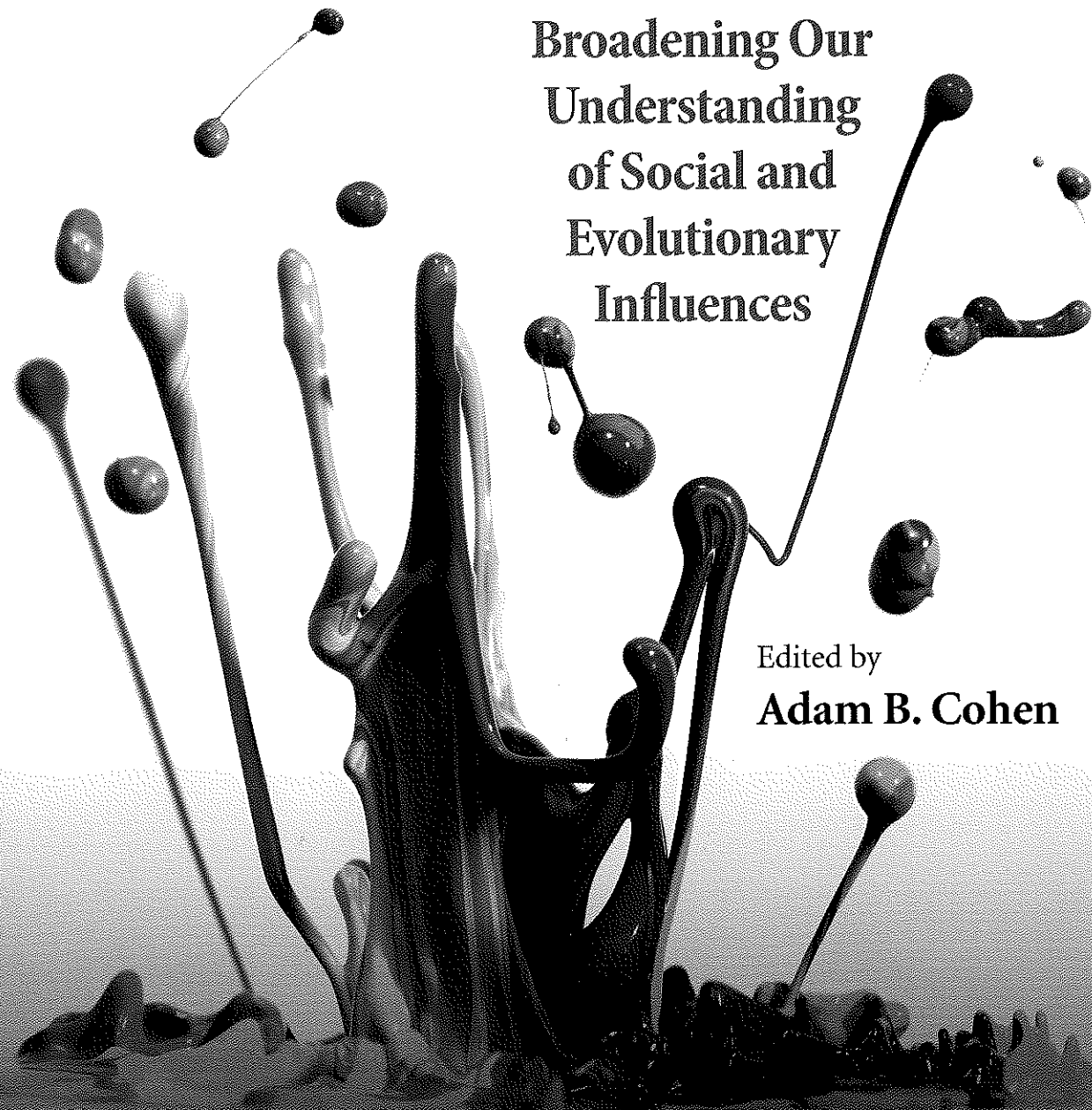


Culture Reexamined

Broadening Our
Understanding
of Social and
Evolutionary
Influences

Edited by
Adam B. Cohen



... of the ...
... of the ...
... of the ...
... of the ...
... of the ...
... of the ...
... of the ...
... of the ...
... of the ...
... of the ...

Culture Reexamined

**Broadening Our
Understanding
of Social and
Evolutionary
Influences**

Edited by
Adam B. Cohen

Copyright © 2014 by the American Psychological Association. All rights reserved. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, including, but not limited to, the process of scanning and digitization, or stored in a database or retrieval system, without the prior written permission of the publisher.

Published by
American Psychological Association
750 First Street, NE
Washington, DC 20002
www.apa.org

To order
APA Order Department
P.O. Box 92984
Washington, DC 20090-2984
Tel: (800) 374-2721; Direct: (202) 336-5510
Fax: (202) 336-5502; TDD/TTY: (202) 336-6123
Online: www.apa.org/pubs/books
E-mail: order@apa.org

In the U.K., Europe, Africa, and the Middle East, copies may be ordered from
American Psychological Association
3 Henrietta Street
Covent Garden, London
WC2E 8LU England

Typeset in Goudy by Circle Graphics, Inc., Columbia, MD

Printer: United Book Press, Baltimore, MD
Cover Designer: Naylor Design, Washington, DC

The opinions and statements published are the responsibility of the authors, and such opinions and statements do not necessarily represent the policies of the American Psychological Association.

Library of Congress Cataloging-in-Publication Data

Cohen, Adam B.
Culture reexamined : broadening our understanding of social and evolutionary influences /
Adam B. Cohen.
pages cm
Includes bibliographical references and index.
ISBN 978-1-4338-1587-4 — ISBN 1-4338-1587-7 1. Social psychology. 2. Culture and
psychology. I. Title.
HM1033.C615 2014
302—dc23

2013021737

British Library Cataloging-in-Publication Data

A CIP record is available from the British Library.

Printed in the United States of America
First Edition

<http://dx.doi.org/10.1037/14274-000>

CONTENTS

Contributors.....	vii
Foreword	ix
<i>Hazel Rose Markus</i>	
Introduction.....	3
<i>Adam B. Cohen</i>	
Chapter 1. Professional and Disciplinary Cultures	11
<i>Chi-yue Chiu, Letty Y.-Y. Kwan, and Shyhnan Liou</i>	
Chapter 2. Generational Cultures	31
<i>Brittany Gentile, W. Keith Campbell, and Jean M. Twenge</i>	
Chapter 3. Culture and Social Class	49
<i>P. J. Henry</i>	
Chapter 4. Regional Culture	77
<i>Joseph A. Vandello, Vanessa E. Hettinger, and Kenneth Michniewicz</i>	

Chapter 5.	Frontier Settlement and Cultural Change.....	93
	<i>Shinobu Kitayama, Michael E. W. Varnum,</i>	
	<i>and A. Timur Sevincer</i>	
Chapter 6.	Political Culture and Democracy.....	129
	<i>Ariel Malka</i>	
Chapter 7.	Food and Culture.....	155
	<i>Benoît Monin and Lauren M. Szczurek</i>	
Chapter 8.	Gendered Sexual Cultures	191
	<i>Angela G. Pirlott and David P. Schmitt</i>	
Chapter 9.	Religions as Cultural Solutions to Social Living	217
	<i>Azim F. Shariff, Benjamin Grant Purzycki,</i>	
	<i>and Richard Sosis</i>	
Index		239
About the Editor		257

CONTRIBUTORS

- W. Keith Campbell, PhD**, Department of Psychology, University of Georgia, Athens
- Chi-yue Chiu, PhD**, Division of Strategy, Management and Organisation, Nanyang Business School, Nanyang Technological University, Singapore, and Institute of Sociology, Chinese Academy of Social Sciences, Beijing, China
- Adam B. Cohen, PhD**, Department of Psychology, Arizona State University, Tempe
- Brittany Gentile, PhD**, Department of Psychology, University of Georgia, Athens
- P. J. Henry, PhD**, Department of Psychology, New York University—Abu Dhabi, Abu Dhabi, United Arab Emirates
- Vanessa E. Hettinger, MA**, Department of Psychology, University of South Florida, Tampa
- Shinobu Kitayama, PhD**, Robert B. Zajonc Collegiate Professor of Psychology, Institute for Social Research, University of Michigan, Ann Arbor
- Letty Y.-Y. Kwan, PhD**, Institute on Asian Consumer Insight, Nanyang Technological University, Singapore

