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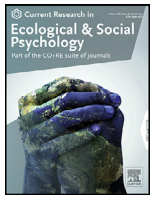

The interaction of faith and science mindsets predicts perceptions of the relationship between religion and science

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ABSTRACT

Religion and Science are two cultural systems that have each played a critical role in shaping human thought, feelings, and behavior, and there is an ongoing debate about the relationship between the two systems. Religion and Science may be viewed as *conflicting* (if one is right, the other is wrong), in *dialogue* (differences can be discussed and reasonably resolved), or as *separate* domains of inquiry. Researchers studying people's attitudes toward conflict and dialogue have focused on the main effects of religious or science-minded variables only. In contrast, we made predictions regarding an interaction effect: As faith scores increase, a positive relationship between science mindset and conflict would be attenuated (H1); and the negative relationship between science mindset and dialogue would also decrease (H2). Using a sample of 669 U.S. participants, we found support for the hypothesized interaction effect. Among participants high in faith mindset, science mindset was negatively related to conflict and positively related to dialogue. In contrast, among participants low in faith mindset, science mindset was positively related to conflict and negatively related to dialogue. Thus, it is important to consider the joint effects of faith *and* science mindsets when predicting views of the relationship between Religion and Science. We also explored the relationships between mindsets and Religion and Science as separate domains and found that mindsets accounted for minimal variance. We discuss how science and faith mindsets may each contribute to well-being but that endorsing a cultural narrative of Religion and Science in conflict may be detrimental to well-being.

1. Introduction

People need to make sense of the world to survive and flourish, and cultural systems such as religion and science often provide information to satisfy that need. Before the scientific revolution in the 16th century, religion and science were branches of philosophy in Western civilization. Scholars generally agreed that God was revealed in the world, and the nature of things in the world provided evidence for God (Barbour, 1998). Subsequently, religion and science became separated from philosophy. Today, they are more likely to be conceptualized as distinct, multi-dimensional cultural systems with specialized epistemological, practical, moral, and social characteristics (Geertz, 1973; Okasha, 2002; Saroglou, 2011).

The separation of religion and science is evident in the academy and also has undergirded disputes in the U.S. regarding education (e.g., evolution), bioethics (e.g., stem cell research), public policy (e.g., euthanasia, climate change, vaccination compliance) (McPhetres and Nguyen, 2018) and perceived moral agendas (Evans, 2011). Consequently, some have come to view religion and science as inherently in conflict (Pew Research Center, 2015) in a kind of "culture war" (Caiazza, 2007). The perception that religion and science are necessarily in conflict and that religious people are "anti-science" can also increase stereotype threat for religious people (Rios, 2021; Rios et al., 2015), dissuade otherwise-qualified religious students from pursuing STEM degrees, and unnecessarily limit career choices (Longest and Smith, 2011; Scheitle, 2011).

Further, a view of religion and science as necessarily in conflict neglects research showing that scientific and religious explanations can and do coexist in the minds of many (Legare and Gelman, 2008; Legare and Visala, 2011; Shtulman and Lombrozo, 2016). Indeed, some believe that the knowledge, positive practices, and communities that constitute Religion and Science[1], writ large, can be mutually beneficial and that epistemological differences can eventually be resolved (e.g., Ecklund et al., 2011; Templeton, 2000).

In his influential essay on the historical relationship between Religion and Science, physicist and theologian Ian Barbour (2000) identified three relational modes of Religion and Science: Conflict, Dialogue, and Separation. We propose that perceptions of these three relational modes between Religion and Science are grounded in an individual's reliance on related mindsets or knowledge networks (Murphy, 2007) used as in-

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terpretive frameworks to make sense of and respond to events in the world. In the present research, we examine whether the prediction of perceptions of the relationship between Religion and Science as being in Conflict, Dialogue, or Separate (Barbour, 2000) is enhanced by taking into account the science mindset by faith mindset *interaction* effect. In other words, we predicted that faith and science mindsets jointly predict perceptions of the relationship between Religion and Science as "enemies, partners, or strangers" (Barbour, 2000).

1.1. Religion and science

As cultural systems, Religion and Science have each greatly influenced how people address life's challenges. Given the historical importance of Religion and Science in the West, a debate about people's perceptions of the relationship between the two systems has been ongoing in modernity (Evans and Evans, 2008; Leicht et al., 2021; McPhetres and Zuckerman, 2018; O'Brien and Noy, 2015; Preston and Epley, 2009), with some portraying a historical "war" between religion and science (White, 1896), some viewing the two systems as separate domains (Gould, 1999), and others finding forms of integration (Barbour, 1998; Ecklund et al., 2011).

