

*CUI BONO?**A REVIEW OF BREAKING THE SPELL: RELIGION AS A NATURAL PHENOMENON BY DANIEL C. DENNETT*

HOWARD RACHLIN

STONY BROOK UNIVERSITY

The three requirements for a Darwinian evolutionary process are replication, variation and selection. Dennett (2006) discusses various theories of how these three processes, especially selection, may have operated in the evolution of religion. He believes that the origins of religion, like the origins of language and music, may be approached scientifically. He hopes that such investigations will open a dialog between science and religion leading to moderation of current religious extremism. One problem with Dennett's program, illustrating the difficulty of breaking away from creationist thinking, is Dennett's own failure to consider how Darwinian methods may be used to study evolution of behavioral patterns over the lifetime of individual organisms.

Key words: religion, evolution, science, Darwinism, teleological behaviourism, intentional stance

The object of Dennett's (2006) *Breaking the Spell* is laudable. Instead of just wringing his hands at current outrages committed by religious zealots, Dennett intends to look at religion scientifically. He brings together strands from anthropology, archeology, biology, psychology, and the philosophy of science to focus on religion itself so as to understand the origins of religious belief in general, and fanatical religious belief in particular, and to suggest what we can do about terrorism in the name of religion.

He asks first, how did religion evolve in human culture? And then, how is religion maintained in modern times? In attempting to answer these questions, he maintains a Darwinian perspective, but he is ecumenical as regards varieties of Darwinism. The three requirements of a Darwinian process are *variation*, *selection*, and *replication*. Any evolutionary theory constituted of these three elements is Darwinian, Dennett tells us. Darwinian theories have been proposed on various levels—economic, societal, behavioral, and sociological, as well as biological; one such theory does not necessarily contradict another, and, in attempting to explain religion, Dennett considers several of them. He arrives at an amalgam in which evolution acts simulta-

neously on both individual and cultural behavior patterns.

According to Dennett, the crucial question for any behavioral pattern, religion included, is *cui bono* (who benefits)? For a pattern to survive as an instinct, it must at some point in its history have differentially benefited the individuals exhibiting that pattern—making them better fit to their environment than others who did not exhibit that pattern and increasing the spread of their genes. A means of transmission considered and tentatively rejected by Dennett is “group selection.” Group selection would work as an evolutionary process in cases, such as unselfishness or altruism, where the benefit from a particular pattern of behavior goes to a group rather than an individual.

For example, imagine a league of basketball teams where points scored represent fitness. In this fictional league, new teams are continually being formed with players varying in degree of general unselfishness. Unsuccessful teams lose their fans, periodically go bankrupt and leave the league. Everything else being equal, teams whose players play nonselfishly tend to score more points than teams whose players play selfishly. Therefore, teams with a predominance of unselfish players will have more fitness (e.g., attract more fans and make more money) and survive, while teams with a predominance of selfish players will die out; more and more unselfish players will populate the league. The problem with this scenario is that, at the same time as group selection is progres-

Preparation of this review was supported by a grant from The National Institutes of Health. Address correspondence to Howard Rachlin, Psychology Department, Stony Brook University, Stony Brook, NY 11794-2500 [howard.rachlin@sunysb.edu].

doi: 10.1901/jeab.2007.45-06

sing at the team level, another evolutionary process goes on at the individual level. Within a team, selfish players score more points than unselfish players. If the general manager of each team gets rid of the low-scoring players and acquires high-scoring players, the two evolutionary levels will compete. On the between-team level, unselfish players dominate; on the within-team level, selfish players dominate. Which of the two levels wins out depends on the relative speed of evolution at the two levels. If teams tend to be replaced in the league relatively quickly while players tend to be replaced on teams relatively slowly, then unselfishness will come to dominate the league; if players tend to be replaced on teams relatively quickly while teams tend to be replaced in the league relatively slowly, then selfishness will come to dominate (as it has in the NBA).

Religion in society is much more like the latter case than the former. That is, people come and go in the world much faster than religions do. So, according to Dennett, we are thrown back on individual evolution to explain religiosity. According to Dennett, at the most fundamental level, the inherited trait most responsible for religious behavior is our tendency to attribute agency to complex moving objects. This tendency is highly useful, even necessary in a human social system. Dennett says (pp. 111–112):

We experience the world as not just full of moving human bodies but of *rememberers* and *forgetters*, *thinkers* and *hoppers* and *villains* and *dupes* and *promise-breakers* and *threateners* and *allies* and *enemies*. Indeed, those human beings who find perceiving the world from this perspective difficult—those suffering from autism are the best-studied category—have a more significant disability than those who are born blind or deaf.

