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**Imagining Complex Adaptive Religions:**
**Science as Disruptive/Transformative Raconteur**

*Abstract*. A rough outline of the science of complex adaptive systems is offered here as an imaginative lens through which to see religions and religious education afresh. Three religious education problems are posed. For each, a story from complexity science is offered as a pathway to a solution. The conversation is then flipped so that the science story offers a lens for seeing religions as complex adaptive systems. This lens invites two imaginative reconceptions of how a religion might be organized to more effectively respond to the challenges of the contemporary world.

A raconteur is one who tells interesting stories. I have been intrigued by the stories of science since high school, but I wasn't sufficiently motivated by the outcomes of those stories to pursue creating new scientific stories. It was the process that unfolded in the sciences stories that I found compelling.

When I finally found a story-ending that motivated me, the story being told was about religious education and visual art. But even when I was moving from exams to dissertation proposal, the stories of a particular new realm of science were disrupting/transforming my thinking. Building a bridge between the two story worlds of religion and science seemed quixotic in those days so I moved the science to the deep background of my thinking and focused on religious education and art. Now I am beginning to build the bridge.

The realm of science that has been the liveliest stimulus to my religious education imagination in recent years is the new interdisciplinary science of complex adaptive systems. The question that drives this scientific endeavor is whether complexity observed in seemingly disparate systems has common properties whereby an explanation for a complex phenomenon in one field (e.g., chemical bonding) offers a framework or model or template to understand a complex phenomenon in another field (e.g., financial market behavior) (See e.g., Goo, Yik Wen et al. 2009).

A complex adaptive system is comprised of many components or agents, which are interactive, self-organizing, and adaptive, and because of those behaviors, the system exhibits emergence and hard-to-predict dynamics in non-linear ways. Emergence in this usage means that agents are able to self-organize, they can communicate and behave in a

coordinated response to external stimuli in a way that no individual agent could. The field started as a dialogue among physicists, economists, and computational mathematicians. It has grown to include social scientists, cultural anthropologists, neuroscientists, evolutionary biologists, strategists, urban planners, public policy experts, and many others.

As I have discovered myriad stories emerging from this new science, my thinking about religious education has been repeatedly disrupted. This complexity story-world has had such an impact on me that how I see religions and thus how I frame the problems in the field of religious education has been transformed.

Some of the smaller disruptions are simply new ways to think about traditional problems. What if we could optimize curriculum redesign as if we had done hundreds of generations worth of trial and error testing?  What if we could distill the teaching about the Golden Rule into a handful of elements demonstrated to result in people actually living that basic teaching? What if innovation and adaptability were skills and dispositions included in a religion curriculum? CAS science and mathematics may offer tools for addressing these questions.

But some of the questions are more fundamental. What if a religion could reflect on its own operating structure, as that structure has emerged, grown, morphed, and calcified over thousands of years, and decide that a different structure would be more responsive to the present environment? What if the religions could learn how to cooperate within and among themselves in such a way that they could show nation states and markets how to likewise overcome their polarities and work toward a shared good? These questions invite a new way of understanding the identity of a religion and thus the task of religious education.


**Complexity Science as a Tool for Religious Education**

The first two questions asked above focus on optimizing curricula. This outcome is especially important in the context of formal religious education programs where teacher interaction with the learners lasts only an hour and a half per week and only during the academic year. In some of the religious traditions, for example, there are debates between emphasizing catechetical content and emphasizing reflective or experiential integration with the learner's worldview. Usually, each side of such a debate has some compelling arguments.

What if religious educators could optimize curriculum redesign as if it had done hundreds of generations' worth of trial-and-error testing?  In computation science, an iterative optimization technique has been developed that mimics such a repeated trial-and-error process. Assume that you start with hundreds of elements in a curriculum including knowledge content, skill building, and disposition cultivation – in other words, elements from both sides of the debate. Assume further that you know something of the effect each of these elements has on religious learners. Suppose that you want to optimize
 certain life-long outcomes and can identify the optimization goals.

That data could be processed using what is known in the world of computing as a genetic algorithm. A genetic algorithm first identifies a certain number (say 100) of possible

combinations of the curriculum elements, weeds out the worst of them, combines elements of the best and offers another generation of results. Again the worst are eliminated and the best are combined for yet another generation of results. This process is repeated many times until an optimized curriculum format is identified (See e.g., Busch-Vishniac, et al, 2011).

What if we could distill all of the teaching about the Golden Rule into a handful of elements that were proven to result in people actually choosing that basic teaching? Science has been exploring prosocial behavior in a number of ways but the one that continues to disrupt my thinking is the cooperation work being done with a game called the Prisoner's Dilemma. It is easy to love the neighbor when to do so doesn't conflict with any other interests. But what happens in the face of a conflict between pro-social and pro-self choices? What will the decision be? It is at this edge that I think religious education has something to learn.