Mindsets are learned through interactions with caregivers, life experiences, and formal education. Critically, faith and science mindsets develop and are embedded within the broader religious and scientific sub-cultures that have evolved over centuries. The roots of both systems in Western culture can be traced to Aristotle, who sought to understand purpose and causality in the world (Barbour, 1998; Okasha, 2002). Belief in God and/or metaphysical forces, the purpose of objects in the cosmos, and understanding through deductive reasoning were central in the Aristotelian worldview. However, beginning in the 1600s, scientists (e.g., Copernicus, Kepler, Galileo, Newton) sought to understand the world through mathematics, inductive reasoning, and quantifiable relationships between objects without regard to purpose. They were more interested in *how* the world works; they thought of the world as mechanical and subject to natural laws.

Over the past 400 years, Religion and Science have continued to evolve such that both systems have come to be seen as bounded categories with their own set of unique characteristics in terms of what can be known, ways of knowing, values, moral priorities, social norms, trained practitioners, and organized communities.

1.2. Faith and science mindsets

These two cultural systems, Religion and Science, provide the cognitive foundations for an individual's mindset—the global beliefs, worldviews, or knowledge networks people use to perceive, interpret, navigate, and respond to life events. As knowledge networks, faith and science mindsets have some commonalities. Both mindsets involve networks of core theories, auxiliary hypotheses, instrumentation, and data about the world (Murphy, 2007). For example, faith and science mindsets share the core belief that the physical world exists. In addition, faith and science mindsets both provide a lens for gathering information and interpreting, predicting, and controlling the physical world. Yet, faith and science mindsets have unique characteristics.

In the present research, we focus on the epistemological aspects and conceptualize the science mindset as involving beliefs such as *rational thought is superior to intuition; logic must generate hypotheses; hypotheses must be tested; novel claims must be supported with empirical evidence; nature can (eventually) be explained by the community of scientists*; and *science can solve the challenges facing humankind*.

In contrast, we conceptualize the faith mindset as involving a set of epistemological and ontological beliefs such as *metaphysical forces or entities also exist; subjective, non-ordinary (e.g., mystical) experiences can be informative; the teachings of one's religious group can be authoritative without empirical evidence*; and *God and other metaphysical forces can help in addressing life's challenges*.

These and other mindsets guide human thoughts, feelings, and behaviors. For hundreds of years, science mindsets have changed the ways people think about God (Barbour, 1998; Ecklund et al., 2011; Johnson et al., 2019; Longest and Smith, 2011), and faith mindsets have greatly influenced people's reliance on science (Johnson, 2021; O'Brien and Noy, 2015; Preston and Epley, 2009; Rutjens et al., 2010; Upenieks et al., 2022).

1.3. Relationship between Religion and Science

Given the importance of Religion and Science and their roles in society, it is unsurprising that philosophers, scientists, and theologians have had much to say regarding the relationship between Religion and Science. In the present research, we examine whether science and faith mindsets jointly predict perceptions of the cultural institutions of Religion and Science as being in conflict or dialogue. We also explore mindsets as predictors of the separate relational mode.

1.3.1. Religion and Science in Conflict

The view of Religion and Science in *conflict* has been traced to historical writings in the 19th and 20th centuries, which often emphasized conflicts between religionists and scientists (e.g., Catholic Church vs. Galileo; White, 1896). The conflict narrative has found implicit support in psychological research demonstrating a hydraulic relationship in terms of cognitive processes (Preston and Epley, 2009; Shenhav et al., 2012) and has gained traction among secularists in debates over Darwinism and bioethics (e.g., stem cell research, euthanasia). The Conflict mode often includes the argument that religion is a primitive belief doomed to eventually yield to the rationality of science and the scientific method as a way of knowing (Evans and Evans, 2008) and has been at the forefront of the New Atheism movement (Cimino and Smith, 2011).

Despite stereotypes that religious people are not good at or interested in (or that they oppose) Science or scientific information, Ecklund and colleagues (2010; 2011) have shown that scientists often retain their religious and spiritual beliefs. Furthermore, some have argued that materialism (the ontological belief that the metaphysical does *not* exist) is a philosophical position not essential to the science mindset (Barbour, 1998; Okasha, 2002).

1.3.2. Religion and Science as Dialectic/Dialogue

The *dialogue*, or dialectic, method of resolving disagreements was employed by the Greeks and can be defined as the "art of investigating or discussing the truth of opinions," especially "inquiry into metaphysical contradictions and their solutions" (Oxford Languages Dictionary, 2022). For Ecklund's scientists (2010; 2011) and others (Barbour, 2000), Religion and Science are compatible, have much to say to each other, and differences can eventually be reconciled. Moreover, Religion and Science each contribute to human flourishing and, therefore, are worthy of attempts at reconciliation.