Dennett calls this way of experiencing the world the *intentional stance*. The intentional stance was and remains vital in everyday life when referring to patterns in the behavior of other people, but it may be misapplied in the case of natural phenomena. Dennett continues: “*So powerful is our innate urge to adopt the intentional stance that we have real difficulty turning it off when it is no longer appropriate [italics added].*” We observe complex patterns of behavior not only in other people and animals but also in the environment—in the

movements of the stars and planets or in the seasons, for examples. If I see an arrow flying in a parabolic arc, I can usually assume someone shot it—even if I cannot directly verify that assumption. I can assume that the flight of the arrow is caused by an intentional act. And this is a highly useful assumption whether or not it is verifiable in any particular case. So when I see the sun rise every morning or when I see winter reliably turning into spring, I make a similar assumption—there is an intentional actor behind these predictable motions. Since the motions to be explained are so complex and so important to me, the actor who caused them must be very powerful and very smart, and since I never do find the actor, he must be located in some inaccessible place. Thus complex movements of all kinds fall under the same explanatory system. Because, in ancient times, no better explanatory system existed to explain complex, regular physical phenomena (no system that allowed better prediction or control), the intentional stance saved a lot of cognitive effort for our ancestors and kept priests and shamans in elevated positions in society. What keeps religion going today, Dennett believes, is this over-extension of the intentional stance, plus benefits to the individual from cooperative behavior (not all social interactions are prisoner’s dilemmas; by far the larger proportion—economic trade for instance—are mutually beneficial), plus the comforts of a belief in life after death (the persistence of the presumption of the intentional stance with regard to other people after their death), plus the placebo effect of faith healing.

In addition to the intentional stance we inherit from our ancestors, according to Dennett, there exists in our genes a form of cultural transmission of particular religious practices through what he calls *memes* (taking the term from Dawkins, 1989). Memes, like genes, work by individual rather than group selection. Just as genes are passed from person to person, so are memes; except that, whereas genes are passed from the bodies of parents to the bodies of children, memes are passed from the minds of parents and teachers to the minds of children. If a practice is pervasive across individuals in a species or across individual cultures (if it is a “persistent pattern”) then it must have evolved in the individual or in the culture. Dennett says

(p. 78), "...cultural transmission can *sometimes* mimic genetic transmission, permitting competing variants to be copied at different rates, resulting in gradual revisions in features of those cultural items, and *these revisions have no deliberate, foresighted authors...* What is copied is a *way of saying something*, a behavior or routine" (italics in original). Regardless of the complexity of a given biological structure (such as the human brain) or a given behavioral pattern (such as birds' nest building or elaborate courtship rituals) or a given cultural practice (such as being an orthodox Jew), that structure, pattern, or practice must, according to Dennett, have evolved by natural selection. In no case was there a deliberate design. But the *Torah* was deliberately written down, you might say. Yes, but as soon as people were writing things down they were writing many stories of creation and rules for behavior. Why were some stories and rules so carefully preserved while others were abandoned? If they were preserved then someone must have benefited from them. For a pattern to survive as a transmitted cultural practice, such as a particular language or a particular religion, the current beneficiaries may be the people who exhibit the pattern or a self-perpetuating group of leaders or priests who pass it down to successive generations. Like our taste for sweets, a pattern of behavior may not be a good thing for everybody to have in their current circumstances (although our taste for sweets is certainly good for large segments of the food production industry). Whether a particular religion serves any useful function in modern society is a question that has to be dealt with separately from the question of how it evolved and separately, of course, from whether God exists.