The Prisoner's Dilemma imagines that you and your friend are arrested – here we will imagine it is because of a social justice protest event. If you and your friend don't talk, you will both get equal short sentences. If one of you talks, that one gets a light sentence and the other one gets a long sentence. If both of you talk you get equal medium or long sentences. Talking is called defecting, remaining silent is called cooperation. Both people remaining silent is the decision that results in the lowest total sentence for your society, that is you and your friend. Repeated versions of this game model have been shown to model social cooperation (Axelrod & Hamilton 1981).[1] It can serve as a metaphor for what it means to love one's neighbor and oneself at the same time, even if there is risk to you when you cooperate. Has religious education identified the rewards and costs of choosing neighbor and self versus choosing self first? Does hell need to be discussed again? And how do we teach this kind of decision making as a habit, cultivate it as a virtue, rather than simply presenting the Golden Rule as a good idea? These questions impact the kind of teaching that needs to occur around the environment and intractable racism.

Innovation and adaptability are teachable.[2] What if innovation and adaptability were included in a religion curriculum? I have mentioned to a few people working in the sciences that I am exploring religion as a complex adaptive system. Several have laughed, "complex maybe, but not adaptable." Most of these people did grow up with some religious education but they learned that their religion does not and should not change. What if young people emerged from a religious education program not only psyched to solve the problems of the world, but also already practiced in bringing creativity, innovation, and religious sensibilities to the problems of markets and governance? What if they were also skilled in using the tools of science, mathematics, and the humanities? Pope Francis' (2015) recent climate enclycical, *Laudato Si*, identifies complex environmental and economic problems but doesn't offer much by way of solutions. He urges further conversation but where are the innovative conversants?

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[1] There is an extensive body of literature on iterated Prisoner's Dilemma games and prosocial behavior following Axelrod & Hamilton (1981). Subtle aspects of the influences on cooperative behavior are still being explored (see e.g., Vilone, et al., 2014)

[2] A peer-reviewed journal from Elsevier is devoted to the subject: *Thinking Skills and Creativity.*

These three problems of curriculum redesign, lived learning for the common good, and cultivating innovation as intimately linked to religion focus on how the science might be applied to specific problems in religious education. This is similar to medieval monasteries using architecture to facilitate the monks securely living their spiritual priorities in a constructed space. The science of CAS also offers potential solutions for a number of contemporary religious communications issues through web algorithms, crowdsourcing schemes, and gaming. It would also be interesting to explore whether work in the realm of immunology offers religious educators any models that would help immunize a religion against extremism.

**Complexity Science as a Lens on Religions and Religious Education**

The field of complexity studies takes a course-grained look at whole systems looking for patterns, patterns missed when focusing on the fine grain, the details within a system. In other words, the old proverb cautions one not to miss the forest for the trees; complexity science suggests adjusting the lens so as to focus somewhere between the forest as a whole and the trees as individual components. Between those extremes, one can see patterns that are significant to the ongoing life of the forest but that an observer wouldn't notice if zooming in too closely on a tree or too widely on the forest in its context. Complexity science posits that those forest patterns can be compared with similar patterns from other biomes (e.g., from savannas or estuaries) or compared with the patterns found in complex systems that aren't biomes (e.g., cities or financial networks) and the life of the forest can be better understood and perhaps enhanced or improved.[3]

This mid-range lens can be focused on a religion. Patterns are thus clearly visible. Adherents have usually organized themselves into hierarchies and institutions; adherents engage in ritual and artistic behavior individually and collectively, usually at regular time intervals; the originating stories or other wisdom of a religious tradition offer adherents behavioral guidance in relation to fellow adherents and others in the world, guidance that is honored or not to varying degrees; and the wisdom traditions offer a framework or perspective for adherents' meaning making vis-à-vis the universe, human existence, and the purpose of life.

This is where meta-questions about religions and religious education begin. CAS science would say that the patterns just identified emerged from the self-organizing behavior of a religion's adherents over a span of time (millennia in the case of the major world religions). The patterns, structures, and institutions that emerged served the ends of the religion at the time they emerged. Some such patterns and structures fell by the wayside in the intervening years. Most of the patterns can be linked to the sacred stories of the religion but few are inscribed in those stories. The adherents of religions (agents as they would be called in CAS) are themselves complex adaptive systems who are intelligent and self-reflexive.

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[3] The forest example relates to a commonly understood idiom but for an in-depth consideration of how patterns in a system can be modeled and improved, see the example of the rice cultivation system Bali described in Stephen Lansing's (2006) *Perfect Order: Recognizing Complexity in Bali*.

Could the adherents of a religion examine the new science and make informed choices about what patterns would work best in the environment(s) in which the religions now find themselves? In other words, could the religions reorganize themselves into patterns and structures that are better suited to a world facing climate change, globalization, Moore's Law, Wright's Law, the volatility of global economies, the potential for nuclear destruction, the anticipated population increase, and the ever-increasing inequality of wealth distribution?

