A rational choice theory of religious authority

Michael McBride
University of California, Irvine, USA

Abstract
The rational choice literature on religion has been noticeably silent on the nature and purpose of religious authority. I first summarize the rational choice theory of authority and offer a rational choice definition of religious authority. A primary insight is that (religious) authority exists to coordinate social action. I then argue that social coordination is a fundamental aspect of religious life, perhaps equally important as the social dilemma problems that have received attention in the literature. Finally, I apply this new rational theory to demonstrate its value. I demonstrate how rituals create religious authority; the relationship between religious authority, organizational hierarchy, and religious strictness; and how the theory creates complementarities between the two, sometimes contentious, sides of the secularization debate.

Keywords
Coordination, game theory, organization, religion

Introduction
Authority matters in religion. Scripture, tradition, personal experience, reason, and charisma are authoritative for practitioners and theologians (e.g. Gifford, 2005; McGrath, 2011), with different traditions and denominations placing different weights on each. Social scientists have long understood the authoritativeness of religious leaders and teachings as having consequences
for society as a whole by providing a source for shared values and social control (e.g. Durkheim, 1915 [2013]). It is no surprise that authority figures prominently in seminal analyses of religion either explicitly (e.g. Weber, 1922 [1968]) or implicitly (e.g. Berger, 1967 [1990]). Yet, it is surprising that the “new paradigm” in the study of religion—the rational choice approach to religion—is relatively silent on the matter of religious authority. Neither Warner’s (1993) initial assessment of the new literature nor Iannaccone’s (1998) review article nor Witham’s (2010) recent trade book offer any meaningful discussion of religious authority. Stark and Finke (2000), perhaps the most comprehensive, unified presentation of a rational choice approach to religion, discuss the relationship between growth and centralization of religious authority, but they do not address fundamental questions about the nature, definition, purpose, or origins of authority in religious groups.

This gap in the rational choice literature on religion is notable for multiple reasons. First, it leaves the impression that rational choice methodology has little to say about this significant aspect of religion. If true, the new paradigm’s claim to be a comprehensive approach to the study of religion would be severely weakened. Yet, there is an existing rational choice literature on authority, and this literature has just not yet been applied to the context of religion. A primary purpose of this article is to provide this application. Second, the gap also indicates that potential synergies with non-rational-choice literatures on authority may exist but have been unexplored. Another purpose of this article is to show how the rational choice theory of religion can, in fact, complement other non-rational-choice literatures. I demonstrate one such complementarity with Chaves’ (1994) influential work on secularization as a decline in religious authority. Finally, addressing this gap has the potential to yield new insights into our more general understanding of religion. I will identify two concrete insights that follow from the approach developed here—the first connecting authority to the important role of collective production in religious groups, the second relating authority and strictness. As seen throughout the article, the approach used herein will lend itself more to explanation to prediction.

This article address the following specific questions: What is a rational choice theory of religious authority? Why is authority so important in religion? What insights into religion does this new understanding of religious authority generate? To address these questions, I first present the basic economic theory of authority as developed in previous work and then define the corresponding analogue for religious authority. The key insight is that authority solves problems of social coordination by creating shared expectations among different actors; the rational choice theory of religious authority developed here is thus an application and extension of ideas from the existing literature to the religious setting. I review various kinds of coordination
problems faced by religious group to demonstrate that authority is important to religious groups and communities because they have many coordination problems to solve. I finally examine three cases to demonstrate how the theory provides new insights into these contexts and to spark future research.

There is a large and distinguished literature on authority. The key questions in this literature are what is authority and in what is it grounded? Although exact definitions have shifted over time, the answer to the first question typically involves reference to a social arrangement with sufficient consensus to provide norms or persons with meaning and force. Some authors stress a difference between coercive and persuasive power, the idea being that once coercion or persuasion is used, authority alone is not in operation (Arendt, 1958). The understanding of the sources of authority has shifted more dramatically than the definition because this understanding is informed by the particular social and historical setting. As demonstrated by Furedi (2013), authority in Ancient Rome was rooted in the custom and tradition intended to provide political and cultural stability; a separation between religious and non-religious sources of authority arose and was contested during the Middle Ages and the Reformation; and modern thinkers have sought new ways to ground authority, such as democratic consent, science, or bureaucratic structures, that do not rely on the importance of custom and tradition assumed in times past. Weber’s (1922 [1968]) classic treatment defines authority as the “probability that certain specific commands (or all commands) will be obeyed by a given group of persons,” and that authority is rooted in bureaucratic rationality, tradition, or charisma. Although understanding authority was a primary concern of the founding figures of the field of sociology such as Durkeim, Parsons, and Weber, Weber’s treatment has remained seminal in part because it was one of the last rigorous attempts to construct a theory of authority, and it does so despite a variety of criticisms (Blau, 1963). After World War II, much effort was given to understanding the psychological traits associated with following authority figures (Milgram, 1974).

Coleman (1990) provides the seminal rational choice theory of authority in the sociological tradition. He defines authority as the socially recognized right to direct action and focuses heavily on a subordinate’s incentive to vest rights of control in a superordinate. Importantly, Coleman identifies an alignment of interests—what game theorists would denote a coordination setting—as a precondition for the vesting of authority, yet his analysis does not incorporate key insights from the game theory literature on coordination problems. Other attempts, independent of Coleman, to develop the rational choice theory of authority have drawn heavily, both conceptually and technically, from game theory. Recent work examines authority directly (e.g. Mailath et al., 2001, 2007) or obliquely in specific form of leadership (e.g.
McBride, 1992, 1995; Foss, 1999; King et al., 2009; Wilson and Rhodes, 1997), yet many of the relevant, fundamental insights go back many decades to Schelling (1960 [1980], 1978 [2006]) and Lewis (1969 [2002]). In short, the theoretical and experimental research establishes that the key to successful social coordination is to create shared expectations among actors, and actors, rules, and norms are given authority because doing so facilitates the creation of the shared expectations needed for successful coordination (e.g. Bicchieri, 1993; Camerer, 2003; Foss, 2001). I draw directly from this work and apply it to the context of religion.