In a study of emerging adults, Longest and Smith (2011) found that increased religiousness was more strongly associated with the belief that the relationship between Religion and Science was compatible rather than conflicting. More recently, Leicht et al. (2021) also found a positive correlation between religiosity and the perceived compatibility of Religion and Science. However, this finding was qualified by an interaction such that those who also identified with Science scored highest on compatibility using a 'compatibility vs. conflict' scale. Notably, study participants were more likely to report Religion and Science as conflicting for questions about origins but as compatible for questions about medical treatments and the environment. Similarly, O'Brien and Noy (2015) have found divergence on specific issues (e.g., human origins) that may not reflect views of a broader conflict between Religion and Science.

These findings are consistent with Jackson et al.'s (2020) compatibility hypothesis that individuals who have one source of knowledge to

accomplish a goal (e.g., atheists who are committed to a science mindset) are more likely than individuals who have two sources of knowledge (individuals committed to both science and faith mindsets) to perceive Religion and Science as conflicting. In multiple studies in the U.S. and across cultures, Jackson and colleagues (2020) also found that religious people perceived less conflict between Religion and Science than non-religious people, which was explained using goal systems theory and an instrumentality hypothesis. That is, religious people used both Religion and Science to explain life events. In contrast, non-religious people relied only on scientific explanations and were more likely to report a conflict between Religion and Science. Consistent with Rios et al. (2015), Jackson and colleagues also found that non-religious people underestimated religious people's positive attitudes toward science, suggesting that the conflict narrative may resonate more with non-religious individuals.

1.3.3. Religion and Science as Separate Domains

The *separate* relational mode portrays Science as providing knowledge about *how* the world works, with the veracity of scientific claims to be evaluated by scientific criteria alone. In contrast, Religion provides knowledge to answer questions of *why* and focuses on the search for meaning and purpose. The separate mode was perhaps most famously elaborated by Gould (1999), who described the two systems as "nonoverlapping *magesteria.*" Gould believed that each cultural system was limited in scope but ideally designed to govern and address its own specific set of questions and concerns. Keeping the beliefs, values, practices, social norms, and communities separate allows one to avoid any inherent cognitive conflict while remaining "faithful to the distinctive character of each area of life and thought" (Barbour, 2000, p. 17).

1.4. Hypotheses and Research Questions

In the present research, our primary goal was to investigate whether science and faith mindsets interact to predict perceptions of Religion and Science as being in conflict and dialogue. A secondary goal was to explore whether faith and science mindsets predict Religion and Science as separate domains. We also examined the mean differences among the three views of the relationship between Religion and Science.

Whereas previous research has investigated the links between religiosity and science (or the perceived relationship between Religion and Science), we sought to carry out a more nuanced investigation positing that faith commitments (a faith mindset) *and* the individual's reliance on science (a science mindset) interact to affect conflict and dialogue scores. We reasoned that people who have a substantial imbalance in their commitment to faith and science mindsets, relative to individuals who were committed to both mindsets, would be more likely to perceive a conflict between Religion and Science; and less likely to perceive a dialogic relationship between Religion and Science. In contrast, people who were high in both faith and science mindsets were expected to see less conflict and more dialogue than those who were committed to only one mindset. Critically, and in view of previous research (Leicht et al., 2021) and the instrumentality hypothesis (Jackson et al., 2020), we suspected that the degree of perceived conflict would be higher (and the degree of perceived dialogue would be lower) for those high in science mindset and low in faith mindset as compared to those high in faith mindset but low in science mindset.

Specifically, we tested two hypotheses regarding faith mindset as a moderator of the effect of science mindset on conflict and dialogue. Hypothesis 1 (**H1**) was that, as faith scores increased, the positive relationship between science mindset and conflict would be attenuated. Hypothesis 2 (**H2**) was that the negative relationship between science mindset and dialogue would decrease as faith scores increased.

We did not have specific hypotheses regarding the separate relationship mode. Instead, we carried out exploratory analyses to address two research questions. First, to what extent do faith and science mindsets account for variation in ratings of the separate relational mode? Second, how strongly do participants endorse the separate relational mode compared to the dialogue and conflict relational modes?