9

RELIGIONS AS CULTURAL SOLUTIONS TO SOCIAL LIVING

AZIM F. SHARIFF, BENJAMIN GRANT PURZYCKI, AND RICHARD SOSIS

Scholars of religion have long assumed that religions offer benefits and fulfill the needs of individuals and that these benefits can explain why religions exist. Religion's ascribed functions include pacifying existential angst (e.g., Darwin, 2004; Durkheim, 1915/2001; Geertz, 1973), creating meaning in a natural world inherently devoid of meaning (Bering, 2011; Inzlicht, Tullet, & Good, 2011; Rappaport 1979), and coping with death anxiety (e.g., Becker, 1973; Spiro, 1987). Religions are, however, more than answers and cures for the psychological concerns of individuals. Religions also solve social and ecological problems faced by groups of people, and it is likely that religions have responsively adapted to serve these roles from their beginnings. In this chapter, we explore evolutionary analyses of religion that aim to explain how

We thank the following institutions for generous support: the Social Sciences and Humanities Research Council of Canada-funded Cultural Evolution of Religion Research Consortium at the University of British Columbia; Oxford University's Cognition, Religion and Theology Project; the University of Connecticut's Anthropology Department; the Economic and Social Research Council (REF RES-060-25-0085); and the Center of Theological Inquiry at Princeton University.

<http://dx.doi.org/10.1037/14274-008>

Culture Reexamined: Broadening Our Understanding of Social and Evolutionary Influences,
A. B. Cohen (Editor)

Copyright © 2014 by the American Psychological Association. All rights reserved.

religions solve many of the social and ecological challenges faced by communities of individuals trying to live together.

First, we discuss the major distinctions between cultural functionalist theory and evolutionary functionalism. Evolution-minded social scientists are often faced with charges of endorsing functionalism, which continues to be a "dirty word in the social sciences" (Sharrock, Hughes, & Martin, 2003, p. 15). Here, we focus on a number of commonly expressed problems associated with cultural functionalism and on how in both theory and practice, evolutionary functionalism overcomes such limitations. We then review some of the evidence that demonstrates the conditions under which religions provide solutions to social and ecological problems faced by particular communities. Finally, we discuss avenues for further research and stress the importance of maintaining the theoretical and methodological pluralism that currently flourishes within the evolutionary study of religion.

CULTURAL FUNCTIONALISM VERSUS EVOLUTIONARY FUNCTIONALISM

In anthropology, functionalism has come in many forms over the years, ranging from the more sociologically oriented structural-functional schools of Lévi-Strauss (1983) and Durkheim (2001) to the cultural materialist and ecological schools of Harris (1966) and Rappaport (1979, 2000). Malinowski (1964), the titular founder of functionalism, defined *function* as the "satisfaction of a need" (p. 159). He offered five components that make up his vision of culture, three of which are key to understanding his thought:

- Culture is essentially an instrumental apparatus by which man is put in a position the better to cope with the concrete specific problems that face him in his environment in the course of the satisfaction he needs.
- It is a system of objects, activities, and attitudes in which every part exists as a means to an end.
- Such activities, attitudes, and objects are organized around important and vital tasks into institutions such as the family, the clan, the local community, the tribe, and the organized teams of economic cooperation, political, legal, and educational activity. (Malinowski, 1964, p. 150)

Malinowski considered the essential core of cultural domains to be functional; they contain within them the means by which to overcome environmental problems to satisfy needs and "every part exists as a means to an end" (p. 150). Therefore, any successful functional analysis of a cultural system,

such as religion, entails understanding the constituent parts' relationships and what their particular end is, even if that end is merely to fulfill the other components' functions. However, a number of problems have been identified with such functionalist accounts of human social systems.

For example, many have taken issue with some cultural functionalists' heavy reliance on interpretation and their lack of a systematic method for data collection (e.g., Sperber, 1996). Harris's (1966) classic explanation of the sacralization of cattle in India, for example, is a regular target for such critiques. Harris argued that Indians taboo the killing of cattle because the utility of keeping them alive for things such as fuel and milk outweighs the benefits reaped by eating them. Bloch (1983) critically pointed out the ad hoc nature of the explanation: "Harris notes that cows are holy in India and then looks around for anything that will show the belief to be reasonable in terms of the economy" (p. 133). Indeed, strong correlative interpretivism and weak methodology characterize much functionalist and other anthropological research throughout the middle of the 20th century. Evolutionary functionalists, however, have made use of a vast array of research methods to avoid the trappings and limitations of interpretive ethnographic inquiry, as is evinced by the studies we review next (which are themselves just a small sampling).

The apparent lack of agency in functionalist accounts has been another target for criticism (for further discussion, see Elster, 1979). In other words, functionalist accounts often lack consideration or minimize the significance of individual motivations and decision making in the formation of institutions and social systems. As a response to this, rational choice theorists have emphasized individuals' beliefs and desires in the process of decision making. However, the classic (but often confused) distinction between *teleology*—an intentional function—and *teleonomy*—functional by design of evolutionary processes—has to be taken into consideration here (Pittendrigh, 1958). Individuals' intentions and decisions may indeed have something to do with their well-being (see Spiro, 1987), and their internal states can, at times, accurately represent the fitness value of a particular strategy. That is, proximate intentions can align with ultimate explanations. Alternatively, however, the proximate, consciously obvious goal can be quite removed from the ultimate, teleonomic purpose for a given behavior, ritual, or teaching. That is to say that group members engaging in a particular ritual might understand the teleonomic group benefit offered by the ritual, or they may conceive of it as beneficial for a radically different reason. People's conscious intentions can consist of a wide range of things, but what matters for evolutionary functionalism is how the behavior affects fitness (see Hames, 1991, 2007; Smith & Wishnie, 2000, for excellent discussions of this distinction with respect to the evolution of conservation practices).

Another common problem identified with functionalism stems from an alleged essentialization of culture. For instance, Collier et al. (1997) noted that

the flaw in Malinowski's argument is the flaw common to all functionalist arguments: Because a social institution is observed to perform a necessary function does not mean either that the function would not be performed if the institution did not exist or that the function is responsible for the existence of the institution. (p. 73)

In other words, Collier et al. took issue with the idea that an institution is inextricably linked with its function or that a function plays some causal role in the formation of an institution. Moreover, they suggested that functionalist analyses essentialize the social context with the institution. Of course, an institution can exist longer than its constituent participants and its function can change, and humans are particularly adept at finding ways to solve problems by formalizing behaviors that work around them. Analytically, however, all one needs to see are an institution's effects to claim it has a function, regardless of whether it is true. This problem with functionalist institutional analysis is that institutions are thought of as essential to a society. Evolutionary analyses (*pace* Gould, 2002) tend to essentialize functions for traits because traits often serve different purposes in different contexts. Likewise, anyone with a modicum of understanding of the ethnographic record cannot deny the diversity in content of religion, and careful arguments must address the possibility that different religions overcome or address problems posed by local environments.

In fact, in some situations, ignorance of the individual over the ultimate teleonomic purpose of a behavior is critical to convincing the individual to partake. Although individuals may be content to engage in an activity because they are aligned with its proximate purpose (say, pleasing the gods), the hidden ultimate purpose may be something that runs counter to their interests. For example, compelling people to avoid cheating, resource hogging, or promiscuity may, as we describe, be instrumental to group success but can often come at a cost to a rationally acting individual. The powerful proximate reasons that religions provide to compel individuals to engage in ultimately self-sacrificing (but group-beneficial) behaviors is, from the perspective of evolutionary functionalism, one of the great strengths of religious systems.

A third criticism of many functionalist accounts is the apparent lack of a feedback mechanism to sustain the movement of elements within the system. In other words, to be convincing and complete, functionalist accounts require a force external to the system to reconstitute, maintain, and reproduce elements within the system (Elster, 1979, 1982; Sperber, 1996). The combination of natural selection and genetic transmission is one obvious feedback

mechanism, but as Stinchcombe (1968) pointed out, other forms of selection and transmission—for example, cultural evolution—can serve as feedback mechanisms as well. What functionalist accounts often lack is attention to the ecological pressures that led to the emergence of an institution and the fitness effects that could explain its persistence.