The foundational basis for many authoritative claims can be found in religious teachings and doctrines, and religious leaders in both the past and present have appealed to divine sanction as legitimizing their claims to authority. What makes authority religious is the resort to the supernatural or ultimate meaning. However, this special feature of religious authority is not necessarily considered to make religious authority fundamentally different from non-religious authority. In Weber’s view of authority, religious prophets are prime examples of charismatic authority, but charismatic authority is not limited to religious settings and can be found in secular leaders; similarly, legal-rational authority is to be found in both secular and religious settings. Many examinations of religious authority thus draw from pre-existing theories of authority and apply them to religious settings (e.g. Bartholomew, 1981; Hammond et al., 1978; Harrison, 1959) rather than formulating a fundamentally different theory of authority.¹ Because these examinations have not used the rational choice approach, this literature has not fully leveraged the insights of modern game theory. Game theory has taught us many lessons about how groups can confront free-rider problems and how individuals and groups can resolve these problems, and authority, as I discuss later in the article, plays a fundamental role in this endeavor. I will demonstrate that authority is of central importance in religious groups in part because of its ability to solve the kinds of collective action problems faced by religious groups. These collective action problems have been previously acknowledged (Iannaccone, 1998), but the role of authority in resolving the religious collective action problems has not. Just as prior literature has drawn from existing theories of authority to study religious groups, I will draw from existing rational choice theory of authority to study religious groups.²

My analysis should also be compared and contrasted with the multi-disciplinary research on religion and cooperation. The ability of religion to foster in-group cooperation is seen by some as the main driving factor in the origins of religion (e.g. Steadman and Palmer, 2008; Wilson, 2002). Other research on the evolution of cooperation more generally shows how morality and cooperation evolve together (e.g. Bowles and Gintis, 2011; Gintis...
et al., 2005); religion has not always been evoked in this literature, but the connections between morality and religion are immediate and obvious. Yet, the production of specifically religious goods, as opposed to the more generic promotion of cooperation, is often a collective matter, and resolving the free-rider problem is seen as the fundamental hurdle to overcome in providing those religious goods (e.g. Iannaccone, 1992, 1994; McBride, 2007). A literature has developed that tests different implications of this theory (i.e. Aimone et al., 2013; Berman, 2000; Olson and Perl, 2005). This article differs in emphasizing the importance of coordination in religious groups. Indeed, the connection between coordination and authority is largely ignored in the rational choice literature on religion. A recent exception is Iannaccone et al. (2011), although their objective is to look at the location of sacred spaces rather than to develop a theory of authority.

A few final notes deserve mention. The rational choice theory of authority views authority as a social phenomenon rather than a psychological or theological one. The definition used here and inspired by Coleman (1990) identifies authority with a coherence in many people’s expectations rather than personality or psychological traits (e.g. Adorno et al., 1950; Altemeyer, 1981). It also differs from theological perceptions about the nature of deity (e.g. Froese and Bader, 2010) because authority exists when social actors agree about the identity of the device that has the right to direct action. Finally, the concept of authority here can be distinguished from power, the latter being the capability to achieve ends. A person might have power but not authority, for example. I focus solely on authority and leave the connections between authority and power for future work.

The economic theory of authority

The rational choice theory of authority posits that authority is rooted in economic problems of coordination as understood by application of game theory. A “game” is here defined as an interactive decision setting with multiple agents, each with clearly articulated possible actions and preferences over the possible outcomes resulting from different action combinations. Simple, game-theoretic, coordination games are used here to illustrate the deeper issues.

Consider a very simple coordination problem in which two actors only succeed in collective production if their actions are appropriately aligned. Figure 1 depicts a number of stylized, two-player coordination games. Column (a) depicts three of what I call focal action games in which successful coordination occurs if both actors choose the same action; focal here means same action. The Pure Coordination Game (i) is called “pure” because there is no asymmetry in payoffs; the actors do not prefer one coordinated
action over another, and either form of coordination is equally preferred. Such may be the case if the actors are choosing at which intersection to meet for lunch, and they do not care at which intersection to meet other than that they meet each other. In the Hi-Lo Coordination Game (ii), one coordinated action is better for both. In the Impure Coordination Game (iii), also called the Battle of the Sexes Game, each actor has a different coordination that is most preferred.

In column (b) are examples of a different kind of coordination problem, what I call a distributed action game. Now, the actors successfully coordinated only if they choose different actions, that is, if their actions are distributed accurately. The Pure Distributed Action Game (i) is perfectly symmetric. For example, consider a pot-luck dinner that succeeds if and only if one actor brings a main course and the other brings a dessert, but it does not matter which actor brings which item. In the Hi-Lo version (ii), one

### Figure 1. Simple 2 × 2 coordination games: (a) focal action games and (b) distributed action games.

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way of distributing actions is Pareto optimal, which could happen if, say, both actors prefer that 1 brings dessert (item B). In the Impure version (iii), each actor prefers to be the one that brings item B. The distinction between focal action games and distributed action is merely for exposition; such games are mathematically equivalent. For example, the pure games in (a)-(i) and (b)-(i) are equivalent with a relabeling of actions (see discussion in Lewis (1969 [2002])).

A fundamental feature of a coordination game is that it has a multiplicity of equilibria, that is, it has multiple behavioral profiles in which no actor wants to deviate given what the other actors are doing. Such equilibrium profiles interest rational choice theorists because they represent stable behavioral patterns. In each of the focal action games in Figure 1, there are two equilibria designated by *: (A,A) and (B,B). If the other player chooses A, then you want to choose A. The distributed action games in Figure 1 also have multiple equilibria: (A,B) and (B,A).

Because a coordination game suffers from a multiplicity of equilibria, the problem of selecting which among them to play is the fundamental concern for the actors; indeed, this is what constitutes the problem of coordination. Standard game-theoretic solution concepts will generally not select one equilibrium over another. A large literature establishes that the key to resolving coordination problems is to create “common knowledge” or “shared beliefs” among the actors about what each other will do (see Chapter 7 in Camerer, 2003). For example, in a pure coordination game, if 1 and 2 both believe each other plays B, then each has an incentive to also choose B, and successful coordination on B will occur. The same logic holds true for other focal action games and for distributed action games. Technically speaking, common knowledge exists when both actors know what the other will do, both know that both know what the other will do, both know that both know that both know what the other will do, and so on. In short, actors must have mutually accurate beliefs about what others will do.