2. Method

2.1. Participants

The study was part of a preregistered set of studies (aspredicted.org/blind.php?x=f8xg9b) examining the relationships among COVID-19 concerns, fundamental social motivations, and faith and science mindsets. The pre-registration determined the sample size. However, the hypotheses presented here were not preregistered. The study was approved by the Arizona State University Institutional Review Board (#00011534 and 00011835). We conducted a longitudinal study, surveying a panel of Mechanical Turk workers in the U.S., across five time periods, in March, April, June, and November of 2020 and November, 2021. Participants provided consent by advancing through the online survey (see Johnson et al., 2021 for specific details regarding data collection). Data for the current study came from the November 2020 wave, which uniquely included questions regarding perceiving Conflict, Dialogue, and Separate relationships between Religion and Science. The data are available at osf.io/khdqf.

Four participants were excluded from the present study due to missing data on one or more of the main study variables, resulting in a sample size of $N = 669$ (56% Female). There were 82% Euro-Americans, 7% Blacks, 5% Asian-Americans, 3% Hispanics, and 3% of multiple races/ethnicities. The mean age was 46.16 years old ($SD = 14.71$). The breakdown for education was as follows: 50% had a college degree, 25% had attended technical school or some years in college, 15% had an advanced college degree, and 10% were post-high school. Forty-six percent of the participants believed that God "does exist" or "certainly does exist," 16% believed that "God might exist," and 35% believed that God "probably does not" or "certainly does not exist." The sample was comprised of: Atheists (14%), Agnostics (21%), Mainline Protestants (23%), Catholics (16%), Evangelicals (13%), Spiritual but not Religious (11%), and "other" (3%) religious groups.

2.2. Sensitivity power analysis

Because the data were collected for a separate project, an *a priori* power analysis was inappropriate. Instead, a sensitivity power analysis revealed that we could detect an effect size as small as $f^2 = .012$ with power of .80.

2.3. Measures

Participants rated their views of the relationship between Religion and Science and items assessing faith in God (henceforth, Faith) and Science mindsets on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*).

We assessed three views regarding the relationship between Religion and Science as proposed by Barbour (2000) and previously assessed by (Johnson et al., 2019). Participants rated the following statements: "If one is right, the other is wrong. Religion and Science both make claims about the same things (like the history of nature), so a person must choose between them" (Conflict); and "Religion and Science have much to say to each other. They each contribute to a coherent worldview, and any differences can (eventually) be reconciled" (Dialogue); and "Religion and Science ask different questions, apply to different areas of life, and have different methods. Each should not meddle in the affairs of the other" (Separate).

We assessed Science ($\alpha = 0$ .92) and Faith ($\alpha = 0.98$) mindsets using a measure developed by Kitchens and Phillips (2018). The scale consists of five pairs of items. For example, one pair of items is, "I trust that Science

Table 1
Means, standard deviations, and zero-order correlations among the variables.

	2	3	4	5	6	7	8	9
1. Sex (Female)	-0.08*	0.14***	-0.02	-0.12***	0.11**	-0.04	0.08*	0.01
2. Education	–	0.00	-0.06	0.12***	-0.04	-0.11**	0.02	0.05
3. Age		–	0.17***	-0.12***	0.14***	-0.08*	0.13***	0.02
4. Conservatism			–	-0.49***	0.50***	-0.04	0.22***	-0.05
5. Science Mindset				–	-0.62***	0.10*	-0.23***	0.12**
6. Faith Mindset					–	-0.22***	0.50***	-0.06
7. Conflict						–	-0.42***	0.05
8. Dialogue							–	-0.01
9. Separate								–
M	2.71	46.16	3.56	5.00	3.84	3.32	4.74	4.26
SD	.84	13.71	11.85	1.48	2.19	1.78	1.63	1.75

Notes:
*** $p \leq .001$;
** $p \leq .01$; $p \leq .05$.

[God] can solve the major problems of humanity." Johnson (2021) performed a principal components analysis of the ten items and found two factors accounting for 83.41% of the variance (Faith Eigenvalue = 6.64 and Science Eigenvalue = 1.70). To further validate the measure, they observed that the Faith Mindset subscale was positively correlated with religious commitment and belief that God exists and negatively correlated with measures of interest in science and commitment to scientific logic. In contrast, the Science Mindset subscale was positively correlated with interest in science and commitment to logic, but negatively correlated with religious commitment and belief in God.

Education was measured on a four-point scale: 1 = high school, 2 = tech school or some college, 3 = college degree, and 4 = advanced degree. Participants rated their political views regarding foreign policy, economic, and social issues on a 7-point Likert scale (1 = very liberal, 7 = very conservative), thus providing a combined measure of conservatism ($\alpha = 0.93$).