Again, methodologically, cultural functionalism has largely been interpretative; one studies an institution and discovers the problem it solves, and this analysis is carried through to other domains of a population's experience. However, researchers must empirically demonstrate that the institution or trait under examination produces benefits that are not available to those who lack the institution or trait. The problem for those who study religion, however, is finding a sufficient control sample (*cf.* Sosis & Bressler, 2003) and, as such, researchers are often limited to evidence that allows them to abductively conclude that particular traditions benefit individuals and communities in particular contexts.

HOW EVOLUTIONARY FUNCTIONALISM CAN EXPLAIN RELIGION

Currently, a complete evolutionary functionalist analysis of any religious system is lacking; however, plenty of evidence has nonetheless suggested that religion is adaptive in specific ecological contexts. Although this evidence relies primarily on cultural evolutionary processes by which cultural information—in the form of beliefs, rituals, and teaching—are selected and transmitted, the approach mimics that which naturalists use to understand why organisms have the particular features they do.

Here, we review the arguments and evidence for six of the most prominent hypotheses regarding religion's cultural adaptations for enabling, sustaining, and facilitating social interaction in human groups. We also note open questions that remain and avenues of future research that may address them.

Hypothesis 1: Monitoring and Punishing Selfish Behavior

Although many nonstate traditions have traces of moralistic deities (Boehm, 2008), anthropologists have understood for at least half a century that these types of morally involved "big" gods are found predominantly in state-level social organizations (Swanson, 1960; Wallace, 1966). In the absence of effective top-down secular institutions, such as policing and court systems, to regulate ethical behavior, groups of this size face considerable challenges in preventing the destabilizing forces of free riding and defection. Genetically evolved mechanisms, such as kin-based altruism and reciprocity

with nonkin, are only able, on their own, to sustain very small groups—much smaller even than the towns that sprang up 9,000 to 11,000 years ago in the Levant (Dunbar, 2003; Henrich, 2004). At this size, anonymous encounters become increasingly frequent and, with them, so too do the opportunities to engage in selfish, other-damaging, unethical behavior without sacrificing one's reputation.

A number of researchers have argued that commitment to omniscient and morally judging supernatural agents facilitated cooperation by discouraging believers from cheating in these otherwise anonymous situations (Lahti, 2009; Rappaport, 1979; Sanderson, 2008; Schloss & Murray, 2011; Shariff & Norenzayan, 2007; Stark, 2001). Furthermore, knowing that a potential interaction partner fears supernatural reprisal for violating social norms builds faith in the moral constraints on this partner's behavior and thus heightens trust among people. These hypotheses have received ample empirical support from several different fields. First, psychological studies have shown that people primed to think about God and other supernatural agents are more cooperative, more honest, and more generous to strangers in anonymous situations (Ahmed & Salas, 2011; Piazza, Bering, & Ingram, 2011; Randolph-Seng & Nielsen, 2007; Shariff & Norenzayan, 2007). Second, cross-cultural research has shown that these types of effects are significantly more likely to occur when individuals believe in powerful, omniscient, and moralizing big gods than in localized gods (Henrich et al., 2010; Johnson, 2005). Third, people do indeed use other people's religiosity as a powerful cue of trust (Gervais, Shariff & Norenzayan, 2011; Tan & Vogel, 2008)

The threat of supernatural punishment, in particular, seems to have a much stronger effect than the promise of supernatural reward. Controlling for relevant variables, people who more strongly believe in a punishing God than a loving and comforting God are less likely to cheat in academic settings (Shariff & Norenzayan, 2011), and those countries that have higher rates of belief in hell and lower rates of belief in heaven also tend to have lower crime rates (Shariff & Rhemtulla, 2012). In fact, indications are that when individuals emphasize God's forgiveness over God's vindictiveness, it actually encourages norm violations (DeBono, Shariff, & Muraven, 2012).

Anthropological work has shown that those societies in which cooperation was especially important and especially difficult to sustain using basic processes of kin selection and close reciprocity—such as larger societies or societies that faced acute resource shortages—were more likely to develop widespread beliefs in big gods (Roes & Raymond, 2003; Snarey, 1996). These findings suggest that supernatural punishment may have emerged to facilitate the management of limited resources. Considered together, the results emerging from this line of research suggest that of the multitudes of forms supernatural deities have taken and could have taken, those now endorsed by

the greatest number of people—specifically, powerful, omniscient, and morally involved gods—evolved because of the moral cohesion that they offered large groups of people. These types of gods thrived because the societies they were attached to managed to succeed where less cohesive groups could not.

Hypothesis 2: Resource Regulation and Management

One of the avenues by which regulated behavior among individuals fosters greater success among groups is the wise management of shared resources—preventing “commons” from becoming tragedies (Hardin, 1968). Durkheim (1915/2001) noted that this type of resource regulation was an example of religion's secular utility. In a well-known example—mentioned earlier—Harris (1966) argued that cattle are sacralized in India because the benefits from the prohibition of slaughter outweigh the benefits of eating cattle. According to Harris, this institutionalized prohibition makes ecological sense for Indians engaging in the practice; if cattle are sacred and not to be slaughtered, then Indians maintain the secular utility of keeping cattle alive for plowing, milk, and dung for fuel. However Harris's analysis failed to demonstrate that those living under similar conditions who did not sacramentally conserve cattle had lower caloric returns or fertility or wealth or any other indicator of fitness.

In Rappaport's (1968/2000) classic study, *Pigs for the Ancestors*, he argued that ritual among the Tsembaga Maring of New Guinea serves a variety of functions. First, ritualized mass pig slaughters are timed at points when pig population sizes become too cumbersome and parasitic on resources used by humans. The slaughter, according to Rappaport,

helps to maintain an undegraded environment, limits fighting to frequencies that do not endanger the existence of the regional population, adjusts man-land ratios, facilitates trade, distributes local surpluses of pig in the form of pork throughout the regional population, and assures people of high-quality protein when they most need it. (p. 224)

Subsequent theoretical models have been mixed in their support for Rappaport's (1968/2000) suggestion about the social utility of the rituals (e.g., Anderies, 1998; Foin & Davis, 1984; Samuels, 1982; Shantzis & Behrens, 1973), but such models still await quantitative empirical testing.

Nevertheless, some studies have produced reliable evidence of higher returns for religiously sanctioned resource management. In a landmark study, Lansing (1987, 1991; Lansing & Kremer, 1993) argued that the religious system among the Balinese teleonomically and strategically mediates water distribution to complex networks of artificially constructed terraced rice paddies operated by cooperative units of people (*subak*). The rice paddies depend on supernaturally sanctioned irrigation practices that affect the nutrient content

of the water, regulate pests, and maximize sunlight exposure to plants. Lansing and Kremer (1993) demonstrated that each *subak*'s yield is better on average than it would be otherwise by virtue of the religiously facilitated wide-scale coordination of competing *subak*.

Unfortunately, studies as detailed and comprehensive as that of Lansing and Kremer (1993) are rare. This scarcity of research is particularly unfortunate because as markets increasingly engulf local economies, the need is greater than ever to understand the hard-won and time-tested cultural solutions for resource acquisition and management that have stabilized and ultimately sustained their communities.

Hypothesis 3: Signaling Rituals

Many have referred to religion as a social glue that binds people together (see, e.g., Graham & Haidt, 2010). Indeed, the likely Latin derivative of the word *religion*, *religare*, means "to bind." But how is this binding accomplished? The currency of social bonds is prosocial behavior, but one question that haunts evolutionary analyses of human cooperation is the problem of how to determine whom to trust in times of need. In the context of religious prosociality, ritual behavior is a strong candidate. Specifically, because of their public visibility and associated costs, rituals can serve as proxies for reputation and reliably indicate trustworthiness (Sosis, 2005). Across the animal kingdom, costly signals often reliably convey fitness, fertility, and mate quality (see Searcy & Nowicki, 2005; Zahavi & Zahavi, 1997). Religious groups often provide social and resource benefits to adherents, benefits that are susceptible to exploitation. Ritual systems that entail somatic, economic, social, time, or opportunity costs can, however, protect these benefits. Ritual performance not only conveys commitment to the supernatural agents accepting or receiving the sacrifice, but it also conveys commitment to the community that proclaims the agent. Such rites can also serve as an effective cultural bulwark against various forms of exploitation if costs are high enough to prevent likely defectors from performing rituals without concomitant beliefs and commitment.¹ A number of studies have bolstered the explanatory power of the signaling theory of religion.

