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RELIGION IN HUMAN SOCIETY: HOW HAS ITS MEANING, ROLE, AND ADAPTATION EVOLVED ACROSS ERAS?

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Abstract

This interdisciplinary review meticulously examines the evolving understanding, multifaceted roles, and adaptive capacity of religion across historical epochs, drawing insights from the humanities and social sciences. Defining religion broadly as a system of beliefs, rituals, and communities that connect individuals to the transcendent, the article first explores its crucial function as an individual meaning-making system, offering existential resources and coping strategies amid life's uncertainties. It then analyzes religion's powerful role as a social structure, fostering solidarity, shaping collective identity, and influencing political landscapes, acknowledging its dual capacity for cohesion and division. The review traces religion's dynamic historical trajectory, from its deep integration in premodern life to the challenges of modernity and secularization theories, and its complex contemporary manifestations, including digital adaptation and the coexistence of resurgence and non-affiliation. Ultimately, the article concludes that religion's trajectory is neither a linear decline nor a simple revival, but rather a continuous interplay of change and persistence, highlighting critical research gaps in non-Western contexts, measurement harmonization, mechanistic explanations, and the "dark side" of religion.

Keywords: Religion, Human Society, Meaning-making, Social Structure, Religious Dynamics

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Introduction

The question of "What is religion?" is a classic and long-debated inquiry in sociology, anthropology, and philosophy of religion. The complexity stems not only from the sheer diversity of global religions but also from religion's multifaceted nature, encompassing dimensions of internal experience, meaning systems, and its status as a social institution. Within the social sciences, various perspectives have attempted to define "religion" to capture these diverse facets, with each definition clearly reflecting its underlying theoretical assumptions (Pals, 2006; Launay, 2022; Torre, 2023).

Durkheim proposed that religion be understood as a system of beliefs and practices centered on the "sacred," distinct from the "profane," serving to unite individuals into a shared moral community. His primary focus was on religion's role in fostering social solidarity and its symbolic representation of "society" in sacred forms. Conversely, Weber highlighted the dimensions of individual meaning and purposeful action, viewing religion as a source of "worldly ethics" and a framework for understanding one's destiny, which profoundly influenced economic patterns and social structures (Gustafsson, 1972; Launay, 2022).

From another perspective, Geertz offered a symbolic framework, defining religion as a "system of symbols" that establishes specific frameworks of meaning, enabling individuals to interpret their experiences and cultivate "moods and motivations" that seem plausible within their life's cosmos. This concept highlights that religion is more than just a set of doctrines; it is both a worldview and a deeply embedded structure of feeling within culture. Concurrently, contemporary approaches in the "philosophy of religion" and "comparative religion" stress that an understanding of religion must be inclusive of theistic, non-theistic, and non-institutionalized spiritual expressions (Wolny, 2012; Jain & Long, 2023; Torre, 2023).

Consequently, this review article adopts a broad "operational definition" of religion, encompassing systems of belief, rituals, symbols, and forms of faith communities that structure relationships between humans and what they perceive as transcendent. This transcendence can manifest as God, deities, spirits, ancestors, doctrines, or abstract "ultimate truths." This definition is designed to cover institutional religions, personal spiritualities, and novel forms of meaning-making in the contemporary era, while also providing scope for understanding both major theological systems and folk beliefs interwoven with local cultures (Pals, 2006; Torre, 2023).

Furthermore, understanding religion in contemporary human society extends beyond merely perceiving it as a personal "belief." It requires recognizing religion as a social institution replete with structures, power dynamics, and networks of relationships with the state, economy, and civil society. Concurrently, religion also functions as "symbolic capital," profoundly shaping individuals' identities and worldviews, and acting as a crucial arena for negotiation among diverse societal groups. The trend of "new sociology of religion" thus advocates moving beyond frameworks that exclusively interpret religion through lenses of decline or growth, urging an appreciation of religion instead as an intrinsic component of a cultural landscape where religion, spirituality, and non-belief dynamically coexist (Cipriani, 2021; Wuthnow, 2022; Tremlett, 2023).

Stemming from the aforementioned conceptual framework, this article addresses two interconnected core questions: 1) "What is religion?" in terms of how it has been understood and imbued with meaning across different historical eras, and 2) "What is religion's role in people's lives across various epochs?" encompassing individual, communal, and societal structural levels. Addressing these questions requires a historical and cross-cultural lens, moving beyond adherence to a singular, modern depiction of religion.

From a historical perspective, religion has evolved through at least three significant epochs: 1) the premodern era, characterized by religion's deep integration with kinship structures, communal life, and traditional cosmologies; 2) the modern/rational era, during which science,

nation-states, and capitalist economies challenged religion's traditional status, fostering the rise of secularization theories; and 3) the contemporary pluralistic era, witnessing religion's re-emergence in novel forms amidst globalization and the digital world. Contemporary sociological research indicates that despite classic secularization hypotheses predicting religion's decline, empirical evidence reveals a more nuanced reality, encompassing its persistence, revitalization, and the proliferation of new spiritual expressions across diverse regions (Beyers, 2013; Gearon, 2019; Parker, 2019).

To address questions about the meaning and role of religion comprehensively, this article employs an interdisciplinary framework that integrates perspectives from the humanities and social sciences. The article's structure comprises five main sections: following this introduction, Section 2 explores religion's role in individual meaning-making and spirituality; Section 3 examines religion at social and communal levels; Section 4 analyzes the historical dynamics of religion from past to future; and the final section summarizes the overall continuity and transformation of religion, while also identifying areas for future research. This structure aims to offer a "big picture" view of religion as both a social phenomenon and an internal experience, and to narrate the dynamic evolution of its role across different epochs.

Religion as a System of Meaning and the Human Inner World

Religion, in the dimension of human inner life, is perhaps best understood as a "meaning system" rather than merely a detached set of doctrinal beliefs. Extensive work in the psychology of religion suggests that humans utilize religion to situate themselves in the world, address existential questions, and lend structure and direction to otherwise chaotic experiences. The concept of a "religious meaning system" posits that faith functions as an overarching meaning structure that integrates beliefs about oneself, others, the world, and the sacred, thereby influencing how events are interpreted and decisions are guided. In this context, religion is not merely an answer to metaphysical questions, but rather a "meaning map" that humans use to navigate life's uncertainties (Van Uden & Zondag, 2016; Krok, 2024; Wilski et al., 2024).

