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The Existential Theory of Mind

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The primary causal explanatory model for interpreting behavior, theory of mind, may have expanded into corridors of human cognition that have little to do with the context in which it evolved, questioning the suitability of domain-specific accounts of mind reading. Namely, philosophical-religious reasoning is a uniquely derived explanatory system anchored in intentionality that does not clearly involve behavior. The presence of an existential theory of mind (EToM) suggests that individuals perceive some nondescript or culturally elaborated (e.g., God) psychological agency as having encoded communicative intentions in the form of life events, similar to a person encoding communicative intentions in deictic gestures. The emergence of EToM is discussed from ontogenetic and phylogenetic perspectives; autism is examined to determine whether alternate core explanatory models (e.g., folk physics) are used by those with deficits in theory of mind to derive existential meaning.

The search for a precise understanding of how the human brain translates *observable* actions into *unobservable* intentions has come to dominate several major disciplines of the cognitive sciences. Cognitive developmentalists, comparative psychologists, and evolutionary psychologists are all enamored with the study of mind (Cheney & Seyfarth, 1990; Cosmides & Tooby, 1992; Flavell, 1999; Sperber, 1994; Tomasello & Call, 1997; Wellman, 1990), and rightly so. Successfully navigating through even the everyday, humdrum social world of human relations requires nothing less than a mechanism of such finesse and precision that it functions outside the boundaries of conscious awareness. A threatening glance from a stranger, a gentle tug of a child's hand on one's sleeve, and the rolled eyes of a disgruntled student are not isolated, meaningless behaviors emitted by mechanical agents but the symbolic manifestations of mental states intentionally transmitted as messages from complex psychological agents to be received by other complex psychological agents. Yet, even these peripherally social be-

haviors are, for most people, effortlessly enriched with meaningful mentalistic interpretations.

Indeed, it is partially because of this extreme efficiency in the area of "mind reading" that some researchers have suggested that, perhaps, such processes are part of a larger adaptive system that has become modularized over evolutionary time (Baron-Cohen, 1995; Leslie, 1987, 1991; Whiten, 1998). Because of its primary importance for human sociality, this "theory of mind" system, as it has come to be called, has become an obvious candidate for the origins of sophisticated human social cognition and the cultural institutions created thereof. Some theorists have gone so far as to claim that it, in fact, was the single evolutionary novelty that gave birth to culture, adding such critical elements into the primate social mélange as deception (Byrne & Whiten, 1988; R. Mitchell & Thompson, 1986), imitation (Tomasello, Kruger, & Ratner, 1993), teaching (Boesch, 1991), and most notably language (Pinker, 1994; Tomasello, 1999).

The intuitiveness of religious thought and its relationship to theory of mind, however, has in large measure been a stone unturned in these debates, or at least it has been kicked about only half seriously. Yet, philosophical-religious theorizing seems an important link in the process of becoming human; for better or worse, it has served to psychologically extricate the human organism from the raw biological heritage of its mind-blind past. Throughout history, it has

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prospered into the higher arts of literature, music, and, even science. But even more important, it has reorganized the way individuals can represent the unique experiences that compose their own narratives.

In this article, I attempt a rapprochement between the theory of mind system that has been popularized in contemporary cognitive academia and a very basic, species-wide *existential theory of mind* (EToM) proposed as an independent system that, although built on the foundations of theory of mind, serves not to explain or predict behavior but, rather, to allow individuals to attribute meaning to certain classes of autobiographical experiences. This is by no means the first attempt of its kind, and others have in fact seen a relationship between theory of mind and theism (e.g., J. L. Barrett & Keil, 1996; Boyer, 1994; Maser & Gallup, 1990); however, it is the first attempt, so far as I can gather, to clearly articulate the issues involved.

Existential Theory of Mind: Distinctiveness and Contextual Issues

I define EToM, in a purposefully general sense, as a biologically based, generic explanatory system that allows individuals to perceive meaning in certain life events. The term *meaning* is used throughout this article in the sense the philosopher Grice (1957) adopted when he spoke of *nonnatural meaning*, which he described as occurring wherever an agent "intended the utterance of x [message] to produce some effect in an audience by means of the recognition of this intention" (p. 385). In the context of EToM, meaning is viewed as an embedded conceptual property that a life event either does or does not possess, in the same manner as the Gricean law just described. Whether it is present in a given situation depends solely on the attributions of the person experiencing the event. A meaningful life event is one that implies purpose or intention as the causal force (e.g., "I was in a bad car accident when I was a teenager *because* I needed to learn that my life is fragile"). A meaningless life event is one that does not imply purpose or intention as the causal force (e.g., "I saw the boat leave the dock").

Underlying EToM is the interpretive perception of natural events as symbolic of the communicative attempts of some nondescript or cul-

turally elaborated (e.g., God) psychological agency. That is, an agent that does not fit into the ontological category of known behavior-driven agents (i.e., humans, animals, or "intentional" artifacts such as robots) is perceived to have orchestrated the life event of its own volition and has framed the event as a symbolic device to transmit information to the experiencing human. For the meaningful case, an implicit question is the following: "What, or who, set out to intentionally teach the teenager about his or her mortality?" To the religious individual, the answer might be God, but note that the statement could just as easily have been made by a nonreligious individual without explicitly representing a specific supernatural agent. For the meaningless case, the only agency involved in moving the boat out of the dock is the human organism at the helm; the occurrence of the event itself is not likely to be perceived as guided by any intentional source or as serving any communicative purpose. (An exception to this, of course, would occur if for some reason seeing the boat leave the dock was an especially important episode in the observer's life, for example, the observer's daughter was aboard the boat and attempting to run away from home and the observer happened to see the boat slinking away from the shoreline.)

Closely related to the perception of meaning in random life events is the perception of meaning in the behaviors of other organisms. A meaningful behavior might be "John is pointing to the corner ceiling of the room because he wants to show me where the spider made its web," whereas a meaningless behavior might be "John extended his arm and index finger and held it upward at a 45 degree angle 58 cm from his face." (This might be something similar to what people with autism see.) In the first case, attached to John's pointing gesture are John's intentions to show the observer the web; this representation of *intentionality* behind the behavior lends the gesture itself meaning. In the second case, however, John's mechanistic positioning of his index finger does not encode any communicative purpose, and hence the behavior is meaningless.

