Religion, cognitive style, and rational thinking

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Abstract

Recent research has reported strong correlations among trait measures of religious belief, social conservatism (as a political ideology), deontological reasoning about morality, and (negatively) measures of rational cognitive style. I suggest many modern societies are divided between two cultural groups who think differently and have different beliefs, with one group being influenced by the Enlightenment and the other still accepting older beliefs and ways of thinking, often based on religious traditions. A plausible alternative account of many results is that individual differences in cognitive style affect the course of individual development, and actively open-minded thinking may lead to abandonment of religion. Here I review some of the recent research on these correlations.

1 Highlights

• Social liberalism, reflective thinking, and utilitarian judgments all correlate positively but negatively with religion.

• It is unlikely that these correlations result from the way subjects do the experimental tasks.

• One possibility is that reflective cognitive style leads, over time, to social liberalism and reduced religious belief.

• Or, studies sample different cultures, some influenced by the Enlightenment and others based on pre-Enlightenment doctrines.

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2 Introduction

Recent research on individual differences has repeatedly found correlations among several traits and characteristics, almost as if there were a common cause at work. These include: religion, including belief in God or gods, social conservatism in politics, deontological moral beliefs, and unreflective cognitive style. Here I review some of this literature, ultimately with the goal of suggesting explanations, but also, along the way, trying to summarize the most recent work. I review this in sections corresponding to pairs of the three relevant traits: religion and cognitive style, deontology and religion, social conservatism and cognitive style. I then comment on the role of epistemic norms, which I think are quite relevant, and corrective dual system theory, which I think is not relevant. I conclude with a suggestion that two major (compatible) explanations remain: the effect of conservative culture, and the effect of reflective thinking itself, wherever it comes from.

3 Cognitive style, religion and related beliefs

Several studies found negative correlations between belief in God or gods and scores on the Cognitive Reflection Test (CRT; [1]), a short test (usually 3 items but often extended) with numerical problems designed to create conflict between an intuitive answer and a correct answer (e.g., [2,3,4]). Questions about some of these supporting studies were addressed by Pennycook et al. [5] in a review and meta-analysis. Baron et al. [6] argue that much of the predictive power of this test does not come from the tendency to correct initial intuitions so much as from the disposition to proceed carefully, trying to get the correct answer even if it takes longer, the trait of reflection/impulsivity.\footnote{Several studies have found small and labile effects of priming reflective thinking on expressions of religious belief (e.g., [2], with [7] reporting a replication failure, and [8]). I omit discussion of these studies because the changes are clearly transient and my concern here is with relatively stable traits.}

Recent articles have questioned the cross-cultural validity of these studies showing correlations between the CRT and belief in God. Gervais et al. [9] examined the correlation between the CRT and belief in God or gods (BiG) on a 0–100 scale, in a variety of cultural groups. The expected negative correlation appeared clearly only in samples from the U.S., Australia and Singapore, and the correlation was reversed in a sample of college students from the U.K. However, Stagnaro et al. [10] reported the expected correlation in different samples from India (where Gervais et al. also found it) and in a sample of ordinary citizens (not just college students) in the U.K.

Yilmaz and Alper [11] examined the relation between social conservatism and the CRT in a variety of cultures differing in “WEIRDness” (Western, educated, industrialized, rich, democratic). They found that this correlation was largely limited to the more WEIRD cultures, such as the U.S.
Social conservatism was measured in terms of the “binding” foundations: loyalty (patriotism), authority (respect for traditions), and sanctity (respect for the sacred), as proposed by moral foundations theory ([12]). Perhaps one reason for these differences is that WEIRD countries have more people experiencing “liberal” higher education, and this creates the relevant variance in order to yield a within-society correlation.

More recently, Bronstein et al. [13] measured several variables in a large sample, including: acceptance of “fake news”, acceptance of real news (as a contrast), CRT, delusional ideation, and religious fundamentalism (e.g., “The basic cause of evil in this world is Satan, who is still constantly and ferociously fighting against God”), and actively open-minded thinking beliefs (AOT). AOT is a set of standards for good thinking, described in general terms that apply to all thinking. The standards are designed so that, if followed, thinking will come as close as possible to optimal conclusions, avoiding common biases such as “confirmation bias” (also called “myside bias”, e.g., [14,15]) taking into account the cost of thinking itself (see [16]).

