Science and Religion: Toward a New Dialogue
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Abstract
Science is based on reason, whereas religion on faith or emotion; science is progressive, whereas religion conservative; science promotes creativity, whereas religion stifles creativity. False assumptions such as these render impossible a productive dialogue between science and religion. Proposing a new foundation for the science and religion dialogue, I redefine reason in terms of ecological rationality. I argue that all cultures, including that of science and religion, have its unique rationality that is evolved to function in its ecological niche. Appreciating the basic difference in rationality between cultures can give us a solid foundation for a mutually appreciative dialogue between science and religion, a dialogue that can harness the critical insights and creative energies of both, since neither alone will be able to solve the intractable problems that confront us today in the 21st century. The rich implications of this analysis for cross-cultural dialogue will be addressed in the discussion.

Topics for the discussion:
- Ecological rationality,
- Culture and cognitive styles,
- What’s culture for, or what is the point of having so many cognitive styles and rationalities?

Recommended reading

Biosketch

Louise Sundararajan was born in Yunnan, China, and grew up in Taiwan. She received her Ph.D. in History of Religions from Harvard University, and her Ed.D. in Counseling Psychology from Boston University. She is founder and chair of the Task Force on Indigenous Psychology, which is joined by nearly two hundred researchers from around the globe. She served as past president of The International Society for the Study of Human Ideas on Ultimate Reality and Meaning, and also past president of the Society for Humanistic Psychology (Division 32 of the American Psychological Association). She is recipient of the Abraham Maslow Award for 2014, from Division 32 of APA. She is a Fellow of the American Psychological Association, and also a member of the Board of Directors for the International Society for Research on Emotions. She serves on the editorial boards of *The Humanistic Psychologist,* and *Journal of Humanistic Psychology.* She is Associate Editor for *Journal of Theoretical and Philosophical Psychology.* She has published extensively on topics related to culture and emotions.

Her recent book is:


**Science and Religion: Toward a New Dialogue**

**Science and Religion as Cultural Wars**

The difference between science and religion may be understood in terms of what C. P. Snow (1963) has described as two cultures—the sciences and humanities. Along the divide between these two cultures fall the differences in knowing—scientific knowing capitalizes on reason and logic, whereas the humanities, a more embodied mode of knowing that considers tradition the portal, rather than a hindrance, to knowledge. Paralleling the ongoing cultural wars between the sciences and humanities, the dialogue between science and religion has been at an impasse for some time. In this talk, I first identify two factors in Western culture that contribute to this impasse—supremacy of reason, and dichotomous thinking. Then I delineate ways to undo these cultural biases, with special focus on a redefinition of reason in terms of an ecologically based rationality that renders possible a more mutually appreciative exchange between science and religion.

**Supremacy of Reason.** The first obstacle to a true dialogue between science and religion is the supremacy of reason, a belief that has a long history in the West. Phillip Cary points out how as early as the fourth century, St. Augustine made the progression from understanding by authority and tradition to understanding by reason and logic the necessary trajectory of maturity. The legacy of this bias can still be seen today in the supremacy of reason over emotion. In the words of Lutz (1996):

> emotion, like the female, has typically been viewed as something natural rather than cultural, irrational rather than rational, chaotic rather than ordered, subjective rather than universal,
physical rather than mental or intellectual, unintended and uncontrollable, and hence often
dangerous. (p.151).

This takes us to the second factor that contributes to the impasse of the science and religion
dialogue, namely dichotomous thinking.

**Dichotomous Thinking.** Dichotomous thinking tends to divide the universe into two antithetical
blocks—rationality versus irrationality—the former is characterized by reason and logic; the
latter, everything that falls outside the box of the former. Thus along the divide between
rationality and irrationality falls the dichotomy of cognition versus emotion; thinking versus
feeling; reason versus faith; and science versus religion.

**Toward a New Dialogue between Science and Religion**

For science and religion to have a new dialogue, we will have to undo these two biases of
Western culture.

The first step toward undoing dichotomous thinking has been taken up by Phillip Cary, whose
analysis of the postmodern discourse on tradition suggests that whatever is supposed to lie
outside the box of reason—religion, tradition, emotion, and so on—can be found within it. With
this postmodern insight, the dichotomy of science versus religion, or rationality versus
irrationality, collapses. From here it is only a short step to challenging the supremacy of reason.
To challenge the supremacy of reason, I redefine reason as rationality and demonstrate how
different traditions/cultures have different rationalities, which are equally functional within their
respective ecological context.