Mechanistically, religion offers explanations for uncontrollable phenomena such as illness, disaster, and death, framing these events within a narrative of sacred purpose—whether as tests, atonement, or part of a higher plan. Contemporary research among chronic illness patients indicates that individuals with a robust "religious meaning system" often report better coping with their ailments and physical limitations, as they can perceive suffering as a meaningful part of their life journey rather than as meaningless or valueless. Similarly, analyses of film and contemporary literature reveal that characters frequently employ religious meaning frameworks to interpret both positive and negative experiences, sometimes in empowering ways and at other times in distorted ones (Van Uden & Zondag, 2016; Izzah & Pratama, 2024; Wilski et al., 2024).

In times of life crisis, religion often functions in distinct ways through what is termed "religious coping," referring to problem-solving strategies that draw upon beliefs, practices, and religious communities as resources. Pargament et al. (2011) developed a framework viewing religious coping as "meaning-making" in situations where original meanings are challenged, distinguishing between positive and negative religious coping. Positive coping may involve seeking comfort from God, framing events as opportunities for spiritual growth, and believing that "some meaning" is hidden behind suffering (Van Uden & Zondag, 2016; Xu, 2016). For instance, a study of sermons in an African church during COVID-19 revealed that religious leaders repeatedly emphasized "God is in control" to help congregants turn to spiritual resources and interpret the pandemic as an event, though incomprehensible, still subject to divine will (Kroesbergen-Kamps, 2024).

Conversely, negative religious coping reflects spiritual conflicts, such as feeling abandoned by God, interpreting suffering as unjust punishment, or experiencing discord with one's religious community. Research indicates that negative coping is associated with higher levels of hopelessness and may increase the risk of mental health issues. In contrast, positive coping is linked to the ability to find new meaning and reduced hopelessness. In the Thai or Southeast Asian context, beliefs in karma, merit-making, or spiritual practices aimed at "releasing suffering" often function similarly to positive religious coping, helping individuals "make sense" of experiences of loss and injustice, even if not described in the same academic terminology (Pargament et al., 2011; Szalachowski & Tuszynska-Bogucka, 2023; Saunders & Stephenson, 2024; Wnuk, 2024).

Regarding mental well-being, extensive literature reviews over the past two decades demonstrate a complex relationship between religion, spirituality, and mental health, both as protective and risk factors. Empirical evidence from multiple countries shows that, on average, religious participation, feelings of closeness to the divine, and supportive religious communities are associated with lower rates of depression and anxiety, as well as higher life satisfaction and perceived quality of life. However, research also clearly indicates that religion is not solely a "cure"; in some cases, beliefs and communal structures can foster guilt, shame, self-stigma, or fear of punishment, which are also linked to mental health issues (Greenberg, 2013; Milner et al., 2020; Lucchetti et al., 2021; Kaushal et al., 2022; Aggarwal et al., 2023). Longitudinal studies in some societies have found a bidirectional relationship between religion and mental health: religious participation can impact long-term mental health, while mental health conditions can also affect religious engagement. A meta-analysis of youth indicates that religiosity and spirituality are linked to lower risks of depression and anxiety. However, these effects depend on cultural context, levels of community support, and the specific nature of beliefs. Furthermore, qualitative work shows that for individuals with lived experience of mental illness, discussing religion and spirituality seriously with mental health professionals can help them "connect" their life stories and illness experiences within a more meaningful framework (Pargament et al., 2011; Milner et al., 2020; Kaushal et al., 2022; Aggarwal et al., 2023; Prati, 2024).

Viewing religion as such a system of meaning and spiritual resource also has significant implications for clinical practice and social work that requires religious and cultural sensitivity. Some researchers propose that systematically gathering a "spiritual history" and assessing clients' religious coping patterns can help identify both meaning-making resources and spiritual vulnerabilities that need attention. At the same time, anthropologists caution that applying Western conceptual frameworks to explain religion and mental health in other contexts risks overlooking distinct local meanings. It is therefore crucial to listen to "people's own words" regarding religion, illness, and hope. Synthesizing the literature in this dimension not only demonstrates religion's significant role in the human inner world across many societies but also reveals that this role has both constructive and problematic aspects. Furthermore, it must be understood carefully through frameworks sensitive to context and the diversity of faith experiences (Hefti, 2011; Dein, 2013; Xu, 2016).

Table 1 Key Conceptual Frameworks for Religion in the Dimensions of Meaning and Spirituality

Framework	Core Idea	How Religion's Role is Viewed	Empirical Evidence/Examples	Implications for Research and Practice
"Religious Meaning System" Concept	Religion is a meaning-making system that integrates beliefs about oneself, the world, others, and the sacred into the interpretation of life events.	Functions as a "meaning map" that helps organize confusing and painful experiences into a narrative with direction and purpose.	Chronic illness patients with clear religious meaning systems report higher life satisfaction and better acceptance of illness, with meaning in life acting as a mediator.	Research should view religion as a measurable meaning structure, not just a binary "religious/non-religious" variable, and consider "meaning in life" as a mediator.
Religious Coping Theory	Coping with crises using religious resources as a process of seeking meaning, control, and connection to the sacred.	Religion is both an empowering resource (e.g., viewing suffering as an opportunity for growth) and potentially a source of spiritual conflict (e.g., feeling punished by God).	Brief RCOPE measures show that positive religious coping correlates with hope and better adjustment, while negative coping correlates with psychological distress and high hopelessness.	Research should clearly distinguish between positive/negative religious coping, and health/social work practice should integrate religious coping assessment as part of client evaluation.
Religion as an Existential Resource	Religion provides existential resources such as meaning, hope, and frameworks for confronting questions of death, vulnerability, and loss.	Functions as a "meaning anchor" in situations where existing meaning systems are shaken, especially in contexts of personal and societal crises.	Qualitative and quantitative studies among those experiencing loss find that interpreting events through faith frameworks and participating in rituals reduces distress and facilitates "re-narration of life."	Proposes that religion/spirituality be viewed as an existential resource that should be integrated into holistic mental health models, rather than merely as a superficial risk or protective factor.

