothetical situation in which a liberal were to say “group loyalties have become problematic in this country.” The linguistic analysis would score this statement as being high (dense) in loyalty language because of the mention of the words *group* and *loyalties*, both of which are words in the loyalty dictionary, even though the speaker’s attitude toward loyalty is clearly critical. To accommodate this concern, they also had people read and code the texts for the speaker’s *attitudes* toward each foundation—whether statements were supportive or critical of a foundation—and claimed that “these usage scores are more valid indicators than the raw counts of *how speakers value* each of the five foundations” (p.1039; emphasis added). They then tested the MFH with respect to whether liberals and conservatives differed as predicted in their *verbalized valuation* of

each foundation. Unequivocal support the MFH on all five foundations, including loyalty, resulted.

Note that Graham et al. (2009) did not dismiss the relevance of word counts vis-à-vis the MFH. Their point was subtler: that word counts are *less* relevant to measuring how much a person *values* a foundation than are contextual usage assessments. I make the theoretical case here that the topics that people bring up (operationalized as word frequencies) are also relevant to MFT and the MFH.

Beginning with first principles, “foundations are not [just] values or virtues” (Graham et al., 2009, p.1031). Instead, foundations are “psychological systems” and thus psychologically pluralistic in that each foundation is made up of not just values, but also cognitions, emotions, physiological reactions, and languages (Graham et al., 2013). Following from this principle of psychological pluralism, both the moral languages that people use (operationalized by word counts) *and* individuals’ verbalized attitudes toward those topics (operationalized by contextualized usage ratings) should *both* be included within the large umbrella of construct plurality that MFT proposes.

This position is consistent with a long psychological research tradition that has accepted the basic premise that what a person talks about (in positive or negative terms) reflects their psychological states and personality traits. Freud (1901) believed that one could draw inferences about a person’s hidden intentions through observation of slips of the tongue. The Rorschach (1921) inkblot test and the Thematic Apperception Test (e.g., McClelland, 1979; Winter, 1998) asked people to make sense of ambiguous images; what they spontaneously said (or projected) was thought to be revealing of personalities and psychopathologies. Gottschalk (e.g., Gottschalk, Gleser, Daniels, & Block, 1958) and McAdams (1995) continued the tradition by coding stream-of-consciousness thoughts and autobiographical life narratives, respectively. With the advent and expanding availability of computers, researchers began developing computerized methods of quantifying word usage (e.g., Rosenberg & Tucker, 1978; Stone, Dunphy, Smith, & Ogilvie, 1966; Weintraub, 1981, 1989).

A century after Freud’s writings on slips-of-the tongue, Pennebaker, Francis, and Booth (2001) released the first version of Linguistic Inquiry and Word Count (LIWC), which has since become enormously popular among psychologists for using text to understand individuals’ states, situations, and personalities (see Tausczik & Pennebaker, 2010, for a review; and used in Graham et al., 2009). LIWC is built on the premise that “the words we use in daily life reflect what we are paying attention to, what we are thinking about, what we are trying to avoid, how we are feeling, and how we are organizing and analyzing our worlds” (Tausczik & Pennebaker, 2010; p.30). Indeed, a number of studies have found that word usage (assessed via word counts and LIWC) is a stable feature of personality (e.g., Pennebaker & Graybeal, 2001; Pennebaker & King, 1999) and correlates with personality traits (e.g., Holtgraves, 2011; Hirsh & Peterson, 2009; Lee, Kim, Seo, & Chung, 2010).

If LIWC analyses are revealing of individuals’ characteristic thoughts and stable personalities and if the finding that liberals use more loyalty words turns out to be robust (i.e. it replicates), then either (a) the MFH regarding loyalty is not supported with respect to word usage; or (b) future moral foundation theorists and researchers ought to tackle the question of why liberals spend so much time criticizing loyalty when loyalty is not a foundation upon which their morality is based. More generally, determining whether there are differences in the moral languages that liberals and conservatives use informs the broader question of whether political ideology should be conceived of as a feature of personality. Evidence that liberals and conservatives use different moral languages would support the notion that ideology is personological.

To my knowledge, 10 years after the publication of [Graham et al. \(2009\)](#), there have been no close or conceptual replications of the moral foundation word frequency analysis. However, some studies are somewhat relevant. One study conceptually “replicated”¹ the linguistic *attitudinal* analysis with a politically diverse set of religious and political active adults and using human coding ([McAdams et al., 2008](#)). Other studies have assessed word frequencies within specific contexts and produced mixed evidence. For instance, when expressing opinions about stem cell research, liberals used more harm (MFH support) and fewer purity words (MFH support) than conservatives ([Clifford & Jerit, 2013](#)), and when talking about abortion or same-sex marriage, liberals used more fairness (MFH support) and fewer purity words (MFH support) than conservatives ([Frimer, Motyl, & Tell, 2016](#); [Sagi & Dehghani, 2014](#)).

Environmental issues have produced mixed results vis-à-vis the MFH. Some studies found that liberals talked about climate change and pollution primarily in terms of harm ([Feinberg & Willer, 2013](#); MFH support), whereas others found that liberals drew from the fairness (MFH support), authority (MFH challenge), and purity foundations ([Frimer, Tell, & Haidt, 2015](#); MFH challenge). And [Frimer et al. \(2016\)](#) found that liberals used *more* purity (MFH challenge) and *fewer* fairness words (MFH challenge) than conservatives when talking about the Keystone XL oil pipeline, implying a complete, context-specific reversal of the MFH. In sum, this research shows that the MFH is not uniformly supported across various issues and topics. Whether or not some enduring dispositional difference between liberals and conservatives exists, as the MFH posits, remains inconclusive from the scientific record. The goal of the present research is to inform that question.

The impetus for the present replication studies is threefold. First, Moral Foundations Theory has been hugely influential. According to Google Scholar, the seminal empirical paper ([Graham et al., 2009](#)) has been cited ~2500 times, and the popular book that followed ([Haidt, 2012](#)) received ~4100 citations as of October 2019. Second, the original study confirmed the MFH for four foundations and disconfirmed it for the fifth. Replication studies may shed light on whether the MFH is indeed supported when it comes to moral language. Third, there seem to be no close or conceptual published replications of the word count version of the MFH.

1.3. The present studies

The goal of the present studies is to apply the “the replication recipe” ([Brandt et al., 2014](#)) to test whether the finding that liberals and conservatives use different moral languages (Table 1 of [Graham et al., 2009](#)) replicates and generalizes to other contexts. The original study reported that liberals use more harm, fairness, and loyalty words whereas conservatives use more authority and purity words.

1.3.1. Statistical power

Effect sizes and their 95% confidence intervals from the original study are shown in Table 1. The weakest ideological differences in word usage from the five foundations in [Graham et al. \(2009](#); Study 4) is $|d| = 0.56$ or an equivalent $|r| = 0.257$ (harm foundation). Assuming that the true effect is smaller than those reported in the original, I designed studies conservatively—to have a 90% chance of detecting an effect that is *half* the size of the smallest effect in the original paper ($|d| = 0.28$; equivalent $|r| = 0.139$) at $p < .05$ and with a 2-tailed test. A power analysis found that this would require $N = 540$. This is the target sample size in all replication studies. All exclusions are described in each individual study.

1.3.2. Text processing

In all studies, I use the original Moral Foundations Dictionaries (MFD1), as reported in [Graham et al. \(2009](#); Appendix D) as well as the updated Moral Foundations Dictionary 2 (MFD2; [Frimer, Boghrati, Haidt, Graham, & Dehgani, 2019](#)), which has enhanced psychometric properties. Linguistic Inquiry and Word Count (LIWC; [Pennebaker, Booth, Boyd, & Francis, 2015](#)) software assesses the density of moral words in each text.