Rationality may be defined as a functional mindset that operates in a particular ecological niche
for which it is evolved (Todd et al., 2012). The central question addressed by rationality is this:
What does mind do in its ecological niche in order to contribute to a life that is good, right, and
reasonable? Richard Shweder (1991) claims that rationality is not one size fits all, but rather
comes in multiple and varied forms. In other words, different rationalities and different ways of
knowing are useful for different purposes. There is, therefore, no grounds for the claim that
scientific reasoning is the only, or the best, way of knowing.

**Culture and Rationality**

Multiple rationalities suggest that reality is plural. Instead of one reality which is the Rome to
which all roads lead, there are multiple realities in the sense of ecological niches that co-evolve
with their respective rationalities. Furthermore, as Charlie Brown once said something to the
effect that life is a ten-speed bike, with many gears remain unused. We are all capable of
multiple ways of knowing, but our cultures/traditions can limit our imagination, because they
privilege one particular form of rationalities or habitual ways of knowing over others. To access
our under-utilized capacities for knowing, exposure to or dialogue with other cultures/traditions
can be very helpful. To illustrate this point, let us consider a psychological study on imitation.

Heyes and Dawson (1992) studied imitation of rats by placing two rats face to face in adjoining
cages. One rat learned to push a joystick to the left to be rewarded with food, a direction which
from the perspective of the other on-looking rat, the imitator, would be to the right. Later the
imitator was placed in the first rat’s cage. Which way would the imitator push the joystick, left
or right? The imitator correctly pushed the joystick to the left, just like human imitators do. Can
we draw the conclusion that rats and humans use the same perceptual strategy to compute the
direction? It turned out that the rat imitator used a very different strategy—sniffing at the side of the joystick where it detected the scent of the first rat.

The question posed by the imitation study may be rephrased as follows: Given the fact that rats do not rely on sight as much as humans do, how do they find out the right lever to press for food in a face to face imitation task? Here the same experimental stimulus (observing a conspecific pressing lever to get food) had different meanings—to the humans face to face observation entails a task of cognitive mapping (transposition of mirror images), whereas to the rats it entails a sniffing task. This is an example of different rationalities evolved to serve different ecological niches. Rats and humans live in two different ecological niches, one of smell, the other sight—the former privileges sensory cues, the latter mental maps.

While cultural shock may be an invitation to learn a few new tricks above and beyond the habitual ways of knowing privileged by one’s own culture and tradition, scientists routinely study rationalities in non-human species to explore other forms of knowing. For instance, bats use echolocation to see. The knowledge of alternative ways of seeing would come in handy when we lose our eyesight, or when we enter a different ecological niche for which the use of eyesight is not adaptive. As for movement, the vast animal kingdom offers all kinds of alternative ways of walking, running, flying, swimming, and so on—with far reaching implications for both stroke victims as well as for the design of better airplanes or better robots for the mars expedition.

Scaling down to the human realm, there may be as many rationalities as there are cultures. But we can further narrow that down to two major types of rationalities—non-relational and relational.

**Relational and Non-Relational Rationality**

Paul Bloom (2009) claims that there are two independently evolved systems for reasoning about the world: one non-relational—for the physical world; and the other relational—for the social world. While it is necessary to have both types of rationality—(non-relational) reasoning about the physical world and (relational) reasoning about the social world—cultures differ in their emphasis on one or the other. The rationality of individualist cultures capitalizes on non-relational cognition, generally referred to as intelligence, whereas that of collectivist cultures, such as China and India, relational cognition (Sundararajan, 2015).

Casting the science and religion dialogue into the cultural framework of rationality, we can see that, echoing Snow, science and religion are two different cultures/traditions that differ in rationality—the former privileges non-relational cognition, known as intellect, that is evolved for the mastery of the material world; the latter, relational cognition that is evolved for relationships—with oneself, with others, and with God. To explore the difference between these two types of rationality, let us take a look at cultural variations in knowing and self-critical reflections.

**Relational and Non-Relational Modes of Knowing.** In the social world, to know is to understand, which means literally to stand under: One has to submit to the authority of tradition in order to benefit from cultural transmission. To master the material world as a scientist, however, to know is to over-stand, to stand over against the world in a manner as best articulated by the Kantian dictum that “We are subjects thinking about objects” (Freeman, 2000, p. 117). While
this standing-over mode of knowing is very productive in scientific pursuits, it is not appropriate in social relationships including our relationship to God, as Dr. Cary points out rightly.