Religion, Spirituality, and Mental Health	The relationship between religion/spirituality and mental health is "two-edged," with both protective and risk aspects, depending on the nature of beliefs and context.	Religion is often linked to lower levels of depression and anxiety, higher hope, and life satisfaction, through mechanisms involving meaning-making, social networks, and behavioral regulation.	Meta-analyses in youth show religion/spirituality associated with reduced risk of depression and anxiety, while longitudinal studies point to a bidirectional relationship between religious participation and mental health.	Research should differentiate institutional religion from personal spirituality, analyze mediating mechanisms (e.g., meaning, social networks), and prioritize cultural and gender context to avoid overgeneralizations. It also recommends integrating spiritual history-taking, religious coping screening, and collaborating professionally with community religious leaders, while ensuring that experts do not impose their personal beliefs on clients.
Framework	Core Idea	How Religion's Role is Viewed	Empirical Evidence/Examples	Implications for Research and Practice

Religion as a Social Structure: Solidarity, Power, and Identity

From sociological and anthropological perspectives, religion is not merely a system of beliefs residing in individual minds. Rather, it functions as a social structure that binds people together, regulates power relations, and shapes group identities at various levels. Durkheim famously pointed out that religion acts as a “representation of society” that becomes sacred, and religious rituals are moments when society collectively experiences itself as “we.” Much contemporary work continues to build on Durkheim’s legacy, explaining the role of rituals, beliefs, and religious institutions as mechanisms for fostering solidarity and trust within communities and society at large (Gustafsson, 1972; Guerin, 1998; Lelis, 2024; McNamara, 2024).

In the dimension of social solidarity, network-based research in rural South Indian villages provides clear quantitative evidence that participants in shared religious rituals are more likely to have supportive relationships, including mutual aid, counseling, and resource support. At the structural level, religious ritual networks show higher density than non-participant groups. At the individual level, participants report greater community embeddedness without necessarily isolating themselves from people of other faiths (Power, 2018). Fieldwork in other contexts, such as Ramadan in Muslim communities, reveals that communal rituals, charity, and food sharing reinforce "mechanical solidarity," fostering a collective consciousness and a sense of readiness for self-sacrifice for the common good (Shalihin & Sholihin, 2022). Recent work in Japan studying ancestor-dance rituals also indicates that belief in ancestors and participation

in communal rituals are associated with feelings of belonging and trust among community members and can reduce anxiety in uncertain situations (Irving et al., 2024). All these findings align with cultural evolutionary perspectives that view religion and rituals as instrumental in fostering cooperation and solving "free-rider" problems in social systems (McNamara, 2024). On the other hand, religion is intimately linked to power and politics. Both classical and contemporary work on state-religion relations demonstrates that states and political movements often leverage religion as a source of legitimacy through sacred symbols, rituals, and discourse, connecting leaders and state institutions to a divine order. The concept of "civil religion," developed by Robert Bellah, explains how many modern states create a "civic religion" through national flags, monuments, national holidays, and political rituals to forge a collective identity and sacred loyalty to the political order (Xie, 2025). Recent comparative studies show that both democratic and authoritarian states can "sacralize politics" through rituals, the treatment of leaders as semi-divine figures, and the creation of national narratives resembling sacred texts. In other contexts, such as European or Middle Eastern history, the relationship between religion and the state also manifests as state religions, theocracies, or secular states that still rely on religious capital to some extent for legitimacy (Mohamed, 2019). These phenomena indicate that religion not only fosters "bottom-up" solidarity but is also utilized as a tool to establish order and secure "top-down" acceptance of authority (Cliteur & Ellian, 2020; Calfano & Umphres, 2022).

In the dimension of identity and group belonging, religion often serves as a primary framework for defining "us" and "them" at familial, ethnic, communal, and national levels (Barzian & Hemmati, 2015; D'amore & Iorio, 2025). Cross-country comparative work in demography and sociology demonstrates that a clear religious identity is often associated with a stronger sense of community belonging, a greater propensity to volunteer, and a belief that others are more cooperative (Leite et al., 2023). Panel data analysis in the UK found that the frequency of religious observance positively affects general trust, volunteering, and perceptions of others' cooperativeness. However, this influence varies by religious tradition (Aksoy & Wiertz, 2024). Conversely, post-Soviet Ukrainian studies indicate that religion plays a significant role in fostering national solidarity and a willingness to self-sacrifice during times of crisis, which the authors attribute to the transition from mechanical to organic solidarity in modern society (Kondratyeva & Fenno, 2022). Meanwhile, qualitative work in multi-ethnic urban contexts, such as the Maitreyan Buddhist community in Indonesia, shows that religion can serve as a framework for building intergroup harmony through teachings on love and forgiveness, social activities, and interfaith dialogue (Fauzi, 2024).

However, this dimension of identity also has a paradoxical side. When religion is tightly bound to ethnicity, nation, or intense political projects, religious identity can become a basis for conflict and exclusion. For example, religious identity politics in some countries use religion to delineate "true nationals" from "others." Research on religious diversity and social capital thus indicates that religion's effect on solidarity depends on whether religious networks are "closed" (fostering cohesion only within the group) or "open" (creating bridges to other groups) (Rais, 2007; Kadri & Abdelsalam, 2020; Rasool & Taqaddausi, 2024; Tu, 2025).

Synthetically, religion in its social and communal dimensions serves at least three interrelated functions: 1) enhancing solidarity, trust, and social capital through shared rituals and religious networks; 2) acting as a resource and language for political legitimacy at both state and movement levels; and 3) serving as a basis for identity and belonging that can both empower and create social divisions. Understanding these roles in each society requires structural analysis, ethnographic fieldwork, and public policy analysis to reveal how "religion as a social structure" exists in a tension between harmony and conflict, liberation and control, within a constantly changing context.