1.3.3. Unit of analysis

A key consideration is whether to use the text file as the unit of analysis. Whereas the text file, as collected, might seem to be a “natural” unit of analysis, this might not always be the case. In most of the studies described here, text files were collections of words from various authors and/or delivered over time to different audiences. Thus, breaking up text files would not disturb some sort of natural order.

Using text files as the unit of analysis would have two limitations. First, text files can vary in length dramatically (note the large SDs of word count per text file in some studies reported below). Some people have a lot more to say than others, for example. Using text files as the unit of analysis would give equal empirical clout to each text file, not to each word. A second limitation of using text files as the unit of analysis would be that doing so would unhelpfully limit statistical power (small Ns). An alternative unit of analysis would result from dividing each text file into segments of a predetermined length before performing text analyses. Segmenting boosts statistical power by increasing sample sizes without sacrificing word density reliability. Larger text files produce more reliable signals, but only to a point ([Pennebaker et al., 2015](#), set a lower limit of 50 words; here, I conservatively use 1000-word segments).

Using some of the same data sets as those reported here, but analyzed for different linguistic features, [Frimer, Brandt, Melton, and Motyl \(2019\)](#) analyzed 1000-word segments and found effects of similar magnitude but of greater precision than when using the text file as the unit of analysis. Following this precedent, when text files are sufficiently large to warrant segmenting (>3000 words on average), I will create 1000-word segments and use the text segment as the unit of analysis. In studies in which text files that are comparatively small (<3000 words on average), I will retain the text file as the unit of analysis.

1.3.4. Data preparation

Text analyses can sometimes produce a large proportion of identically-zero scores and skewed distributions and the present analyses are no exception (see Table S1). Across all of the data sets, the average percentage of text analyses using the MFD1 that yielded scores that were identically zero were 18% for harm, 51% for fairness, 21% for loyalty, 25% for authority, and 66% for purity. The average skewness scores across the samples were 2.62 for harm, 6.61 for fairness, 3.37 for loyalty, 3.40 for authority, and 5.16 for purity. For analyses that yielded skewed distributions ($\text{skew} > 2$), I converted identically zero scores to a score of 0.001%. I chose this number because the smallest possible output of LIWC is 0.01%, which is 10 times larger than the replacement value. The conversion of 0% scores to 0.001% retains the ordinal placement of these data and means that they are retained in all analyses. I then log transformed the data to reduce or eliminate skewness (see Table S1).

While addressing the issue of skewness, this conversion created a new interpretive problem. The main goal of the present work is to replicate a study that may have not addressed non-normality before conducting analyses that assume normality. The raw-data analysis would be a close replication but psychometrically questionable, whereas the log-transformed analysis would be more

¹ This study was published the year before [Graham et al. \(2009\)](#).

Table 1
Descriptive and inferential statistics assessing which of Southern Baptist (conservative) or Universal Unitarian (liberal) sermons were richer in moral foundation language reported in the original [Graham et al. \(2009; Study 4\)](#). Effect sizes assess the degree to which conservatives used words more frequently than liberals. Positive effect size mean that conservatives used the words more frequently and vice versa. Note that the effect size valence convention differs from that of the original study. [Graham et al. \(2009\)](#) reported the direction of effect sizes as whether the result supported (positive) or did not support (negative) the *Moral Foundations Hypothesis*.

Foundation	Average Word Density		<i>d</i>	<i>r</i> [95% confidence interval]
	Liberal Sermons	Conservative Sermons		
Harm	0.44%	0.26%	−0.56**	−0.257 [−0.429, −0.067]
Fairness	0.22%	0.10%	−0.65**	−0.295 [−0.462, −0.108]
Loyalty	0.52%	0.22%	−1.27***	−0.516 [−0.645, −0.359]
Authority	0.46%	0.98%	0.81***	0.359 [0.178, 0.516]
Purity	0.25%	0.64%	0.99***	0.425 [0.253, 0.571]

Note.
** *p* < .01.
*** *p* < .001.

analytically sound but more distant from the original. The approach I adopt is to report both analyses and note their significance and meaning in the text.

In all multilevel models, I standardize all variables (z-scores) before running analyses. This has the effect of making the unstandardized estimate into a standardized estimate and thus a measure of effect size and directly comparable across studies and contexts.

1.3.5. Replication test criteria

I report replication success in two ways: (a) the *Effect Size Overlap Criterion* is that the replication effect size estimate (with its 95% confidence interval) overlaps with that of the original (and its 95% confidence interval), and (b) the *Direction and Significance Criterion* is that the replication test is in the same direction as the original, and is statistically significant at *p* < .05 with a 2-tailed test. Finalized data and dictionaries are publicly available at <https://osf.io/9a6fg/>.

1.3.6. Context

Context may play a key role in moderating liberal-conservative differences in moral language usage. [Graham et al. \(2009\)](#) analyzed sermons from Unitarian Universalist (liberal) and Southern Baptist (conservative) pastors, citing this context as an appropriate test of the MFH. They chose to examine religious sermons after examining and dismissing political speeches because they “were so full of policy proposals, and of moral appeals to the political center of the country, that extracting distinctive moral content was unfeasible using the simple word-count procedures we describe below” (p.1038). They reported no evidence to support these assertions, nor did they report whether liberal and conservative politicians use different moral languages.

In Study 1, I thus attempt to replicate [Graham et al. \(2009\)](#) Study 4 as closely as possible. In Study 2, I test whether these effects generalize to other U.S. Christian denominations. Studies 3–5 provide the first tests of whether liberals and conservatives tend to use different moral languages in non-religious samples: politicians, the media, and political organizations. Studies 3–5 also test whether the context (compared to religious sermons) moderates conservatism-moral language relationships. Finally, Study 6 provides a meta-analysis of all of the available data.

2. Study 1: Close replication

The goal of Study 1 was to replicate the [Graham et al. \(2009; Study 4\)](#) analyses as closely as possible, assessing whether liberals use harm, fairness, and loyalty more and authority and purity words less often than conservatives.

2.1. Method

[Graham et al. \(2009\)](#) used a Google search to access databases containing Unitarian Universalist (liberal) and Southern Baptist (conservative) texts of sermons. The result was 69 liberal and 34 conservative sermons. To closely replicate this procedure, I performed a Google search for “Southern Baptist sermons.” The first result was <http://www.sermonaudio.com>, which contained audio files only. The second result was <https://www.lifeway.com/en/articles/pastors-sermon-index-by-scripture>, which contained the text of many Southern Baptist sermons. I therefore used this (latter) website as a conservative sermon database. A “Unitarian Universalist sermons” Google search returned <https://www.uua.org/worship/words/sermon>, which contained the text of many Unitarian Universalist sermons so I used this website as a liberal sermon database.

I scraped all of the texts from the aforementioned databases. The result was 405 Southern Baptist and 220 Unitarian Universalist sermons. Baptist sermons were posted between 2006 and 2014, with a majority (>97%) having been posted in 2014. Information about when the sermons were delivered was not available nor was any information about posting or delivery of the Unitarian sermons. While the sermons in [Graham et al. \(2009\)](#) were delivered between 1994 and 2006, it is unclear how many of the same sermons were analyzed in the former and the present studies. Sermons in the present study were 1875 words long on average (*SD* = 998). Since text files were small (<3000 words long on average), I used the text file (sermon) as the unit of analysis, which yielded 92% power.

2.2. Analytic strategy

I tested which of liberals or conservatives use words from the five foundations more frequently using five separate independent-samples *t*-tests, one for each foundation.