In the simplest coordination settings, agreement through verbal or written deliberation may be sufficient to generate a shared belief about what others will do. For example, actors 1 and 2 get together to discuss their options. One of them then proposes to the other which way to coordinate, further discussion continues until they verbally agree to select a particular way to coordinate, and then they choose their actions after their discussion has reached some element of agreement about what to do. With a small number of people and only a few relevant possible actions, such deliberation can be very effective even without any formal mechanism for enforcing their agreement, as we see when two friends easily determine via communication where they will meet to eat lunch together.
However, if there are a large number of actors, imperfectly aligned preferences, costly communication, or some degree of uncertainty about the exact nature of the coordination problem, actors often resort to more sophisticated social devices in order to create common knowledge. These devices can be categorized by their level of formality. Formal social devices include explicitly designated leaders and codified rules and policies. Informal social devices include conventions, traditions, and social norms. These devices function to align expectations. For example, the coach of a sports team selects and publicly announces the play to the players on the team, thereby creating a common belief among the players about what each other will do, or a social norm to shake hands creates a common belief among acquaintances that shaking hands upon meeting is the appropriate way to show respect and friendliness. By aligning expectations, the actors can undertake their actions with greater confidence and greater chance of successful coordination.

Observe that the coordinating device does not choose for the actor but rather directs the action of the actors by suggesting, proposing, or instructing actions, thereby creating expectations about what others will do. When the device is commonly recognized as having the right to direct action, we say that that device has authority; specifically, as defined by Coleman, authority is the right to direct action. The actual making of actions is inalienable (not tradable), but an actor can allow a device, be it a person or a rule of thumb, to suggest her action. A right is a commonly recognized, social agreement about who or what is allowed to do or control something (Coleman, 1990). Hence, the device has authority when the actors commonly agree that it has the right to direct action.

To say that a device has a right implies that there is a consensus (Coleman, 1990). However, this consensus does not imply a lack of any tension or conflict. An actor may dislike how another actor uses her right while simultaneously acknowledging that the other actor has the right, and actors may also disagree on who ought to have the right while agreeing on who currently has the right. But the existence of a right, by definition, implies that there exists a sufficient level of agreement among the actors about the possessor of the right. The right may be held by an individual, such as a judge or company president, or it may be held by a community, as in the case of a social norm.

The rights associated with authority are effective precisely because they solve coordination problems; that is, actors grant authority because authority solves coordination problems. If a device, be it a person or an actor, has authority, then by definition that device is focally identified as the means by which actions are directed. Due to the aligned preferences inherent in coordination games, agreement that others follow the device’s recommendation
is enough to generate compliant behavior in coordination games. Thus, we see why authority is associated with coordination games. Yet, authority is related to coordination in another way: the selection of an authority device is itself a second-order coordination problem in which actors must agree on the device that directs action. This second-order coordination problem will be considered in more detail below when discussing ritual.

Religious authority can now be defined. I offer two possible definitions, and as will be apparent below, either one can be appropriate depending on the setting:

**Definition 1.** Religious authority is the right to direct action that is justified by reference to the supernatural.

This substantive definition draws inspiration from Chaves (1994):

a religious authority structure is a social structure that attempts to enforce its order and reach its ends by controlling the access of individuals to some desired goods, where the legitimation of that control includes some supernatural component, however weak.

However, my definition references a right to direct action rather than a social structure.

Yet, reference to the supernatural is not necessary for much of our analysis, and an alternate definition can also work:

**Definition 2.** Religious authority is the right to direct action within a religious community or group.

This latter definition does not rely on reference to the supernatural, but can instead use whatever is the preferred definition of religion. Notice that a formal, organized religion is not required because the definition is broad enough to apply to many kinds of collective action scenarios. I do not take a strong stand on the overall value of one definition over the other but allow for each to be appropriate given the particular application.

Non-rational choice notions of authority may acknowledge the coordinating role of authority even if not explicitly accounting for the technical characteristics that the rational choice theory emphasizes. Simon (1948), for example, posits that the key purpose of authority is to “assure a unity of action” among a multitude of persons (p. 5), thus connecting assurance (common expectations) with unification (coordination) in behavior. The rational choice theory agrees with Simon but with further clarification: it is coordination games, not just any social interaction, that such unity of action
in possible, and assurance is critical in such games. However, the notion of authority in the Western intellectual tradition has traditionally meant something more specific. Arendt (1958) explains that the notion of authority in past centuries distinguished between authority and coercive power and between authority and persuasion. If coercive power is used, then in her view authority has failed; if persuasion is necessary, then again authority has failed. This particular notion of authority thus exists in conjunction with its own socially recognized basis for obedience, such as an appeal to tradition, without recourse to threats or convincing. The rational choice notion of authority does not entail these restrictions because a coercive or persuasive agent can still have authority as long as there is consensus that the authority is directing action.

This abstraction from historical context also distinguishes rational choice theory from Weber’s depiction of authority, still the most influential depiction of authority today (Furedi, 2013). Weber’s distinction between three sources of authority—charisma, tradition, and rational-legal—is not important in the rational choice theory because all three of Weber’s types of authority may occur in social coordination settings. The different sources may be understood in the rational choice perspective as merely reflecting different focal devices that serve coordinate expectations and actions. For example, the formal policies and procedures of a rationalized, bureaucratic organization provide a common point of reference for guiding and directing behavior while a charismatic leader is another focal point of reference. Indeed, there is lack of agreement in the literature about whether or not charisma is a characteristic of the leader or instead a feature of the relationship between leader and follower, thus suggesting that the charismatic leader’s traits may not in and of themselves be the key to his or her success. A rational choice approach does not rule out the former but also accommodates the latter because authority arises in settings where there is sufficient consensus for action to be directed. In this regard, the rational choice approach to understanding authority is more abstract and removed from historical context.