Table 2 Social Dimensions of Religion: Solidarity, Power, and Identity

Dimension	Core Idea	Empirical Evidence/Examples	Constructive Aspects	Paradoxical/Limiting Aspects
Social Solidarity and Social Capital	Shared religious rituals and activities foster trust, mutual aid, and a collective sense of "we."	Mutual aid networks in rural Indian villages participating in shared rituals are denser and more prone to mutual help. Ramadan in Muslim communities increases generosity and cooperation through charity and collective activities.	Fosters trust, readiness for mutual aid, and community resilience in crises.	If religious networks are closed, it can lead to in-group/out-group division and limit trust to "our people" only.
Power and Politics	Religion serves as a symbolic resource for legitimizing states and political movements, and as a moral framework for public policy.	Cases of "civil religion" where states use symbols, rituals, and abstract narratives to create sacred identity and loyalty. State-religion relations patterns, such as theocracies, secular states, and states with official religions in Europe and Asia.	It can be a basis for mobilizing resources for social change, affirming human dignity, and resisting unjust power structures in some contexts.	Risks are being used to foster exclusion, legitimize violence, and close off space for dissenting views when religion and nation/state are strongly intertwined.
Identity and Belonging	Religion defines "who we are" at individual and group levels, providing a framework for defining good membership in family, community, and nation.	Religious participation correlated with a sense of belonging and volunteering in the UK panel data. Work in Ukraine and multicultural communities shows religion can be a basis for national self-sacrifice and fostering interfaith dialogue.	Empowers self and group pride, supports civic engagement and mutual care in communities.	When religious identity rigidly defines "insiders" and "outsiders," it can lead to tension, stigma, and ethnoreligious conflict.

Dynamics of Religion Across Eras: From the Sacred World to Pluralism and the Digital Age

To comprehensively understand the role of religion in human society, it is essential to view it through the lens of "time," not merely as a static snapshot of the present. Religion, in each era, manifests in distinct forms, meanings, and roles. While certain lines of continuity persist across

epochs, exploring the dynamics of religion reveals both its endurance and transformation within cultural and social structural evolution. This analysis can be broadly divided into at least three key periods: the premodern era, the modern era, and the contemporary/future era (Startup, 2020; McNamara, 2024).

In the premodern era, religion was almost inseparable from daily life, kinship structures, and human cosmologies. Anthropological and archaeological studies of hunter-gatherer societies and early agrarian communities indicate that beliefs in spirits (animism), ancestor veneration, and shamanic rituals were deeply embedded in economic, political, and human-nature relations. Rather than a clear distinction between "religion" and "non-religion," the world for people of this era was often perceived as permeated by the sacred in every dimension—from forests and mountains to rivers and the human body itself. Religion thus served to regulate human relationships with the supernatural, providing meaning to seasons, birth, marriage, and death through rituals that fostered social cohesion and helped manage uncertainty, such as rain rituals, ancestor propitiation, and hunting ceremonies (Hoppal, 2006; Peoples et al., 2016; Qu, 2021).

With the advent of large-scale agrarian societies and ancient states, institutional forms of religion became more pronounced through the development of world religions such as Hinduism, Buddhism, Christianity, and Islam, and through the re-systematization of indigenous traditions. This period, often referred to as the "Axial Age," saw a new emphasis on universal ethics and deeper inquiries into justice, liberation, and the meaning of suffering. These world religions gradually became foundational to imperial and civilizational identities, establishing clergy, scriptures, sacred sites, and religious education systems. In medieval Europe and the Islamic world, religion often encompassed law, education, and science, leading to a worldview where the earthly and the otherworldly were intricately linked through theological frameworks (Levitin, 2012; Baumard & Chevallier, 2015; Chung, 2018; Holdrege, 2018).

The transition to the modern era, associated with the scientific revolution, the Reformation in Europe, the formation of nation-states, and the expansion of capitalism, significantly challenged religion's traditional position. Weber spoke of the "disenchantment" of the world, referring to the increasing displacement of mythic-religious explanations by rational and scientific accounts in many areas of life, including medicine, law, and economics. Many classic secularization theories therefore posited that modernity would lead to a decline in religion's importance, both individually and structurally, with religion being increasingly confined from the public sphere to the private realm. This picture seemed partially confirmed by the Western European experience of declining church attendance, fewer religious vocations, and the separation of church and state in public policy (Beyers, 2013; Gearon, 2019; Weingast, 2023). However, at the global level, the narrative of "modernity = religious decline" has proven less straightforward than classic secularization theories predicted. Berger, who initially supported secularization theory, later reconsidered and proposed the concept of "desecularization," pointing out that many regions have experienced religious resurgence, the growth of new religious movements, and the contemporary use of religion in politics. Work in the "new sociology of religion" also indicates that while modernity may reduce the role of certain forms of religion (e.g., traditional institutional religion in Europe), it simultaneously facilitates the emergence of new religious forms, alternative spiritualities, and more complex religious diversity (Beyers, 2013; Parker, 2019; Cipriani, 2021; Hasanzadeh & Elmi, 2025).

The contemporary era is increasingly characterized by concepts of religious pluralism and a post-secular society. Religious and spiritual diversity has expanded due to both cross-border migration and the diffusion of belief systems through mass media and the internet. Beyond traditional major religions, there's a noticeable growth in the "nones" (those with no religious affiliation) and individuals who identify as "spiritual but not religious" in many societies,

particularly among younger generations in developed countries. Concurrently, religion is being integrated into consumer culture and the digital world, manifesting in phenomena such as online merit-making, meditation apps, and the creation of faith communities on social media platforms (Iqbal, 2016; Pace & Moreira, 2018; Parker, 2019; Pyrhönen & Tiusanen, 2025).

Technology and automation are also proposed as factors explaining trends in religious decline in certain contexts. Recent multi-country data suggest that exposure to automation and systems that reduce uncertainty in daily life may diminish the perceived necessity of religious explanations and reliance on the sacred for some populations. However, technology also provides avenues for religion to adapt, such as disseminating teachings via digital platforms, conducting online rituals, and creating trans-physical spiritual networks (Iqbal, 2016; Baker et al., 2020; Jackson et al., 2023).