Of course, Dennett acknowledges, much of this argument is speculative and subject to debate. But, he believes, the debate must be carried on within an evolutionary framework. Dennett wants to engage religious readers in these arguments. He believes that you can accept an evolutionary framework and still be religious. But he also believes that, accepting an evolutionary framework, once you do engage in such arguments you would not be able to hold onto more extreme practices. Knowing how the belief in heaven arose in your culture, you might not be so willing to kill or be killed in order to get there. Dennett's

prescription for combating terrorism is to establish free or low cost schools (presumably with evolutionary biology prominent on the syllabus) to compete with the madrasahs in Muslim countries. Given that those countries could be bribed or pressured to allow secular schools (a big "given"), such a project might eventually have an effect. Certainly Dennett's plan is better than invading those countries. Though, of course, the more likely such schools are to work, the less likely they are to be permitted.

Beyond the promotion of Dennett's school-development plan, the book has a more immediate purpose—to engage not only scientists but intelligent laymen ("...curious and conscientious citizens..." p. xiii) in these discussions. The topics discussed are so wide ranging that any scientist specializing in one discipline will have to take Dennett's word about developments in the others. I, for one, can't do it. On the single point at which the book touches on operant conditioning (p. 118), Dennett gets it wrong. He cites Skinner's (1948) superstition experiment as an explanation of the origin of some religious beliefs; for example, he says, rain dances may have evolved after they were coincidentally reinforced by rain. First, Skinner's theory of the development of superstitious behavior by accidental contiguity has been called into question by later research (Staddon & Simmelhag, 1971); second, Dennett says that the schedule Skinner used to develop repetitive behavior was "a *random* schedule of reinforcement" (italics in original); but only *fixed*-time schedules generate the repetitive behavior Skinner observed.¹ With regard to other science areas, a review in *The New Yorker* by an evolutionary biologist (Orr, 2006) was largely sympathetic but pointed out errors of interpretation of evolutionary biology in the book.

Religious intellectuals have been even less willing to engage in Dennett's proposed dialog. A review in *The New York Times Book Review* by Leon Wieseltier (2006) consisted of a vituperative, *ad-hominem* attack on Dennett. Wieseltier is the literary editor of *The New Republic*. He is an intellectual and a religious Jew—just the sort of person Dennett is trying to reach. If

¹Staddon and Simmelhag (1971) present a detailed experimental analysis of Skinner's original "superstition" experiment and show that the repetitive behavior Skinner described may best be understood as the outcome of variation and selection—that is, as a Darwinian process.

he refuses to consider his religion as an evolutionary process, who will? Another review, in *The New York Review of Books*, by the mathematician and physicist (and Christian), Freeman Dyson (2006), was much more reasonable and sympathetic than Wieseltier's, but still dismissed Dennett's main point. On balance Dyson feels that the good that religion causes bad people to do outweighs the bad that religion causes good people to do. (Where you come out on this issue depends, of course, on whether you consider people to be naturally bad or naturally good.) Dennett certainly does not prejudge this question. But Dyson, like *The New Yorker* reviewer, believes that all debates about religion—not only the question of innate goodness or badness—are orthogonal to scientific inquiry. Religion, Dyson feels, can be usefully studied only from the *inside*, in religious terms, as William James did in *The Varieties of Religious Experience* (James, 1902/1982), not scientific ones. Dennett's proposal to establish a scientific dialog on religion is thus rejected by some of the very people he is trying so hard to reach.

As a behaviorist I find it hard to muster any sympathy for Dennett's failure in this regard because, in one crucial area, the behavior of individual organisms, Dennett is a thoroughgoing creationist. Just as some critics unfairly accuse Dennett of trivializing religion, Dennett (1978) has unfairly accused behaviorists in general and Skinner in particular of trivializing human cognition. As I said above, the intentional stance is unquestionably necessary in our everyday interactions with each other. I may believe that you believe that I believe that you are telling the truth—and this chain of my beliefs (in the form of overt verbal and nonverbal behavioral patterns) may be reinforced by your behavior as it interacts with mine.²

²You may justly say that this is just hand-waving. What are the patterns of verbal and nonverbal behavior that constitute belief and belief in belief, etc.? In a given case, it may be possible to determine such patterns—juries and judges in law courts frequently have to do just that. Defining belief behaviorally is another matter. I make an attempt in the next several paragraphs to define imagination (apparently a more purely internal concept than belief) in behavioral terms. I only claim that the difficulties standing in the way of establishing a wholly behavioral definition of belief are as nothing compared to the difficulty of discovering the workings of the internal mechanism that governs such behavior.