Sosis and Bressler (2003) found that religious communes outlast secular ones by a significant margin; at the end of each year, religious communes were 4 times as likely to still exist than secular ones. Notably, the strongest predictor of which religious communes survived the longest was the number of costly displays of commitment to the group. Those communities that offered their

¹In Henrich's (2009) model of credibility-enhancing displays, the signals of commitment need not be costly to the honest signaler, only too costly for a dishonest signaler to fake.

individual members more opportunities to display their commitment to the group saw the lowest rates of dissolution from internal or external strife. Sosis, Kress, and Boster (2007) found that those societies that needed the high levels of coordination required for warfare also engaged in riskier and more taxing rituals. Soler (2012) found a significant relationship between increased cooperation and commitment to ritual participation among Candomblé cult members in Brazil. Similarly, Sosis and Ruffle (2003, 2004; Ruffle & Sosis, 2007) found that religious kibbutzim engaging in expensive religious commitments are more cooperative and generous with each other than with their secular equivalents. Berman (2009) argued that even actions such as sending one's children to religious schools (which he showed provides demonstrably lower future returns on investment per year of education) serve as a form of sacrificial display of commitment to one's religious group. These studies suggested that, indeed, costly religious rituals reliably convey commitment to other people. As such, it overcomes problems inherent in human relationships regarding who is trustworthy; reliable partners in cooperative ventures are those willing to demonstrate commitment at a cost to themselves. This commitment therefore translates to increased cooperation and establishes social bonds that promote individual well-being, which is ritual's adaptive function. Among other things, what religious concepts do is provide an unverifiable, powerful, and agentic impetus for engaging in and maintaining costly ritualistic traditions as well as provide a means by which people can communicate shared mental states (Purzycki & Sosis, 2010).

However, although these studies may explain why rituals build trusting and cohesive societies, researchers have little understanding of the proximate psychological mechanisms responsible for equating costly, ritualized displays of commitment with trustworthiness. Can other factors mediate perceptions of trustworthiness in a religious context? What are the factors involved in changing the perceived cost of ritual acts? These questions likely revolve around the nature of human institutions in which people have shared expectations and meanings for things. The operative word here is *shared*. However, as discussed next and in Exhibit 9.1, various traditions appear to measure sharedness and conformity in different ways.

Hypothesis 4: Cohesion Rituals—The Case of Synchrony

What are the proximate mechanisms involved in behavioral conformity? One answer may lie in the recent research on synchrony, wherein multiple people engage in identically coordinated behaviors such as singing or dancing. In a seminal article, Wiltermuth and Heath (2009) showed that individuals instructed to move in time with other research participants (as opposed to engaging in the same behaviors but doing so out of sync)

EXHIBIT 9.1
Religious Conformities: Doxa and Praxis

One popularly entertained idea is that religions function to maximize ideological conformity. Perhaps surprisingly, though, with the notable exception of a few imperialistic traditions, having faith or belief in the same religious concepts as others in the community is not considered vital to most of the religious traditions that have existed through the ages. These traditions often emphasize behavioral consistency and participation, that is, practice, as the mark of religiosity rather than consensus in belief (see Fernandez, 1965). It tends to be only the universalizing and often imperialistic religious traditions—which seek to include a wide variety of diverse groups—in which faith is indicative of religiosity (Purzycki & Sosis, 2011). In other words, different contexts appear to influence the factors that indicate what it means to be religious. A. B. Cohen, Siegel, and Rozin (2003) predicted that an emphasis on practice—and not on faith—is likely associated with ethnicity-bound traditions. Indeed, if a religious group considers itself to be different by virtue of some internal essence (see Gil-White, 2001), then likely less need exists to demonstrate ideological conformity than in those traditions—such as Christianity, Islam, and Buddhism—in which anyone can be a member. In support of this thesis, A. B. Cohen et al. (2003) showed that Protestants are significantly more likely than Jews to emphasize faith as an indicator of religiosity. The distinction between an emphasis on belief versus one on practice presents a compelling and illustrative example of different adaptive solutions that culturally evolved from different social needs and pressures.

reported higher levels of similarity, connection, and trust with their group members and also showed higher levels of coordination and self-sacrifice for their group. Paladino, Mazurega, Pavani, and Schubert (2010) found that watching others receive identical sensory stimulation (in this case having their cheek brushed) in synchrony rather than out of synchrony not only felt more resemblance to and attraction for their sensation partner, but actually tended to, at some level, confuse themselves with the other subject, perceiving more agency over the other person and experiencing “body illusions” of feeling one’s own sensations in the location of the other person. Notably, the synchronous participants also showed more conformity in their responses than the asynchronous ones.

Similarly, synchronic behavior has been shown to increase both pain tolerance and, perhaps as a consequence, work output (E. E. A. Cohen, Ejsmond-Frey, Knight, & Dunbar, 2010). Moreover, neuroimaging research has revealed that the intense audiovisual sensory experiences that often accompany religious rituals actually inhibit self-related processing (Goldberg, Harel, & Malach, 2006). The effectiveness of synchrony at promoting the importance of the group at the expense of the individual likely explains its persistence across a vast variety of religious rituals—from the Sufi whirling dervishes to the coordinated movements (*Raka'ah*) performed during Muslim prayers to the collective hymn singing that is found throughout religions. Of course, religions

are not the only institutions to have leveraged the socially cohesive effects of synchronic behaviors. As Wiltermuth and Heath (2009) pointed out, modern militaries maintain frequent marching drills even though marching has all but been abandoned as an actual strategy in military engagement. Various forms of dancing, such as the coordinated step dances of primarily African American fraternities and sororities, likely achieve the same type of social binding.

Future research would do well to investigate whether other aspects common to religious rituals—for example, subordination postures—produce similar effects for submitting individual interests to those of the group.

Hypothesis 5: Management of Competitors, Defectors, and Other Threats to Influence

As religious systems bind ingroup members, religions also often endorse mechanisms that manage potential outgroup disruptions to social order. For example, Steadman and Palmer (2008) argued that the various witch hunts around the world have been directly tied to perceptions of threats to the social order. They predicted that “witch-killings occur only when there is a significant threat to the social hierarchy of the killers and those supporting them,” noting that the rash of witch hunts in Europe “began and ended with the Reformation and Counter-Reformation” (p. 168). Such killings appear to have little to do with fear that witchcraft has efficacy but more with the social consequences of killing witches. This explains why suspected witches are typically vulnerable individuals; they are a less risky group of people to publicly decry to demonstrate the authority of leaders.

In the Abrahamic traditions, antiatheist teachings are explicit and pervasive in scriptures and sermons. For example, the *Shemoneh Esrei*, which is recited thrice daily by observant Jews, includes a paragraph against non-believers who can threaten the continuity of the community. The Qur'an, meanwhile, instructs that bodily harm should be done to unbelievers in this life (e.g., 8:59–60) and promises even more grievous punishment in the next (22:19–20). The worst fate is reserved not for pagans or Jews but for apostates who were formerly Muslim but have left the faith (3:90)—thereby doubling as a powerful disincentive for doubt among current believers. (Apostasy in Islam can include a rejection of either the existence of God [religious belief] or of obligatory rituals [practice]. The distinction between these two forms of religious conformities is discussed more in Exhibit 9.1.) Certain hadiths imply that the appropriate punishment for apostasy should be death for men and life imprisonment for women, and although the meaning and application of these hadiths are topics of active debate among modern Islamic scholars (e.g., Saeed & Saeed, 2004), apostasy remains illegal in a number of Muslim-majority countries and a capital crime in Saudi Arabia and Iran.