2.3. Results & discussion

Table 2 displays the results. In general, the results of GHN replicated successfully. Using the original MFD1, I found that conservatives used more authority and purity words, and fewer harm, fairness, and loyalty words. All GHN effects replicated by both the direction-and-significance and effect size overlap criteria, with the exception that the effect sizes were smaller in the present analysis than they were in the original for the loyalty and purity foundations. The skewed distributions among all five foundations (see Table S1) motivated an analytical correction. Using log-transformed data, the effects for harm, fairness, and loyalty still replicated successfully by both criteria. The results for the

Table 2

Results from a close replication of the Moral Foundations Hypothesis among conservative (Southern Baptist) and liberal (Unitarian Universalist) sermons (Study 1).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>M</i> (<i>SD</i>)										
Conservative	0.21 (0.31)	0.04 (0.17)	0.10 (0.15)	0.23 (0.33)	0.11 (0.17)	0.84 (0.66)	0.24 (0.43)	0.42 (0.41)	0.51 (0.56)	4.62 (1.97)
Liberal	0.34 (0.33)	0.08 (0.09)	0.25 (0.31)	0.17 (0.16)	0.07 (0.08)	1.16 (0.75)	0.34 (0.32)	0.79 (0.49)	0.37 (0.25)	1.47 (1.01)
Contrast										
<i>p</i>	<0.001	0.009	<0.001	0.010	<0.001	<0.001	0.005	<0.001	0.001	<0.001
<i>d</i>	−0.405	−0.238	−0.627	0.236	0.360	−0.454	−0.246	−0.819	0.319	2.009
<i>r</i>	−0.190	−0.113	−0.287	0.112	0.169	−0.212	−0.117	−0.364	0.151	0.692
Lower bound	−0.264	−0.189	−0.357	0.034	0.092	−0.286	−0.193	−0.430	0.073	0.649
Upper bound	−0.113	−0.035	−0.213	0.189	0.245	−0.136	−0.038	−0.294	0.227	0.731
Replicated the Original?										
Direction & Significance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Effect Size Overlap	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No

Log Transformed	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>M</i> (<i>SD</i>)										
Conservative	−1.29 (1.03)	−2.30 (0.92)	−1.69 (1.04)	−1.19 (1.00)	−1.67 (1.06)		−1.25 (1.02)		−0.56 (0.72)	
Liberal	−0.73 (0.66)	−1.69 (0.94)	−1.01 (0.86)	−1.17 (0.88)	−1.80 (0.96)		−0.82 (0.82)		−0.64 (0.67)	
Contrast										
<i>p</i>	<0.001	<0.001	<0.001	0.738	0.130		<0.001		0.196	
<i>d</i>	−0.654	−0.659	−0.714	−0.029	0.129		−0.464		0.110	
<i>r</i>	−0.298	−0.300	−0.323	−0.014	0.061		−0.216		0.052	
Lower bound	−0.368	−0.370	−0.391	−0.092	−0.017		−0.290		−0.026	
Upper bound	−0.225	−0.227	−0.251	0.065	0.139		−0.140		0.130	
Replicated the Original?										
Direction & Significance	Yes	Yes	Yes	No	No		Yes		No	
Effect Size Overlap	Yes	Yes	Yes	No	No		Yes		No	

authority and purity foundations, in contrast, did not reach significance and failed to replicate by either criterion.

Using the updated and more valid MFD2, a similar pattern emerged. Conservatives used more authority and purity words, and fewer harm, fairness, and loyalty words. All GHN effects replicated by both the direction-and-significance and effect size overlap criteria, with the lone exception being that the effect size for purity was larger in the present analysis. Observing the log-transformed data for the two foundations that evidenced skewed distributions, the fairness foundation still replicated whereas the authority foundation did not (by either criterion). In sum, the results from GHN replicated successfully, with several exceptions noted above. It appears that Southern Baptists' and Unitarian Universalists' moral language usage differs as predicted by the MFH, with the exception of the loyalty foundation. That said, whether the MFH replicates among other Christian denominations remains unknown, a question I address in Study 2.

3. Study 2: Conceptual replication with other religious denominations

I next tested whether the effects conceptually replicate and thus generalize to U.S. Christian denominations not included in the original paper/Study 1. The contextual factors specified in the original study would predict that the effects should generalize to other denominations.

3.1. Method

To build a text corpus, a systematic and non-arbitrary way of deciding which denominations to include was needed. Necessary inclusion criteria were that I could dimensionalize the conservatism of each denomination, and could gain access to the texts from many sermons. To this end, I used results from a Pew (2016) poll, which reported the percentage of congregants that identified as (a) "Republican or lean Republican", (b) "Democrat or lean Democrat", or (c) "Independent/ no lean/other" of 23 Chris-

tian denominations in the U.S. I computed conservatism scores by subtracting (b) from (a). Table S2 shows the full list.

Graham et al. (2009) chose Southern Baptists and Unitarian Universalists because they were known for being very conservative and very liberal, respectively. I found corroborating evidence of this premise in the current data set, with Southern Baptism being the third (of 23) most conservative, and Unitarian Universalists being the third most liberal denominations. I excluded these two denominations to ensure that this sample was independent from that of Study 1. I then built a text corpus by scraping <https://www.sermoncentral.com>, a searchable sermon database. I used three search criteria: (a) English sermons only, (b) texts that comprised full sermons (not just outlines of sermons), and (c) sermons aimed at an adult audience. For nine denominations, texts were unavailable, leaving 12 denominations included in the study. I scraped the first page² of 1483 sermons (see Table S2 for a breakdown by denomination). Sermons were 834 words long on average (*SD* = 104). Since text files were small (<3000 words long on average), I used the text file (sermon) as the unit of analysis. This provided >99% power.

3.2. Analytic strategy

Sermons were nested within denominations. Therefore, I used multilevel modeling, including random intercepts, with sermons (i) nested within denominations (j) to estimate the association between conservatism and moral foundation word usage for each of the five foundations:

$$\text{Foundation}_{ij} = \beta_0 + \beta_1 \text{Conservatism}_j + u_{0j} + e_{0ij} \quad (1)$$

I then tested whether the original comparison (Baptist vs. Universalist Unitarian) generalizes to other denominations by coding the results from the Graham et al. (2009) and Study 1 as 0 (*original denominations*) and the results from Study 2 as 1 (*other*

² The decision to scrape the first page was prompted by the structure of the website and limitations in the scraping software.

denominations) and conducting a [Hedges and Vevea \(1998\)](#) random effects meta-analysis with this dummy variable as a potential moderator.

3.3. Results & discussion

[Table 3](#) displays the results. In general, the results of GHN did not replicate successfully. Using the original MFD1, I found that conservatives and liberals did not differ in their use of any of the five foundations. All GHN effects failed to replicate by the direction-and-significance criterion, and all but harm and fairness failed to replicate by the effect size overlap criterion. Using log-transformed data produced an identical pattern of results, and using the updated MFD2 produced the same pattern except that only the harm foundation's effect size now overlapped with the original one.

I then tested whether the associations between conservatism and moral language usage was moderated by the set of denominations (original = (Baptist and Universalist Unitarian) versus other = (12 denominations in Study 2)). [Table 3](#) shows how, using the MFD1's raw scores, I found evidence of moderation for the harm foundation, but not for fairness, loyalty, authority, or purity. Using the more valid of the raw or log-transformed data revealed that the harm, fairness, and loyalty foundations were moderated by the set of denominations, but authority and purity were not. The MFD2 yielded an almost identical set of results.

In sum, the results from GHN did not replicate successfully with other Christian denominations, and there was some evidence for the harm, fairness, and loyalty foundations that the associations between conservatism and moral language usage in the original two denominations studied do not seem to generalize to other Christian denominations. These results might suggest that the denominations studied in GHN may not have been representative of Christian denominations in general, raising questions about

whether the MFH is generally supported in terms of language usage. To address this question, I next step out of the religious context and into the political one to assess whether political liberals and conservatives differ in the moral language usage.

