

The ego dampening influence of religion: evidence from behavioral genetics and psychology

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Religion is a product of evolutionary and biological processes. Thus, understanding why some people are religious and how it impacts their everyday lives requires an integrated perspective. This review presents a theoretical framework incorporating recent findings on religious influences on the behavioral expression of genetic and psychological predispositions. We propose that religion may facilitate *ego dampening*, or weakening of the impact of one's internal drive, for the service of sociality. Evidence from gene–environment interaction and behavioral studies suggests that religious beliefs and practices may dampen more prepotent, self-focused motives that can be at odds with cooperation and social cohesion. The review underscores the importance of taking an interdisciplinary perspective to understand complex and fundamental questions about religion.

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Current Opinion in Psychology 2021, 40:24–28

This review comes from a themed issue on **Religion**

Edited by **Vassilis Saroglou** and **Adam B Cohen**

<https://doi.org/10.1016/j.copsyc.2020.08.007>

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Religion is a system of symbols and meaning [1], with ritualized practices and beliefs shared in close fellowship with others [2] and revolving around the supernatural, sacred, or 'divine' [3]. That religion includes phenomena believed to be *supernatural*, or operating outside natural laws, is germane to its definition. Nevertheless, religion is a product of evolutionary processes [4], and there is much to gain from integrating the study of the supernatural with the natural. There has been considerable progress in understanding the predictors of religiosity, such as personality [5], and the way religion influences psychological processes and outcomes, including the need for control [6] and prosocial behaviors [7]. However, empirical studies and theoretical frameworks connecting religion to biology, and particularly

genetics, remain limited. In this review, we discuss recent findings on the behavioral expression of genetic and psychological predispositions linked to religion, offering a broader theoretical framework to understand the interplay between religion and biology.

Religion as part of the socio-cultural context

Religion can be conceptualized as part of the broader social or cultural context, as one form of culture [8] that can satisfy the need for meaning [9] and provide a coherent structure for beliefs, expectations, and actions. The human mind is shaped by a complex interplay of cultural and biological factors [10,11]. Religion—as part of the socio-cultural context—works in concert with biological processes of the people who believe in its creeds and enact its rituals.

The complex beliefs and rituals that make up various religious traditions are theorized to have adapted for social cohesion and cooperation [7]. In the service of sociality, religion may offer a cognitive explanation [12] and alternative reward structure [13•] for people to reduce their individual desires and support group goals, even when things do not go their way. For example, experimental elicitation of religious feelings seems to activate neural reward circuitry among devout Mormons [13•], suggesting that participating in religion and following religious teachings can provide intrinsic rewards for religious people. Another experiment used a behavioral trust game to show that when participants extend trust to others but then receive nothing in return, they increase their belief that God is displeased with greed [14•]. These recent experimental findings complement ethnographic research suggesting that threats to reproduction and survival seem to track local religious beliefs and behaviors [15], demonstrating how features of religion serve the function of social coordination in the broader socio-cultural context. Moving forward, we propose that incorporating an understanding of biological processes informs the mechanism of religious influence on individual psychology.

Ego-dampening influence of religion in psychology

One psychological effect of religion may be *ego dampening*, or reducing pursuits of personal goals and impulses. Unmitigated pursuit of individual needs can at times be at odds with societal cooperation and cohesion. We reasoned that in order for individuals to maintain social cohesion, they may need to temper their automatic self-focused impulses. Indeed, most major religions involve an

external, supernatural source of control to which individuals are to yield their personal volitions [7]. Both correlational and experimental evidence show that certain features of religion, such as belief in a controlling god, can decrease people's motivation to pursue personal goals (e.g. Refs. [16[•],17]).

Religion may reduce anti-social actions via tempering an individual's self-focused impulses and motives. Because certain basic impulses are targeted explicitly by religious texts, some religious followers may change their behaviors in response to these teachings. For instance, religious involvement has been found to be a protective factor against 'risky and impulsive' behaviors, such as alcohol use and disorders ([18]; see Ref. [19^{••}] for meta-analysis), sexual behavior and promiscuity [20], and aggression [21].