Coordination in religion

We can now answer the second question: authority is important in religion because religious groups must solve a number of coordination problems. I here argue that religious coordination problems are pervasive and fundamental, thus revealing why religious authority will be essential to the successful provision of religious collective goods. I also explain how coordination is closely related to the problem of cooperation, which is considered by the literature to be the primary group concern.
Inherent coordination problems

One class of coordination problems that religious authority solves are collective action scenarios that can be called *inherent coordination problems*. Many of these problems are faced by any organization, be it religious or secular. Common examples of such problems faced by religious groups include the planning and carrying out of regular religious services or other social activities (distributed action), the allocation of congregational funds (distributed action), and deciding which ministry or other outreach activity for the congregation to focus efforts (focal action). Even something as mundane as deciding where to construct a church building is a kind of focal action coordination problem, both for the direction of resources toward construction and for the creation of a focal location for religious community members to gather for worship.

Consider the following tasks to be done to carry out a typical Protestant Sunday service: the building must be unlocked; electronic equipment must be turned on and tested; hymns must be selected; ritual objects must be displayed; bulletins must be distributed; a sermon must be prepared and delivered; trash must be picked up and disposed; and so on. The quality of the service depends in part on these tasks being accomplished. In general, any undertaking that involves the bringing together of resources, the selection of how to direct those resources, and the carrying out plans to complete the undertaking involves a number of focal action and distributed action problems, and these problems are solved by devices with authority, both formal and informal. Formally designated religious leaders prepare sermons, select projects to receive funding, and enlist help in cleaning church buildings, and formally instituted denominational policies guide funding decisions. Informal norms may also guide behavior, such as the taking of turns for picking up trash after the service. These organizational efforts may entail large-scale coordination.

Of course, it is not the mundane organizational coordination that makes religious authority interesting but rather the coordination related to more distinctive features of religious groups. If we define an identity as a collection of norms and doctrines (e.g. drawing from Akerlof and Kranton, 2010), then one of the most important coordination problems to be solved by a religious community is the selection of doctrines and norms that together constitute its identity. There are many possible religious identities that a community could have, and for the members of the community to have a high degree of unity, they must all agree on what constitutes that identity. For example, with Protestant Christianity alone, groups must decide whether to treat the Apocrypha as canon, whether to emphasize Jesus as Savior from sin or as moral teacher, whether baptism is essential for group membership,
whether grace enables belief or good works or both, what to teach as the conditions for afterlife communion with God, how to structure Church organization, whether to accept as valid the rites of other denominations, and so on. These decisions about congregational teachings and practices may be made less frequently than day-to-day operational activities, and decisions made about them may be less than deliberate but instead emerge or be inherited within their religious traditions. Yet, groups do periodically confront them, as is the case in many churches currently determining the role and status of same-sex marriage within their religious practices.

Because there are many possible combinations of factors that make up a religious identity, selecting an identity is a kind of focal action coordination problem. This problem often finds its resolution via an authoritative device. The exact devices used to solve these problems of religious identity formation may differ from those used to solve the day-to-day problems of running a well-established religious congregation, but like for the day-to-day problems, the larger issues of identity must also be solved by appropriate creation of common expectations. Charismatic leaders of new religious movements define and promote new identities. Official proclamations, creeds, or other statements can serve a similar function for established religious groups. Both leaders and official statements exercise authority by creating a focal point in the identity. A shared understanding of the identity creates a coordinated unity in action among community members. Yet, identity is not always under the complete control of formal authority devices. Many norms are less formal but still important to the group. For example, some groups such as Hasidic Jews or Amish have strict dress standards, and these standards may vary in their level of officialness.

Dress standards and other highly visible components of a group’s identity are interesting for another reason. In addition to constituting part of a religious group’s identity, style of dress may also constitute a method of signaling group membership. This distinction between identity and signal is subtle but important. Some norms or teachings may not be visible to non-group members in many social interactions but yet still be a part of the group’s identity. Telling jokes about their love of coffee, lack of certainty about religious beliefs, or love for debate is part of the Unitarian Universalist identity but is not a boundary marker apparent to outsiders. Other elements of a group identity publicly communicate group membership and signal commitment to the group while also constituting part of the group identity. Such is the case with the dress code for different forms of Islam. The major Sunni forms of practice require that the entire body of the women (except face and hands) be covered, which serves as a visible marker of the woman’s compliance with group rules. This marker creates a visible boundary between membership and non-membership.
As made clear by Lewis (1969 [2002]) in his early work on coordination games, the creation of meaning through action constitutes a coordination game because the meaning can only be conveyed if all parties agree on what the action is meant to convey. Distinctive group markers such as hairstyle and outward dress appearance, particularly when those markers set one apart from most others in the community, constitute meaningful signals. An example is the wearing of a turban by a Sikh man during humid summer months in Florida. The selection of these markers and the creation of meaning attached to those markers is a coordination problem because there are many possible markers of group membership and different possible meanings. For example, the hijab is just one of many possible ways to signal commitment to Islam and female modesty; the dress code for Hassidic women, though different, serves a similar purpose. The selection of a group’s marker may be guided by leaders or sacred texts or may emerge via the decentralized actions of community members. Either way, authority is involved in the selection of markers and the creation of this meaning about those markers.

Religious authority is also associated with the conveying of other kinds of religious meaning. Religious symbols (e.g. crosses), objects (e.g. scrolls), and ritual acts (some aspects of rituals are discussed in greater detail in section “Applying the theory”) serve to communicate important ideas and reinforce identity. For these symbols and symbolic acts to have meaning, there must be convergence in understanding about that very meaning. Again, this coordination occurs within communities via decentralized emergence of authoritative norms or from explicit and intentional decisions made by authoritative leaders.

Derived coordination problems

Other collective action problems common to religious groups may not be inherently ones of coordination but may be derived coordination problems. A particularly important class of derived coordination problems are connected to social dilemmas such as public good or prisoner’s dilemma scenarios. As mentioned earlier, the prominent attempts to understand the supply of religious goods and services depict religious group production as the production of non-rivalrous but excludable club goods, and the free-rider problem is the key organizational concern due to positive externalities in group production (e.g. Iannaccone, 1992; McBride, 2007). I now consider three ways in which social dilemmas are converted into coordination games, thus demonstrating how the conversion of social dilemmas into coordination problems is a primary way to address the free-rider problem.
Other-regarding preferences. A large literature has developed across disciplines which recognizes the importance of other-regarding sentiments (e.g. Gintis et al., 2005), and there are compelling arguments for why humans evolved such preferences (e.g. Bowles and Gintis, 2011). This literature is important for understanding religious authority for at least two reasons. First, a wide body of evidence suggests that such preferences reflect actual human preferences more closely than purely selfish ones. Second, such preferences imply that social interactions that appear to be social dilemmas may actually be coordination games. This insight is widely understood, but its implications for understanding behavior in religious groups have not been examined in detail, so I review the insight here.