4. Study 3: Extension with politicians

[Graham et al. \(2009\)](#) opted to study religious sermons after having informally reviewed political convention speeches and observing that they “were so full of policy proposals, and of moral appeals to the political center of the country, that extracting distinctive moral content was unfeasible using the simple word-count procedures we describe” (p.1038). However, they presented no corroborating evidence for this assertion. Whether or not ideological differences in moral foundation word usage surface in the political realm remains unknown. In the present Study 3, I tested whether politicians of liberal and conservative leanings use moral foundation related words to different degrees. Given the hypothesized contextual moderator (religious sermons vs. political speeches) described in [Graham et al. \(2009\)](#), I also tested whether the context being political versus religious moderates whether the conservatism-moral foundation word usage associations surface.

4.1. Method

I collected four data sets containing texts from U.S. politicians of varying political ideologies.

1 & 2. Senate and House of Representatives speeches. The texts were verbatim transcripts of all of the speeches delivered on the floor of the U.S. Congress between 1996 (when transcription began) and 2016. Speeches were parsed by member and session of Congress, with the average transcript containing 45,897 words ($SD = 74,068$). I then operationalized conservatism with DW-Nominate, dimension 1 ([Lewis & Poole, 2004](#)). DW-Nominate uses multidimensional scaling to estimate politicians' ideal points based

Table 3
Results from a conceptual replication of the Moral Foundations Hypothesis among 12 Christian denominations (Study 2).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	0.790	0.060	0.917	0.591	0.722	0.583	0.646	0.160	0.565	0.672
β	−0.010	−0.074	0.006	0.025	−0.016	−0.026	−0.015	0.073	0.015	0.040
β lower bound	−0.096	−0.152	−0.128	−0.076	−0.118	−0.132	−0.083	−0.038	−0.036	−0.166
β upper bound	0.076	0.004	0.141	0.126	0.086	0.079	0.054	0.183	0.066	0.246
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	No	No
Effect Size Overlap	Yes	Yes	No	No	No	Yes	No	No	No	No
Original vs. Other Denominations										
χ^2 (1, $N = 2,211$)	17.85	0.59	3.52	0.89	1.81	18.56	1.48	13.39	1.67	3.38
<i>p</i>	<0.001	0.443	0.061	0.346	0.179	<0.001	0.224	<0.001	0.196	0.066
ϕ	0.090	0.016	0.040	0.020	0.029	0.092	0.026	0.078	0.027	0.039
<hr/>										
Log Transformed	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	0.845	0.162	0.868	0.393	0.551	0.630	0.505	0.615		
β	−0.007	−0.047	−0.006	0.038	−0.027	−0.026	0.020	0.017		
β lower bound	−0.086	−0.117	−0.097	−0.058	−0.130	−0.146	−0.046	−0.065		
β upper bound	0.072	0.023	0.085	0.135	0.076	0.094	0.086	0.100		
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No		
Effect Size Overlap	Yes	Yes	No	No	No	Yes	No	No		
<hr/>										
Most Valid										
Original vs. Other Denominations										
χ^2 (1, $N = 2,211$)	41.88	33.14	5.16	0.16	0.68	18.56	30.53	10.68	0.47	3.38
<i>p</i>	<0.001	<0.001	0.023	0.689	0.409	<0.001	<0.001	0.001	0.492	0.066
ϕ	0.138	0.122	0.048	0.009	0.018	0.092	0.118	0.070	0.015	0.039

on the politician's pattern of roll call voting. DW-Nominate scores describe how liberal (negative scores), moderate (scores near 0), or conservative (positive scores) each politician was, and are comparable over time. The first dimension reflects positions on social issues.

To be included, a transcript needed to have an accompanying conservatism score: there were 1104 in the Senate and 4743 in the House. Since text files were large (>3000 words long on average), I used the 1000-word text segment as the unit of analysis. There were 129,994 segments from the House, and 142,259 segments from the Senate. Each sample provided > 99% power.

Segments were nested within transcripts (i). Transcripts were nested within politicians (j). And politicians were nested within sessions of Congress (k). I therefore used three-level multilevel models, separately for each chamber (House, Senate) and for each foundation, which included random intercepts for both politicians and for sessions:

$$\text{Foundation}_{ij} = \beta_0 + \beta_1 \text{Conservatism}_{jk} + u_{0jk} + u_{0k} + e_{0ijk} \quad (2)$$

3. Party platforms. I acquired all 82 of the U.S. Democratic and Republican platforms from <http://www.presidency.ucsb.edu/platforms.php> in presidential election years in which both parties existed (1856–2016). Platforms were 11,095 words long on average, $SD = 11,843$. Since the political ideologies of the two parties has changed over time (recall that Republicans freed the slaves whereas Democrats were once the protectors of Jim Crow laws), I used the average DW-Nominate dimension 1 score of each party's members of Congress at that time to operationalize conservatism (see Table S3). Since text files were large (>3000 words long on average), I used the 1000-word text segment as the unit of analysis. Segmenting provided $N = 946$ and ~99% power. I then used Eq. (1) with segments (i) nested within platforms (j).

4. State of the Union addresses. State of the Union Addresses were acquired from <http://www.presidency.ucsb.edu/sou.php>. I used DW-Nominate, dimension 1 (Lewis & Poole, 2004) to operationalize the conservatism of the U.S. Presidents. DW-Nominate scores of U.S. Presidents are based on the public positions that Presidents took on bills in Congress. Jimmy Carter and George W. Bush were the most liberal and conservative presidents, respectively (see Table S4 for the full list). There were 201 State of the Union addresses for which text and conservatism scores were available. They were 8125 words long on average ($SD = 5713$). Since text files were large (>3000 words long on average), I used the 1000-word text segment as the unit of analysis. Segmenting

yielded a sample of $N = 1732$ and > 99% power. I then used Eq. (1) with segments (i) nested within speeches (j).

4.2. Analytic strategy

First, I tested whether moral foundation word usage is associated with conservatism in the four new data sets, separately for each of the five foundations. Second, I conducted Hedges and Vevea (1998) random effects meta-analyses on the standardized estimates for each foundation within the political realm to evaluate whether U.S. liberal and conservative politicians use different moral languages. Third, I used the data from the original study, Studies 1 and 2 (all of which were coded 0 = *religious*), and the four new political studies (all of which were coded 1 = *political*) to test whether conservatism-foundation associations are moderated by whether the context is religious or political.

4.3. Results & discussion

4.3.1. U.S. House of representatives

Table 4 displays the results. In general, replication success was mixed. Using the original MFD1, I found that conservatives used fewer harm words than liberals, replicating GHN, but also fewer purity and authority words (the *opposite* to what GHN found). For fairness and loyalty, I did not observe differences between liberals and conservatives and none of the effects of GHN replicated. Correcting for skewed distributions, I found that conservatives used fewer words from *all* five foundations. This finding replicating GHN's findings for harm and fairness in terms of direction and significance but not effect size overlap, and was the opposite of what GHN found for loyalty, authority, and purity. Using the updated MFD2 yielded a somewhat different pattern of results. For all five foundations, I replicated the GHN findings that conservatives used more authority and purity words and fewer harm, fairness and loyalty words. However, none of the effect sizes overlapped with the originals except for harm. Correcting for skew yielded a similar pattern of results for harm, fairness, and loyalty. However, conservatives no longer used more authority words and now used more purity words than liberals.