According to this description, then, meaning stems from the mind of some intentional source. The reason the preceding analogy between the perception of ultimate meaning in life events and the perception of meaning in the behavior

of others is useful is that both tap reasoning processes involving mental causality. Note that in the case of the meaningful life event, the individual would not be satisfying the existential question by answering that the car accident occurred because the other driver did not flash his turn signal before changing lanes or because his tire blew out; rather, we want to know what he perceives to be the ultimate meaning of the accident (how the individual makes sense of the occurrence of the event itself). Likewise, in the meaningful behavior case, when we ask the individual why John is pointing, it is not appropriate for him to answer "Because the axons of the corticospinal tract formed synapses with motor neurons in the spinal cord and triggered John's arm and finger extension." Mechanical accounts of behavior are of little help in maneuvering through the social world because they do not satisfy a search for intentional causality. Ultimately, it is up to the individual to interpret the behaviors of others in terms of underlying mental states if he or she is to function normally in society. The unfortunate impoverishments in just this area of reasoning render people with autism greatly impaired in their communicative interactions with others (see Baron-Cohen, 1995; Frith, 1991; Leslie, 1991, 1994).

To perceive the symbolic referent in either actions or life events, one must be able to attribute mental states to the psychological agents using these devices as methods of symbolic communication. It involves, in a sense, unwrapping the package that the communicatory device arrives in—gesture, language, eye gaze, or life event, among others—and arriving at the semantic core of the primary perceptual experience. However, although EToM shares many of its core processes with those governing everyday social cognition and is a social system in itself, it is important to stress that it works largely in a different domain: that of experience, not behavior. It takes an entire complex of a given life event, including the emotional products associated with such an event, and translates that complex into a symbolic message for the self. In effect, it answers the question "Why did this happen to me, of all people?" In contrast, theory of mind is normally conceptualized as being triggered only in response to action-related changes in the environment, such as behaving agents or the self-propelledness of inanimate objects.

EToM, then, describes a prepared drive in the human mind to represent some nondescript agency—essentially, disembodied mind—and to view this agency as causing experiences. Although the most obvious example of a worldview directly dependent on EToM is a religious institution that posits that gods or spirits or deceased relatives are the main causative agents in the daily affairs of an individual, EToM need not be confined to such typically religious mind-sets. EToM is not a set of ideas, nor is it necessarily transmitted or mediated by socio-cultural processes such as are the dictates of institutionalized religions or the highly formalized laws of established philosophical schools. Although these dictates and laws may involve EToM by postulating the form of agency that distinctively characterizes it, they do not capture the naturalness of an evolved EToM, which does not need such explicit causal reasoning strategies to be instantiated in the individual mind.

Rather, ostensibly all that is required to generate EToM is that individuals have already built up their understanding of intentional relations. Any person who has ever harbored accounts of his or her life that do not center on the philosophical school of existentialism has employed his or her EToM. Among other knee-jerk responses, anyone who has ever entertained notions of individual purpose, questioned the equity of unfortunate biological or environmental circumstances (e.g., disease, death, or natural disasters), attempted stoicism, succumbed to the appeal of the concept of destiny, found patterns or purpose in random life episodes, seen planned order among nature, or felt compelled to decipher the deontic codes of human living has tacitly reflected upon the mind of some immaterial agency and has placed—or attempted to place—meaning on the otherwise meaningless.

For what or, better, who are such intuitive thoughts appealing to when they flutter, perhaps unconsciously, through our heads? What intentional source do we perceive to have caused such purposeful design in our experiences? Meaning arises through mind (Grice, 1957), and if meaning is ever perceived to have an existence apart from human minds by becoming embedded in life events or existential signifiers, then EToM is implicated. As argued later, the notion of God (and other culturally suited su-

pernatural agents, deities, or cosmic forces) may be less an idea stemming from external sources (cf. Boyer, 1994; Sperber, 1996) than a descriptor of natural inferential processes. If belief in God is any measure of the accuracy of these claims (and I believe it is), the overwhelming majority of people view the universe as being touched by the hands of psychological agency, precisely because humans happen to specialize in the area of mentalistic causal reasoning. The application of such reasoning to personal experiential factors in the context of self-narrative is what gives EToM its distinctiveness as a cognitive system.

But from whence did such an interpretive meaning-based process arise? Certainly commensurate natural, random events took place long before modern humans came onto the scene around 180,000 years ago impinging upon the livelihood of our ancestors. Primordial organisms were displaced and killed in ancient earthquakes and wildfires, and creatures of the Miocene had their homes destroyed and their offspring injured by wild, prehistoric tornadoes. Australopithecines suffered the unpredictable elements, *Homo habilis* successfully caught and slaughtered prey animals or became prey itself, and *Homo ergaster* searched for mates and was crippled prematurely by disease. But did the brains of human ancestors see design in life-altering events or pattern in the vicissitudes of being? What about other extant species, such as chimpanzees? Among modern humans, at what ontogenetic stage are people likely to develop EToM, and how does it typically express itself during the course of normal development? Can EToM be stunted—or prevented—by a developmental disorder that severely impoverishes the ability to reason about the unobservable causes of behavior, or do people with autism express an entirely different type of philosophical-religious reasoning altogether? We are prevented from arriving at suitable answers for many of these questions because the issues have not yet been empirically explored or have only just begun to be explored.

We can, fortunately, find answers to more specific related questions, and by so doing we may begin to build a bridge to the larger ones posed earlier. In what follows, I review portions of the literature on the evolutionary and developmental emergence of theory of mind that seem to provide some important insight into

EToM and usher in related theoretical views concerning philosophical-religious reasoning wherever they might apply. Also, I offer some tentative hypotheses regarding what may happen to the EToM “pull” when social-cognitive development goes astray, namely in individuals afflicted with autism.

EToM in Phylogeny

Previous authors have attempted to sketch a plausible scenario for the evolution of social-cognitive systems based on the fossil record and a smattered assemblage of prehistorical material artifacts (Donald, 1991; Mithen, 1996). Although such an approach is highly worthwhile and can be exquisitely argued, the degree of speculation and creativity involved is a cause of serious concern for many scientific investigators, who largely prefer to deal with extant brains to extinct ones. Fortunately, we can investigate the evolution of human social cognition through experimental means by studying our closest living relatives, the great apes.

Modern estimates put the phyletic divergence of humans from the African ape lineage at approximately 5–7 million years ago. Because chimpanzees (*Pan troglodytes*) are envisioned to be a conservative species in that they seem to have mostly retained the morphological characteristics of the common ancestor and have also probably retained a similar lifestyle, they are especially important to comparative psychologists interested in tracing the evolution of the human mind. The underlying assumption among such investigators is that if a cognitive skill is markedly absent in the chimpanzee mind but fundamental to the human mind, then the conceptual architecture supporting such a skill probably arose at some point after the hominids separated from the rest of the great apes. Thus, by conducting carefully controlled experimental studies with chimpanzees, we may be able to catch a glimpse of the way the common ancestor might have viewed the world. Whether such an assumption is warranted is still a question open to debate, but the consensus among most scientists is that this methodological approach is both highly valuable and theoretically justified (for a review, see Zihlman, 1996).