The Spearman correlations of these measures were (from Table 2 in [13], n=502):

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Of particular interest is the negative correlation of AOT with delusional ideation, dogmatism and fundamentalism.²

4 Deontology and religious belief

Shariff, Piazza and Kramer [17] review evidence of correlations between deontological morality and religious belief. In general theists believed that some sort of God or gods were necessary for morality, both for defining what is moral and for providing reasons for people to follow moral principles. Thus, morality was externally defined, usually in terms of God-given rules. Nontheists generally believed that people could figure this out on our own.

Piazza [18] found that explanations of the wrongness of immoral actions were based on rules, rather than consequences, more often in religious people, particularly those who held orthodox

²I discuss the AOT correlations further in the next section.
Christian beliefs. Christian doctrine is divided on these issues, but many traditions emphasize both moral rules and the obligation to follow them whatever the consequences (i.e., deontology). However, the correlation between religious belief and deontological morality could result from accidents of history. Deontology is not a necessary part of religion, and Christian utilitarians claim to have no problem reconciling their religious and philosophical beliefs. Yet the attachment to rules as such could result more simply from attachment to a cultural group; after all, the rules of etiquette are also culturally defined and are often enforced as social norms.

Barak-Corren and Bazerman [19] further analyzed the relation between deontological and religious beliefs. They point out that deontological responses to sacrificial dilemmas, in which some people are harmed (or killed) in order to prevent harm to a larger number of others, can arise from two different principles. One favors harmful acts over (equally or more harmful) omissions. The other favors direct harm due to action from (equally or more harmful) indirect harm due to action. To test this, the authors used scenarios with three options concerning the response to (e.g.) a runaway trolley: do nothing, in which case the trolley will kill five people; push one person off a bridge, saving the five but killing the one person pushed (direct action); or flip a switch to switch the trolley to another track where it would kill one person but save only three (an indirect action). Religiosity was measured with a five-item scale that included belief in God or gods, identification with religion, and other items. Religiosity correlated negatively with the utilitarian choice (push) but equally with the two other choices, thus suggesting that both indirectness and inaction were relevant. Those who chose inaction often justified their response by saying that the outcome was “up to God” and it was not their business to interfere. Similar results were found for subjects in the U.S. (where Christianity was the most frequent religion) and Israel (where Judaism was most frequent). This study is of particular interest because it shows that particular religious beliefs are associated with the use of particular deontological principles.

Baron et al. [6], and Piazza & Landy [20] report high correlations among deontological reasoning, low levels of AOT beliefs, and belief in divine-command theory, the idea that people do not have the capacity to engage in moral reasoning or to understand it, so that we must accept the word of God without question (which we called “Religion”, misleadingly). It seems unlikely that many of our subjects came to accept divine-command theory on their own, without strong influence of their particular religious culture. Culture may also affect cognitive style if some people grow up in cultures that oppose questioning.

Stanovich and Toplak [21] have recently questioned these large correlations with AOT, arguing
that the unusually high correlations result from the use of questions about resistance of “beliefs” to evidence, in the scale used by Baron et al. to measure AOT. They argue that religious people think of beliefs as referring to religious beliefs, which are, by their nature, more resistant than other beliefs. Thus, the scales are biased to give low AOT scores to religious believers. In fact, in the Baron et al. study [6], the “belief” items did correlate more highly than other items with belief in divine command theory, but they correlated with other criteria, even the CRT, more highly than other items, to about the same extent. They were just good items. However, even a higher correlation of belief items with religion than with other measures would not necessarily indicate an anti-religion bias. Rather, what some religious people count as beliefs may be especially impervious to challenge, to the point where strong rejection of the standards of AOT is necessary in order to entertain such beliefs.