The codified disparagement of atheism can be understood as a self-protective device on the part of religions aiming to discourage defection from their cultural system. From the perspective of religious prosociality, however, antiatheist prejudice can also be understood as a reaction against a moral threat. If cooperation and trust rely on the shared religious beliefs of those surrounding one, then members of one's society who explicitly reject these beliefs are immediately morally suspect. This theory fits recent empirical findings. Examining the virulent antiatheist prejudice in North America—polls have consistently shown atheists at the top of lists of most disliked groups (Edgell, Gerteis, & Hartmann, 2006)—Gervais et al. (2011) found that these intense negative attitudes are driven by a profound moral distrust. Antiatheist prejudice appears most prominently in high-trust situations. Participants were not overwhelmingly concerned about being served food by an atheist (a low-trust situation) but were highly unwilling to hire one for babysitting (a high-trust situation). When given a scenario briefly describing a man of dubious moral character, participants were as likely to implicitly attribute the description to an atheist as they were to a rapist.

Research has also found that antiatheist prejudice does not exhibit the typical signature of standard social identity-driven ingroup-outgroup psychology. As Gervais et al. (2011) discussed, these standard models fail to account for the domain specificity of the antipathy (confined to trust-based situations) or the lack of a corresponding ingroup preference on behalf of nonbelievers. Instead, the distrust of non- and other-believers can be seen as the direct—and selected-for—outcome of the emphasis religions put on a trusted community of common believers. In a sense, these are flip sides of the same cultural adaptation.

Open questions remain. How does the distrust people feel toward nonbelievers compare with the distrust they feel toward believers of other religions? Consistent with theoretical predictions that the fear of any God is preferable to the fear of none, preliminary research has indicated that people are more inclined to trust a believer from another religion than someone from their own religion who thereby shares a social identity but who nonetheless claims nonbelief (Shariff & Clark, 2012).

The bulk of the research on attitudes about atheists has, however, been conducted primarily with Christian participants. Another open question is how differently members of religions that rely more on religious practice than belief as a cue of religiosity (see Exhibit 9.1) feel toward atheism. Might the level or kind of prejudice differ in, say, Judaism? Finally, what role will the vastly increasing number of atheists have on antiatheist prejudice and on religion in general? Gervais (2011) showed that people led to believe that atheists were more, rather than less, prevalent in their community showed higher levels of trust. As the "otherness" of atheists decreases, so too might

the prejudice directed against them. That said, it remains possible that the rise of a more coalitional form of atheism, which could unify nonbelievers into a coherent ingroup, may provoke more aggressive responses.

Hypothesis 6: Marriage and Other Regulations on Sexuality and Reproduction

Religion may also be credited with the salutary effects that monogamous marriage norms have had on societies. Polygyny is common among other primates and has been a demonstrable feature of human mating patterns throughout history—the vast majority of societies in the anthropological record permitted men to take multiple wives (White et al., 1988). The historical transition from nomadic hunter-gatherer lifestyles to permanent settlements, however, amplified the destabilizing effect that such polygyny norms had on human groups. As the wealth inequality between men grew, so did the inequality in the number of wives that men could acquire. The ability of a handful of wealthy, high-status men to monopolize a disproportionate share of mating opportunities led to a large and particularly socially disruptive underclass of unpaired men. Facing restricted sexual opportunities, unpaired men of reproductive age are liable to engage in increasingly desperate, risky, and often violent behavior (Wilson & Daly, 1985). Consistently, the historical anthropological record has shown that polygynous societies had higher rates of crime and engaged in higher levels of warfare than did predominantly monogamous ones (Bacon, Child, & Barry, 1963; White & Burton, 1988). Even today, societies with higher rates of polygyny show higher levels of murder, rape, and robbery (after controlling for relevant variables such as gross domestic product per capita and economic inequality; Kanazawa & Still, 2000).

Modern monogamous marriage norms, which originated in ancient Greece 2,500 years ago and spread via the vehicles of Christian expansion and European colonialism, are thus likely to be adaptive cultural innovations that offer increased stability to large, unequal groups (Henrich, Boyd, & Richerson, 2012). Had those societies that adopted monogamous marriage norms been more able to restrict the antisocial consequences that accompany polygyny (while at the same time increasing paternal investment in offspring and generally redirecting the energy men devoted to finding ever-increasing numbers of wives), then the increased stability of these societies would make them more competitive in the cultural evolutionary market (Henrich et al., 2012).²

²As Buss and Schmitt (1993) argued, the high rates of singledom, divorce, and adultery in modern Western societies make it difficult to argue that they are purely monogamous societies. However, monogamous marriage norms limit the number of women that can be explicitly tied to one man, leaving unmarried women at least theoretically available to other men.

Although they are likely to have strengthened groups, these norms ran counter to the evolved sexual strategies of individual men—and were particularly unappealing for high-status men who had the greatest opportunities for polygynous pursuits, thus making marriage a hard sell, especially for those with power. As with other group-beneficial but personally costly phenomena, tying these norms to religion would have been a particularly efficacious way of ensuring they had the strength to restrict behavior. Research has shown that norms are more likely to be adopted when they are backed by religious edict (Bushman, Ridge, Das, Key, & Busath, 2007).³ Moreover, in societies with weak legal enforcement, religion served not only as the primary moral authority but also as the only one whose sanctions could be mostly trusted to apply equally to those at the top of the hierarchy (whose behavior, in this case, needed the most regulating).

Today, ample evidence exists for the relationship between religion and monogamous sexual behavior. In the United States, religious adherents have significantly fewer lifetime sexual partners than those who are not religious (Billy, Tanfer, Grady, & Klepinger, 1993). They also have lower rates of premarital sex (Beck, Cole, & Hammond, 1991; Herold & Goodwin, 1981; Zelnik & Shah, 1983), are more likely to get married (Thornton, Axinn, & Hill, 1992), have higher marital satisfaction (Call & Heaton, 1997; Wilson & Filsinger, 1986), and have fewer extramarital affairs (Atkins, Baucom, & Jacobson, 2001; Reiss, Anderson, & Sponaugle, 1980). Although these findings are supportive, future research would do well to explore historical trends to see whether the spread of religions with monogamous norms indeed increased levels of monogamy and social stability.

Aside from providing social stability via marriage norms, religions may also have contributed to the success of culture groups by maximizing fertility. Today, fertility rates have declined all across the world but have done so at a slower rate among those who are religious—and particularly those of the more conservative and orthodox religious sects (Berman, 2000). At both the individual and the national level, religiosity is one of the strongest predictors of family size, even after controlling for important related variables (Blume, 2009; Frejka & Westhoff, 2008; Kaufmann, 2010; Lehrer, 1996). One provocative suggestion as to why religious people have lagged behind the general trend of reduced fertility is that religiously backed norms maintain entrenched gender roles while simultaneously promoting a “cult of motherhood and fertility” (Beit-Hallahmi, 1997, p. 167). Restrictions preventing women in highly religious cultures from accessing education and economic

³Aside from just monogamy norms, the enveloping of other important group-beneficial norms in the power of supernatural sanction has likely been a highly effective and frequently used cultural strategy for ensuring compliance. Violating sacred values, after all, is a much weightier offense than breaking secular norms.

autonomy have prevented these women both from exercising as much control over their reproductive decisions and seeing alternative opportunities to motherhood as women in other cultures. This suggestion has received some support, especially among rural populations (Amin & Alam, 2008); however, it is an important topic that is ripe for more research. Although historically these high rates of fertility likely allowed religious groups to grow into very populous cultural groups that could outcompete less fertile ones, these norms may today be a double-edged sword. High birth rates in modern times are tied to cycles of poverty and economic stagnation—drawing into question just how culturally adaptive these norms should still be considered.

CONCLUSION

The preceding sections are not meant to be an exhaustive list of cultural adaptations that religions offer groups. We have scarcely mentioned many other likely important group functions that religious rituals and proscriptions may serve—mostly because of a lack of available research. For example, researchers have begun to discuss the idea of a cultural immune system consisting of cultural practices that are devoted to avoiding and managing the spread of virulent pathogenic diseases. The preferential culinary use of spices with antibacterial properties in areas of high pathogenic load is one oft-cited example (Sherman & Billing, 1999; see Henrich & Henrich, 2010, for another example). It is very likely that many religiously sanctioned dietary and cleansing rituals serve similar disease-avoidance purposes. Although much anthropological research has been devoted to the great variety of these types of rituals, little of it has adopted the functionalist perspective featured here. Doing so in the future, however, may provide a critical tool for understanding the culturally adaptive reasons why these and other rituals and edicts exist.