Representation of Intentionality in Chimpanzees

There is something of a firestorm raging in the comparative sciences, the center of the blaze lying in the matter of whether chimpanzees can represent the intentional states of themselves and others. Some theorists ardently claim that indeed they can do so (Suddendorf & Whiten, 2001), much in the manner of 2-year-old humans; others (Heyes, 1998; Povinelli, Bering, & Giambrone, 2000; Tomasello & Call, 1997), often referred to as advocates of the killjoy hypothesis, forcibly argue the other side by holding that chimpanzees' representational capacity in the area of intentionality bears little resemblance to that seen in toddlers. For present purposes, I need not get too deep in the conceptual issues, but I must nonetheless get deep enough to convey what is involved in the various arguments.

To start with, a distinction must be made between those skills involved in *secondary representation* and *metarepresentation*. According to Perner (1991), secondary representation occurs insofar as one is capable of representing a singular object of attention, say, a photograph, in multiple ways. Thus, a picture of a dog is, to the possessing individual, both a representation of the dog and a four-cornered piece of glossy paper. This requires, according to Leslie (1987), a process of "decoupling" in which the primary representation must be temporarily held apart from the thing that it is actually about.

There is sufficient evidence to argue that chimpanzees, in fact, are capable of this form of secondary representational thought (for a review, see Suddendorf & Whiten, 2001). Experimental apes' imperative usage of ideographic language systems, based mostly on arbitrary lexigrams, suggests a general symbolic capacity (Savage-Rumbaugh, 1986), as does their ability to convert abstract numeric quantities to Arabic numerals (Boysen, 1993). In addition, Kuhlmeier, Boysen, and Mukobi (1999) showed that chimpanzees can solve scale-model, hidden reward tasks; after witnessing an experimenter hide a food reward in a miniaturized version of the laboratory, subjects successfully retrieved the object in the real location that the model had served to represent.

The evidence that chimpanzees are able to represent the desires and intentions of others

is much more tenuous than the preceding. Whereas findings from several studies suggest, for instance, that apes are able to distinguish between accidental outcomes and intentional ones, data from other experiments show quite the opposite. Povinelli, Perilloux, Reaux, and Bierschwale (1998), for example, discovered that their group of 6 juvenile chimpanzees was just as likely to select an experimenter who had earlier maliciously poured out a juice reward as one who had stumbled and accidentally spilled the juice.

More solid evidence for secondary representation in the area of mental states comes from gaze-following behavior. Several studies (Povinelli & Eddy, 1996; Tomasello, Hare, & Agnetta, 1999) have independently shown that chimpanzees visually track experimenters' gaze around occlusive barriers, suggesting that they are representing the psychological referent of the gaze rather than simply following the visual trajectory in an automatic fashion (Whiten, 1998). Yet this, in turn, does not agree with the larger suite of findings reported in Povinelli and Eddy's (1996) monograph in which their group of chimpanzee subjects did not seem able to represent the perceptual state of seeing; the animals were just as likely to solicit an out-of-reach food item from an experimenter with a blinding bucket over her head as they were from one paying rapt attention to them. But the matter still does not rest here, it seems. There have been a number of writers (for a review, see Hare, 2001) who have called Povinelli and Eddy's (1996) findings into question. Chief among their concerns were the fact that Povinelli's chimpanzees had been reared in atypical environments and the fact that the measures used were highly artificial (chimpanzees in the wild, these critics claim, seldom encounter bucket-wearing humans ready to relinquish food).

Recently, Hare, Call, Agnetta, and Tomasello (2000) provided empirical support for these rejoinders (see also Karin-D'Arcy & Povinelli, 2001). When the testing conditions are embedded in a context of conspecific competition, as when a subordinate animal has visual access to a food item but the dominant does not, chimpanzees do in fact seem to appreciate the perceptual state of seeing (e.g., they will inhibit their behavior toward the food while in the dominant's presence):

However, what this implies for the issue of metarepresentation is unclear. Metarepresentation, according to Perner (1991), involves the explicit representation of mental states, particularly those issuing from epistemic relations to the perceptual world, such as knowledge and ignorance. Whether Hare et al.'s (2000) apes were operating at this level is still a question open for debate and one that awaits further replication (Bering & Povinelli, in press; Karind'Arcy & Povinelli, 2001), but their findings are greatly overshadowed by the larger number of studies showing negative performance on metarepresentational tasks. For instance, the only carefully controlled study (of which I am aware) on false-belief understanding (false beliefs are discussed later in the Emergence of Theory of Mind in Ontogeny section) in chimpanzees produced no evidence of metarepresentation (Call & Tomasello, 1999). Chimpanzees also do not appear able to understand the communicative intentions of others through gestures such as pointing (for reviews, see Povinelli, Bering, & Giambrone, in press; Povinelli, Reaux, Bierschwale, Allain, & Simon, 1997; Tomasello, Call, & Gluckman, 1997), nor do their own gestures appear to be regulated or to arise through an understanding of intentional relations between parties (Tomasello, Gust, & Frost, 1989). If intentional communication is to occur, one agent must understand that the other has a message (secondary representation) to share in the form of a gesture or vocalization (primary representation), and the other agent must understand that the communicative partner has the mental wherewithal to receive that message.

Although the jury is still out, I suspect that in the area of sociality, chimpanzees do not take others' mental states into consideration at an explicit level; rather, they depend on evolved behavioral mechanisms in collaboration with unique ontogenetic experiences in response to the observable actions exhibited by others. For example, mother chimpanzees evolved to be sensitive to milk requests by their offspring, and juveniles evolved to solicit milk when hungry. The particular way to go about this, however, might vary between mother-offspring dyads such that one juvenile might have initially gotten milk by tugging on the mother's arm, whereas another had to crawl upon the mother's stomach for access to her mammary glands. The

first may eventually need to merely touch the mother's arm for her to position herself for nursing, because the entire sequence, as a result of its repetition and the anticipation of the mother, has been truncated. The second juvenile, in contrast, may only have to approach the mother ventrally. In both cases, we need not argue that the mother understands that her baby "wants" milk when it makes such approaches or that the gesture is "about" wanting milk. Rather, the entire sequence becomes, borrowing from Tomasello and Call (1997), *ontogenetically ritualized*, such that both parties come to be successful participants in an established communicative set without really ever understanding the intentions of the other's gestures.