4.3.2. U.S. Senate

Table 5 displays the results. In general, replication success was mixed. Using the original MFD1, I found that conservatives used fewer harm, fairness, and purity words than liberals, replicating GHN for the former two (with the exception that the fairness effect

Table 4
Results from a test of the Moral Foundations Hypothesis in the U.S. House of Representatives (Study 3).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
p	<0.001	0.462	0.455	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
β	-0.057	0.005	0.006	-0.021	-0.037	-0.077	-0.037	-0.083	0.035	0.027
β lower bound	-0.072	-0.009	-0.009	-0.033	-0.048	-0.092	-0.050	-0.098	0.023	0.012
β upper bound	-0.043	0.020	0.020	-0.009	-0.026	-0.062	-0.024	-0.068	0.048	0.042
Replicated the Original?										
Direction & Significance	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Effect Size Overlap	Yes	No	No	No	No	Yes	No	No	No	No
Log Transformed	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
p	<0.001	0.001	0.019	<0.001	<0.001	<0.001	<0.001	<0.001	0.248	0.006
β	-0.064	-0.021	-0.015	-0.046	-0.065	-0.081	-0.045	-0.080	0.007	-0.017
β lower bound	-0.077	-0.034	-0.027	-0.056	-0.075	-0.094	-0.057	-0.093	-0.005	-0.030
β upper bound	-0.052	-0.008	-0.002	-0.035	-0.054	-0.068	-0.033	-0.067	0.019	-0.005
Replicated the Original?										
Direction & Significance	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Effect Size Overlap	Yes	No	No	No	No	Yes	No	No	No	No

Table 5
Results from a test of the Moral Foundations Hypothesis in the U.S. Senate (Study 3).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	<0.001	0.042	0.679	0.853	<0.001	<0.001	0.040	<0.001	<0.001	0.029
β	−0.074	−0.013	−0.004	0.002	−0.055	−0.092	−0.019	−0.094	0.071	−0.017
β lower bound	−0.092	−0.026	−0.022	−0.015	−0.066	−0.111	−0.036	−0.114	0.052	−0.033
β upper bound	−0.057	0.000	0.014	0.018	−0.043	−0.072	−0.001	−0.074	0.091	−0.002
Replicated the Original?										
Direction & Significance	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No
Effect Size Overlap	Yes	No	No	No	No	Yes	No	No	No	No
Log Transformed										
<i>p</i>	<0.001	0.018	0.369	0.006	<0.001	<0.001	0.007			<0.001
β	−0.071	−0.014	−0.008	−0.021	−0.068	−0.096	−0.022			−0.038
β lower bound	−0.087	−0.026	−0.024	−0.036	−0.080	−0.113	−0.038			−0.053
β upper bound	−0.055	−0.002	0.009	−0.006	−0.056	−0.079	−0.006			−0.023
Replicated the Original?										
Direction & Significance	Yes	Yes	No	No	No	Yes	Yes			No
Effect Size Overlap	Yes	No	No	No	No	Yes	No			No

size did not overlap with the original) but finding the opposite of what GHN found for purity. For loyalty and authority, I did not observe differences between liberals and conservatives and neither of the effects of GHN replicated. Correcting for skewed distributions, a similar pattern emerged except that conservatives now used fewer authority words than liberals, a reversal of effects reported in GHN. Using the updated MFD2, a somewhat different pattern emerged. I found that conservatives used fewer harm, fairness, loyalty, and purity words, and more authority words. All of these effects replicated GHN in terms of direction and significance, with the exception of the purity foundation reversal. Only the harm foundation's effect size overlapped with the original. Correcting for skewed distributions yielded a similar pattern of results.

4.3.3. Party platforms

Table 6 displays the results. In general, replication success was mixed. Using the original MFD1, I found that conservatives used more loyalty words; I did not observe differences for the harm, fairness, authority or purity foundations. Thus, none of the effect from the original replicated in terms of direction and significance. That said, effect sizes overlapped with the original for the harm, fairness, and authority foundations. Correcting for a skewed distribution on the purity foundation did not alter the pattern of results. Using the MFD2, I found that conservatives used more authority

words than liberals, replicating the original finding. However, I did not detect differences between conservatives and liberals for the harm, fairness, or purity, thus failing to replicate the original in terms of direction and significance. Effect sizes for harm and fairness overlapped with those in the original whereas those for loyalty and purity did not. Correcting for skew did not alter the pattern of results.

4.3.4. State of the union addresses

Table 7 displays the results. In general, replication success was poor. Using the original MFD1, I found that conservatives used more loyalty words; I did not observe differences for the harm, fairness, authority or purity foundations. None of the effects from the original replicated based on either criterion. Correcting for a skewed distribution did not alter the pattern of results. Using the MFD2, I found no differences in the moral languages of conservatives and liberals and no effects replicated. Correcting for skew did not alter the pattern of results, except that conservatives now used more purity words than liberals, replicating the original in terms of direction and significance but not effect size overlap.

4.3.5. Meta-analysis of political samples

Table 8 presents the results of meta-analyses of the four samples. Since log-transformed analyses were not appropriate and

Table 6
Results from a test of the Moral Foundations Hypothesis in U.S. Democratic and Republican Party platforms (Study 3).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	0.820	0.384	<0.001	0.237	0.731	0.651	0.275	0.551	0.001	0.680
β	−0.009	−0.044	0.161	0.079	0.014	−0.026	−0.048	−0.028	0.201	0.017
β lower bound	−0.085	−0.144	0.076	−0.054	−0.070	−0.138	−0.136	−0.123	0.086	−0.066
β upper bound	0.068	0.056	0.245	0.212	0.099	0.087	0.040	0.067	0.316	0.101
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	Yes	No
Effect Size Overlap	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	No
Log Transformed										
<i>p</i>					0.626		0.792			0.417
β					−0.018		0.028			0.035
β lower bound					−0.095		−0.182			−0.052
β upper bound					0.058		0.238			0.122
Replicated the Original?										
Direction & Significance					no		no			no
Effect Size Overlap					no		yes			no

Table 7

Results from a test of the Moral Foundations Hypothesis in U.S. State of the Union Addresses (Study 3).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	0.462	0.792	0.028	0.299	0.630	0.328	0.123	0.145	0.643	0.566
β	0.031	0.007	0.077	0.031	−0.014	0.052	0.049	−0.055	−0.017	0.017
β lower bound	−0.053	−0.048	0.008	−0.028	−0.071	−0.053	−0.013	−0.129	−0.091	−0.042
β upper bound	0.116	0.063	0.145	0.090	0.043	0.156	0.112	0.019	0.056	0.077
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	No	No
Effect Size Overlap	No	No	No	No	No	No	No	No	No	No
Log Transformed										
<i>p</i>		0.368		0.401	0.786	0.738	0.368			0.037
β		0.031		0.024	−0.008	0.013	0.031			0.065
β lower bound		−0.037		−0.033	−0.063	−0.065	−0.037			0.004
β upper bound		0.099		0.082	0.048	0.092	0.099			0.127
Replicated the Original?										
Direction & Significance		No		No	No	No	No			Yes
Effect Size Overlap		No		No	No	No	No			No