3. Results

3.1. Descriptive statistics and intercorrelations

Table 1 presents the means, standard deviations, and correlations among the predictors and the criterion variables. Science Mindset scores were significantly higher than Faith Mindset scores, t (668) = 9.08, $p <$ .001, [95%CI: 0.91, 1.41], Cohen's $d = 0.35$. We examined mean differences in the three relational mode measures to address our second research question. Dialogue scores were significantly higher than Separate scores, t (668) = 5.18, $p <$ .001, [95%CI: 0.30, 0.66], Cohen's $d = 0.20$, and Conflict scores, t (668) = 12.79, $p <$ .001, [95%CI: 1.20, 1.64], Cohen's $d = 0.49$. Furthermore, Separate scores were significantly higher than Conflict scores, t (668) = 9.94, p < .001, [95%CI: 0.75, 1.12], Cohen's $d = 0.38$. Science Mindset was negatively correlated with Faith Mindset and Dialogue scores which, in turn, were negatively correlated with Conflict scores. As expected, Science Mindset was positively correlated with Conflict (and also with Separate). Also, as expected, Faith Mindset was negatively correlated with Conflict but positively correlated with Dialogue.

3.2. Multiple Regression Analyses

We conducted separate regression analyses predicting Conflict, Dialogue, and Separate scores. Ratings of each type of relationship were regressed on Faith and Science Mindsets and the Science Mindset by Faith Mindset interaction term, controlling for Sex, [Female = 1, Male = 0], Age, Education, and Conservatism. All continuous predictors were centered.

With respect to our first hypothesis (H1), the predictors accounted for a significant amount of the variance in Conflict scores, F (7, 661) = 12.22, $p <$ .001, $R^2 = .11$. Similarly, the predictors explained a significant amount of the variance in Dialogue scores, F (7, 661) = 42.36, $p <$ .001, $R^2 = .31$. To explore our first additional research question, we regressed separate relational mode ratings on the variables in our model. The model explained only 2 percent of the variance in Separate scores, F (7, 661) = 1.96, $p = .058$. The regression coefficients for the predictors for each criterion variable are shown in Table 2.

Education (95% CI for B [-0.38, -0.08]) and Faith Mindset (95% CI for B [-0.27, -0.11]) were significant, negative predictors of Conflict. As predicted, the Science Mindset x Faith Mindset interaction was significant (95% CI for B [-0.16, -0.08]), uniquely accounting for 4% of the variance in Conflict. Faith Mindset was a significant, positive predictor of Dialogue (95% CI for B [0.34, 0.47]). As predicted, the Science Mindset x Faith Mindset interaction was significant (95% CI for B [0.07, 0.14]), uniquely explaining 4% of the variance in Dialogue. Finally, the only significant predictor for Separate relational mode scores was Science Mindset (95% CI for B [0.01, 0.25]).

3.3. Graphic Representation of Interaction Effects and Tests of Simple Effects

Figs. 1A and B visually depict the Science Mindset x Faith Mindset interaction effects on Conflict (H1) and Dialogue (H2) scores, respectively.

Tests of the simple slopes revealed that Science Mindset was (a) significantly ($p <$ .001), negatively related to Conflict when Faith Mindset was high (B = -.22, 95%CI [-0.35, -0.09]), (b) significantly (p < .001), positively related to Conflict when Faith Mindset was low (B = .30, 95%CI [0.14, 0.46]), and not significantly (p = .479) related to Conflict when Faith Mindset was at the mean (B = .04, 95%CI [-0.07, 0.16]). In addition, simple slope tests indicated that Science Mindset was (a) significantly ($p <$ .001) positively related to Dialogue when Faith Mindset was high (B = .32, 95%CI [0.21, 0.42]), (b) significantly (p = .050), negatively related to Dialogue when Faith Mindset was low (B = -0.14, 95%CI [-0.28, -0.01]), and not significantly (p = .077) related to Dialogue when Faith Mindset was at the mean (B = .08, 95%CI [-0.01, 0.18]).

3.4. Post hoc Analysis

To provide an additional view of the magnitude of differences between individuals high in both mindsets versus individuals high in only one mindset, we carried out a MANOVA and independent sample t-tests separately on Conflict and Dialogue scores. We created and analyzed three groups as follows: (a) participants with scores of 5 or higher on both the Faith and Science mindset scales were classified as High Science/High Faith, (b) participants with scores of 5 or higher on the Science mindset scale and 3 or lower on the Faith mindset scale were clas-

Table 2
Unstandardized regression coefficients predicting separate, conflict, and dialogue.