Investigating the culturally evolved group utility that religions serve must, however, resist the pull of naïve pan-adaptationism. Not every aspect of religions evolved to serve the group. For one thing, as briefly discussed in the introduction, many aspects may have developed to directly serve the individual. In addition, though, many aspects of religions can be destructive to both groups and individuals. Cases such as the Jonestown and Heaven's Gate mass suicides illustrate the disastrous results for constituents when the costs of commitment so drastically outweigh the benefits of devotion. Indeed, aspects of religions that convey no adaptive advantages to the group or to the individual can persist for generations without being extinguished simply because they effectively sustain belief in that religion (see Shariff, 2008, for a discussion).

Finally, as changes occur to the sociocultural environment in which religions exist—including the growth of competition from other religions, ideologies, and social institutions, hitherto adaptive elements can become inert and even negative to the welfare and survival of the group and group members. As typically conservative and tradition-rich institutions, religions may be slow to adapt to these changes, leading them to lose market share, or they may maintain the devotion of their adherents but condemn them to diminishing returns in comparison with other contemporary social institutions. The future, ultimately, will belong to those religions that combine the best group- and individual-level cultural adaptations for the current environment and provide the best solutions to both the persistent and the novel challenges of modern life.

REFERENCES

- Ahmed, A. M., & Salas, O. (2011). Implicit influences of Christian religious representations on dictator and prisoner's dilemma game decisions. *Journal of Socio-Economics*, 40, 242–246. doi:10.1016/j.socec.2010.12.013
- Amin, S., & Alam, I. (2008). Women's employment decisions in Malaysia: Does religion matter? *Journal of Socio-Economics*, 37, 2368–2379. doi:10.1016/j.socec.2008.04.012
- Anderies, J. M. (1998). Culture and human agro-ecosystem dynamics: The Tsembaga of New Guinea. *Journal of Theoretical Biology*, 192, 515–530. doi:10.1006/jtbi.1998.0681
- Atkins, D. C., Baucom, D. H., & Jacobson, N. S. (2001). Understanding infidelity: Correlates in a national random sample. *Journal of Family Psychology*, 15, 735–749. doi:10.1037/0893-3200.15.4.735
- Bacon, M. K., Child, I. L., & Barry, H. (1963). A cross-cultural study of correlates of crime. *Journal of Abnormal and Social Psychology*, 66, 291–300. doi:10.1037/h0042395
- Beck, S. H., Cole, B. S., & Hammond, J. A. (1991). Religious heritage and premariatal sex: Evidence from a national sample of young adults. *Journal for the Scientific Study of Religion*, 30, 173–180. doi:10.2307/1387211
- Becker, E. (1973). *The denial of death*. New York, NY: Simon & Schuster.
- Beit-Hallahmi, B. (1997). Biology, density and change: Women's religiosity and economic development. *Journal of Institutional and Theoretical Economics*, 153, 166–178.
- Bering, J. (2011). *The God instinct*. London, England: Nicolas Brealy.
- Berman, E. (2000). Sect, subsidy and sacrifice: An economist's view of ultra-orthodox Jews. *Quarterly Journal of Economics*, 115, 905–953. doi:10.1162/003355300554944
- Berman, E. (2009). *Radical, religious, and violent: The new economics of terrorism*. Cambridge, MA: MIT Press.
- Billy, J. O. G., Tanfer, K., Grady, W. R., & Klepinger, D. H. (1993). The sexual behavior of men in the United States. *Family Planning Perspectives*, 25, 52–60. doi:10.2307/2136206
- Bloch, M. (1983). *Marxism and anthropology*. New York, NY: Oxford University Press.
- Blume, M. (2009). The reproductive benefits of religious affiliation. In E. Voland & W. Schiefenhoefel (Eds.), *The biological evolution of religious mind and behavior* (pp. 117–126). Berlin, Germany: Springer. doi:10.1007/978-3-642-00128-4_8
- Boehm, C. (2008). A biocultural evolutionary exploration of supernatural sanctioning. In J. Bulbulia, R. Sosis, E. Harris, R. Genet, C. Genet, & K. Wyman (Eds.), *Evolution of religion: Studies, theories, and critiques* (pp. 143–152). Santa Margarita, CA: Collins Foundation Press.
- Bushman, B. J., Ridge, R. D., Das, E., Key, C. W., & Busath, G. M. (2007). When God sanctions killing: Effect of scriptural violence on aggression. *Psychological Science*, 18, 204–207. doi:10.1111/j.1467-9280.2007.01873.x
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: A contextual evolutionary analysis of human mating. *Psychological Review*, 100, 204–232. doi:10.1037/0033-295X.100.2.204
- Call, V. R. A., & Heaton, T. B. (1997). Religious influence on marital stability. *Journal for the Scientific Study of Religion*, 36, 382–392. doi:10.2307/1387856
- Cohen, A. B., Siegel, J. I., & Rozin, P. (2003). Faith versus practice: Different bases for religiosity judgments by Jews and Protestants. *European Journal of Social Psychology*, 33, 287–295. doi:10.1002/ejsp.148
- Cohen, E. E. A., Ejsmond-Frey, R., Knight, N., & Dunbar, R. I. M. (2010). Rowers' high: Behavioural synchrony is correlated with elevated pain thresholds. *Biology Letters*, 6, 106–108. doi:10.1098/rsbl.2009.0670
- Collier, J. F., Rosaldo, M. Z., & Yanagisako, S. (1997). Is there a family? New anthropological views. In R. N. Lancaster & M. di Leonardo (Eds.), *The gender/sexuality reader: Culture, history, political economy* (pp. 71–81). New York, NY: Routledge Chapman & Hall.
- Darwin, C. (2004). *The descent of man*. New York, NY: Penguin Classics. (Original work published 1872)
- DeBono, A., Shariff, A. F., & Muraven, M. (2012). *Forgive us our trespasses: Priming a forgiving (but not a punishing) god increases theft*. Unpublished manuscript.
- Dunbar, R. I. M. (2003). The social brain: Mind, language, and society in evolutionary perspective. *Annual Review of Anthropology*, 32, 163–181. doi:10.1146/annurev.anthro.32.061002.093158
- Durkheim, É. (2001). *The elementary forms of religious life*. New York, NY: Oxford University Press. (Original work published 1915)
- Edgell, P., Gerteis, J., & Hartmann, D. (2006). Atheists as "other": Moral boundaries and cultural membership in American society. *American Sociological Review*, 71, 211–234. doi:10.1177/000312240607100203