5 Social conservatism and cognitive style

A number of papers show that cognitive styles are related to political conservatism. Jost [23] (see also [24]) summarizes much of this literature, which uses a variety of measures of cognitive style. Perhaps the most directly interpretable of these measures is “integrative complexity” (e.g., [25]), a system for scoring texts, based on the principles of differentiation and integration. “Differentiation”, which does most of the work, involves thinking of, and accounting for, arguments opposed to the main argument being advanced. In this regard, the measure overlaps with the concept of AOT, which also emphasizes considering arguments on both sides.

Some (but not all) studies suggest that these results are stronger for social conservatism than economic conservatism. Social conservatism captures adherence to traditional values about families and the role of religion in society. Social conservatives tend to oppose abortion, homosexuality, fully equal rights for women, and they often favor making exceptions to laws that conflict with religious teaching. Economic conservatism is usually defined as a preference for free markets over government control, low taxes, free trade, free movement of capital, and opposition to “excessive” regulation. Although economic conservatism is correlated with social conservatism in most samples, the correlation is weakened by libertarians, who are socially liberal and economically conservative.

As an example of this sort of difference, Deppe et al. ([27]; see also the re-analysis in [28]) found that, in several different samples, reflective thought, as measured by the CRT, was positively

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3Pennycook et al. [22] recently replaced “belief” with “opinion” in several items and found that the belief items predicted religion in particular, more than the opinion items. The question about whether this is a bias at all is still open.

4The existing correlation may be increased by partisan loyalty; for example, Republicans (now but not always in the past) favor both social and economic conservatism, while Democrats generally take the opposite view of both [26].
correlated with social liberalism but essentially uncorrelated with economic “liberalism”. Other, similar results are those of Yilmaz and Saribay [29]; this study was done in Turkey, thus showing that the results hold in a society where the predominant religion is Islam rather than Christianity. Less clearly, Yilmaz and Saribay [30] found that a combined measure of reflective thought correlated more highly with social liberalism than with economic liberalism in a U.S. sample, but the CRT by itself did not correlate highly with either, and a measure of AOT beliefs correlated with both. (Baron [31] also reported a correlation between AOT and general liberalism, without any distinction between social and economic aspects, in a data set that showed no correlation with the CRT.) Reynolds et al. [32] also found a stronger correlation of the CRT with social than with economic conservatism. And Yilmaz and Saribay [33] found that CRT (in different forms) correlated negatively with resistance to change (arguably more related to social conservatism) but not with opposition to equality (arguably more related to economic conservatism).

The correlation of social liberalism in particular with more reflective cognitive style, which is of primary interest here and is not disputed, is consistent with the possibility that the culture of religion itself, as a social institution, affects both cognitive style and political beliefs [6]. Religions must maintain themselves in a heterogeneous culture by discouraging their adherents from leaving, and one way they do this is by discouraging questioning in general and questioning of authorities in particular. Such social norms may also discourage liberal higher education, perhaps seeing higher education as specialized career training at best and dangerous at worst. Liberal education by its nature encourages challenging students with a diversity of new ideas. These conflicts begin even in secondary education, where political battle lines are often drawn over such issues as the teaching of Darwin’s theory of evolution.

6 Epistemic norms

Metz, Weissberg and Weisberg [34] provide an important clue about the culture of social conservatism and how it could affect cognitive style. They examined beliefs about human evolution in a U.S. sample. Creationists (who accept, in various ways, the Biblical account of the creation of humans) differ from evolutionists (who accept the view that humans arose through natural selection) in their criteria for belief, that is, what they count as reasons for believing something. In particular, creationists accept the authority of the Bible (74% vs. 1% for evolutionists) and “It feels true in my heart” (74% vs. 21%). Metz et al. suggest that this sort of epistemic norm could account for

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5Economic conservatives are also called “neo-liberals” or, in Europe, just “liberals”. But here I use “liberal” just to indicate the opposite of “conservative”.