Another ego-dampening influence of religion is reducing the centrality of personal beliefs in shaping people's decision making and behaviors. While personal belief is one of the key determinants of human behaviors (e.g. Ref. [22]), the degree to which it is predictive of relevant actions systematically varies across different socio-cultural factors, such as individualism–collectivism [23] and social class backgrounds ([24]; see Ref. [25] for a review). Religiosity is another such factor. One study ([26], unpublished results) examined the role of religion in xenophobic responses (e.g. support for xenophobic national policies) to the threat of Ebola. Individuals' feelings of disease vulnerability were less predictive of support for group protective actions among more (versus less) religious people. Moreover, this moderation of religiosity was mediated by social affiliative orientation, suggesting that religious involvement may serve group goals by reducing individuals' tendencies to act on their personal thoughts and feelings.

A recent set of studies [16[•]] investigated the role of belief in a controlling god, a core aspect of Abrahamic religions, in the ego-dampening effects of religion. This research shows that personal environmental belief is a less important predictor of pro-environmental support among people who are highly religious versus not. More importantly, belief in a controlling god, above other tenets of religiosity, reduces the importance of personally held environmental beliefs in shaping one's support for pro-environmental actions. Taken together, these findings suggest that religious people may be less motivated to express personal beliefs through their actions because they believe in an external source of control, and thus, they subdue the motivation to act on their own desires.

Biological underpinnings of religion and ego-dampening

While there are basic human needs and drives that are shared universally, genes may influence the degree to

which individuals experience them. Genetic factors predict variation in individual predispositions, such as neuroticism and impulsivity (e.g. Refs. [27,28[•]]), and some have argued that religious belief itself has genetic antecedents (e.g. via genetic correlates of educational attainment [29]). In addition, research on gene–environment interactions ($G \times E$) suggests that features of the environment may interact with genetically predisposed tendencies to predict different psychological outcomes [30,31], and the 'environment' can be extended to include the socio-cultural context [32], including religion [33].

There is recent empirical evidence that religion can interact with genes to lead to different outcomes (e.g. Ref. [34]), including those relevant to social goals. For example, people with certain genotypes linked to reward sensitivity—those with 2-repeat or 7-repeat alleles of DRD4—are *less likely* to behave prosocially than those without 2-repeat/7-repeat alleles [33]. However, when people are experimentally reminded of the supernatural, this association is reversed such that those with 2-repeat/7-repeat alleles become *more likely* to behave prosocially than those without 2-repeat/7-repeat alleles. These findings suggest that previously found links between religion and prosociality may vary depending on genetic predispositions, and that religion's ego-dampening effect in the service of prosocial behavior is particularly strong for people with certain genotypes (see Ref. [35] for a similar effect for Christian versus non-Christian males). At the same time, these findings illuminate how religious thoughts could change—or even reverse—previously found links between genotypes and prosocial behavior [36]. As another example, people with genotypes linked to socio-emotional sensitivity are more likely to use coping behaviors that control their emotional expressions when thinking about the supernatural versus not [37], showing moderating effects of religion on gene associations, or a $G \times E$ interaction.

There are a number of possible ways in which the social environment moderates the behavioral expression of genes, including acting as a 'social control' that limits behavior via structures that maintain social order [38]. Religion can be conceptualized as a form of social control [39] that has the effect of dampening or inhibiting a prepotent response [40], and there is some evidence from behavioral genetics that this is the case.

One study with a large sample of adolescent and young adult twins ($N = 1974$) examined genetic and environmental contributions to disinhibition, or the desire to engage in unconventional or taboo experiences, such as enjoying 'wild uninhibited parties' [41]. Results showed a $G \times E$ interaction for males such that differences in disinhibition were largely explained by genetic factors for those without religious upbringing, but not among those with a religious upbringing. A study using the same

sample [42] found additional evidence of religiosity as a moderator in a $G \times E$ interaction, but this time for alcohol use initiation as the outcome among females. Specifically, there was higher heritability of having ever used alcohol for non-religious young females (40% variance accounted for by genetic influences) than religious counterparts (0%). These earlier $G \times E$ studies provide some evidence that religion may work to dampen impulses, including the desire for disinhibited behavior or early alcohol use.