The hierarchical structure of Christian religious organizations, for example, emerged in the context of late-Roman imperialism. It was affirmed and refined in the Medieval European feudal hierarchical context. Given the ubiquitous presence of hierarchical ordering in human organizations, such an ordering pattern in a religion is not even questioned.

What if, instead of a hierarchical ordering principle, religions were able to choose an alternative structure? For example, could a religion choose to reorganize itself by learning the religious equivalent of the kinds of behaviors exhibited in a murmuration of starlings, that undulating, cooperative flock of flying responsiveness to wind, food, threats, and each other that has captivated observers and spawned viral videos.[4] How do they do it? Could religious educators teach that kind of cooperation and responsiveness to the members of their communities so that the religious community could better navigate rapidly changing social ecologies of interdependent organisms?

Or what if the human body were taken more seriously as a model for religious organization? The Body of Christ image is one of the earliest metaphors for the Christian Church (1 Cor. 12:12-27) but what if that image were explored in dialogue with the contemporary understanding of the human body as a complex interaction of the circulatory system, the digestive system including all of the microorganisms that live in the gut, the immune system, the nervous system and its tree-like network of information processing mechanisms, and the reproductive system – cellular and otherwise (see e.g., West 2012). None of these systems is independent of the others and none is in competition with the others. Without their intricate cooperation, the human person dies. Yet the religions are not exhibiting this kind of cooperation or interdependence. Could they learn to in such a way as to set an example for the economies and for nation states? Religions critique these secular institutions but offer little modeling of how to live differently.

The questions for religious education that flow from a deeper identification with the body imagery are rich. How is energy (e.g., faith, hope, love, joy, justice) circulated in a religious system? How is energy absorbed (metabolized) and redirected in a religious system? Does religious metabolism require the presence of other organisms? What kind? How does the religious system immunize itself against threats in its environment? What is the information processing (nervous) system in a religion? How does a religious system reproduce itself and what is the role of religious education in that process? With these questions come questions of resilience, flexibility, waste processing, energy sources, and interactions with other social systems.

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[4] The Clive & Smith (2012) video has been watched more than 7 million times.

Religions tend to understand themselves as offering identities and worldviews superior to those of consumerism, materialism, and science. Yet the lived realities of the world religions in recent years do not seem to bear fruit that is dramatically different than that which emerges from secular society.[5] If the religions know better how to deal with cooperation, conflict, and the dignity of each human being than the secular society, then why are they not demonstrating the efficacy of those methods in how they operate? What if the religions could learn how to cooperate within and among themselves in such a way that they could show nation states and markets how to likewise overcome their polarities and work toward a shared good? Perhaps if the religions were organized differently than other social systems, that task would be easier.

## Manifesting the Imaginative

The last comprehensive flowering of religious imagination in the Christian world occurred in the 14th through 16th centuries in Europe. This resulted in fragmentation and an emphasis on difference that endures. Imagine a Christianity that respected its internal differences (as blood cells don't try to be neurons, which don't try to convert endocrine cells) but committed its combined missional energy to an agreed vision of a shared social good.

Among the conditions for such a dramatic reimagining of any religion is that it remain in dialogue with its core texts and traditions. One might fairly ask whether such a dialogue is possible without some shared metaphysical ground. Does an engagement between religions and the science of complex systems require deeper engagement with process thought? If so, does one have to explore and hash out the philosophical and theological ground before one can engage in the practical dialogue? Systematic theology (see e.g., Kaufman, 2007) and religious studies (see e.g., Sosis & Kiper, 2014) are certainly engaging in a conversation with CAS but I would argue that that practical theologians and religious educators do not have to wait for those conversations to reach some sort of finality before the practical engagement can begin.

The problem is fairly urgent. No religion can exist long without energy and information transfer. That means that no religion can maintain an isolationist position from the food production and transportation system, a system that converts fuel into heat or electricity, and a communications network – even a simple one like a villager walking to the local monastery for worship and instruction. Likewise, even in the developing world, the simplest of food, energy or communications systems are interconnected with larger economic, urban, and environmental systems.

The question is how might a religion interact with those systems. For centuries in the West, religions have surrendered control of the energy and communications systems to the world of science. Religious education has taught the texts and traditions of the religion with little attention to teaching innovation, creativity, or imagination as those might be practiced with links to and roots in religion. It is surprising when a good scientist or a good artist also evidences an

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[5] For example the Catholic clergy sex-abuse handling, the Buddhist violence against Muslims in Myanmar (Burma), the Muslim on Muslim violence in the Middle East, the near-schismatic disutes in the Anglican and Lutheran contexts, and corruption scandals in various religions.

advanced stage of faith development – too often religious education doesn't continue after an interest is expressed in art or science.

Will the religions risk this kind of religious education? If not, where will the religions find raconteurs to tell provocative stories?

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