Meanwhile, many regions are experiencing a "religious resurgence" in politics and the public sphere, including religious movements challenging political regimes, the use of religious identity as a basis for new nationalisms, and the rise of fundamentalist movements across various religions. These phenomena lead the "post-secular" concept to emphasize that, rather than disappearing, religion is re-negotiating its position in the public sphere, interacting with human rights discourse, liberalism, and global politics. For example, in some Asian countries, nation and religion are tightly intertwined in modern nation-building projects. Yet, they also face internal diversity and pressures from international human rights standards, making religion's role as both a resource for harmony and a basis for conflict even more complex (Lombaard, 2016; Mohamed, 2019; Astapov, 2021; Prodi & Campbell, 2023; Stolz & Voas, 2023; Cui & Li, 2025).

Looking ahead, the future dynamics of religion are unlikely to follow a single path toward either a "religion-less world" or a "religious revival." Instead, it is more likely to be a hybrid landscape encompassing the decline of institutional religion in some areas, the growth of alternative spiritualities, the evolution of religion in the digital world, and the use of religion in new political and identity projects. Understanding these dynamics requires an interdisciplinary framework that integrates data from history, demography, political economy, and digital culture. Crucially, it must not be confined by a singular model of "modernity" derived solely from the experience of any one region (Herzog et al., 2020).

Table 3 Dynamics of Meaning and Role of Religion Across Eras

Era/Timeframe (Approximate)	Key Characteristics of "Religion"	Main Role of Religion in Life and Society	Key Trends of Change	Examples/References
Premodern Era (Hunter-gatherers, early agriculture, ancient states)	Religion is deeply integrated with nature, kinship structures, and cosmologies; no clear distinction between religious and non-religious.	Orders relationships with spirits/ancestors; manages uncertainty (rain, harvest, health) through rituals; builds community solidarity.	Shift from diffuse beliefs to institutional religion; emergence of world religions and universal ethics in the Axial Age.	Hunter-gatherer tribes with animistic beliefs and shamanic rituals; emergence of Buddhism, Christianity, Islam, and theological systems in various empires.

Modern Era (Post-Reformation)	Religion challenged by science, rationalism, and secular states; understanding of religion becomes systematically separated from science and politics.	Religion's role declines in some public institutions but remains within family, community, and personal life rituals; some separation of religion from the state in public policy.	Rise of secularization theories predicting religious decline and the transformation of religion into a more "personal" dimension, but with significant regional variation.	Decline in church attendance in Western Europe; persistence or growth of religion in the US and other regions.
Contemporary & Future Era (Late 20th-21st Century)	Pluralistic religious landscape; rise of "nones" and alternative spiritualities; religion integrated with consumer culture and technology.	Religion adapts to the digital world; new spiritual forms emerge; religion serves as both a resource for meaning and healing and a basis for political and identity conflicts.	Trends of "desecularization" in some regions; religion's return to the public sphere; post-secular thought; the role of technology and automation in religious decline/transformation.	Expansion of new religious movements and fundamentalism; use of online platforms for religious activities; growth of "spiritual but not religious" groups in some societies; use of religion in contemporary nationalist projects.

Conclusion: Religion Between Continuity and Change

This exploration of religion in human society, conducted through an interdisciplinary framework and a historical dynamic analysis, reveals critical "lines of continuity" and the enduring significance of religion's role across eras. Despite varying forms, religion consistently serves as a "meaning-making system," helping humans orient themselves in the world and address fundamental questions of "who we are and why we are here." Religion also continues to foster solidarity and support networks at the community level, even as the nature of these rituals and networks evolves from outdoor ceremonies and physical sacred spaces to online engagement and digital communities. Moreover, religion persists in the domains of politics, power, and the pursuit of legitimacy, despite shifts in its actors and surrounding environments. However, the most salient aspect of this analysis is the recognition of religion's complexity and dynamic role throughout history. There is no linear path towards religion's "disappearance" or a simplistic "return." Instead, the global religious landscape is characterized by complex, diverse patterns, such as the decline of traditional institutional religion in Western Europe, the persistence or growth of religion in the United States and various regions of Asia, Africa, and Latin America, the emergence of alternative spiritualities, the rise of "spiritual but not religious" individuals, and the increasing number of "nones," alongside the utilization of religion in new political and nationalist projects.

Turning to contemporary research, this review identifies several significant "research gaps" that warrant further investigation. Firstly, there is a notable scarcity of studies on religion and

spirituality in local contexts, particularly when viewed through a traditional anthropological lens. The majority of research in the psychology of religion and mental health originates from Western countries (especially the U.S. and Europe). At the same time, other contexts, such as Asia, the Middle East, and Africa, are significantly understudied in terms of theoretical frameworks, research methodologies, and empirical findings. Research in these regions is likely to uncover distinct mechanisms through which religion/spirituality relates to mental health and contribute to a deeper, culturally informed understanding (Herzog et al., 2020; Elzamzamy et al., 2024; Chukwu et al., 2025).

Secondly, the current research landscape suffers from a lack of harmonization in measurement techniques. In studies concerning religion and spirituality, some investigations focus on religious attendance, while others emphasize belief or meaning-seeking. This inconsistency makes cross-study comparisons challenging. There is an urgent need to develop validated and cross-culturally applicable measures. Furthermore, the often blurred distinction between "religion" (emphasizing institutions) and "spirituality" (emphasizing personal experience) leads to confusion in interpreting research outcomes. Future research should clearly differentiate between these dimensions (Stripp et al., 2023; Elzamzamy et al., 2024; Koenig & Carey, 2024; Stein et al., 2024).

Thirdly, there is an urgent need to investigate the "mechanisms" through which religion/spirituality impacts health and well-being. Much recent research merely identifies "correlations" without adequately explaining "how" and "why" these relationships exist. Factors such as meaning in life, social networks, behavioral regulation, risk reduction, health behaviors, and cognitive restructuring are likely to be important mediating mechanisms, warranting more in-depth study. This aligns with the call to shift from "descriptive research" to "explanatory and mechanistic research" that identifies clear mediating variables (Rosmarin et al., 2011).

Fourthly, there are significant gaps in research concerning religion, spirituality, and crucial public policy variables, such as state support, the development of human rights standards, access to education and healthcare, and climate change. Research that integrates religion into public policy analysis could reveal religion as a key variable in achieving broader societal goals, whether by reinforcing or hindering progress (Faries et al., 2024; Moya & Toledano, 2025).