The absence of metarepresentation in chimpanzees can explain why there are no definitive reports of true imitation, teaching, declarative pointing, or progressive cultural change among wild populations, because all of these things depend ultimately on the ability to explicitly entertain what another individual does or does not know (Tomasello, 1999; Tomasello et al., 1993). Note, however, that I am not implying that chimpanzees lack symbolic competencies altogether. To the contrary, as argued earlier, it seems as if they have intact secondary representational skills when applied to matters outside the mind. And, as Hare et al.'s (2000) results have shown, they may perhaps even have some implicit awareness of goals and perceptual states such as seeing.¹

Most important for present purposes, however, there is no reason to suspect that chimpanzees can represent epistemic states, such as knowledge and ignorance, or other higher order cognitions, or that they are able to represent intentions at higher orders of recursiveness (e.g., "She knows that I know that she knows," and so on). It is at this level, at which representations of mental states have been "redescribed" (Karmiloff-Smith, 1992) to a degree allowing conscious reflection, that EToM is employed, in

¹ There are as yet no grounds to claim that apes understand emotions. In contrast to Suddendorf and Whiten (2001), I find the evidence for empathic consolation, wherein chimpanzees have been observed to pacify the mental duress of others, to be thoroughly unconvincing; one can easily imagine how reconciliation and pacification behaviors could have evolved in a highly political, social species without invoking theory of mind to explain them.

that most of the time it involves a deliberate ad hoc attempt to understand life experiences.

Proto-Religion in Chimpanzees

Boyer (1994) has convincingly argued that a recurrent component of all religions is the postulation of nonphysical psychological agents. These transcendent agents are endowed with the folk psychologies of humans but are somewhat less likely to be represented as possessing folk biological traits such as the need to eat or drink or being subject to disease and death. Thus, explicitly defined and culturally elaborated deities, spirits, demons, or ancestral relatives are represented as crystallized mind; they are conceptual encapsulations of distinct personalities built of mental states and devoid of physical body. Deference, supplication, or even threat toward such agents demands the capacity to attribute mental states such as beliefs, knowledge, and intentions.

Irrespective of claims made earlier that chimpanzees probably are unable to intentionally transmit cultural information by means of shared representations (and hence the improbability of their mutual construction of a transcendent hierarchy), without an ability to metarepresent chimpanzees cannot possess even the rudiments of religious cognition (Bering, 2001; for an alternative account, see Maser & Gallup, 1990). I propose that the causal reasoning processes involved in perceiving meaning in life events were therefore probably not developed before the evolution of hominids. The intuitive perception of meaning in particular event episodes that characterizes EToM is an extension of the theory of mind system and is tied to a neurological-cognitive apparatus that may not have arrived until very recently in primate evolution. Chimpanzees cannot represent the actions of others (e.g., gestures) as intentionally communicative (Povinelli et al., 1997; Tomasello et al., 1989; for a review, see Povinelli et al., in press), nor can they understand the communicative function of external symbols, even iconic ones (Tomasello et al., 1997). Without these inferential proclivities in the area of communication, there is no means for organisms to perceive "aboutness" or meaning in random life episodes; such intuitive reasoning implies the perception of an external mind that intentionally

generates sequences of experiences for the individual.

Does this mean that chimpanzees are "mere" existentialists, of the same ilk as Sartre and Camus? Not quite. Philosophical existentialism demands an enormous assemblage of metarepresentations to impose self-derived meaning on life events. In addition, it is not a natural state but an adopted one and is thus often initially accompanied by a severe psychological crisis in the human mind as EToM interpretations are forcefully shed (see subsequent discussion).

We can be fairly confident, therefore, in estimates that the earliest forms of EToM did not come into our ancestral portrait until approximately 5–7 million years ago. Such a wide time frame leaves us largely unsettled; however, it is but a shard of geologic time in terms of the entire history of life on earth. And there is good reason to suspect that EToM is more recent still. The cultural explosion occurring between 30,000 and 60,000 years ago in modern *Homo sapiens* reveals the earliest material products of art, technology, and animistic religions and might well mark such a dramatic transition to metarepresentation (Mithen, 1996).

Yet some theorists, in contrast to this position, have attempted to argue that the cognitive bases of religion arose before the severing of the human lineage from the rest of the primate line and that, accordingly, chimpanzees express religious behaviors (Goodall, 1975; Guthrie, 1993). Goodall (1975) described how chimpanzees engage in elaborate threat displays in the presence of rushing streams and in the midst of loud thunderstorms, and she took such behavior as evidence of proto-religion in the species (see also Whiten et al., 1999). Such displays, according to this rationale, are rituals directed toward the streams or storms themselves, or else directed to a causal transcendent force in an attempt to ward off its admonition. The implication of such a grand claim, of course (further elaborated by Guthrie, 1993), is that the origins of the cognitive underpinnings of religious behavior are quite primitive, present in the mental architecture of the common ancestor of chimpanzees and humans. However, this argument is not borne out if we adhere to the earlier-described empirical findings of work related to theory of mind in chimpanzees. Because a foundational characteristic of all religious behaviors involves representation of psychological agency,

and because chimpanzees seem to lack the capacity to represent even embodied minds, there is little justification for claims of proto-religion in *Pan*.²

According to Lawson and McCauley (1990, p. 54), "Religious rituals . . . involve communication in the sense that they contain information and transmit it." Following this definition, if chimpanzee "rain-dancing" is to qualify as religious ritual, those enacting it must be intentionally sending a message they have encoded in symbolic action to be received and decoded by the mind of either the animated event or the transcendent force generating it; they must also represent the recipient as an intentional agent capable of knowledge acquisition. I find it exceedingly difficult to believe that this is what they are doing. Rather, what is arguably occurring in the rain-dancing case is that the chimpanzees are experiencing the rather primitive cognitive phenomenon of *reflexive animism* (Bering, 2001).

Reflexive animism is conceived as an adaptation of the sympathetic nervous system to serve the individual organism in avoiding potential predation or injury from other organisms. It is exemplified in the cases of the vervet monkey that emits an eagle alarm call in response to a falling leaf and the farmer who (much to his later embarrassment) uses his pitchfork to puncture the garden hose that has taken on the movement of a snake while wrapped around his foot. In reflexive animism, inanimate objects are imbued with the animate correlates of biological agency, such as unpredictable movements and loud noises. However, attributions of psychological agency, such as higher order intentions, knowledge, and beliefs, do not occur. Such attributions, I have argued, are reserved to the more phylogenetically recent cognitive phenomenon of *reflective animism*, in which humans quite seriously and deliberately endow inanimate objects, such as religious statues and idols, vehicles, computers, or weather episodes, with mental states (for a more comprehensive distinction between reflexive and reflective animism, as well as a detailed theoretical treatment of religious percepts in chimpanzees, see Bering, 2001).