Table 8

Results of a meta-analysis of four samples testing the Moral Foundations Hypothesis in American speeches (Study 3). The second set of analyses used the most valid of the raw or log-transformed data (the least skewed).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	<0.001	0.522	0.021	0.719	<0.001	<0.001	<0.001	<0.001	<0.001	0.595
β	−0.049	−0.005	0.024	0.004	−0.039	−0.059	−0.016	−0.085	0.061	0.009
β lower bound	−0.069	−0.021	0.004	−0.018	−0.056	−0.082	−0.025	−0.097	0.029	−0.025
β upper bound	−0.029	0.011	0.045	0.026	−0.022	−0.037	−0.007	−0.072	0.093	0.043
Political vs. Religious										
$\chi^2(1, N = 277,142)$	1.96	14.01	30.58	6.09	14.98	2.72	2.79	3.77	0.82	60.77
<i>p</i>	0.162	<0.001	<0.001	0.014	<0.001	0.099	0.095	0.052	0.365	<0.001
ϕ	0.003	0.007	0.011	0.005	0.007	0.003	0.003	0.004	0.002	0.015
Most Valid										
<i>P</i>	<0.001	0.029	0.148	0.301	<0.001	<0.001	0.015	<0.001	0.021	0.442
β	−0.055	−0.021	0.016	−0.013	−0.063	−0.064	−0.026	−0.082	0.058	−0.009
β lower bound	−0.071	−0.039	−0.006	−0.037	−0.073	−0.086	−0.047	−0.096	0.009	−0.031
β upper bound	−0.040	−0.002	0.037	0.011	−0.054	−0.043	−0.005	−0.068	0.107	0.013
Political vs. Religious										
$\chi^2(1, N = 277,142)$	7.04	24.66	34.64	3.36	10.92	2.25	3.69	8.11	0.09	70.31
<i>p</i>	0.008	<0.001	<0.001	0.067	0.001	0.134	0.055	0.004	0.769	<0.001
ϕ	0.005	0.009	0.011	0.003	0.006	0.003	0.004	0.005	0.001	0.016

not computed in cases where the raw data were not skewed, I present analyses for the raw data and for the most valid of the raw or log-transformed data (if the raw was not skewed, then the raw; otherwise, log-transformed). Using the MFD1, I found that political conservatives used fewer harm and purity words and more loyalty words than liberals, with no differences detected for the fairness or authority foundations. Using the most valid data set revealed a similar but not identical pattern: political conservatives used fewer harm, fairness, and purity words than liberals, with no differences detected for the loyalty or authority foundations. The updated MFD2 yielded a slightly different pattern again: Conservatives used fewer harm, fairness, and loyalty words but more authority words than liberals, with no differences detected for purity foundation. Using the most valid data set yielded the same pattern of results. In sum, support for the MFH in the political realm was mixed and weak.

4.3.6. Religious versus political contexts

Table 8 presents the results of meta-analyses examining whether the context was religious or political moderated the conservatism-moral language association. The harm foundation

exhibited little evidence of moderation by context: conservatives consistently used fewer harm words than liberals, regardless of the context. The one exception was results from more valid MFD1 analysis (liberals used more harm words compared to conservatives to a greater degree in religious vs. political contexts). Fairness exhibited moderation by context when using the MFD1 but not the MFD2. The loyalty and purity foundations yielded fairly consistent evidence of moderation, whereas the authority foundation did not. In sum, evidence of moderation by context was present for the loyalty and purity foundations, but not consistently present for the harm, fairness, or authority foundations. These results suggest that GHN's claim that conservatism-moral language associations may be observed in religious but not political contexts has limited support.

5. Study 4: Extension in the media

Study 4 tested whether moral foundation word usage and conservatism associations exist in the media. Graham et al. (2009) did not discuss the possibility of whether effects should replicate in this context.

5.1. Method

5.1.1. Materials

Texts were from 20 media outlets that spanned the ideological spectrum. The website <http://allsides.com> uses crowdsourcing to classify the conservatism of 59 news organizations as *left wing*, *leans left*, *center*, *leans right*, or *right wing*, twenty of which had full texts available on the database LexisNexus. I thus included these 20 sources (see Table S5) in the sample. I gathered the text corpus by applying the search term “politics or political” on LexisNexus. I then searched for and downloaded the 1000 most relevant articles, as determined by the LexisNexus sorting algorithm. Each media outlet produced 1,145,888 words on average ($SD = 667,322$). Since text files were large (>3000 words long on average), I used the 1000-word text segment as the unit of analysis. This yielded 22,915 segments and >99% power. I analyzed the data using Eq. (1) with segments (i) nested within media outlets (j).

5.2. Analytic strategy

First, I tested whether moral foundation word usage is associated with conservatism in the media, separately for each of the five foundations. Second, I used Hedges-Vecchia random-effects models to meta-analyze the data from the original study, Studies 1 and 2 (all coded 0 = *religious*), and the present study (coded 1 = *media*) to test whether conservatism-foundation associations are different in religious versus media contexts.

5.3. Results & discussion

Table 9 displays the results. In general, replication success was poor. Using the original MFD1, I found no differences in the moral language usage of conservatives and liberals and none of GHN's effects replicated, except for the harm foundation, whose effect

size overlapped with the original. Correcting for skew produced a similar pattern of results, except the harm effect size no longer overlapped. Using the MFD2, I found no differences in the moral languages of conservatives and liberals and no effects replicated. Correcting for skew did not alter the pattern of results, except that the effect size for purity now overlapped with the original.

Evidence of moderation by context (religious vs. media) was consistent for the loyalty foundation. The MFD1, but not the MFD2, yielded evidence of moderation for harm, and both dictionaries yielded some evidence of moderation for purity. I found little evidence of moderation by context for the fairness and authority foundations. These results generally suggest that the MFH is not supported in the media's language.

6. Study 5: Extension with political organizations

Study 5 tested whether liberal and conservative politically minded organizations tend to use different moral languages. Graham et al. (2009) did not discuss the possibility of whether effects should replicate in this context.

6.1. Method

This sample was 100 politically diverse organizations that had publicly available texts (see Table S6 for a complete list). Frimer, Boghrati, et al. (2019), Frimer, Brandt, et al. (2019) reported the conservatism of each organization. A first sample of 189 Americans rated the conservatism of each organization; they used those ratings to categorize each organization as being either liberal (−1) or conservative (1) based on whether the mean ideology rating (−100 = *extremely liberal* to 100 = *extremely conservative*) was negative or positive, respectively. A second sample of 189 Americans then rated how ideological extreme each organization was on a scale from 0 (*moderate*) to 100 (*extreme*). Aggregate extremism

Table 9
Results from a test of the Moral Foundations Hypothesis in the media (Study 4), along with tests of whether the context being religious or the media moderates conservatism-moral language associations.

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
p	0.662	0.225	0.298	0.638	0.144	0.158	0.117	0.645	0.610	0.397
β	0.022	0.067	0.081	0.033	0.055	0.081	0.099	−0.033	−0.045	0.052
β lower bound	−0.081	−0.045	−0.078	−0.112	−0.021	−0.034	−0.027	−0.183	−0.225	−0.073
β upper bound	0.124	0.180	0.241	0.178	0.131	0.196	0.226	0.116	0.136	0.176
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	No	No
Effect Size Overlap	Yes	No	No	No	No	No	No	No	No	No
Religious vs. Media										
$\chi^2(1, N = 25,126)$	15.63	3.25	12.20	7.64	11.83	3.03	1.93	20.22	6.09	2.71
p	0.001	0.354	0.007	0.054	0.008	0.387	0.586	<0.001	0.107	<0.001
ϕ	0.025	0.011	0.022	0.017	0.022	0.011	0.009	0.028	0.016	0.010
Log Transformed										
p	0.511	0.196	0.454	0.399	0.139	0.343	0.196			0.427
β	0.029	0.072	0.072	0.057	0.065	0.068	0.072			0.074
β lower bound	−0.062	−0.041	−0.125	−0.081	−0.023	−0.079	−0.041			−0.117
β upper bound	0.121	0.185	0.268	0.195	0.154	0.215	0.185			0.265
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No			No
Effect Size Overlap	No	No	No	No	No	No	No			Yes
Most Valid										
Religious vs. Media										
$\chi^2(1, N = 25,126)$	27.99	4.82	17.54	5.21	6.49	4.05	4.83	6.23	7.34	82.77
p	<0.001	0.185	0.001	0.157	0.090	0.257	0.185	<0.001	0.062	<0.001
ϕ	0.033	0.014	0.026	0.014	0.016	0.013	0.014	0.016	0.017	0.057

scores were scaled to vary from 0 to 1 and multiplied by the ideological classification to yield conservatism scores, which could vary from -1 (*extremely liberal*) to 1 (*extremely conservative*). The ratings were both face valid and evidenced predictive validity. See Frimer, Brandt, et al. (2019) for more details.