	Conflict			Dialogue			Separate		
Predictor	*B*	*SE*	*P*	*B*	*SE*	*p*	*B*	*SE*	*p*
Sex (Female = 1)	-.03	.13	.841	.07	.11	.534	.09	.14	.523
Education	-.23	.08	.004	.05	.06	.437	.07	.08	.369
Age	-.00	.01	.392	.01	.00	.223	.00	.01	.585
Conservatism	.05	.04	.222	.01	.03	.664	.01	.04	.842
Science Mindset	.04	.06	.491	.09	.05	.073	.13	.06	.033
Faith Mindset	-.19	.04	<.001	.40	.03	< .001	-.00	.04	.968
Science × Faith	-.12	.02	<.001	.11	.02	< .001	.03	.02	.144

Note: All continuous variables were centered.

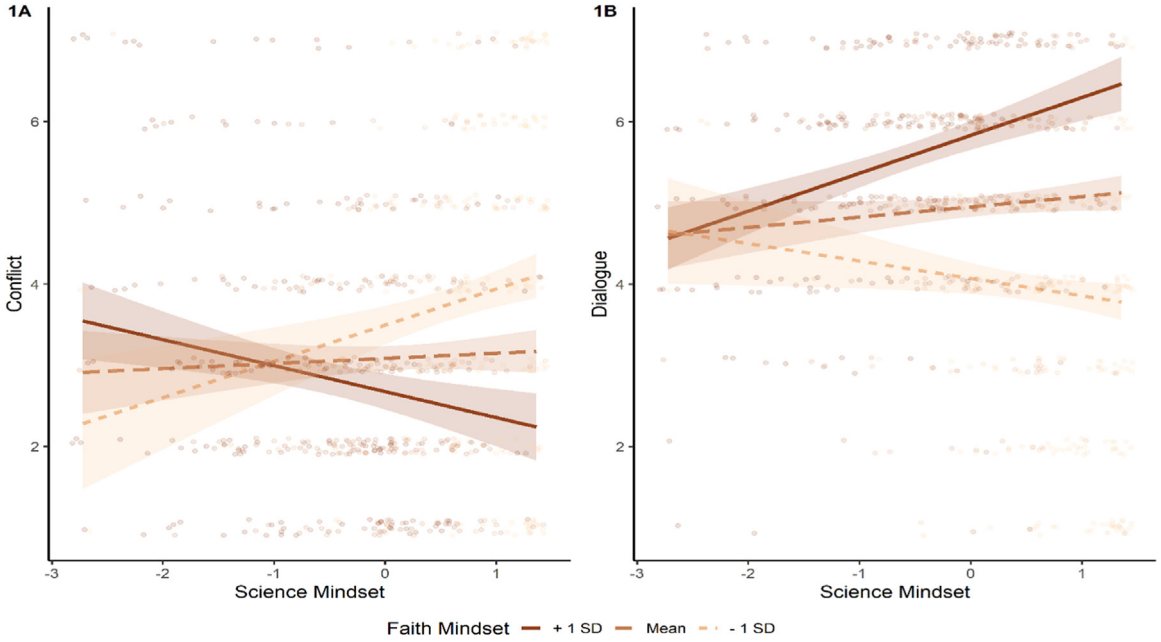

Fig. 1. Predicted Values of Conflict (1A) and Dialogue (1B) as a Function of Faith and Science Mindsets.
Note: Simple slopes show the effect of Science Mindset at high (+1 SD), mean, and low (-1 SD) values of Faith Mindset. Points are jittered to minimize overlap, and their depth of color represents their scores on Faith Mindset. The range of scores reflects centered scores.

Table 3
Means and standard deviations for conflict and dialogue by group.

	Conflict			Dialogue		
Group	*M*	*SD*	*N*	*M*	*SD*	*N*
High Science/High Faith	2.67	1.70	78	5.94	1.33	78
High Science/Low Faith	4.02	1.90	227	3.67	1.64	227
Low Science/High Faith	3.59	1.84	68	4.91	1.39	68

sified as High Science/Low Faith, and (c) participants with scores of 5 or higher on the Faith mindset scale and 3 or lower on the Science mindset scale were classified as Low Science/High Faith. There were only seven participants with scores less than 3 on both Science and Faith mindset, and these were omitted from the analyses due to insufficient sample size.

Table 3 provides means and standard deviations for both dependent variables by group. As expected, a MANOVA controlling for age, sex, education, and conservatism demonstrated a significant effect of Type of Group, Wilks' Lambda = .77, F (4, 730) = 24.81, $p < .001$, $\eta^2 = .12$. Differences were significant for both Conflict, F (2, 366) = 13.72, $p < .001$, $\eta^2 = .07$, and Dialogue, F (2, 366) = 51.96, $p < .001$, $\eta^2 = .22$.