**Relational and Non-Relational Modes of Critical Reflections.** Along the divide between non-relational and relational cognition, we may distinguish two types of self-critical reflection, one capitalizing on the head; the other, the heart. The heady type of self-critical reflection makes much use of the art of argumentation known as Socratic questioning. The affective type of self-critical reflection puts a premium on intuition rather than on the intellect or cold reason. For a more systematic comparison, I borrow from quantum mechanics the framework of symmetry and symmetry breaking.

Symmetry refers to an undifferentiated wholeness which through spontaneous symmetry breakdown gives rise to differences and differentiations, with the more differentiation, the more loss of symmetry. For instance, a drop of water contains all possible patterns of a snowflake. This is a state of symmetry. From this plethora of possibilities, only one particular snowflake pattern emerges, when that drop of water freezes and all the other possible patterns for snowflakes are lost. This is called symmetry breakdown.

The philosopher John Bolender (2010) uses the phase transitions from plasma to gas to liquid to solid to describe the sequence of symmetry breaking found in nature as a descending chain of symmetry subgroups nested like the Russian dolls, with each lower symmetry concealed by the next higher symmetry. For instance, water in its frozen state, such as the ice crystal, is a lower symmetry subgroup of the group for liquid water. He further claims that the same sequence of symmetry breaking is found in human thought, as evidenced by the four measurement scales: nominal (A versus not A), ordinal (plus direction of difference), interval (plus quantifiable amount of difference), and ratio (plus an absolute zero). See Table 1. Note. Downward arrow = symmetry breakdown in analytical thinking; upward arrow = symmetry restoration in holistic thinking.

![Diagram of measurement scales](image-url)

**Table 1**

The descending chain of symmetry in measurement scales.
Cast into the symmetry and symmetry breakdown framework, I have shown elsewhere (Sundararajan, 2015) that non-relational rationality privileges cognitive styles that serve the purpose of symmetry breakdown; whereas relational rationality, cognitive styles that enhance symmetry maintenance or restoration. There is much research in psychology on two very different ways of thinking, otherwise known as cognitive styles-- analytical thinking versus holistic thinking. Consistent with the theory of symmetry breakdown, the non-relational rationality that plays a pivotal role in science and democracy places a premium on analytical thinking, which is the basic mechanism behind argumentation in general, and the Socratic questioning in particular. This much is clear. But we may not be as familiar with holistic thinking, nor are we as clear about how this cognitive style serves the purpose of relational rationality that privileges symmetry maintenance and symmetry restoration. For illustration, let us take a look at another psychological experiment.

**Set and set breaking.** You are asked to choose for a friend two puppies from five photographs and then learned that the landlord would allow only one pet per apartment. What a bummer! This is the type of experiment known as the blocked-choice paradigm. Consider this scenario: You get to choose a drink and a snack from three bottled beverages (milk, soda, fitness water) and three packaged snacks (cookies, chips, fitness bar). Say you picked soda and chips. Then you are told, “Whoops! A mistake had been made: Instead of getting to choose two options, you can select only one.” How would you like to proceed? Pick one out of the selected pair (soda or chip)? Or start over and choose one from the unelected items (milk, fitness water, cookies, or fitness bar)? It turns out that the choice you make in this type of situations depends on whether you have a collectivist or individualist mindset (corresponding to our relational and non-relational rationality, respectively), according to a series of studies conducted by Mourey et al. (2013).

Mourey et al. (2013) found that compared with those in the (non-relational) individualist-mindset condition, “participants in the [relational] collectivist-mind-set condition listed more reasons their initial snack and beverage selections went together and then, when told that one of their selected items was unavailable for consumption, chose to select a new snack or beverage instead of consuming their other initially selected item that was available” (p. 1620). Proceeding with only the available products meant that participants had broken up their selected set, whereas not willing to proceed with it suggests an unwillingness to break up with their initially selected set. Mourey et al. (2013) found repeatedly that an accessible collectivist mindset “increased the likelihood of rejecting a partial set and the willingness to pay more to complete the set” (p. 1618). And again: “Latinos and people randomly assigned to the collectivist-mind-set condition were more hesitant to break up a set, more willing to pay extra to restore a set, and more sensitive to the existence of a relationship among members of a set” (p. 1620). How do we understand this?