In the matter of ritualistic rain-dancing in wild chimpanzees, then, the persistent and extreme stimulus inducement inherent in treacherous weather (shaking branches, loud noises,

and unpredictable movements) and loud, rushing streams probably triggers physiological arousal in chimpanzees that leads to display behavior, a hardwired response to rival chimpanzees or other perceived animate threats. Support for this interpretation of rain-dancing in chimpanzees comes from the fact that only adult males have been seen to engage in the behavior (Andrew Whiten, personal communication, July 5, 2001). Interestingly, although physiological arousal might have much to do with EToM in organisms that specialize in mentalistic causality, it is neither necessary nor sufficient for intuitive philosophical-religious reasoning and can do nothing but engender scripted behavioral routines in creatures without metarepresentational skills. A theory of mind must serve as the scaffolding for such experiences if they are to be perceived as meaningful.

EToM in Development

In significant contrast to chimpanzees, humans are undeniably adept at psychological causal reasoning. Indeed, so encompassing is our capacity to explain the behaviors of others and ourselves in mentalistic terms, so much has human evolution invested in the theory of mind system, that the drive to attribute mental states has expanded into corridors of human cognition that probably had nothing whatever to do with the system's initial selection. In so doing, I argue, it may have diversified into at least one wholly different animal—EToM—as it has come to operate simultaneously in an entirely different domain and with an entirely different class of input. Before addressing these issues, however, it is necessary to present a brief review of the developmental emergence of the theory of mind system.

² Interestingly, Maser and Gallup (1990) have argued that chimpanzees do indeed possess a theory of mind and, therefore, the necessary cognitive substrate for entertaining theistic notions. However, because they do not have an awareness of their own deaths (which does little to support the authors' simulation-like model of theory of mind), argued the authors, chimpanzees have no reason to invoke theism to palliate existential anxiety. Although I agree with them that chimpanzees are not explicitly aware of their impending deaths (see Bering, 2001), I disagree with them that death awareness is necessary to instantiate representations of the sort involved in theism.

Emergence of Theory of Mind in Human Ontogeny

From early on, young infants are sensitive to the differences between inanimate objects and animate beings. A chair, a book, and a pumpkin are quite different things altogether from a rabbit and a big sister, not, per se, simply because of some intrinsic taxonomy based on superficial characteristics (although this probably has a lot to do with it; see Bering, 2001) but because the latter two are perceived as agents. That is, rabbits and big sisters are capable of self-propelled motion, and they are directed, goal-driven animate beings, whereas the objects listed are simply that. If a pumpkin were to scurry away whenever the youngster cried, it would be quite a strange sight indeed.

In fact, there have been a number of studies that have investigated whether young infants are "surprised" by the ostensibly animate behavior of inanimate objects (Golinkoff, Harding, Carlson-Luden, & Sexton, 1984; Leslie, 1982); the data suggest that they are, insofar as patterns of dishabituation are accurate measures of violated expectations. Hauser (1998) has shown that this is something shared with other primates as well. In addition, when visual displays on a computer screen are depicted as behaving agents (e.g., a circle skirting around a partition), young infants readily dishabituate to seemingly anomalous "behavior" (e.g., the partition is removed but the circle still moves as if its path were blocked; Gergely, Nádasdy, Csibra, & Biró, 1995). Such evidence argues for an understanding of agents as goal-directed, animate beings in early infancy and perhaps in other species.

Such an understanding of other agents is still primitive, however, because at this level infants probably are only reasoning about the primary representational features of the immediate environment, such as movement or behavior, and how these features conflict with an intuitive set of expectations about animacy. It is not until 18–24 months of age that full-fledged secondary representational abilities in the area of intentionality are clearly expressed, marked by such things as pretense (Leslie, 1987). The 2-year-old observing her father dancing in the kitchen with a mop may find the whole scene quite funny because she is now able to temporarily set aside the fact that the mop is just an

insensate object from the knowledge that her dad is simply pretending that the mop is a dancing partner with a full head of hair. Tomasello (1999) quite effectively argued that such abilities might be driven by an understanding of the self as an intentional agent; because the child knows what it is like to see one thing and act as if it is quite another, it is not such a great leap for her to imagine that other people might do the same as well.

Also, 18-month-olds, but not younger children, understand that others might have desires different from theirs (Repacholi & Gopnik, 1997), and older infants can infer what others are intending to do, even if these others make mistakes or are unsuccessful in their attempts at achieving a goal (Meltzoff, 1995). The 2-year-old understands others as agents who can have their attention directed to entities and events in the outside world (Baldwin & Moses, 1994; Butler, 1999; Flavell, 1992), and thus it is at this age that protodeclarative gesturing, wherein individuals seek to redirect an observer's attention to an outside event by pointing or showing for purposes of sharing experience, emerges (Bates, 1976; Kita, in press; Moore & Dunham, 1995).

In short, the child evolves over the first 2 years of life from understanding that the self and other agents *do things* (many of which are intuitively expected) to understanding that the self and other agents *do things because*. It is not for several years more, however, that children become able to appreciate knowledge states at an explicit level. That is, although younger children have a concept of attention, intention, belief, and desire, they do not yet seem to connect these states to what agents actually know about the world, at least not at an explicit level (e.g., see Clements & Perner, 1994). To test this, experimenters have used various versions of the false-belief task, which usually involves some naive sap who has been played a trick on by changing the location of, say, his candy bar, when he leaves the room, say, from the fridge to the pantry. Where will he look for it when he returns? Most 3-year-olds will incorrectly answer that he will look in the pantry, as if the actor had actually seen the hiding event, whereas 4-year-olds get it right and insist that the actor will think that his candy bar is still in the place he had left it.

Thus, the older children seem to appreciate the fact that others can harbor false beliefs and

will therefore be more likely to reason and explain the behaviors of others correctly (for excellent reviews, see Flavell, 1999; P. Mitchell, 1996). By no means have preschoolers arrived at an end point in conceptual development (e.g., see Bartsch & London, 2000)—their understanding of minds will extend well into adulthood—but they have indubitably reached a developmental period that marks a point of no return. Older children cannot turn off their mind-reading skills even if they want to. All human actions are forevermore perceived to be the products of unobservable mental states, and every behavior, therefore, is subject to intense sociocognitive scrutiny.