Figure 2(a) depicts a two-person social dilemma (prisoner’s dilemma) in which each actor is a selfish type of actor. The utility values in the matrix match one-for-one with, say, the actor’s own monetary payoff. The interaction of these two types constitutes a social dilemma (here, a prisoner’s dilemma), and the unique Nash Equilibrium has both actors choose to defect (D) rather than cooperation (C). Now suppose another type of actor cares equally about both her own money payoff and about the money of the other actor. For lack of a better term, we may call this an altruistic type because she cares equally about all actors (including herself). The utility values in the matrix in Figure 2(b) with two altruistic types now have each actor’s utility equal to the sum of her own payoff and the other’s payoff. Importantly, we see that the social interaction is no longer a social dilemma but rather a
Hi-Lo coordination game with two equilibrium: (C,C) and (D,D). Figure 2(c) depicts another variation. Suppose a player has a preference for collective norm following, that is, she receives an added boost to her utility of 2 when both parties follow a cooperative norm (see Bicchieri, 2006). With these norm-conditional preferences, the social dilemma is again converted into a coordination game.

As these examples illustrate, with utility functions inspired by evolutionary arguments, some social interactions that appear to be social dilemmas may instead be coordination games, thus creating a scope for authority to facilitate collective action. Indeed, we might very well expect such to be the case in many religious groups where participants’ preferences have been shaped intentionally to incorporate other-regarding motivations. Most religious groups promote such other-regarding norms in some version of the Golden Rule, the maxim which suggests treating others as you prefer to be treated. Although the exact intent varies across cultural context, there is enough commonality to meaningfully speak of the Golden Rule as a principle universal across the most world religions, including Hinduism, Islam, Christianity, and Judaism (Wattles, 1996). The internalization of the Golden Rule converts many social dilemmas into coordination games while simultaneously suggesting how to act in that coordination game. Thus, as an authoritative norm, the Golden rule, if followed, converts interactions from social dilemmas into coordination games while also providing a focal action for that newly derived coordination game.

**Screening.** One method of confronting the free-rider problem that has received much attention in the economics of religion literature is that the religious group can raise the cost of membership to screen out those more likely to free-ride, thereby obtaining a membership of highly devout contributors (Iannaccone, 1992, 1994). I here draw explicitly from the appendix of Iannaccone’s (1994) seminal paper. Suppose there are multiple types of actors, some less committed than others. A group with only less-committed (weak) members is depicted in Figure 3(a). Each can cooperate (C) or defect (D) with associated social dilemma (prisoner’s dilemma) payoffs. The free-rider problem dominates, leading to a unique Nash Equilibrium of defection (D,D) wherein each weak player received payoff 2. A strong group with only committed types is depicted in Figure 3(b). Committed types are distinguished by their stronger preferences for both participation in the group and for successful cooperation (6 is 2 higher than 4 for strong types, whereas 3 is only 1 higher than 2 for weak types). As just discussed earlier, this synergy created among committed types converts the collective action problem into a Hi-Lo coordination problem with two Nash Equilibrium of (C,C) and
so that reciprocated cooperation and reciprocated defection are each an equilibrium.

Iannaccone does not examine how the strong group coordinates on (C,C) because he is interested in the problem of preventing invasion in the strong group by weak actors. Production within a group with both types would again face the social dilemma logic as depicted in Figure 2(c). Because the weak type will defect, the strong type will reciprocate with defection. The unique Nash Equilibrium of (D,D) yields utility payoffs of 4 for the committed type and 2 for the selfish type. However, by requiring some costly but observable stigma-generating action that has cost 1 in utility, the social dilemma becomes that depicted in Figure 2(d). The unique Nash Equilibrium is again (D,D) for the same logic, but the payoffs are now 3 for the committed type and 1 for the selfish type. Importantly, the selfish type would now rather be in a group of only selfish types to get payoff 2 than in the mixed group with payoff 1. The strong group can thus retain high cooperation by the costly screening of weak types combined with successful post-screening coordination (Figure 2(e)).

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Figure 3. Social dilemmas: (a) social dilemma selfish types, (b) coordination game committed types, (c) social dilemma with mixed types, (d) social dilemma with membership cost, and (e) committed types with membership cost.
This key insight about the screening role of stigmas is an important one in the rational choice literature. However, Iannaccone’s original theory is ultimately incomplete for two reasons. First, it does not provide any explanation for how the group successfully coordinates after successful screening (i.e. in the game in Figure 2(e)). Authoritative leaders, rules, and norms can provide the kind of shared expectations necessary for coordination. Second, there is an additional, second-order, coordination problem. As explained in the earlier discussion on religious identity and signals of commitment, there are many behaviors that can signal group membership. Each of these will have with it an associated level of resulting stigma; some may produce cost 1, others may produce cost 0, and still others may, in principle, produce almost any other possible cost. The selection of the group’s marker is itself an inherent, focal action coordination problem. Again, authoritative leaders, rules, and norms can provide the means for selecting the behavior that constitutes the boundary marker on which screening takes place. Importantly, this analysis reveals that the logic of the well-known stigma-screening theory is bracketed on both sides—before and after—by coordination problems. The effectiveness of strictness as a way to generate strength in religious groups necessitates successful coordination. Religious authority can foster this coordination, thus serving an important role in the boundary maintenance of religious communities.

**Repetition.** The most well-known manner in which a social dilemma is converted into a coordination game is by fostering repeated interaction between the actors. The Folk Theorem establishes that with sufficiently high discount factors in an infinitely repeated game, there exists an equilibrium in which individually rational and feasible payoff profile can be sustained (Fudenberg and Tirole, 1996). The intuition is that players can use history-dependent strategies to punish players in the future for not cooperating in the present. These strategies act to convert the social dilemma stage game into a larger supergame that has coordination game properties.