I have an old friend from the Bronx who is a professional actor. I see him at very long intervals—10 years on the average. Invariably I come away confused. I don't know if he's really a nice guy or is just acting like a nice guy. (I'm not sure whether he knows either.) Having a conversation with a professional actor is like sparring with a professional boxer; they're in absolute control. How could I have resolved my confusion after my conversations with my actor friend? What information did I need that I didn't have? According to Dennett, the information I needed was inside my friend at the time of my conversations with him in the form of a set of mechanisms in his brain which, if I only knew how they were organized and their state at the time, would tell me what he was really thinking as he said what he said. It is the collective state of these mechanisms that constitute, for Dennett, the actor's mental state. And it is his mind that directly causes him to say what he says; that is, his behavior is created by his mind and his mind is inside his head. That seems to me nonsense. What I need is not information about my friend's internal state but information about his overt behavior over extended periods during the previous 10 years (and, as it comes in, information about his overt behavior over the next 10 years). A frank conversation about him with his children and wife would tell me far more about what he was really thinking at the time we met than would any kind of examination of his insides.

A behaviorist would have to say that, like my intentional stance with respect to the behavior of water (it seeks its own level) and the behavior of my computer (it hates me), my intentional stance with respect to my own behavior and that of other people, while convenient for everyday life, is a hindrance to scientific understanding. Dennett thinks, on the other hand, that although my intentional stance toward inanimate objects, plants, and most animals, is certainly unscientific, my intentional stance toward people, and especially toward myself, is the very basis of scientific psychology.

Behaviorists, following Skinner (1990), are far more consistent Darwinians than Dennett is. For us, behavioral patterns within the lifetime of an individual person evolve by a Darwinian process just as genetic and cultural patterns do. For an excellent discus-

sion of the evolution and maintenance of religion consistent with this behavioral outlook (and of course ignored by Dennett) see Baum (2005). For Baum, memes are transmitted not from one (internal) mind to another but by a history of discriminative stimuli, behavior, and reinforcement. He says:

No understanding is gained by imagining that the units of cultural transmission are [internal] mental entities...or unknown neural structures. Such explanatory fictions remain superfluous as ever and cannot explain how cultural practices originate and change, a question that demands attention to history and behavior over time for its answer... (p. 268)

It is important to specify exactly how an evolutionary view of complex individual behavior patterns differs from Dennett's intentional stance. For Dennett, memes are passed down from the minds of parents to the minds of children. But what exactly are memes and where exactly are they located? Dennett admits (p. 349), "...it is unlikely that any *independently identifiable* common brain structures, in different brains, could ever be isolated as the material substrate for a particular meme" (italics in original). Instead, he argues, each meme, like each thought, wish, belief, etc. is a compound of small mechanisms most likely distributed across various places in our nervous systems. He quotes himself (approvingly) as follows (p. 302): "*Yes we have a soul; but it's made of lots of tiny robots*" (italics in original). Thus, for Dennett, our beliefs reside not in our verbal and nonverbal behavioral patterns but in a set of mechanisms (the tiny robots) in our brains. The data Dennett recommends for cognitive science are behavioral; cognitive science is distinct from neurophysiology. But those data are to be interpreted as evidence for internal mechanisms (the tiny robots)—not indeed neural connections but flow diagrams where the boxes have labels like *memory, imagination, thought*, and so forth.³

³It is not clear whether Dennett recommends that behavioral observations be supplemented by introspection. Sometimes he uses the term *reflection* (properly, I believe) to refer to observations of the consequences of one's own overt behavior as reflected by the environment (including other people). But sometimes it seems he conceives reflection to be a kind of *introspection*—a wholly internal process—as when he talks about how "...our ancestors became reflective (and hyperreflective) about their own beliefs" (p. 200).