Intentionality Outside Behavior

It seems not to be just behavior, however, that becomes the object of causal analyses. Of course, I am not the first to propose that theory of mind becomes generalized to other domains (see Carey, 1985, 1995; Clark, 1994; Kelemen, 1999a, 1999b). Carey (1985, 1995), for instance, has suggested that children's folk psychology leads them to become animists of the sort described by Piaget (1929). That is, children's knowledge of the biological world (such as what distinguishes the sun from a scorpion) is underpinned by their theorizing about psychological causality in both animate beings and inanimate objects. Thus, the animistic child might say "The rock tumbled down the side of the mountain because it 'wanted' to get to the bottom." Surely such an interpretation shows that the child is inferring intention in the rock's movement.

However, children's knowledge about ontological categories seems to be more sophisticated than Carey (and Piaget) initially supposed and is precocious enough to suggest to Atran (1995) and others (e.g., Keil, 1989; Wellman & Gelman, 1992) that humans possess a folk biology that is modular in its own right. Young children have a rudimentary understanding of genetic transmission (Keil, 1989), understand the biological correlates of living (e.g., need for sustenance) and the inevitableness of death for all living organisms (H. C. Barrett, 1999; Slaughter, Jaakola, & Carey, 1999), and, when the study design is sufficiently sensitive to implicit beliefs, evidence a firm understanding of what separates living things from inanimate ob-

jects. Namely, they do not easily confuse the animate world with the inanimate world unless there are misleading cues typical of living kinds (e.g., self-propelled movements or animate physical features; see Premack & Premack, 1997), and, for the most part, they reserve serious mental state attribution to explaining the behaviors of intentional agents.

But Carey might be on the right track after all, just searching for overextension of mentalistic explanation in the wrong place. The novel contribution of EToM rests in the fact that it can account for why life episodes, not the behaviors of agents in the environment (either animate or inanimate with animate characteristics), are so often explained by invoking intentional agency. The perception of meaning is, in fact, perseverative in the sense that it finds its way into experiential categories that, intuitively, have little to do with the behavior-reading context in which it presumably evolved. By taking the intentional stance, the human perceptual system recognizes not only human action, with its characteristic unpredictability, but ambient life experiences, also with their characteristic unpredictability, as intentional behaviors. That is, a wide net is cast over what is envisioned to be purposeful action: Human cognition situates the random churning of the cosmos into the same framework in which it has placed human behavior. Mind is perceived to be the causal force behind both categories. The human brain effectively pirated the theoretical system designed for interpreting action (theory of mind) in its attempt to harness and make sense of the unpredictable nature of nature. And, indeed, it has succeeded in doing just this. As the theory of mind system matures, it engrains itself into the individual's perception of event-related phenomena, lending meaning to the experiences that come to define personal narratives.

To illustrate the difference between EToM and animism, the girl witnessing the rock tumbling down the side of the mountain may or may not be attributing mental states to the rock itself, but she very well may perceive intention behind the occurrence of the event. If we ask her "Why did this occur, just at the time you happened to be walking along the road?" we might receive an EToM response in which she reasons that it happened "to tell her to go back home." Note that it is not the rock itself that intended to give her this message; no animistic force propelled it

forward. Rather, some external agency caused the event to occur.

Experimental support of the developmental origins of representing this form of agency can be discovered in Kelemen's (1999a, 1999b) findings of a "promiscuous teleology" in preschoolers. This term refers to the tendency of young children to apply teleological-functional purposes to objects in both the artifactual world (e.g., chairs, cars, and forks) and the natural world (e.g., oceans, rocks, and dirt). Kelemen (1999b) showed that when asked questions about the purpose of inanimate objects, 4- and 5-year-old children, for instance, stated that clouds were "for raining" and that mountains were "for climbing." She concluded that "young children promiscuously assert that entities of all types, including non-living natural objects, are 'made for something'" (Kelemen, 1999a, p. 467).

The question of interest for present purposes is the following: "If such objects were designed for a purpose, then whose intentions do they reflect?" Evans (2000) and Gelman and Kremer (1991) found that a significant portion of young children reasoned that natural objects were made by God. The importance of these responses resides not in the children's theistic answer but in that God is a culturally specific representative of the form of psychological agency later involved in EToM. As a young child, the linguistic isolate Helen Keller, kept from the cultural realm of explicit ideas as a result of her congenital deafness and blindness, reportedly spontaneously pondered the same questions posed to the children in the studies just mentioned: "Who made the sky, the sea, everything?" (Bovet, 1928). What is intriguing about her case is that, because others did not have a means to communicate and share specific religious beliefs with her, she could not apply the label "God" to this causal force but could simply represent some unspecified psychological agency (for a similar case, see James, 1892).

The functional explanations children give for natural objects are attempts to make sense of the intentions of the perceived agent that created them. Whenever theistic answers are given for fundamental "why" questions, respondents are essentially exercising their theory of mind. This early teleology coincides with the emergent metarepresentational capacity children use to account for behavior in the social domain and is

sufficiently developed by 4-5 years to allow them to successfully receive religious instruction. Interestingly, this time period corresponds to the age at which children understand the relationship between God and prayer (see Woolley, 2000).

When children evolve into mentalistic specialists, they simultaneously step into nothing less than a theater of the mind. The world has become a stage, occupied by the performance of random events. The ironies; the hardships; the prosperity; the loneliness; the wealth of friendship, suffering, and dying; the accidents the joys; the losses—the blueprints to a human biography!—are perceived as intentionally driven. No longer do they "just happen" inside a vacuum, but to the mind-reading child and adult, these experiences "happen *because*" and are imbued with purpose and, hence, meaning. As discussed earlier, meaning in the sense used here must come from mind, and it rests upon the representations shared between members of an interactive dyad. To extrapolate meaning from such experiences, the recipient of the "message" must decode the symbolic device that the communicator encoded it in. Only by so doing can the recipient infer the intent of the sender. In many cases, the identity of the communicator may be unknown, and literally unprocessed, by the recipient of the message, as in the case of proclaimed atheists or linguistic isolates. But the possible presence of an intuitive perception of intentional agency in the external world as driving the experiences of the individual seriously challenges assertions that gods infiltrated human culture by way of idea transmission (cf. Boyer, 1994; Sperber, 1996). Rather, I argue that the gods were already in our brains and that culture merely gave them names.