Figure 4(a) displays the one-shot social dilemma from Figure 2(a). Figure 4(b) displays a reduced version of the much larger, infinitely repeated version of the game from Figure 4(a). In actuality, the infinite repetition allows for a large number of new strategies, but I only list three—always cooperate (C), always defect (D), and Grim Trigger (Grim)—because such is sufficient to illustrate the logic. Under Grim Trigger, an actor cooperates in the first period, cooperates in any period thereafter if the other actor has always cooperated up to the period, but defects thereafter if the other actor ever defected. The numbers in Figure 4(b) now represent the average utility in the game when the corresponding strategies are played. The number 3+ means that the player gets a payoff slightly larger than 3, and 3− means that the player gets a payoff slightly smaller than 3. Defecting each period is an
equilibrium in the repeated setting just as in the one-shot interaction, but now each playing Grim Trigger is also an equilibrium in the repeated setting. Moreover, when each plays Grim Trigger, we observe continual cooperative behavior with much higher payoffs than in the other equilibrium. Repetition thus allows the actors to convert the social dilemma into a form of Hi-Lo coordination game.

This fact about repetition has direct relevance for religious groups. Religious groups are long-lived entities with actors engaged in repeated interaction, and the literature has ignored the coordination problems that arise when the members of the religious group engage in repeated interaction. Because there are many possible payoff profiles that can be sustained, in this repeated context there is a role a leader with authority to select which equilibrium punishment strategy to coordinate on. Religious groups facing repeated free-rider problems can and have used threats of punishment, such as shunning, ostracizing, removal of fellowship, or excommunication, to enforce cooperative behavior in repeated settings. Such punishments can be found in various forms in Christianity, Judaism, Bahai, and other traditions. These forms of punishments found in religions may be some of the best examples of coordinated Grim Trigger strategies seen in the real world. The shunning that occurs in Amish communities is a salient example as all members of the community socially exclude the offender. Because there are many different ways that these punishments may be implemented, the members of the community must coordinate on their implementation of the strategy for the free-rider problem to be overcome. The community rules and norms provide the mechanism for coordinating on the punishment, thereby making the punishment threat more salient, which in turn leads to a lower frequency of offending behavior. Given the multiplicity of possible punishments, the authority of the rules and leaders is crucial in making this coordinated social action happen.

![Figure 4. Social dilemmas and repetition: (a) social dilemma played once and (b) infinitely repeated social dilemma.](image-url)
Applying the theory

I now apply this theory of religious authority to three commonly studied aspects of religion. My purpose is not to fully develop these applications but rather to demonstrate how the theory may be applied to produce new insights or add conceptual clarity.

Public rituals

By definition, authority only exists when there is common agreement that the device (leader, norm, etc.) has the right to direct action. However, there will generally exist many different devices that could be given authority, so for authority to exist, there must be a shared belief about which device has authority. As mentioned earlier, this selection of the authority device is itself a coordination problem. It is appropriate to call this coordination on the authority device a second-order coordination problem because it is coordination on the identity of the device that directs action in the first-order coordination problem.

This idea has been explored in what is called the Leadership Game (e.g. King et al., 2009). Consider the Battle of the Sexes game in Figure 1(a)-(iii). If actor 1 tries to lead and 2 agrees to follow, then 1 will select coordination on A, and successful coordination occurs as both follow 1’s directive. If 2 leads and 1 follows, then by similar logic they coordinate on B. However, if both try to lead, then conflict ensues, and if neither leads, then they are back at their original problem. The selection of the leader can thus be depicted as the distributed action game in Figure 1(b)-(iii) where choice A now means “try to lead” and choice B means “follow the other.” Although the name “Leadership Game” connotes the selection of a formal leader, note that the same second-order coordination must occur for other authority devices including informal rules and norms.

Researchers have identified many features and facets of ritual (e.g. Bell, 2009; Bradshaw and Melloh, 2007; Grimes, 2013), yet a novel argument by Chwe (2001) is that public rituals function to create the shared expectations that foster coordination. Although the Leadership Game is not his primary interest, his argument applies directly. Public rituals, by virtue of being public, create a commonly shared experience and common knowledge of the event, and they can thus be used to create the shared expectations needed for resolving coordination problems. Chwe draws from the humanistic and anthropological literature to show how features of many kinds of rituals, such as repetitive language, organized sequencing of ritual actions, and the layout of ritual space, serve to facilitate the creation of common knowledge among participants. This logic is highly pertinent for my purposes here as it
demonstrates that public rituals serve a function tied directly to authority. Specifically, public religious rituals can create authority by creating shared expectations about coordination in the Leadership Game. I do not claim that all rituals do this, but merely that some public rituals do, as the examples below demonstrate.

Many public religious rituals accomplish this coordination explicitly to resolve the Leadership Game. For example, many religious groups have special public rituals when new leaders begin office. This is true for leaders of large denominations, such as the Pope’s inauguration or the Anglican Archbishop’s enthronement. Both occur in front of large audiences, often with spectators encircling the newly identified leader. The circle structure, Chwe explains, fosters the creation of a shared belief because each person in the circle sees the others also witness the ritual, thus creating a shared belief among the spectators that all acknowledge the leader’s identity. Similar inaugurations also occur at congregational levels. The inauguration of a Reform Jewish rabbi and the sustaining of a Mormon bishop both occur publicly in front of the entire congregation. According to this theory of authority, authority is created during these rituals because the ritual creates a shared expectation that adherents accept the new leader’s right to direct action.

By similar logic, many public religious rituals create or enhance the authority of social norms. An example is the baptism of adults in Christian religious groups. Baptism is understood by many Christian groups to be a public display of a person’s repentance and commitment to follow the norms of the religious group. During the public ritual, the person being baptized publicly acknowledges her commitment, and both the person being baptized and the observers create and reinforce a common belief that the norms associated with Christian life have the right to direct action. The public ritual reaffirms and creates a common belief about appropriate behavior. In some religious groups, the baptism is even accompanied by an explicit, verbal, and publicly expressed vow of commitment to the new rules of Christian discipleship. Baptism thus serves to reinforce the authority of the group norms. Of course, rituals may serve many other functions, but as illustrated here, public rituals provide a means of creating and reinforcing the role of authority in religious groups by the way in which they create shared expectations.