Fifthly, there is limited research on the "dark side" of religion, where religion can become a basis for stigma, exclusion, or violence. While most research focuses on the benefits of religion, phenomena like spiritual struggle, religious trauma, scrupulosity, and the use of religion to foster violence remain relatively understudied. Balanced research (viewing religion as both a resource and a risk factor) is crucial for designing appropriate policies and care in diverse contexts (Krause & Wulff, 2004; Hobson & Inzlicht, 2016; Priest et al., 2024).

Sixthly, there are research gaps concerning the future of religion in the context of technology, the digital world, and globalization. Concurrently, a deeper understanding of how religion adapts and transforms in online environments, how artificial intelligence might affect religious meaning-making, and how faith communities are built across economic and political boundaries still requires systematic and comprehensive research (Baker et al., 2020; Taylor & Benac, 2022).

Beyond these research gaps, this review article emphasizes the importance of adopting a truly interdisciplinary framework. Future research on religion and human life should not isolate religion as a single psychological variable or a separate sociological phenomenon. Instead, it should be understood in the context of its complex relationships with history, political economy, demographics, gender systems, and individual-level changes. This necessitates conferences and research centers that bring together scientists, anthropologists, sociologists,

psychiatrists, demographers, and religious leaders as co-creators of knowledge, rather than mere data providers (Herzog et al., 2020; Jensen, 2021).

This review article further highlights that understanding religion in the future must not present religion as something that will "disappear," "return," or require a choice between one aspect or another. Instead, if religion is viewed as part of diverse human endeavors for meaning-making, journey, and hope in an era of continuous uncertainty, then a shift in academic perspective - from judging what religion "should be" to embracing religion as a phenomenon of multiple "realities" and involving diverse "plural stakeholders" - will be another crucial step in building comprehensive knowledge about religion's role in people's lives, both presently and in the future (Baker & Dinham, 2017; Baker et al., 2020).

In summary, the role of religion in human society is not a question with a single answer. Rather, it is a matter of continuous dynamics involving continuity, adaptation, and transformation across historical eras. Recognizing that religion is a vital variable that demands ongoing observation and study, without prejudging its significance, is paramount. Research should thus focus not merely on "what is happening to religion," but on "how religion's role in people's lives is changing and what its implications are," conducted in each society and context without bias.

References

- Aggarwal, S., Wright, J., Morgan, A., Patton, G., & Reavley, N. (2023). Religiosity and spirituality in the prevention and management of depression and anxiety in young people: A systematic review and meta-analysis. *BMC Psychiatry*, 23, 729.
- Aksoy, O., & Wiertz, D. (2024). The impact of religious involvement on trust, volunteering, and perceived cooperativeness: Evidence from two British panels. *European Sociological Review*, 40, 143-159.
- Astapov, S. (2021). Transforming the study of religious situations: The view of postsecular society theories. *Acta Theologica, Supp* 32, 13-30.
- Baker, C., & Dinham, A. (2017). New Interdisciplinary Spaces of Religions and Beliefs in Contemporary Thought and Practice: An Analysis. *Religions*, 8, 16.
- Baker, J., Martí, G., Braunstein, R., Whitehead, A., & Yukich, G. (2020). Religion in the Age of Social Distancing: How COVID-19 Presents New Directions for Research. *Sociology of Religion*, 81(4), 357-370.
- Barzian, A., & Hemmati, R. (2015). Religious Identity in Iranian Society: A Systematic Review of Previous Studies (2001-2013). *Journal of Applied Sociology*, 59(3), 23-28.
- Baumard, n., & Chevallier, C. (2015). The nature and dynamics of world religions: A life-history approach. *Proceedings of the Royal Society B: Biological Sciences*, 282(1818), 20151593.
- Beyers, J. (2013). Obituaries and predictions: A sociological perspective on the future of religion. *Acta Theologica*, 33(1), 1-28.
- Calfano, B., & Umphres, W. (2022). Religion Applied to Government: Navigating Competing and Complementary Spheres of Power. *Religions*, 13, 1041.
- Chukwu, A., Timmins, F., Üzar-Özçetin, Y., Stokes, D., Hernon, O., & Frawley, T. (2025). Examining the influence of religion and spirituality on mental health help-seeking among Nigerians: A scoping review protocol. *Journal for the Study of Spirituality*, 15(2), 148-157.
- Chung, D. (2018). Evolutionary Origin of Religions and Religious Evolution: Religious Neurosociology. *Journal of Behavioral and Brain Science*, 8, 485-511.
- Cipriani, R. (2021). The New Sociology of Religion. *Encyclopedia*, 1, 822-830.
- Cliteur, P., & Ellian, A. (2020). The Five Models for State and Religion: Atheism, Theocracy, State Church, Multiculturalism, and Secularism. *ICL Journal*, 14(1), 103-132.