- Elster, J. (1979). *Ulysses and the sirens*. Cambridge, England: Cambridge University Press.
- Elster, J. (1982). The case for methodological individualism. *Theory and Society*, 11, 453–482.
- Fernandez, J. (1965). Symbolic consensus in a Fang reformatory cult. *American Anthropologist*, 67, 902–929. doi:10.1525/aa.1965.67.4.02a00030
- Foin, T. C., & Davis, W. G. (1984). Ritual and self-regulation of the Tsembaga Maring ecosystem in the New Guinea highlands. *Human Ecology*, 12, 385–412. doi:10.1007/BF01531125
- Frejka, T., & Westhoff, C. F. (2008). Religion, religiousness and fertility in the US and Europe. *European Journal of Population*, 24, 5–31. doi:10.1007/s10680-007-9121-y
- Geertz, C. (1973). *The interpretation of cultures*. New York, NY: Basic Books.
- Gervais, W. M. (2011). Finding the faithless: Perceived atheist prevalence reduces anti-atheist prejudice. *Personality and Social Psychology Bulletin*, 37, 543–556. doi:10.1177/0146167211399583
- Gervais, W. M., Shariff, A. F., & Norenzayan, A. (2011). Do you believe in atheists? Trust and anti-atheist prejudice. *Journal of Personality and Social Psychology*, 101, 1189–1206. doi:10.1037/a0025882
- Gil-White, F. J. (2001). Are ethnic groups biological “species” to the human brain? Essentialism in our cognition of some social categories. *Current Anthropology*, 42, 515–554. doi:10.1086/321802
- Goldberg, I. I., Harel, M., & Malach, R. (2006). When the brain loses its self: Prefrontal inactivation during sensorimotor processing. *Neuron*, 50, 329–339. doi:10.1016/j.neuron.2006.03.015
- Gould, S. J. (2002). *The structure of evolutionary theory*. Cambridge, MA: Harvard University Press.
- Graham, J., & Haidt, J. (2010). Beyond beliefs: Religion binds individuals into moral communities. *Personality and Social Psychology Review*, 14, 140–150. doi:10.1177/1088868309353415
- Hames, R. (1991). Wildlife conservation in tribal societies. In M. Oldfield & J. Alcorn (Eds.), *Biodiversity: Culture, conservation, and ecodevelopment* (pp. 172–199). Denver, CO: Westview Press.
- Hames, R. (2007). The ecologically noble savage debate. *Annual Review of Anthropology*, 36, 177–190. doi:10.1146/annurev.anthro.35.081705.123321
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243–1248. doi:10.1126/science.162.3859.1243
- Harris, M. (1966). The cultural ecology of India's sacred cattle. *Current Anthropology*, 7, 51–66. doi:10.1086/200662
- Henrich, J. (2004). Cultural group selection, coevolutionary processes and large-scale cooperation. *Journal of Economic Behavior & Organization*, 53, 3–35. doi:10.1016/S0167-2681(03)00094-5
- Henrich, J. (2009). The evolution of costly displays, cooperation, and religion: Credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior*, 30, 244–260. doi:10.1016/j.evolhumbehav.2009.03.005
- Henrich, J., Boyd, R., & Richerson, P. J. (2012). The puzzle of monogamous marriage. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 367, 657–669. doi:10.1098/rstb.2011.0290
- Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., . . . Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness and punishment. *Science*, 327, 1480–1484. doi:10.1126/science.1182238
- Henrich, J., & Henrich, N. (2010). The evolution of cultural adaptations: Fijian food taboos protect against dangerous marine toxins. *Proceedings of the Royal Society B: Biological Sciences*, 277, 3715–3724. doi:10.1098/rspb.2010.1191
- Herold, E. S., & Goodwin, M. S. (1981). Adamant virgins, potential virgins and non-virgins. *Journal of Sex Research*, 17, 97–113. doi:10.1080/00224498109551105
- Inzlicht, M., Tullet, A. M., & Good, M. (2011). The need to believe: A neuroscience account of religion as a motivated process. *Religion, Brain & Behavior*, 1, 192–251.
- Johnson, D. D. P. (2005). God's punishment and public goods: A test of the supernatural punishment hypothesis in 186 world cultures. *Human Nature*, 16, 410–446. doi:10.1007/s12110-005-1017-0
- Kanazawa, S., & Still, M. C. (2000). Why men commit crimes (and why they desist). *Sociological Theory*, 18, 434–447. doi:10.1111/0735-2751.00110
- Kaufmann, E. (2010). *Shall the religious inherit the earth?* London, England: Profile Books.
- Lahti, D. C. (2009). The correlated history of social organization, morality, and religion. In E. Volland & W. Schiefenhövel (Eds.), *The evolution of religious mind and behavior* (pp. 67–88). New York, NY: Springer. doi:10.1007/978-3-642-00128-4_5
- Lansing, J. S. (1987). Balinese “water temples” and the management of irrigation. *American Anthropologist*, 89, 326–341. doi:10.1525/aa.1987.89.2.02a00030
- Lansing, J. S. (1991). *Priests and programmers: Technologies of power in the engineered landscape of Bali*. Princeton, NJ: Princeton University Press.
- Lansing, J. S., & Kremer, J. N. (1993). Emergent properties of Balinese water temple networks: Coadaptation on a rugged fitness landscape. *American Anthropologist*, 95, 97–114.
- Lehrer, E. L. (1996). Religion as a determinant of marital fertility. *Journal of Population Economics*, 9, 173–196. doi:10.1007/s001480050013
- Lévi-Strauss, C. (1983). *Structural anthropology* (Vol. 2). Chicago, IL: University of Chicago Press.
- Malinowski, B. (1964). *A scientific theory of culture and other essays*. Chapel Hill: University of North Carolina.

- Paladino, M.-P., Mazurega, M., Pavani, F., & Schubert, T. W. (2010). Synchronous multisensory stimulation blurs self-other boundaries. *Psychological Science, 21*, 1202–1207. doi:10.1177/0956797610379234
- Piazza, J., Bering, J. M., & Ingram, G. (2011). "Princess Alice is watching you": Children's belief in an invisible person inhibits cheating. *Journal of Experimental Child Psychology, 109*, 311–320. doi:10.1016/j.jecp.2011.02.003
- Pittendrigh, C. S. (1958). Adaptation, natural selection, and behavior. In A. Roe & G. G. Simpson (Eds.), *Behavior and evolution* (pp. 390–416). New Haven, CT: Yale University Press.
- Purzycki, B. G., & Sosis, R. (2010). Religious concepts as necessary components of the adaptive religious system. In U. Frey (Ed.), *The nature of God: Evolution and religion* (pp. 37–59). Marburg, Germany: Tectum Verlag.
- Purzycki, B. G., & Sosis, R. (2011). Our gods: Variation in supernatural minds. In U. J. Frey, C. Störmer, & K. P. Willführ (Eds.), *Essential building blocks of human nature* (pp. 77–93). New York, NY: Springer-Verlag. doi:10.1007/978-3-642-13968-0_5
- Randolph-Seng, B., & Nielsen, M. E. (2007). Honesty: One effect of primed religious representations. *International Journal for the Psychology of Religion, 17*, 303–315. doi:10.1080/10508610701572812
- Rappaport, R. A. (1979). *Ecology, meaning, and religion*. Berkeley, CA: North Atlantic Books.
- Rappaport, R. A. (2000). *Pigs for the ancestors: Ritual in the ecology of a New Guinea people*. New Haven, CT: Yale University Press.
- Reiss, I. L., Anderson, R. E., & Sponaugle, G. C. (1980). A multivariate model of the determinants of extramarital sexual permissiveness. *Journal of Marriage and the Family, 42*, 395–411. doi:10.2307/351237
- Roes, F. L., & Raymond, M. (2003). Belief in moralizing gods. *Evolution and Human Behavior, 24*, 126–135. doi:10.1016/S1090-5138(02)00134-4
- Ruffle, B. J., & Sosis, R. H. (2007). Does it pay to pray? Costly ritual and cooperation. *B.E. Journal of Economic Analysis & Policy, 7*, 1–35. doi:10.2202/1935-1682.1629
- Saeed, A., & Saeed, H. (2004). *Freedom of religion, apostasy and Islam*. Burlington, VT: Ashgate.
- Samuels, M. L. (1982). POPREG I: A simulation of population regulation among the Maring of New Guinea. *Human Ecology, 10*, 1–45. doi:10.1007/BF01531103
- Sanderson, S. K. (2008). Religious attachment theory and the biosocial evolution of the major world religions. In J. Bulbulia, R. Sosis, E. Harris, R. Genet, C. Genet, & K. Wyman (Eds.), *The evolution of religion: Studies, theories, and critiques* (pp. 67–72). Santa Margarita, CA: Collins Foundation Press.
- Schloss, J. P., & Murray, M. J. (2011). Evolutionary accounts of belief in supernatural punishment: A critical review. *Religion, Brain and Behavior, 1*, 46–99.
- Searcy, W. A., & Nowicki, S. (2005). *The evolution of animal communication: Reliability and deception in signaling systems*. Princeton, NJ: Princeton University Press.