EToM in Autism

Autism is a developmental disorder that seems to impair the specific nexus of social-cognitive skills that are guided by theory of mind. Whereas the vast majority of those with autism are also profoundly retarded, some autists are left with intact general intellectual skills; indeed, in such cases, their IQs frequently test well above average. Yet, even these individuals cannot typically complete false-belief tasks in a successful manner, and they have problems in other areas that necessitate having

mind-reading abilities (Baron-Cohen, 1995; Frith, 1991; Happé & Frith, 1995; Leekam & Perner, 1990; Leslie, 1991, 1994; Swettenham, Baron-Cohen, Gomez, & Walsh, 1996; but see Frith & Happé, 1995). Baron-Cohen (1990) accordingly coined the term "mindblindness" as a synonym for autism but is sure to point out that the disorder should be conceptualized as involving mindblindness to varying degrees. For instance, people with Asperger syndrome, a form of very high-functioning autism, might be able to complete second-order false-belief tasks but would have trouble making out the underlying, foggier shades of intention in dialogue, missing faux pas in others' speech and violating Gricean conversational maxims (Baron-Cohen, O'Riordan, Stone, Jones, & Plaisted, 1999; Fine, Bartolucci, Szatmari, & Ginsberg, 1994; Happé, 1993; Landa, 2000). It might be better to conceptualize higher functioning patients, then, as having never developed a fully erect intentional stance. Their sensitivity to intentionality is seemingly attenuated rather than missing altogether.

Baron-Cohen (2000) and his colleagues (Baron-Cohen, Wheelwright, Stone, & Rutherford, 1999) have recently advanced the compelling argument that, although people with autism are not mentalistic specialists and generally function poorly in the social realm, their understanding of physical causality might actually be superior. That is, they may not be much in the way of folk psychologists, but they excel in the domain of folk physics. Folk physics, according to Baron-Cohen (2000, p. 1253), "is our everyday ability to understand and predict the behavior of inanimate objects in terms of principles relating to physical causality." To support this idea of superior folk physics in autism, he takes as evidence, among other things, the fact that the targets of obsessive-compulsive interests in autistic children overwhelmingly cluster around machines and physical systems. In short, autists are preoccupied with the way things work, such as cameras, in terms of how they do so, not in terms of why they do so.

In some high-functioning cases, this form of expertise is seemingly translated to problem solving in the area of social matters, and it affords individuals the capacity to exploit observable cues emitted by behaving bodies and to subsequently get by in the real world. Tantum (2000), for example, wrote of one Asperger

syndrome woman's attempt to decipher implicit social codes, such as the average distance people leave between their bodies when waiting in line to use an automated teller machine.

She had observed that when people lined up, they left a gap between themselves and the person in front, and that this gap was substantially larger in the case of men standing behind women. She used this information to jump lines, looking for this combination and pushing in behind the woman nearest the front who was followed by a man. (p. 382)

This woman's understanding of the way people work was motivated by a desire to learn how they typically behaved, not why. Only by assessing and becoming extraordinarily sensitive to the way routines and conventional social rules intersect with people's manifest behavior could she enter the social environment, albeit inappropriately (she still could not take into consideration how others would perceive her butting into the line).

There have been, to my knowledge, no studies on religion in autism, nor are there any related experimental data (e.g., teleological-functional explanations in autistic children) to shed light on these important questions; thus, it is unclear how those with the disorder entertain philosophical-religious issues. Yet several recent autobiographical accounts provide intriguing hints. For instance, Temple Grandin (1995), a well-known high-functioning autist, wrote in several passages of her lifelong struggle with her religious beliefs:

It is beyond my comprehension to accept anything on faith alone, because of the fact that my thinking is governed by logic instead of emotion. (p. 189)

In high school I came to the conclusion that God was an ordering force that was in everything. I found the idea of the universe becoming more and more disordered profoundly disturbing. (p. 191)

In nature, particles are entangled with millions of other particles, all interacting with each other. One could speculate that entanglement of these particles could cause a kind of consciousness for the universe. This is my current concept of God. (p. 200)

Another telling case comes from autistic mathematician and computer programmer Edgar Schneider's (1999) book, *Discovering My Autism*. In chapters devoted exclusively to his religious beliefs, Schneider wrote:

My belief in the existence of a supreme intelligence (or, if you will, a God) is based on scientific factors. (p. 54)

It must be pointed out explicitly that none of this [religious beliefs] has any emotional underpinnings, but is totally intellectual in its nature. (p. 72)

To me, as far as adherence to a religion (or any other type of ideology) is concerned, intellectual conviction is a condition that mathematicians call "both necessary and sufficient." My religious faith, I guess I could say, is not a gift from God, as so many people say; it is a gift I gave to myself. In line with this, I have never felt the emotional exhilaration that people must feel when they have a "religious experience." This is true even when I receive the sacraments. The only thing that has deeply moved me is the *reasonableness* of it all. (p. 73)

One gets the distinct impression by reading such descriptions that religion in autism consists of entirely different processes than the normative experience. Namely, in these passages, God, the *sine qua non* of Western religious experience, is perceived more as a principle than as a rich psychological agent. God is perceived as a force in the universe that is directly responsible for the organization of cosmic structure—arranging matter in an orderly fashion or treating entropy—or has been reduced to the conceptualization of scientific logic altogether. To Schneider, instead of experiencing the emotional correlates of church ritual that often engender the physiology of "religious" feelings, Catholicism is perceived as an anxiety-reducing medium with its formal, predictable procedures and the clarity of its canons.

Although these views present an extraordinarily sophisticated theological stance, it rings quite differently from the overarching religious sentiments expressed in William James's (1902/1994) classic text, *Varieties of Religious Experience*, or current psychology of religion work (e.g., Hood, Spilka, Hunsberger, & Gorusch, 1996). What is noticeably absent in the autistic accounts is a sense of deep interpersonal relations between the worshipper and the deity, a sense of emotional dependency on an intentional agent who has control over the experiences and existence of the individual. God is not presented as an agent who communicates intentions through indirect symbolic means or who has a distinct constellation of mental states that form a global personality structure. Rather, it is as if the autistic algorithmic strategies used to deal with other people have been translated to the authors' religious beliefs, wherein deductive logic is used to lay the groundwork for understanding existence and to impose order on an otherwise chaotic world. The sense of the *mu-*

minous, or otherness, inherent in normal religious perception is not there.

This is precisely what we should expect, however, from a cognitive phenotype that is preoccupied with uncovering fundamental principles of physical causality. Because people with autistic spectrum disorders have difficulty interpreting the meaning attached to social behavior and therefore probably cannot rely on a theory of mind to explain their experiences, their religious beliefs cannot affix to core representations of psychological agency. The religious beliefs of people with autism could therefore be envisioned as sliding into conceptual slots provided by the folk physics system, even those, such as supernatural agent concepts, that are traditionally relegated to slots in the folk psychology system. Thus, supernatural agents, such as God, are perceived as behavioral rather than intentional agents.