We probed the significant main effects between each pair using independent samples *t*-tests. The High Science/High Faith group had significantly lower Conflict scores than both the High Science/Low Faith group, t (303) = -5.56, $p < .001$, [95%CI: -1.83, -0.87], Cohen's d = -0.75, and the Low Science/High Faith group, t (144) = -3.14, $p = .003$, [95%CI: -1.50, -0.34], Cohen's d = -0.52. The High Science/Low Faith group did not differ significantly from the Low Science/High Faith group on Conflict scores, t (293) = -1.65, $p = .100$, [95%CI: -0.94, 0.08], Cohen's d = -0.23. These results suggest that more conflict is perceived when Faith and Science mindsets are imbalanced—yet we note that the group means for Conflict for all groups were either at or below the midpoint on the 7-point Likert scale.

Consistent with the compatibility and instrumentality (Jackson et al., 2020) hypotheses, the High Science/High Faith group had significantly higher Dialogue scores than both the High Science/Low Faith group, t (303) = 11.04, $p < .001$, [95%CI: 1.87, 2.67], Cohen's d = 1.52, and the Low Science/High Faith group, t (144) = 4.57, $p < .001$, [95%CI: 0.58, 1.48], Cohen's d = 0.76. Critically, however, the High Science/Low Faith group also had significantly lower Dialogue scores than the Low Science/High Faith group, t (293) = 5.65, $p < .001$, [95%CI: 0.81, 1.67], Cohen's d = 0.82, suggesting that those low in Faith Mindset seem to find the least utility in reconciling Religion and Science.

4. Discussion

Since the scientific revolution in the 16th and 17th centuries, when Science became a distinct scholarly discipline (Barbour, 1998; Wootton, 2016), some have argued that rationalist thought, empirical

evidence, a mechanistic view of nature, and the scientific method would and should replace religious faith. Scholars have pointed to past and current debates and asserted that religious people view Religion and Science as conflicting, often supposing there is something unique about religiosity driving opposition to alternative viewpoints. The historical record and our data suggest that commitments to Science might evoke opposition in similar ways. We hypothesized that one must take into account the i*nteraction* between faith and science mindsets to understand why people perceive Religion and Science as conflicting.

In the present research, our first hypothesis (H1) was that the positive relationship between science mindset and conflict would be attenuated as faith mindset increased. In support of this prediction, we found that science mindset was a positive predictor of conflict when faith mindset scores were one standard deviation below the mean. When faith mindset scores were at the mean, science mindset was not a significant predictor of conflict. Furthermore, when faith mindset scores were one standard deviation above the mean, science mindset was a negative predictor of conflict. Finally, when faith mindset scores were one standard deviation above the mean, science mindset was a negative predictor of conflict.

Critically, these results demonstrate that faith and science mindsets *jointly* affect views of the relationship between Religion and Science as being in conflict. For example, when science mindset is high but faith is low, people may be especially likely to think of Religion and Science as being in conflict. In contrast, when both science and faith mindsets are high, people report minimal conflict. Our pair-wise comparisons of group means (see Table 3) provided another demonstration that people who are low in faith and high in science mindsets, on average, have the highest conflict (and the lowest dialogue) ratings.

Our second hypothesis (H2) was that the negative relationship between science mindset and dialogue would decrease as faith mindset increased. Consistent with this prediction, when faith mindset scores were one standard deviation below the mean, science mindset was a negative predictor of dialogue. When faith mindset scores were at the mean, science mindset was not a significant predictor of dialogue. Furthermore, when faith mindset scores were one standard deviation above the mean, science mindset was a positive predictor of dialogue. That is, we found that people high in faith mindset who also reported reliance on a science mindset were the most likely to view Religion and Science in dialogue, agreeing that "they each contribute to a coherent worldview, and any differences can (eventually) be reconciled." Thus, in accord with other research—including queries of scientists (Ecklund, 2010; Ecklund et al., 2011; Evans, 2013), we found that many religious people believe Religion and Science have much to say to one another (Legare et al., 2012) and both Religion and Science can be useful (Jackson et al., 2020; Legare and Gelman, 2008).

Indeed, *any* degree of self-reported faith seems to be associated with agreement that Religion and Science are compatible (at least to some extent or eventually). One explanation is that people with a faith mindset are quite likely to also believe in the existence of a physical world. All monotheistic religions explicitly regulate how adherents ought to think about and behave in the physical world (thus, implicitly recognizing the existence of the physical world). Moreover, people everywhere must rely on information about the physical world to survive and flourish, and Science can provide much of this helpful information. Consequently, Religion and Science, as cultural systems, each provide useful information and are viewed as being in dialogue (compatible, reconcilable, or dialectic).