In holistic thinking, when items combine they form a new entity--a set. Thus if:

\[a=\text{soda}; \quad b=\text{chips}; \quad a + b = C\]

The question of C did not arise for analytical thinking, which sees (a) and (b) as individual items only (a, b), even when combined. Thus to the non-relational individualist mindset, the blocked-choice paradigm simply means a reduction of the number of one’s choice from two items (a, b) to one-- (a) or (b). But to the relational holistic mindset, the blocked-choice paradigm entails the symmetry breakdown of C, which is something to be avoided if possible. Cast into the
theoretical framework of symmetry, a broken set entails symmetry breakdown; forming a new set, an act of symmetry restoration; and holding onto a ready-made set, symmetry maintenance. This hypothesis predicts that when confronted with the blocked-choice problem, holistic mindset would prefer the symmetry restoration strategy of choosing from the unselected items that have never formed a set over choices that involve breaking a ready-made set. This is exactly what the researchers (Moure et al., 2013) found.

Note that whereas analytical reasoning is associated with symmetry breaking as evidenced by the willingness to work with the broken set, holistic reasoning is associated with two seemingly contradictory tendencies—the tendency to hold onto the ready-made set, as evidenced by the conservatism of religious traditions that Dr. Cary has told us about, on the one hand; and on the other, a radical tendency to abandon a broken set, to start all over in order to form a new set or tradition. As a fine example of the self-critical element in religious traditions, this radical tendency in holistic reasoning warrants further elaboration.

Symmetry Restoration in Zen Buddhism. In the framework of symmetry and symmetry breaking, starting all over is a form of symmetry restoration. However, to abandon the broken set is itself a form of symmetry breaking in the sense of breaking away from the tradition as symbolized by the old set. This radical break away from the tradition is known as set-breaking in the literature on creativity (Pritzker, 2011). Consider one very radical form of set breaking, namely a so far neglected option that was included in Study 1 conducted by Mourey et al. (2013)—to select nothing and exit the experiment. This option is well represented by the Buddhist notion of kong (emptiness), by means of which the agent says, in effect, Stop the bus— I want to get off.

To start all over with a new set of choices, however, requires a quantum leap of consciousness, a moment known as “enlightenment”-- wu or satori --in Zen Buddhism.

Consider this famous story of wu (enlightenment) in the history of Zen Buddhism: The time had come for the Fifth Patriarch of the Zen school to select his successor. An announcement was made for a competition to show the best comprehension of the religion. A learned disciple by the name of Shen-hsiu composed a poem (A) and posted on the wall of the meditation hall:

This body is the Bodhi-tree,
The soul is like a mirror bright;
Take heed to keep it always clean,
And let not dust collect on it. (Suzuki, 1956, p. 67)

Hui-neng (638-713) who won the competition and later became the Sixth Patriarch, wrote the winning poem and posted alongside of Shen-hsiu’s. The poem (B) of Hui-neng went as follows:

The Bodhi is not like the tree,
The mirror bright is nowhere shining;
As there is nothing from the first,
Where can the dust itself collect? (Suzuki, 1956, p. 68)

Here we have here two competing assumptions about meditation:
A—the conventional wisdom that the mind is like a mirror that needs to be kept clean by diligent practices of meditation.

B—the higher level awareness that repudiates the lower level understanding (A) as a delusion based on reification of the mind.

(A) claims that the more thoroughly one keeps the mind pure from delusions through the diligent practice of meditation, the closer one gets to the goal of enlightenment. Fat chance, said the Sixth Patriarch in so many words. Comparing (A) to polishing a brick in the hope of making a mirror, the Sixth Patriarch claims that enlightenment is an entirely different ball game from studies and practices of the religion. What is reiterated here is the Buddhist insight that the attempt to rid the mind of its delusions inevitably creates a more intractable delusion—reification of the mind. Thus there is no way one can progress from (A) to (B), regardless of how hard one analyzes things critically. What is needed is a sudden leap of consciousness. Along the way, it would probably be helpful to have a habit of the mind, characteristic of holistic thinking, that is ever ready to get off the bus—be it the well-trodden path or well established tradition-- in order to start the journey afresh.

For another scenario of the self-critical moment that takes the form of a leap in consciousness, we turn to the book of Job.

**Socrates meets the Hippo.** The Biblical story that best represents both scientific and religious rationalities is found in the book of Job. In Job, the Socratic questioning is taken to a new height where the argumentation was carried out between Job and God. In this conversation, Job’s analytical reasoning encountered a very different type of rationality, as represented by the epiphany of the hippo.