A Dennettian experimental psychologist would approach her object of study (the human mind) as if it were an unknown computer. Conducting an experiment would be like typing the keys in certain patterns, observing the patterns on the screen, and trying to infer, from their relationships, what the computer's program (its software) must be to have produced just those outputs from those inputs. It would be up to the neurophysiologist then to take the computer apart to discover the wiring diagram (the hardware) that instantiate the program. Extending Dennett's analogy to a behavioral analysis, the human soul would consist not of a bunch of tiny robots but of the behavior of a single big robot—the person as a whole. The behavior analyst turns the dials and presses the levers, as it were, to discover, not what goes on inside the robot, but how the robot as a whole functions in its environment (i.e., what are the relevant reinforcement contingencies and discriminative stimuli). That is, the behavior analyst approaches the study of a human being in exactly the same way as the evolutionary biologist approaches the study of a nonhuman animal. But Dennett believes that the study of the behavior of organisms as wholes (at what he calls the "personal level") is unscientific (Dennett, 1978, p. 154, footnote). Although complex patterns on the genetic and cultural levels "have no deliberate farsighted authors," complex patterns do have authors on the personal (i.e., the behavioral) level, Dennett believes—those little robots inside the head. Once these are discovered, the Dennettian cognitivist's task is finished.

But, granted that no complete understanding of human behavior can be achieved without understanding internal mechanisms, if you knew everything there is to know about those tiny robots (and the tinier robots inside them, and those inside them) you would still not understand why people do the things they do and why they say the things they say. You will have ignored the most important scientific fact—the most important Darwinian fact—about those patterns (including religious patterns): their function in the person's environment (including the social environment).

Behaviorists disagree with each other about whether complex behavioral patterns of whole organisms are usefully labeled by terms from

our mental vocabulary. Skinner (1990) thought not. I believe, on the contrary, that mental terms are useful in behavior analysis (Rachlin, 1994). You could call this the *teleological stance*. Imagination, for example, may be seen, from this perspective, not as an image in your head but as a functional mode of behavior—behaving in the absence of some state of affairs as you normally would in its presence. Suppose two people in a room are both asked to imagine a lion. The first person closes her eyes and says, “Yes, I see it; it has a mane and a tail.” The second person runs screaming from the room. The first person is imagining a picture or a movie of a lion but the second is imagining a lion itself. What is the function of such behavior? Imagination is a necessary part of perception. If perception (as distinct from sensation) is current discrimination of complex, temporally extended sequences of stimuli (as distinct from simpler, immediate stimuli), then the immediate discriminative response, especially if made early in the sequence, involves a sort of gamble—behaving as if the extended sequence had occurred. For example, at any given moment I treat my wife as the person she is in the long run not as the particular bundle of sensations she presents to me at that moment. It is in connection with such premature but necessary discrimination (the universal arising out of particular instances) that Aristotle gives us his famous analogy of soldiers in a rout turning one by one and making a stand (Rachlin, 1994, p. 72). The function of the soldiers’ behavior is to create an abstraction (the renewed formation) out of individual actions. The first soldier to turn is behaving as he would if all the others had already turned; he is imagining that they had already turned. His imagination is what *he* does, not what the robots in his head are doing. The functions of our ordinary imaginations are to allow us to get around in the world on the basis of partial information. We do not have to carefully test the floor of every room we walk into.

Imagination is also necessary in self-control. One cigarette refusal by a smoker is utterly worthless—like only one soldier in a rout turning and making a stand. Refusal of an individual cigarette is never reinforced—not now, not later, not symbolically, not internally. Only an extended series of cigarette refusals is reinforced. Refusal of the first cigarette is thus

an act of imagination—behaving as you would if a state of affairs existed when it does not (yet) exist. Such complex long-term imaginative acts would be shaped from simpler short-term acts. The function of such behavior is clear. Getting up in the morning, at least for me, is an act of imagination.

How do complex patterns evolve? One possibility is group selection. Recall that the problem with group selection as an explanation of cultural evolution of altruism is that individuals are replaced in social groups faster than groups are replaced in their cultures. But in the case of behavioral patterns within a person’s lifetime, larger more complex patterns (habits) may well be replaced (when they do not succeed) faster than their components (perhaps initially reflexive acts). Thus, selection (by reinforcement) of patterns of acts in an individual’s lifetime may overwhelm selection of components of those patterns. Consider the habit of eating three meals a day and snacking a little between meals. Occasionally we vary it but, if we vary it too far, we gain or lose weight and lose social reinforcement, perhaps job performance and even health. The unit of selection in this case is the wider (more molar) pattern. We vary the amount we eat by varying our pattern across days or weeks while our rate of eating each meal remains fairly fixed. Similarly, a rat normally varies its rate of lever pressing (and eating and drinking) by adjusting the duration of bursts of behavior rather than the time between each lever press (or chew or lick). Reinforcement thus may shape the wider unit before it shapes the smaller. This is group selection, but the groups are groups of responses in the lifetime of an organism rather than groups of organisms in a society. In Aristotle’s analogy, for a trained soldier, brave behavior in the long run may be selected over cowardly behavior in the long run more easily than running away from the enemy is selected over turning and making a stand right now. Of course, no part of this process need rely on a “deliberate foresighted author.” As wider and wider patterns are reinforced, the units of imagination evolve from simpler to more complex forms over our lifetimes—just as complex structures like the vertebrate eye evolve from simpler structures in the lifetime of a species.