Measuring authority and its relationship to hierarchy and strictness

To consider the relationship between authority and hierarchy and between authority and strictness, it will be useful to think of ways to conceptualize the
measurement of authority. Two immediate possibilities are considering authority at both extensive and intensive margins. The extensive margin would here refer to the number of actors in the community that agree on the authoritativeness of the community’s devices, that is, the number of actors whose actions are directed by the devices. Adding members to that community would, all else equal, increase the authoritativeness of the community’s devices. The intensive margin would refer to the number of actions directed for each actor in that community, that is, the number of an actor’s actions directed by the devices. While holding the size of the community fixed, if a device previously directing \( x \) actions now directs \( x + 1 \) actions, then, all else constant, then the authority has increased on the intensive margin.

Consider the CEO of a medium-sized corporation. Her authority may be more extensive and more intensive than a desk clerk employed in the company, more extensive but less intensive than a parent with two children, less extensive but more intensive than the authority of the US President, and less extensive and less intensive than a General in the US Army. Because this typology yields only a partial ordering, it may be difficult to compare the authoritativeness of devices across communities. However, a few examples are sufficient to show how we may think of the relationship between authority and hierarchy and between authority and religious strictness.

Authority as defined here can exist independently of organizational hierarchy. A distinction between authority and levels of hierarchy is evident in Weber’s classification: legal-rational authority has strong ties to bureaucracy and multi-level hierarchical structure, while charismatic can exist largely outside of vertical hierarchy, and traditional authority may exist within more complex patrimonial networks (Weber, 1922 [1968]). It is in principle possible for one instance of legal-rational authority to be stronger than an instance of charismatic authority (e.g. the US President may have more authority than a popular radio talk show host), while another instance of legal-rational authority is weaker than another instance of charismatic authority (e.g. the director of janitors in a large office building may have less authority than that same popular talk show host).

As with Weber, the rational choice notion of authority does not imply a simple, monotonic relationship between religious authority and organization hierarchy. The Pope, the leader of the multi-level hierarchical Roman Catholic Church, may have more authority than the Chief Governance Office of the less hierarchical Unitarian Universalist Association, and the Roman Catholic Church’s hierarchy may be relevant in this comparison as the hierarchy facilitates the directing of more actors and actions by the Pope. However, a local Catholic priest has less authority than the Amish Ordnung, the strict set of rules that govern private, public, and religious life.
within an Amish district. In fact, the Amish have very little hierarchy, but
the rules of the district carry tremendous weight and direct many aspects of
an Amish person’s life. Authority is very intensive in Amish communities
but is not hierarchically based.

An obvious conjecture is that organizational hierarchy is correlated with
extensive authority because organizational hierarchy is necessary for the
management of large member bodies. However, there is no obvious conjec-
ture about the relationship between organizational hierarchy and intensive
authority. Some hierarchy may be needed to implement and sustain a small
degree of authority, but because authority often resides within the commu-
nity rather than leaders in small-scale communities and societies, strong
forms of intensive authority in the form of strict social norms can be highly
effective even with very limited hierarchy, as is the case with the Amish.

A prediction about the relationship between religious authority and
religious strictness is easier to identify. According to Kelley (1986), reli-
gious strictness is typified by absolutism, fanaticism, and conformity, and
it is this latter characteristic that implies that stricter churches are more
authoritarian. I here argue that this relationship between strictness and
authority is not merely definitional but reflects a reinforcing relationship
between authority and strictness. The logic behind this argument draws
heavily from my earlier discussion about screening. Indeed, Iannaccone
(1992, 1994) drew the connection between strictness and screening by
recognizing that many elements of religious strictness raise the cost of
outside activities, thereby making particular strict, behavioral demands
effective ways of screening.

My first claim is that authority is a necessary precondition for strictness.
As evidenced by the many, quite different, highly strict groups, there are
many different possible combinations of strict rules and codes of conduct
that a religious group may maintain. Before a particular combination can be
used by a community, there must be sufficient agreement about which com-
bination of rules is authoritative for the community. In other words, for
strictness to exist in a community, there must first arise some coordination
on the rules of the group. Thus, for the rules to have effect, they must be
authoritative, that is, without the authority of these rules, there cannot be
religious strictness. Authority is necessary for strictness.

But a second claim is that strictness also implies more scope for authority
to direct action. According to the screening theory, strictness separates highly
committed types from the free-riding less-committed types, and these more
committed types devote more time, money, energy, and other resources to
the group. Stricter groups thus have more resources and actions that can be
directed by authoritative devices, so their authoritative devices have larger
intensive authority. The greater conformity observed in stricter groups is
evidence of this connection between strictness and authority because the group members are willing to contribute more in resources, thus allowing more of their actions to be directed. To summarize, authority is necessary for strictness, but it is also enhanced by strictness; authority and strictness reinforce each other.

**Secularization**

No topic is more emblematic of the diverse assessment of the rational choice literature on religion than the topic of secularization. Vocal proponents of rational choice methodology have adamantly claimed the death of secularization—“Secularization, R.I.P” (see Stark, 1999), while critics of rational choice methodology claim that “God is Dead” (see Bruce, 2002), which in turn prompted two journalists sympathetic to the former camp to claim “God Is Back” (see Micklethwait and Wooldridge, 2009). An unfortunate result of the heated debate is that the truth or falseness of the empirical claims made by particularly vocal rational choice practitioners is taken as evidence for or against the very methodology of rational choice (e.g. Bruce, 1999), although the rational choice framework is perfectly amenable to accounting for various forms of secularization once changes in both supply and demand are accounted for (see McBride, 2010). In other words, the particular application of a methodology has unfortunately been equated with the methodology itself, although the methodology is more flexible than any particular application.

Part of the problem is that there is disagreement about how to conceptualize and measure secularization; for example, is it about personal piety or about institutional change? In an important contribution to the development of secularization theory, Chaves (1994) examined what we learn by defining secularization as the decline in the scope of religious authority. This definition has been highly influential for sociologists of religion as a whole but less so among those using rational choice theory. I will now argue that Chaves’ definition of secularization combined with the rational choice definition of authority developed here (in place of Chaves’ definition of religious authority) creates complementarities between the two, often strongly opposed camps.