Notably, participants in the Low Science/High Faith group had significantly higher dialogue scores than participants in the High Science/Low Faith group. One explanation is that more fundamental, ontological beliefs about what exists drive differences in whether non-religious individuals perceive conflict. Again, in accord with Jackson et al.'s (2020) instrumentality hypothesis, we suggest that people with a strong science mindset who reject belief in the existence of metaphysical entities or forces are, understandably, unlikely to agree that there is any utility in Religion or religious knowledge.

In sum, individual differences in thinking about the relationship between Religion and Science vary depending on *both* an individual's faith and degree of reliance on science.

4.1. Exploratory Research Questions

We found that a science mindset was the only significant predictor of the separation relational mode, although science mindsets accounted for minimal variance. Compared to participants with lower science mindset scores, participants with higher science mindset scores more strongly endorsed the separation item. One explanation is that some people who are high in science mindset are uninterested in Religion, yet also agnostic, unconcerned about, or not bothered by others' religious beliefs.

Notably, on average, all participants rated the separate relational mode item slightly above the midpoint of the 7-point scale, indicating a moderate endorsement of this view of the relationship between Religion and Science. One possibility is that the tendency to view Science and Religion as separate reflects other individual differences such as cognitive complexity, which refers to the degree of complexity of an individual's thoughts about a topic (Woodard et al., 2021). Relatedly, as scientist Stephen Jay Gould (1999) has argued, Science and Religion can be viewed by some as simply distinct domains of inquiry without giving rise to concerns about conflict or dialogue.

Comparing the means across all three relational modes, our research also revealed that the prominence of the conflict narrative in U.S. culture today may be somewhat overstated. We found that conflict ratings were substantially lower than both dialogue and separate relational mode ratings. Religious participants around the globe generally perceive less conflict between Religion and Science than U.S. participants (McPhetres et al., 2021). The people in our U.S. sample also tended *not* to see Religion and Science as inherently in conflict, providing ratings for conflict that, on average, fell below the mean of the 7-point scale. Earlier measures of science mindsets may have captured an anti-religion bias (e.g., Farias et al., 2013). However, when statements assessing a science mindset are presented more neutrally (e.g., Kitchens and Phillips, 2018), a science mindset does not necessarily reflect a perceived conflict between Religion and Science. We suspect that where specific conflict does exist (e.g., evolution, stem cell research, cloning), religious people have developed cognitive strategies to make sense of discrepancies—for example, provisionally disaggregating contentious topics from 'Science' more broadly (Leicht et al., 2021).

4.2. Limitations

The main focus of our study was to investigate the faith by science mindset interaction as a predictor of perceptions of the cultural institutions of Religion and Science as being in conflict or dialogue. We investigated whether the association of science mindsets with perceptions of conflict and dialogue depends on the individual's faith and vice versa. However, it is just as likely, that increased endorsement of the conflict narrative can lead people to reject a faith mindset, perhaps sacrificing the potential benefits of religion and spirituality, such as better mental health, higher life satisfaction, religious group social support, and lower mortality rates (Hoogeveen et al., 2022; McCullough et al., 2000). Conversely, endorsement of the conflict narrative may lead others to oppose or reject science-based earth sustainability initiatives, certain beneficial health practices, or the many innovations afforded by science. Thus, more research is needed to investigate how the different cultural narratives of conflict, dialogue (and separation) of Religion and Science might, in turn, shape individuals' reliance on faith and science mindsets—for better or worse.

4.3. Conclusion

Religion and Science each provide foundational knowledge networks reflected in the faith and science mindsets which influence how people interpret the world and face life's challenges. Certainly, the perceived utility of faith and science mindsets can vary greatly with context and content (Leicht et al., 2021, O'Brien and Noy, 2015). Likewise, perceptions of the relationship between Religion and Science are shaped by other factors, including education, group identities, and the social, political, and moral controversies of the time. A complete understanding of the causes and consequences of these mindsets and their corresponding cultural narratives regarding the relationship between Religion and Science will require a continued, deeper, and increasingly nuanced understanding of their roles within individuals' cognitive and social lives.

Note

1 Our strategy was to capitalize Religion and Science when discussing the cultural constructs and to use lowercase for faith mindset and science mindset to increase readability and differentiate science mindset from Science as a cultural construct. However, we capitalized all variable names in the Results section when discussing measured variables.

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Data availability

osf.io/khdqf

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