The reason for this long discussion of imagination is to demonstrate, by one exam-

ple, that analysis of the function of mental behavior in the life of a whole human being is at least as scientifically productive as speculating about internal mechanisms. To explain our behavior, we do not have to rely on creators of our actions, placed by an intentional stance inside our heads—as Donner, the thunder god, is placed in Valhalla—because we cannot find them in our environments.

This form of the Darwinian approach to individual behavior is speculative, of course, but there is nothing about it that cannot be studied with the behavioral technology we have in hand. Of the Darwinian trinity (replication, variation, and selection), operant studies have focused on selection by reinforcement contingencies. But studies of variation (e.g., Neuringer, 2002) and replication in the form of *behavioral momentum* (e.g., Nevin, 1992) or *commitment* (de la Piedad, Field, & Rachlin, 2006) are gaining space in operant literature. If we do not now know the underlying replicator of overt behavioral patterns we may take some comfort that Darwin could only speculate on the form that genetics would take. One avenue that might lead to a genetics of overt behavioral patterns is the study of rule-governed behavior (Hayes, Barnes-Holmes, & Roche, 2001). As discriminative stimuli grow more complex they may take on a life of their own, not inside people's heads but in the written and oral language that guides individual behavior.

This is not to say that there are no mechanisms in our heads. There certainly are mechanisms underlying all of our behavior, mental and otherwise. Neurophysiology is proceeding to identify some of them. But you can question whether it is scientifically useful to give those mechanisms labels like *perception*

and *memory* and *thought* and *imagination*, especially when those labels may be so usefully applied to patterns of overt behavior of whole organisms over time.

REFERENCES

- Baum, W. M. (2005). *Understanding behaviorism: Behavior, culture, and evolution*. (2nd ed.). Oxford, England: Blackwell.
- Dawkins, R. (1989). *The selfish gene* (Rev. ed.). Oxford, England: Oxford University Press.
- de la Piedad, X., Field, D., & Rachlin, H. (2006). The influence of prior choices on current choice. *Journal of the Experimental Analysis of Behavior*, *85*, 3–21.
- Dennett, D. C. (1978). *Brainstorms: Philosophical essays on mind and psychology*. Montpelier, VT: Bradford Books.
- Dennett, D. C. (2006). *Breaking the spell: Religion as a natural phenomenon*. New York: Viking.
- Dyson, F. (2006, June 22). Religion from the outside. *The New York Review of Books*, *53*, 4–8.
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.) (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York: Springer.
- James, W. (1982). *The varieties of religious experience* (M. Marty, Ed.). New York: Penguin. (Original work published in 1902)
- Neuringer, A. (2002). Operant variability: Evidence, functions, and theory. *Psychonomic Bulletin & Review*, *9*, 672–705.
- Nevin, J. A. (1992). An integrative model for the study of behavioral momentum. *Journal of the Experimental Analysis of Behavior*, *57*, 301–316.
- Orr, H. A. (2006, April 3). The God project. *The New Yorker*, *82*, 80–83.
- Rachlin, H. (1994). *Behavior and mind: The roots of modern psychology*. New York: Oxford University Press.
- Skinner, B. F. (1948). 'Superstition' in the pigeon. *Journal of Experimental Psychology*, *38*, 168–172.
- Skinner, B. F. (1990). Can psychology be a science of mind? *American Psychologist*, *41*, 1206–1210.
- Staddon, J. E. R., & Simmelhag, V. L. (1971). The superstition experiment: A reexamination of its implications for the study of adaptive behavior. *Psychological Review*, *78*, 3–43.
- Wieseltier, L. (2006, February 19). The God genome. *The New York Times*. section 7, p. 11.