Web searches of each organization's Internet base produced 35,700 words from each organization on average ($SD = 119,749$). Since text files were large (>3000 words long on average), I used the 1000-word text segment as the unit of analysis. This yielded 3623 segments and $>99\%$ power. I used the same analytic strategies as in Study 4.

6.2. Results & discussion

Table 10 displays the results. In general, replication success was poor. Using the original MFD1, I found that liberals used more purity words than conservatives, a reversal of GHN's findings. I found no differences in the moral language usage of conservatives and liberals in terms of the other four foundations. None of the foundations replicated in terms of direction and significance, whereas harm and fairness, but not loyalty, authority, or purity, replicated in terms of the effect size overlap criterion. Correcting for skewed distributions, I found no differences in the moral languages of liberals and conservatives, except that liberals used more purity words. No effect replicated by either criterion.

Using the MFD2, a slightly different pattern emerged. Conservatives now used more purity words than liberals, an effect that replicated GHN's finding by both criteria. I found no differences in the moral language usage of conservatives and liberals in terms of the other four foundations. None of the foundations replicated in terms of direction and significance, whereas harm, fairness, and authority (but not loyalty) replicated in terms of the effect size overlap criterion. Correcting for skewed distributions, I found no differences in the moral languages of liberals and conservatives, except that conservatives used more purity words. Only authority and purity's effect sizes overlapped with

those in the original, and no effect sizes overlapped with those in the original. The context being religious versus in organizations moderated none of the effects (see Table 10). These results generally suggest that the MFH was unsupported in a sample of political organizations.

7. Study 6: Meta-analysis

Study 6 brought together all of the available data (including from Graham et al., 2009) in a meta-analysis to provide the most comprehensive test to date of whether liberals and conservatives use different moral languages. I aggregated effect sizes (in Study 1, equivalent r s; in all other studies, standardized estimates from multilevel models) in Hedges-Vecchia random effects models, one for each foundation.

7.1. Results & discussion

Table 11 presents a summary of the replication success rate, which averaged 30% across all foundations, metrics, dictionaries, and criteria. Using the MFD1, the harm foundation had the highest replication success rate, followed by fairness. Loyalty, authority, and purity replication success rates were lower. Using the MFD2, harm was again the most replicable effect, with the other four foundations all being similarly lower. Correcting for skew seemed to only slightly lower replication success rate (by 2–7%). And the MFD2 was more successful at replicating the original findings (35%) than the MFD1 (25%). Replication success rates were similar for the direction & significance and the effect size overlap criteria.

Table 12 and Fig. 1 display the results of 20 meta-analyses (5 foundations \times 4 analytical forms; $N = 303,680$ in each one). Across the 20 meta-analyses, effect sizes were uniformly smaller (2.3–212 times, with an average of 38 times smaller) than those reported in the original study. Using the MFD1, I found no

Table 10
Results from a test of the Moral Foundations Hypothesis in the political organizations (Study 5).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
p	0.892	0.788	0.203	0.208	0.017	0.563	0.232	0.698	0.223	<0.001
β	−0.008	−0.016	0.121	−0.081	−0.136	−0.052	−0.082	0.030	0.081	0.448
β lower bound	−0.122	−0.133	−0.067	−0.208	−0.248	−0.229	−0.218	−0.124	−0.050	0.216
β upper bound	0.106	0.101	0.308	0.046	−0.025	0.125	0.054	0.185	0.211	0.679
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	No	Yes
Effect Size Overlap	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes
Religious vs. Organizations										
$\chi^2(1, N = 5,834)$	0.76	2.12	1.95	2.94	0.01	0.45	0.08	0.67	0.56	0.00
p	0.383	0.145	0.163	0.086	0.931	0.504	0.783	0.414	0.455	0.955
ϕ	0.011	0.019	0.018	0.022	0.001	0.009	0.004	0.011	0.010	0.001
Log Transformed										
p	0.466	0.658	0.630	0.996	0.019	0.653	0.658	0.802	0.127	0.018
β	−0.043	−0.022	0.032	0.000	−0.133	−0.031	−0.022	−0.014	0.096	0.150
β lower bound	−0.160	−0.120	−0.101	−0.110	−0.244	−0.165	−0.120	−0.127	−0.028	0.026
β upper bound	0.074	0.076	0.166	0.110	−0.023	0.104	0.076	0.098	0.220	0.273
Replicated the Original?										
Direction & Significance	No	No	No	No	No	No	No	No	No	Yes
Effect Size Overlap	No	No	No	No	No	No	No	No	Yes	Yes
Most Valid										
Religious vs. Organizations										
$\chi^2(1, N = 5,834)$	0.38	0.86	1.20	0.56	2.43	0.65	0.45	0.71	0.01	0.23
p	0.536	0.354	0.274	0.455	0.119	0.420	0.503	0.398	0.931	0.630
Φ	0.008	0.012	0.014	0.010	0.020	0.011	0.009	0.011	0.001	0.006

Table 11
Replication success rate across all studies.

Raw	Moral Foundations Dictionary 1						Moral Foundations Dictionary 2						Grand Average
	Harm	Fairness	Loyalty	Authority	Purity	Average	Harm	Fairness	Loyalty	Authority	Purity	Average	
Direction & Significance	38%	25%	13%	13%	13%	20%	38%	38%	38%	50%	38%	40%	30%
Effect Size Overlap	88%	50%	0%	25%	0%	33%	75%	38%	13%	38%	13%	35%	34%
Average	63%	38%	6%	19%	6%	26%	56%	38%	25%	44%	25%	38%	32%
Log Transformed													
Direction & Significance	50%	43%	33%	14%	0%	26%	29%	43%	33%	0%	33%	31%	28%
Effect Size Overlap	67%	29%	17%	0%	0%	21%	57%	14%	0%	33%	33%	31%	25%
Average	58%	36%	25%	7%	0%	24%	43%	29%	17%	17%	33%	31%	27%
Grand Average	61%	37%	14%	13%	3%	25%	50%	33%	23%	36%	29%	35%	30%

Table 12
Results of a meta-analysis of all samples testing the Moral Foundations Hypothesis in. The second set of analyses used the most valid of the raw or log-transformed data (the least skewed).

Raw	Moral Foundations Dictionary 1					Moral Foundations Dictionary 2				
	Harm	Fairness	Loyalty	Authority	Purity	Harm	Fairness	Loyalty	Authority	Purity
<i>p</i>	0.569	0.278	0.282	0.238	0.921	0.141	0.194	<0.001	<0.001	<0.001
β	-0.004	-0.013	0.017	0.013	-0.002	0.017	-0.023	-0.068	0.060	0.187
β lower bound	-0.017	-0.037	-0.014	-0.009	-0.034	-0.006	-0.058	-0.096	0.027	0.126
β upper bound	0.009	0.011	0.049	0.035	0.031	0.039	0.012	-0.040	0.093	0.246
Most Valid										
<i>p</i>	0.014	0.035	0.841	0.218	0.408	0.743	0.119	<0.001	0.006	<0.001
β	-0.017	-0.031	-0.003	0.018	-0.015	0.003	-0.025	-0.077	0.053	0.140
β lower bound	-0.031	-0.059	-0.034	-0.011	-0.051	-0.016	-0.056	-0.102	0.015	0.091
β upper bound	-0.003	-0.002	0.028	0.047	0.021	0.023	0.006	-0.051	0.091	0.187

differences between the language usage of liberals and conservatives for any of the foundations, supporting the MFH for zero of five foundations. Using the most valid metric instead, I found that conservatives used fewer harm and fairness words, but no more or less loyalty, authority, or purity words, supporting the MFH for two of five foundations. The MFD2 yielded a different pattern of results, with conservatives using fewer loyalty words and more authority and purity words than liberals, with no differences observed for the harm or fairness foundations (supporting the MFH for 2 foundations and challenging the MFH for one). Using the most valid metrics did not alter that pattern of results.