A first complementarity is an explicit bridge between the two camps in the form of an explicit rational choice theory that considers secularization as declining religious authority. If religious leaders, institutions, and norms are directing less action at extensive margins at the societal level, as seems to be the case, then secularization is occurring according to my proposed variation on Chaves’ definition of secularization. Future work using rational choice methodology would seek to identify the coordination games that
were previously resolved via religiously affiliated social devices but are now being resolved by secular devices.

A second complementarity is that this conceptualization may lead to novel rational choice theory that predicts the form and extent of secularization. This theory would focus on the coordination games for which the directing of authority is shifting from religious to secular social devices. One question might be, “Why is coordination at macro-societal levels increasingly less likely to be directed by religious authority?” Of course, many possible answers could exist, but to illustrate the potential value of the rational choice theory of religious authority developed here, let me raise one potential connection between religious markets and secularization. The well-known prediction is that open religious markets with low barriers to religious entry will tend to have higher religious pluralism than markets with high barriers to entry (McBride, 2008). However, the high degree of religious pluralism created by open religious markets increases heterogeneity at the societal level, which in turn can decrease the alignment of preferences of members of the society in societal-level coordination problems such as the running of government programs, the involvement in foreign wars, or the creation of certain civil liberties. It is possible that a majority of devout religious persons may prefer that a particular secular authority device direct societal-level coordination to having the authority device of a particular, previously dominant, religious group continue to direct this action. If true, an open religious market may actually spur the decline in religious authority at societal levels! The logic comes directly from this view of authority as a property of coordinating devices, and future work can develop this theory for a richer body of rational choice-based predictions.

**Discussion**

Religious authority has been a neglected topic in the rational choice literature on religion. This article proposes a rational choice theory definition of religious authority, illustrates how this definition illuminates the role of authority in religious groups, and demonstrates how application of this theory has the potential to generate new insights into various aspects of religion. The fundamental insight of the theory is that authority functions to coordinate social activity, and coordination games are thus seen as a fundamental part of social religious life, even being elevated to the same level of importance as social dilemmas.

As stated earlier, consensus about an authority device does not imply perfect satisfaction or lack of tension. Indeed, members of a religious community may differ widely in what is considered the best authoritative device. The earlier discussion on the Leadership Game provides one simplified way
of viewing such disagreements, yet these disagreements often occur with complex institutional constraints and as a part of dynamic societal trends. One example is the challenge to the authoritativeness of traditional interpretations of the Bible in early 20th-century Protestant denominations. Disagreement about the degree to which the scientific understanding of evolution and the conclusions of higher criticism in Biblical studies should inform Protestant theology led to dramatic splits within Protestant denominations of the day (Butler et al., 2000). Such disagreements can lead to formal changes in official teachings and the creation of religious schism and new denomination formation. Another example is the status of prohibitions against birth control in the Roman Catholic Church. Although the church officially opposes the use of contraception, birth control usage among members of the Catholic church is similar to usage among Protestants who do not face official opposition (Goldscheider and Mosher, 1991). This tension is not creating any threat of schism nor even pressure to change church policy. Instead, many of these Catholics who use contraception acknowledge church leaders’ authority to make statements on such matters as contraceptive use but still decide to privately act against the policy.

The complex nature of authority may be nowhere more visible than in those religious groups experiencing tension today as they confront the status of same-sex marriage in their religious communities. Perhaps no church is experiencing this tension more than the Anglican Communion. Leaders of the Episcopal Church (the American branch of the worldwide Anglican Communion) decided in 2015 to allow clergy to perform same-sex marriages contrary to the policy of the Communion, and the Communion responded in 2016 by officially sanctioning the Episcopal Church so that the Episcopal Church cannot fully participate in Communion affairs for 3 years (Goodstein and De Freytas-Tamaras, 2016). The Anglican Church of Canada allowed some clergy to perform same-sex marriages without fully allowing such marriages everywhere and was not punished. Various authoritative devices are being challenged in this case: whether the worldwide leadership can dictate the actions of the national branches, whether changes in public opinion should determine changes in church policy, whether individual clergy can act against the leaders of the local branch, and how to interpret scripture. Interestingly, the Episcopal Church accepted the sanctions and the authority of the Anglican Communion to impose them while asserting its own authority to set policies within its own branch, but the conflict within the Communion is still not fully settled.

Game-theoretic threshold models like those first examined by Schelling (1960 [1980], 1978 [2006]) provide one way of capturing the apparent suddenness in actors switching from one equilibrium to another. Such models have the potential to illuminate our understanding of how religious
groups and communities make the switch from one authoritative device to another, but more work is needed on this and other fronts. The ultimate goal is the development of a rich body of theory and cases that yield new insights into the richness of religious life.

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Notes
1. Religion is of primary importance in other studies, particularly those examining the changing importance of different types of institutions in society. An example would be research like that of Thomas (2013) that draws from Chaves’ (1994) work on declining religious authority to examine changing sources of authority within particular religious groups.
2. This approach of applying pre-existing rational choice theory to the study of religious groups is common in the rational choice study of religion. For example, Iannaccone (1992) applies the signaling and screening theory from economics to examine stigma in religious groups, and McBride (2008) applies the theory of spatial competition in studying religious markets.
3. Note that the label “game” has a precise meaning in game theory that is different from everyday use of the word. In game theory, a game is a well-defined multi-person interaction with three components: a set of actors, a set of strategies (i.e. actions or behaviors) available to each actor, and a utility function for each actor that represents the preferences over different outcomes resulting from the many different strategy combinations. There are many good introductions to game theory, such as Osborne (2004). Sociologists interested in the problem of cooperation may particularly benefit from the introductory chapters of Bowles and Gintis (2011).
4. Such equilibrium profiles are called Nash Equilibria (Osborne, 2004).
5. Each also has a mixed equilibrium in which the actors randomize their actions, but such mixtures are not necessary for our discussion here. Examination of the non-mixing equilibria is sufficient for the purposes of this article.
References