- Cui, J., & Li, T. (2025). Religion, Power, and National Identity: The Dual Role of Islam in the History and Modernization of the Maldives. *Religions*, 16(2), 201.
- D'amore, R., & Iorio, R. (2025). Religion as a determinant of social capital and economic performance: An analysis of Italian data. *Prosperitas*, 12(3), 4.
- Dein, S. (2013). Religion and mental health: the contribution of anthropology. *World Psychiatry*, 12(1), 34-35.
- Elzamzamy, K., Naveed, S., & Dell, M. (2024). Religion, spirituality, and pediatric mental health: A scoping review of research on religion and spirituality in the Journal of the American Academy of Child and Adolescent Psychiatry from 2000 to 2023. *Frontiers in Psychiatry*, 15, 1472629.
- Faries, M., Corrêa Fernandes, C., Phillips, E., West, T., & Stout, R. (2024). Religion and Spirituality in Lifestyle Medicine. *American Journal of Lifestyle Medicine*, 19(2), 324-333.
- Fauzi, M. (2024). The Role of Maitreya Buddhism in Fostering Harmony in Multicultural Societies: Doctrinal, Ritual, and Social Contributions. *Smaratungga: Journal of Education and Buddhist Studies*, 4(2), 105-116.
- Gearon, L. (2019). The Educational Sociology and Political Theology of Disenchantment: From the Secularization to the Securitization of the Sacred. *Religions*, 10, 12.
- Greenberg, D. (2013). Religion and mental health: A double-edged sword or a life-giving medicine?. *World Psychiatry*, 12(1), 40-41.
- Guerin, B. (1998). Religious Behaviors as Strategies for Organizing Groups of People: A Social Contingency Analysis. *The Behavior Analyst*, 21, 53-72.
- Gustafsson, B. (1972). Durkheim on power and holiness. *Scripta Instituti Donneriani Aboensis*, 6, 20-30.
- Hasanzadeh, M., & Elmi, G. (2025). A Critical Review of Peter L. Berger's Approach to Religion. *Dissertia Research Reviews*, 1(1), 54-65.
- Hefti, R. (2011). Integrating Religion and Spirituality into Mental Health Care, Psychiatry and Psychotherapy. *Religions*, 2, 611-627.
- Herzog, P., King, D., Khader, R., Strohmeier, A., & Williams, A. (2020). Studying Religiosity and Spirituality: A Review of Macro, Micro, and Meso-Level Approaches. *Religions*, 11, 437.
- Hobson, N., & Inzlicht, M. (2016). Recognizing religion's dark side: Religious ritual increases antisociality and hinders self-control. *Behavioral and Brain Sciences*, 39, 30-31.
- Holdrege, B. (2018). Interrogating the Comparative Method: Whither, Why, and How?. *Religions*, 9, 58.
- Hoppal, M. (2006). Shamanic and/or cognitive evolution. *Documenta Praehistorica*, 33, 229-236.
- Iqbal, A. (2016). When Religion Meets the Internet (Cyber-Religion and the Secularization Thesis). *Jurnal Komunikasi Islam*, 6(1), 1-28.
- Irving, B., Kavanagh, C., Fischer, R., & Yuki, M. (2024). Dance for the dead: The role of top-down beliefs for social cohesion and anxiety management in naturally occurring collective rituals. *PLOS ONE*, 19(3), e0291655.
- Izzah, L., & Pratama, R. (2024). The Fathom for Good and Evil: Decoding Religious Meaning System in Antonio Campos' *The Devil All the Time* (2020). *Culturalistics: Journal of Cultural, Literary, and Linguistic Studies*, 8(1), 83-89.
- Jackson, J., Yam, K., Tang, P., & Waytz, A. (2023). Exposure to automation explains religious declines. *Proceedings of the National Academy of Sciences*, 120(34), e2304748120.
- Jain, P., & Long, J. (eds.). (2023). *Indian and Western Philosophical Concepts in Religion*. Maryland: Lexington Books.

- Jensen, L. (2021). The Cultural Psychology of Religiosity, Spirituality, and Secularism in Adolescence. *Adolescent Research Review*, 6, 277-288.
- Kadri, H., & Abdelsalam, E. (2020). Geopolitics of Religion: How Does Religion Influence International Relations and States' Foreign Policies?. *International Journal of World Policy and Development Studies*, 6(3), 28-37.
- Kaushal, A., Stafford, A., Cadar, D., & Richards, M. (2022). Bi-directional associations between religious attendance and mental health: Findings from a British birth cohort study. *Journal of Epidemiology and Community Health*, 76, 190-195.
- Koenig, H., & Carey, L. (2024). Religion, Spirituality and Health Research: Warning of Contaminated Scales. *Journal of Religion and Health*, 63, 3729-3743.
- Kondratyeva, I., & Fenno, I. (2022). The role of religion in the formation of solidarity and social cohesion in independent Ukraine. *Skhid*, 3(4), 23-30.
- Krause, N., & Wulff, K. (2004). Religious Doubt and Health: Exploring the Potential Dark Side of Religion. *Sociology of Religion*, 65(1), 35-56.
- Kroesbergen-Kamps, J. (2024). "God is in Control": Religious Coping in Sermons About the COVID-19 Pandemic in the Reformed Church in Zambia. *Journal of Religion and Health*, 63, 704-724.
- Krok, D. (2024). The religious meaning system as a conceptual construct of interdenominational approach: A psychological analysis. *Studia Oecumenica*, 24, 213-230.
- Launay, R. (2022). Defining Religion: Durkheim and Weber Compared. *Religions*, 13, 89.
- Leite, Â., Nobre, B., & Dias, P. (2023). Religious identity, religious practice, and religious beliefs across countries and world regions. *Archive for the Psychology of Religion*, 45(2), 107-132.
- Lelis, R. (2024). The great transformation: The Durkheimian sociology of religion from Émile Durkheim to Henri Hubert. *Anthropological Theory*, 25(1), 97-117.
- Levitin, D. (2012). From Sacred History to the History of Religion: Paganism, Judaism, and Christianity in European Historiography from Reformation to 'Enlightenment'. *The Historical Journal*, 55(4), 1117-1160.
- Lombaard, C. (2016). Sensing a "second coming": An overview of new concepts in Sociology, Philosophy, Law and Theology on the re-emerging religious in private and public life. *Verbum et Ecclesia*, 37(1), a1488.
- Lucchetti, G., Koenig, H., & Lucchetti, A. (2021). Spirituality, religiousness, and mental health: A review of the current scientific evidence. *World Journal of Clinical Cases*, 9(26), 7620-7631.
- McNamara, R. (2024). Cultural Evolution of Religion, Spirituality and Ritual: Impacts on Human Cooperation. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 76, 769-788.
- Milner, K., Crawford, P., Edgley, A., Hare-Duke, L., & Slade, M. (2020). The experiences of spirituality among adults with mental health difficulties: A qualitative systematic review. *Epidemiology and Psychiatric Sciences*, 29, e34.
- Mohamed, T. (2019). The Relationship Between the Religion and the State Between the Western Vision and the Islamic Vision in Its Asian Models. *Asian Social Science*, 15(5), 102-117.
- Moya, S., & Toledano, N. (2025). The Space for Religion and Spirituality in Business, Management, and Entrepreneurship Education: Reflections on the Main Contributions and Tentative Directions. *Journal of Business Ethics*, 198, 155-175.
- Pace, E., & Moreira, A. (2018). Introduction—Religious Diversity in a Global Religious Field. *Religions*, 9, 95.
- Pals, D. (2006). *Eight Theories of Religion* (2nd ed.). Oxford: Oxford University Press.