More recent findings also suggest that religion may dampen individual motives, perhaps via biological underpinnings. Meyers *et al.* [43^{**}], for instance, examined whether cannabis involvement is influenced by both environmental and genetic factors in a large European-ancestry sample ($N = 7591$). Using polygenic risk scores (PRS), which aggregate across a number of genetic variants linked to complex traits and behaviors, they tested specific environmental moderators of the link between genetic risk and cannabis involvement. Results showed that PRS predicted cannabis use only among people exposed to trauma, and notably, PRS was less predictive of cannabis use for people who frequently attended religious services compared to those who attended infrequently. Similarly, greater religiosity seems to dampen genetic risk for smoking initiation [44], alcohol dependence [45], and adolescent delinquency [46].

Limitations of the current literature and future directions

There are a number of practical and theoretical issues with research examining genes in psychology, especially the need to directly replicate single association studies [47]. Because of prohibitions to cost and time, there are very few behavioral genetics studies that include experimental manipulations, and existing studies often have relatively small sample sizes (e.g. Ref. [33]; $N = 178$). The majority of recent studies with large genetic databases or twin samples are correlational, which limits causal interpretations. Moreover, studies involving existing large databases often need to be *post-hoc*, testing hypotheses developed after the data have been collected. However, these types of studies and other big-data approaches are highly valuable for initial discoveries and present opportunities for demonstrating generalizability of findings. Future research should take advantage of these approaches and complement them with more focused approaches to develop and test novel theory-based hypotheses.

Although past $G \times E$ studies have often attempted to isolate a single environmental factor, such as religious involvement, to test for possible interactions with genetic factors, there are of course many additional features of the environment that may be crucial for shaping any given psychological outcome of interest. For example, one study found that phenotypic variance of prosocial

behavior was reduced at higher levels of religious attendance [48], consistent with the idea that individual motives may be dampened by religion. Interestingly, the influence of religious attendance on prosocial behavior was explained by non-shared environmental variances rather than genetic variance. These findings suggest that additional aspects of environment that are consequences of religious attendance (e.g. different social network or activities) may matter in how religion dampens self-interested behavior. Using advanced computational techniques, such as the structure linear mixed model (StructLMM), researchers may be able to study the proposed link between religion and ego dampening by focusing on $G \times E$ effects that account for multiple environments (i.e. hundreds of environmental variables [49^{**}]). Other promising advances in genetics research include phenotypic annotation, which focuses on whole genomes and developmental processes across the lifespan [50], and incorporating high-quality exposure assessment and longitudinal measures to increase $G \times E$ fidelity [51].

Future research can also explore whether the ego dampening effects of religion are moderated by different cultural and religious contexts. In more individualistic cultural contexts, such as the U.S., religion (mainly Christianity) tends to more strongly increase the use of secondary control (acceptance and adjustment to situations) than in more collectivistic cultural contexts, such as Korea [52]. Ego dampening is a concept closely related to secondary control. Thus, it is possible that religion's ego dampening effects on psychological and genetic predisposition may be particularly strong in highly individualistic cultures. In collectivistic cultures where secondary control is already strongly fostered [53] via secular cultural teaching, the ego dampening effects of religion may not be as pronounced. In addition, different religious contexts vary in the degree to which they moralize individuals' thoughts [54]. An interesting next-step could be to test how psychological and genetic ego dampening effects of religion may be more or less pronounced in diverse secular and religious cultural contexts.

Conclusion

Despite these limitations, the current literature provides a coherent picture. Existing evidence, taken together, supports the idea that religion shifts individual minds from egocentric to allocentric. Religion appears to decrease behavioral expression of one's will, desire, and impulses that are rooted in both socialization and genetic predisposition. In doing so, religion can serve as a glue for social interactions. By incorporating psychological and genetic perspectives, the present review aims to advance the understanding of specific mechanisms through which religion facilitates human sociality.

Conflict of interest statement

Nothing declared.

Funding

This work was funded by National Science Foundation GrantBCS-1823824.

CRedit authorship contribution statement

Joni Y Sasaki: Conceptualization, Writing - original draft.
Heejung S Kim: Conceptualization, Writing - original draft, Funding acquisition.

Acknowledgements

We want to thank members of the Culture and Religion Lab at University of Hawai'i at Mānoa for their feedback on earlier versions of this manuscript.

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