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negative correlations between creationism and the CRT [35], because the CRT itself may be affected by willingness to trust intuition.\textsuperscript{6}

\section{The role of a corrective System 2}

One possible explanation for some of the correlations of interest here is that people differ in their tendency to reflect on initial intuitive responses and correct them, in experiments. Arguably, a disposition to check and correct intuitive conclusions could cause people to question religious doctrines they are asked to accept. The CRT was intended to measure this tendency, and to some extent does so, but the tendency can be assessed in other tasks. So far, the literature has some suggestive results, but mostly negative ones. Experiments of this sort seems unlikely to help answer the question of why the correlations of interest here are found.

Yilmaz and Isler [36] used a two-response procedure to study belief in God or gods: a fast intuitive response to question about belief on a 0–100 scale, followed by a reflective response to the same question. They found some decreases, but slightly more increases in belief, with reflection. Some apparent non-believers with low ratings increased their belief on reflection. To understand these changes, Yilmaz and Isler asked about specific types of belief. Of particular interest here, increases were correlated with polytheism (“There are many gods”) and deism (“God created the universe, but this being no longer has any contact with the universe. Nor does this being respond to the prayers and concerns of people”). In both cases, the intuitive response might have been based on the assumption that the question was about the “normal” concept of God, in which case the answer would be negative. But, on reflection, a deist (for example) might think, “I don’t believe in your God, but in a fashion I guess I do believe in some sort of God.”

Other results concerning deontological reasoning largely reject the hypothesis that utilitarian responses to moral dilemmas are the result of correction of intuitive deontological responses in the experiment itself. For example, Koop [37] and Gürçay and Baron [38] used mouse tracking to look for changes of mind in the course of answering a moral dilemma, finding that changes occurred equally in both directions (utilitarian to deontological as well as the reverse). Baron and Gürçay [39], in a meta-analysis, found no evidence of longer response times for utilitarian responses, using a mathematical model to estimate what the response time would be when the probability of each response was .5 (since responses are generally faster for more frequent responses, and response

\textsuperscript{6}Note that this explanation could be true even if subjects do not choose the intuitive answer in the CRT problems. They might still answer intuitively, without checking, and get a different wrong answer.
frequency depends on both the dilemma and the subject). Bago and De Neys [40], using a two-
response procedure in which subjects made a quick intuitive response and then a reflective response,
also found little evidence for a switch toward utilitarian responding: reflective utilitarian responses
were typically preceded by intuitive utilitarian responses.

8 Conclusions

If we set aside the possibility that the correlational results of interest can be explained by a corrective
reflective process within experiments, two major, compatible, explanations remain.

One, already mentioned, is in terms of cultures and their historical development, leading typically
to mixtures of cultures within most samples of subjects. The cultures differ primarily in attachment
to traditional values, including organized religion, and this attachment influences cognitive style,
moral judgment, and politics.

A second explanation, consistent the correlations reviewed here, is that cognitive style itself is
a primary cause. Cognitive style may be influenced by genetic factors as well as socialization, but
the socialization differences need not depend on religion. In the course of development, those with
a more actively open-minded cognitive style tend to arrive at utilitarian views of morality, religious
skepticism or rejection, and socially liberal politics.

Some results reviewed here support the cultural explanation (although, as noted, both explana-
tions could be true). In particular, some religious doctrines that seem to account for the correlations,
such as acceptance of divine command theory and various deontological principles, are clearly seen
as influences of culture, because it is difficult to see how people would arrive at these doctrines
without such influence.

Perhaps the most direct approach to further research is to examine individual development, ulti-
mately with longitudinal studies, but perhaps initially with retrospective accounts (perhaps checked
with data from siblings or parents) of how people came to hold their current views about morality,
thinking, and politics, and how this was, or was not, related to their family backgrounds.

References

tives, 19*, 24–42.
   *Science, 336*(6080), 493–496.


Reports several experiments concerning the (small) correlation between CRT and utilitarian responses, and goes on to report much larger correlations among utilitarian responses, AOT and acceptance of divine-command theory.


Provides a good overview of the correlates among several measures discussed in the present article.


Reviews the nature AOT as a standard, measures of endorsement of the standard and its application in thinking itself. Emphasizes the application of the standard to the evaluation of other people’s thinking (since we get many conclusions in politics from others), and the role of appropriate confidence both in the thinking of others and one’s own thinking.