Since it is well known, the story of Job can be quickly adumbrated as follows: Job is a righteous man who suffered greatly. Having lost everything he had--property, children, and health--Job wanted to know why. Claiming his innocence, and rejecting all the conventional explanations given by his pious friends, Job demanded an answer from God Himself. It was after rounds of futile debate between Job and his pious friends that the God of Job spoke “out of the whirlwind.” What did God say? Otto points out that God did not argue along the lines of: “My ways are higher than your ways; in my deeds and my actions I have ends that you understand not . . .” (1970/1923, P. 78). Otherwise put, the divine revelation was not cast in the propositional or conceptual framework, or anything that analytical reasoning can sink its teeth in.

According to Otto, God’s argument rested on “the sheer absolute wondrousness that transcends [rational, analytical] thought, on the mysterium, presented in its pure, non-rational form. All the glorious examples from nature speak very plainly in this sense. The eagle . . . is rather the creature of strangeness and marvel . . . the ostrich with its inexplicable instincts . . .” (P. 79). It is conjectured that the descriptions of the hippopotamus (behemoth) and crocodile (leviathan) are a later interpolation. Nonetheless, the interpolator has felt the point of the entire narrative extraordinarily well, says Otto (1970/1923), as these epiphanies “express in masterly fashion the downright stupendousness, the wellnigh daemonic and wholly incomprehensible character of the eternal creative power; how, incalculable and ‘wholly other’, it mocks at all conceiving but can yet stir the mind to its depths, fascinate and overbrim the heart” (P. 80).

A concrete example of the divine rebuttal may be helpful. Consider the following questions posed by God:
Who has cut channels for the downpour
And cleared a passage for the thunderstorm,
for rain to fall on land where no man lives
and on the deserted wilderness,
clothing lands waste and derelict with green
and making grass grow on thirsty ground? (The new English Bible, 1970, Job 38: 25-27)

In these rhetorical questions of God, Job is confronted with the vision of a world that concerns him not, a world that is totally irrelevant to his objectives and interests. It renders irrelevant the “main evaluative issues” of both “primary appraisal”--“Am I in trouble or being benefited, now or in the future, and in what way?” and “secondary appraisal”--“What if anything can be done about it?” (Lazarus and Folkman, 1984, P. 31). Similarly losing anchorage in relevance are all three “primary systems” of emotion (Oatley, 2000): the attachment system with its need for protection, the assertion system with its concern for power and dominance, and the affection system with its concern for affiliation. As Ricoeur (1974) points out: “the vision of the Behemoth and the Leviathan . . . has no relationship to Job’s personal situation. No theology emerges from the whirlwind; no intelligible connection is established between the physical order and the ethical order . . .” (P. 461). The upshot of all this is the emergence of a new consciousness, which according to Otto (1970/1923) entails a reconciliation: “this strange ‘moment’ of experience that here operates at once as a vindication of God to Job and a reconciliation of Job to God” (p. 78). And healing: “For latent in the weird experience that Job underwent in the revelation of Elohim [Yahweh] is at once an inward relaxing of his soul’s anguish and an appeasement . . . ” (p. 78).

Job’s dialogue with God constitutes a dramatic paradigm shift from conventional reason and logic to a holistic new vision of what life is all about. This, according to Otto and others, is what solved the problem for Job. Why is it important for problem solving to abandon the old set and start all over? Einstein has a good answer, “We can't solve problems by using the same kind of thinking we used when we created them.” This may be why symmetry restoration is found to be associated with creativity across cultures (Sundararajan & Fatemi, 2015). In the final analysis, symmetry restoration --to abandon the whole thing and start all over --works because it restores our vision of the larger whole, as Fingarette (1991) puts it:

We are allowed [in the Book of Job] a vision of existence as inexhaustibly rich in creative energies. We see life and death, harmonies and discords, joys and terrors, grace and monsters, the domestic and the wild. We are as nothing as measured against the whole; we are puny, vulnerable, and transient . . . . But as beings who are conscious of this miracle, who participate however humbly in it, we are transcendentally elevated and exhilarated. We are like unto the angels. (p. 215)

**Conclusion**

Both science and religion exhibit self-critical moments, but in different ways. Science is invested in making new discoveries. The scientific inquiry capitalizes on the symmetry breaking mechanism of argumentation and debate, as best exemplified by Socrates, to always question the taken for granted. Religion, on the other hand, is geared toward the creation of new consciousness. This leap of consciousness entails symmetry restoration, a process that consists
of two interlocking steps: rejecting what is taken for granted, and starting over with a new heaven and new earth. Appreciating the basic difference in rationality can give us a solid ground for a productive dialogue between science and religion, a dialogue that can harness the critical insights and creative energies of both, since neither alone will be able to solve the intractable problems that confront us today in the 21st century.

References