- Pargament, K., Feuille, M., & Burdzy, D. (2011). The Brief RCOPE: Current Psychometric Status of a Short Measure of Religious Coping. *Religions*, 2(1), 51-76.
- Parker, C. (2019). Popular Religions and Multiple Modernities: A Framework for Understanding Current Religious Transformations. *Religions*, 10, 565.
- Peoples, H., Duda, P., & Marlowe, F. (2016). Hunter-Gatherers and the Origins of Religion. *Human Nature*, 27, 261-282.
- Power, E. (2018). Collective ritual and social support networks in rural South India. *Proceedings of the Royal Society B*, 285, 20180023.
- Prati, G. (2024). Is religion beneficial for mental health? A 9-year longitudinal study. *International Journal of Clinical and Health Psychology*, 24(3), 100491.
- Priest, N., Esler, M., Ransome, Y., Williams, D., & Perry, R. (2024). A “Dark Side” of religion? Associations between religious involvement, identity and domestic violence determinants in Australia. *Australian Journal of Social Issues*, 59(1), 186-205.
- Prodi, P., & Campbell, I. (2023). From secularisations to political religions. *History of European Ideas*, 59(1), 86-107.
- Pyrhönen, N., & Tiusanen, K. (2025). Religion, media, and democracy in the Nordic countries: A scoping review of empirical research 2011-2024. *Nordicom Review*, 46(s1), 130-147.
- Qu, F. (2021). Embodiment of Ancestral Spirits, the Social Interface, and Ritual Ceremonies: Construction of the Shamanic Landscape among the Daur in North China. *Religions*, 12, 567.
- Rais, R. (2007). Identity Politics and Minorities in Pakistan. *South Asia: Journal of South Asian Studies*, 30(1), 111-125.
- Rasool, A., & Taqaddausi, M. (2024). Unveiling the Dynamics of Religion and Social Cohesion in Kabul: Perspectives from Kabul University Academics. *Sprink Journal of Arts, Humanities and Social Sciences*, 3(5), 1-8.
- Rosmarin, D., Wachholtz, A., & Ai, A. (2011). Beyond descriptive research: Advancing the study of spirituality and health. *Journal of Behavioral Medicine*, 34, 409-413.
- Saunders, N., & Stephenson, Z. (2024). Reviewing the use of the Brief Religious Coping Scale (Brief RCOPE) across diverse cultures and populations. *Journal of Religion and Health*, 63, 3926-3941.
- Shalihin, N., & Sholihin, M. (2022). Ramadan: the month of fasting for Muslim and social cohesion—mapping the unexplored effect. *Heliyon*, 8(10), e10977.
- Startup, R. (2020). Religion: Its Origins, Social Role and Sources of Variation. *Open Journal of Philosophy*, 10, 346-367.
- Stein, L., & Sandage, S. (2024). Psychology of religion and spirituality in Jewish contexts: A synthetic review. *Archive for the Psychology of Religion*. <https://doi.org/10.1177/00846724241275130>
- Stolz, J., & Voas, D. (2023). Explaining Religious Revival in the Context of Long-Term Secularization. *Religions*, 14, 723.
- Stripp, T., Long, E., Mosashvili, K., Cipta, A., Labat, S., Seshadri, S. (2023). Training Researchers in the Field of Religion, Spirituality, and Health: Experiences from a Workshop in the United States and Recommendations for Future Workshop Curricula. *Journal of Religion and Health*, 62, 3520-3528.
- Szalachowski, R., & Tuszyńska-Bogucka, W. (2023). “Faith Is Not Enough?” Ego-Resiliency and Religiosity as Coping Resources with Pandemic Stress—Mediation Study. *International Journal of Environmental Research and Public Health*, 20, 1942.
- Taylor, S., & Benac, D. (2022). Pandemic Spiritual Leadership: A Trans-national Study of Innovation and Spiritual Practices. *Review of Religious Research*, 64(4), 883-905.
- Torre, M. (2023). What Is the Philosophy of Religion?: A Thomistic Account. *Religions*, 14, 253.

- Tremlett, P. (2023). Transreligiosity and the Messiness of Religious and Social Worlds: Towards a Deleuzian Methodological Imagination for Religious Studies. *Religions*, 14, 527.
- Tu, B. (2025). Bridging or Breaking: Unraveling the Impact of Village Religious Diversity on Individual Trust in China's Ethnic Regions. *Social Indicators Research*, 179, 617-651.
- Van Uden, M., & Zondag, H. (2016). Religion as an Existential Resource: On Meaning-Making, Religious Coping and Rituals. *European Journal of Mental Health*, 11(1-2), 3-17.
- Weingast, B. (2023). Adam Smith's "Industrial Organization" of Religion. In P. Sagar (ed.). *Interpreting Adam Smith* (pp. 39-61). Cambridge: Cambridge University Press.
- Wilski, M., Wnuk, M., Broła, W., Szczesniak, M., Zak, M., Sobolewski, P., ... & Potemkowski, A (2024). Religious meaning system and life satisfaction: The mediating role of meaning in life among Polish people with multiple sclerosis. *Frontiers in Psychiatry*, 14, 1352021.
- Wnuk, M. (2024). The Mechanisms Underlying Religious Coping and Hopelessness: Role of Meaning in Life and Affectivity. *Pastoral Psychology*. <https://doi.org/10.1007/s11089-024-01181-4>
- Wolny, W. (2012). What, How, and Why: The Geertzian Definition of Religion and Neurotheological Project on Meta and Megatheology. *International Journal of Humanities and Social Science*, 2(5), 32-37.
- Wuthnow, R. (2022). *Religion's Power: What Makes It Work*. Oxford: Oxford University Press.
- Xie, S. (2025). States Construct Collective Beliefs Similar to Religion: Mechanisms and Methods. *Communications in Humanities Research*, 98, 207-212.
- Xu, J. (2016). Pargament's Theory of Religious Coping: Implications for Spiritually Sensitive Social Work Practice. *The British Journal of Social Work*, 46(5), 1394-1410.

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