- Shantzis, S. B., & Behrens, W. W. (1973). Population control mechanisms in a primitive agricultural society. In D. L. Meadows & D. H. Meadows (Eds.), *Towards global equilibrium* (pp. 257–288). Cambridge, MA: Wright-Allen Press.
- Shariff, A. F. (2008). One species under God? Sorting through the pieces of religion and cooperation. In J. Bulbulia, R. Sosis, C. Genet, R. Genet, E. Harris, & K. Wyman (Eds.), *The evolution of religion: Studies, theories, and critiques* (pp. 119–125). Santa Margarita, CA: Collins Foundation Press.
- Shariff, A. F., & Clark, B. (2012). [Atheists versus Muslims: Comparing religious prejudices]. Unpublished raw data.
- Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Supernatural agent concepts increase prosocial behavior in an anonymous economic game. *Psychological Science, 18*, 803–809. doi:10.1111/j.1467-9280.2007.01983.x
- Shariff, A. F., & Norenzayan, A. (2011). Mean gods make good people. *International Journal for the Psychology of Religion, 21*, 85–96. doi:10.1080/10508619.2011.556990
- Shariff, A. F., & Rhemtulla, M. (2012). *Divergent effects of heaven and hell beliefs on national crime*. Unpublished manuscript.
- Sharrock, W. W., Hughes, J. A., & Martin, P. J. (2003). *Understanding modern sociology*. Thousand Oaks, CA: Sage.
- Sherman, P. W., & Billing, J. (1999). Darwinian gastronomy: Why we use spices. *Bioscience, 49*, 453–463. doi:10.2307/1313553
- Smith, E. A., & Wishnie, M. (2000). Conservation and subsistence in small-scale societies. *Annual Review of Anthropology, 29*, 493–524. doi:10.1146/annurev.anthro.29.1.493
- Snarey, J. (1996). The natural environment's impact upon religious ethics: A cross-cultural study. *Journal for the Scientific Study of Religion, 35*, 85–96. doi:10.2307/1387077
- Soler, M. (2012). Costly signaling, ritual and cooperation: Evidence from Candomblé, an Afro-Brazilian religion. *Evolution and Human Behavior, 33*, 346–356. doi:10.1016/j.evolhumbehav.2011.11.004
- Sosis, R. (2005). Does religion promote trust? The role of signaling, reputation, and punishment. *Interdisciplinary Journal of Research on Religion, 1*, Article 7. Retrieved from <http://www.religjournal.com>
- Sosis, R., & Bressler, E. R. (2003). Cooperation and commune longevity: A test of the costly signaling theory of religion. *Cross-Cultural Research: The Journal of Comparative Social Science, 37*, 211–239. doi:10.1177/1069397103037002003
- Sosis, R., Kress, H. C., & Boster, J. S. (2007). Scars for war: Evaluating alternative signaling explanations for cross cultural variance in ritual costs. *Evolution and Human Behavior, 28*, 234–247. doi:10.1016/j.evolhumbehav.2007.02.007
- Sosis, R., & Ruffle, B. (2003). Religious ritual and cooperation: Testing for a relationship on Israeli religious and secular kibbutzim. *Current Anthropology, 44*, 713–722. doi:10.1086/379260

- Sosis, R., & Ruffle, B. (2004). Ideology, religion, and the evolution of cooperation: Field tests on Israeli kibbutzim. *Research in Economic Anthropology*, 23, 89–117. doi:10.1016/S0190-1281(04)23004-9
- Sperber, D. (1996). *Explaining culture: A naturalistic approach*. Malden, MA: Blackwell.
- Spiro, M. E. (1987). *Culture and human nature: Theoretical papers of Melford E. Spiro* (B. Kilborne & L. L. Langness, Eds.). Chicago, IL: University of Chicago Press.
- Stark, R. (2001). Gods, rituals, and the moral order. *Journal for the Scientific Study of Religion*, 40, 619–636. doi:10.1111/0021-8294.00081
- Steadman, L. B., & Palmer, C. T. (2008). *The supernatural and natural selection: Religion and evolutionary success*. Boulder, CO: Paradigm.
- Stinchcombe, A. L. (1968). *Constructing social theories*. New York, NY: Harcourt, Brace & World.
- Swanson, G. E. (1960). *The birth of the gods: The origin of primitive beliefs*. Ann Arbor: University of Michigan Press.
- Tan, J. H. W., & Vogel, C. (2008). Religion and trust: An experimental study. *Journal of Economic Psychology*, 29, 832–848. doi:10.1016/j.joep.2008.03.002
- Thornton, A., Axinn, W. G., & Hill, D. H. (1992). Reciprocal effects of religiosity, cohabitation, and marriage. *American Journal of Sociology*, 98, 628–651. doi:10.1086/230051
- Wallace, A. F. C. (1966). *Religion: An anthropological view*. New York, NY: McGraw-Hill.
- White, D. R., Betzig, L., Borgerhoff Mulder, M., Chick, G., Hartung, J., Irons, W., . . . Otterbein, K. F. (1988). Rethinking polygyny: Co-wives, codes, and cultural systems. *Current Anthropology*, 29, 529–572. doi:10.1086/203674
- White, D. R., & Burton, M. L. (1988). Causes of polygyny—Ecology, economy, kinship, and warfare. *American Anthropologist*, 90, 871–887. doi:10.1525/aa.1988.90.4.02a00060
- Wilson, M., & Daly, M. (1985). Competitiveness, risk-taking, and violence: The young male syndrome. *Ethology & Sociobiology*, 6, 59–73. doi:10.1016/0162-3095(85)90041-X
- Wilson, M. R., & Filsinger, E. E. (1986). Religiosity and marital adjustment: Multi-dimensional interrelationships. *Journal of Marriage and the Family*, 48, 147–151. doi:10.2307/352238
- Wiltermuth, S. S., & Heath, C. (2009). Synchrony and cooperation. *Psychological Science*, 20, 1–5. doi:10.1111/j.1467-9280.2008.02253.x
- Zahavi, A., & Zahavi, A. (1997). *The handicap principle: A missing piece of Darwin's puzzle*. New York, NY: Oxford University Press.
- Zelnik, M., & Shah, F. H. (1983). First intercourse among young Americans. *Family Planning Perspectives*, 15, 64–70. doi:10.2307/2134848

INDEX

- Abebe, E. M., 43
- Abramowitz, A. I., 145
- Academic disciplines. *See also* Professional and disciplinary cultures
cultural perspective on, 16–21
national/ethnic groups represented in, 18–20
- Acculturation, in disciplinary and professional cultures, 13, 14
- Achievement, happiness from social harmony vs., 102
- Acquiescence, 99
- Activism, political, 134
- Adaptation(s)
culture as, 50
and culture formation, 65–68
facultative, 194, 195
generating gendered sexuality, 194
opportunistic reproductive strategy as, 203
in religions, 217
and religious practices, 231, 232
- Advertising, food product, 176, 179–181
- Affect, food and, 164–165
- African American culture
explicit values in, 96, 97
health and food choices of, 173
step dances in, 227
in U.S. culture, 69
- African American subculture (U.S.), 60
- Agency
and attunement to sociocultural contexts, x–xi
in functionalist accounts, 219
- Agentic traits, in cross-temporal research, 41, 42
- Aggregations of individual-level adaptations, 66–67
- Agreeableness, regional differences in, 82
- Almond, G. A., 132, 133
- Ambady, N., 174
- American Freshman Survey, 37, 38, 41
- American Psychological Association (APA), 24
- Analysis
levels of, in understanding social class, 68–69
modes of, in disciplinary and professional cultures, 14
- Antiatheism, 227–229
- APA (American Psychological Association), 24
- Apostasy, 227
- Arab Spring, 138
- Asch, S. E., x, xi, 107
- Asia
collectivistic culture in, 33
explicit values in, 97
independence in the U.S. vs., 102–103
- Asian Americans, food and identity denial in, 174
- Asians
in production of psychological knowledge, 19–23
stereotypes of, 174
- Asocial learning, 25
- Assertiveness, in cross-temporal research, 41
- Atheism, 227–229
- Attachment styles
pancultural sex differences in, 194, 198
variation across cultures in, 202–203
- Attention, focused, 101
- Attitudes
about atheists, 228–229
among social classes, 53, 55
and democracy, 132
of lower classes, 53
in mass cultural orientation, 136–137
pancultural sex differences in, 198
in political culture, 131
of self-direction, 55
sexual, 195–196
sociopolitical, 13–14
sociosexual, 194
toward food, 165