8. General discussion

Two replications and six extensions found limited support for the MFH in terms of language usage. Whereas a close replication of sermons from the same two U.S. Christian denominations as those in the original was successful (Study 1), a conceptual replication with 12 other U.S. Christian denominations was largely unsuccessful (Study 2), meaning that the two denominations studied in Graham et al. (2009) may not be representative of Christian denominations in general. This suggests that even within the context of religious sermons by U.S. Christian pastors, liberals and conservatives may not use different moral languages as much as previously thought. Although Graham et al. (2009) suggested that political speeches may not be the ideal context for detecting the different moral languages of liberals and conservatives, conceptual replications with four political samples were successful in aggregate for four of the five foundations (Study 3). A moderation analysis found that the differences in the moral languages of liberals and conservatives changed when moving from a religious to a

political context for two of the five foundations only, meaning that the distinction between religion and politics may not be as important as Graham et al. (2009) suggested.

Samples drawn from the media and organizations, contexts not ruled out by Graham et al. (2009), allowed for a novel assessment of whether liberal and conservative commoners (broadly defined) use different moral languages (Studies 4–5). Tests of the MFH in these contexts were predominantly unsuccessful. Across all samples, metrics, foundations, and dictionaries, replication success rate was just 30%, meaning that 70% of replications failed. A meta-analysis (Study 6) of all the available data found support for the MFH for the authority and purity foundations, no evidence to support the MFH for harm and fairness, and evidence that is counter to the MFH for the loyalty foundation. Effect sizes were 38 times smaller on average. The most generous viable conclusion is that these results offer limited support for the MFH in the language of liberals and conservatives.

8.1. Analytical considerations

The present analyses revealed that most distributions generated by the moral foundations dictionaries have a large number of identically-zero entries and are skewed. Correcting for this skew had relatively little effect on replication success and the resulting effect sizes. Thus, this analytic issue ended up being relatively inconsequential vis-à-vis replication considerations. Another analytical question concerned the dictionaries themselves. I used both the original MFD1 and the more recent and more valid MFD2. While results were not always the same, they tended to be largely similar. Analyses of non-skewed distributions stemming from the MFD2 are probably the most valid due to enhanced normality and predictive validity of this analytical set up.

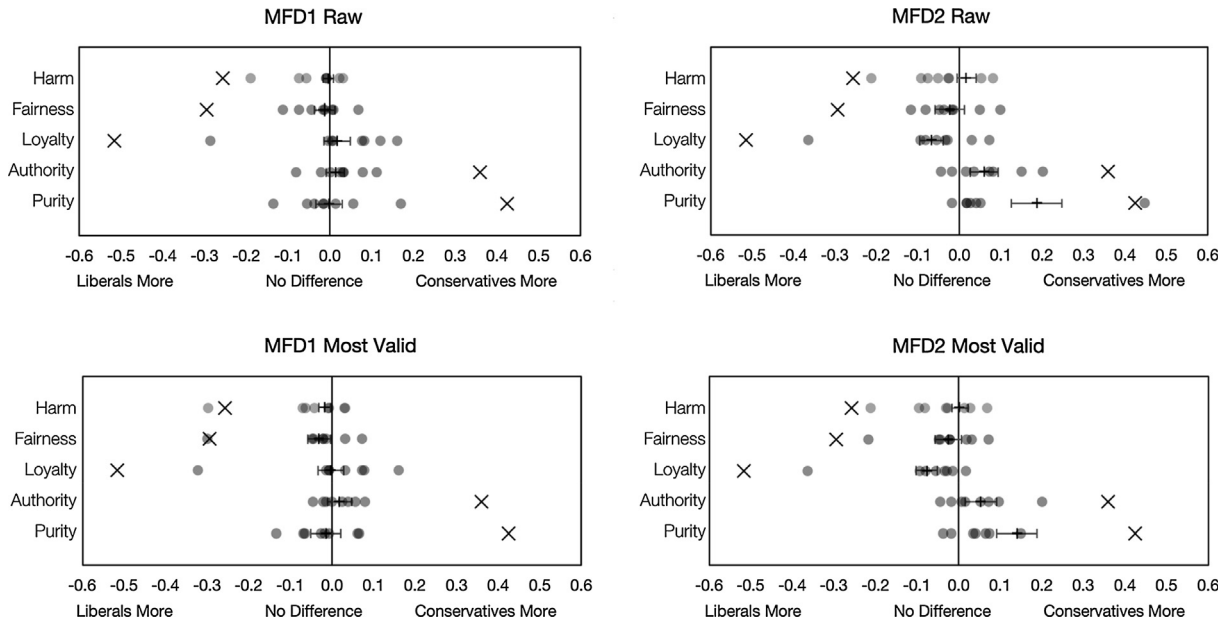


Fig. 1. Results from the original Graham et al. (2009) study (Xs), the present Studies 1–5 (grey dots), and meta-analyses of all the aforementioned data (crosshairs with 95% confidence intervals). The horizontal axis represents the correlation between conservatism and moral language usage. The raw data graphs represent the raw scores from the two sets of dictionaries. The “most valid” graphs represent results using the raw data when they were not skewed, and otherwise log-transformed data that reduced or eliminated skewness.

Both GHN and the present studies relied on a simple word counting program to operationalize the usage of moral languages (GHN also coded the speakers’ attitudes towards those words). For more than a century, psychologists have drawn inferences about topics of conversation and speakers’ internal states and traits through methods like these. And word counting procedures have generally been shown to be valid. However, topics are not fully reducible to the presence of certain words. Future work might use other linguistic techniques to assess whether liberals and conservatives have similar or different attitudes toward moral languages and use them in similar or different ways.

8.2. Theoretical considerations

Graham et al. (2009) found that liberals used more loyalty words than conservatives, a finding that is at variance with the MFH. The present analyses suggested that although this effect is weak, it is robust. Why liberals talk more about a topic upon which their morality is not based remains an important and pressing question for MFT.

The present and recent empirical findings motivate the revisiting of a fundamental question: what is a moral foundation, psychologically speaking? Proponents of the theory have advocated for construct pluralism in the sense that foundations are *general* mental modules that manifest in multiple psychological forms, including values, perceptions, behavioral orientations, language, and so on. The present findings, along with other work, raise questions about this tenet of Moral Foundations Theory. Results from the present studies suggest that differences in the moral language usage of liberals and conservatives are generally small. Moreover, for three foundations, the MFH was unsupported. It would probably be more accurate to conclude that liberals and conservatives use similar moral languages than that they use different languages.

Along with their similar languages, liberals and conservatives may not be as different as previously thought in terms of their general action orientations: liberals and conservatives are similarly obedient to their own authorities (Frimer, Gaucher, & Schaefer, 2014) and condemn perceived abuses of their ideology’s sacralized

objects (Frimer et al., 2015, 2016) and heroes (Frimer, Biesanz, Walker, & MacKinlay, 2013). This growing body of evidence is in line with idea that liberals and conservatives are made up of the same psychological stuff, but each ideology has its own set of cherished values and symbols. Whereas conservatism tends to cherish religion and the military, liberalism champions social justice and the environment (Frimer et al., 2015, 2016). Psychologically speaking, liberals and conservatives may cut from the same cloth.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrp.2019.103906>.

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