Unlike people without the disorder, people with autism or Asperger syndrome should be less likely to employ an EToM when confronted with life-altering events. This is because the events themselves will not be understood as things to be decoded (i.e., to derive meaning). The events will not be perceived as driven by the mind of some intentional agent. Although their basic life events will largely mirror those of their nonautistic peers, their specific deficit in theory of mind abilities will prevent them from attempting to interpret the meaning of those experiences. Because autists cannot adequately represent psychological agency, they will not experience the EToM pull triggered by particular perceptual inputs to a cognitively normal mind. One man with Asperger syndrome inquired recently on an Internet bulletin board whether others with the disorder were like him, "conscious of no feedback from the divine." This characterizes the basic problems faced by people with Asperger syndrome: They seek meaningful relationships with others but have great difficulty understanding the intentions behind people's behaviors. Thus, translated to the area of religion, a person with Asperger syndrome might attempt to engage in ritualistic activities (e.g., praying for a wife) but will not be able to decode the symbolic device with which a supernatural agent "responds" (e.g., a female friend's husband leaves her for another woman).

In general, if the thoughts presented here approach some measure of truth, then autistic people should show relatively little interest in spiritual matters or should explain existential issues by means of physical causation, as in the preceding accounts. Those who do adopt institutionalized religious views should do so primarily to learn how to engage in acceptable behavior within the culture. Autistic individuals should therefore be disproportionately represented in more rule-based, structured religions, especially those that have laid out their social ethical laws in written form and in which adherence to such laws is strictly enforced within the religious community. There is reason to suspect that this is indeed the case (A. Attwood, personal communication, October 15, 2000). Also, as a result of the obsessive-compulsive interests of autists to rigidly adhere to social rules once they have been learned, such individuals might run the risk of proselytizing and becoming exceedingly moralistic when confronted with religious rule breakers. This, too, seems to be supported by anecdotal reports.

Domain Specificity, Theory of Mind, and EToM

To account for the striking universal presence of religion, numerous authors have recently speculated that spiritual beliefs and behaviors hinge upon cognitive mechanisms that evolved for other adaptive purposes. Many have even suggested that humans' theory of mind can account for the ease with which supernatural agent concepts are transmitted and represented (J. L. Barrett & Keil, 1996; Boyer, 1994; Boyer & Walker, 2000; Hinde, 1999; Kirkpatrick, 1999). Beliefs in spirits or gods are envisioned to feed off humans' understanding of intentional agents; these beings are endowed with the same general catalogue of mental states (knowledge, intentions, desires, beliefs, and so forth) that a being with a material brain possesses. Boyer (1994; Boyer & Walker, 2000) has suggested that religious ideas are developed within the cultural community and are spread through mechanisms of social transmission, arguing that the ideas are intercepted by individual minds and squeezed into the appropriate conceptual slots. Those ideas that are most "attention grabbing," such as the idea of people being dead and invisible but also cognitively viable (e.g.,

ghosts), are the ones that will be maintained and incorporated into the religious explanatory system.

In a recent commentary on this area of inquiry in the cognitive sciences, Sperber and Hirschfeld (1999) stated that "religious beliefs can be seen as parasitical on domain-specific competencies that they both exploit and challenge" (p. cxx). Such a sentiment captures the flavor of the argument being made: Religious ideas, including supernatural agent concepts, are products of cultural immersion that, after being effectively transmitted between minds, settle into host modules such as theory of mind. I am somewhat partial to this sentiment as well. The trouble, however, is that with regard to psychological attributions, these authors have not taken into account the fact that supernatural agent concepts deal in a domain different from the one in which they envision their "domain-specific" module of theory of mind to operate. The notion of domain specificity crumbles, and the very idea that theory of mind is modular suffers a serious blow, when one considers that intentional explanations can be evoked by entirely different classes of input: behavior and experience.

Also, the arguments of these cognitive anthropologists overlook the intuitiveness of philosophical-religious reasoning. Although explicit religious beliefs indeed stem from the cultural milieu and find their way into the minds of individuals through seeds planted by social learning processes, individuals must already come bearing with them the representation of some nondescript psychological agency as causing events. Rather than imbibing from cultural sources qualitatively novel ideas about the presence of transcendent agents, culture provides labels for perceptual experiences of such agents that children operating with a theory of mind are already very familiar with. Just as the perception of the color red is experienced before the word *red* becomes attached to it, perception of this agency is experienced in the human mind before, for example, the Western label "God" (or the African label "Gamab" or the Eskimo label "Sila-Pinga") becomes attached to it. Only because the metarepresentational child can reflectively attend to the class of perceptual experiences do such causal agent terms denote that religious pedagogy is successful at indoctrinating new members into belief systems.

What I am suggesting is not reification inasmuch as the perception of such agency exists universally in humans. Particular agent concepts may be reified with cultural elaboration of this agency into specific characters, but this need not concern cognitive scientists, only theologians. An individual's enculturation within the religious community serves to carve up different categories of experiences as belonging to particular transcendent agents, with some religious systems (e.g., Islamic monotheism) attributing nearly all classes of life events to the handiwork of a single agent and others (e.g., American Indian polytheism) ascribing certain types of experiences to a wide variety of "specialty" gods.³ Only after having been effectively communicated do explicit ideas regarding agent concepts work against a default background of folk physics, folk biology, and, of course, folk psychology (e.g., J. L. Barrett & Keil, 1996; Boyer, 1994; Kirkpatrick, 1999; but see J. L. Barrett, Richert, & Driesenga, 2001), and are probably subject to changes during conceptual development (Elkind, 1979; Woolley, 1997).

Is EToM an Adaptation?

A question inherent in this article is whether EToM has its own evolutionary history, wrought by the forces of natural selection, or whether its generalization from theory of mind implies that it is merely a useless by-product of the primary adaptation of seeing intention behind behavior. Such questions of evolved traits are notoriously tricky (see Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998). Buss et al. (1998, p. 537) described by-products of adaptations as "characteristics that do not solve adaptive problems and do not have functional design. They are carried along with characteristics that do have functional design because they happen to be coupled with those adaptations." The whiteness of bones, they claimed, is a case in point, in that the color is a by-product of the large amount of calcium that gives bones their strength, which was what was selected for.

However, under certain conditions by-products can come to have their own functions, as Gould (1991) proposed with his concept of *exaptations*, which are "features that now enhance fitness, but were not built by natural selection

for their current role" (p. 47). The feathers of birds, originally selected for thermoregulation but then co-opted for flight, are often used as an example of an exaptation. Ironically, in contrast to Gould (1991), who cited religion as one of many functionless, useless by-products of a large brain and certainly not an exaptation, it seems quite plausible to me that EToM has been co-opted from a broad intentional stance taken by our ancestors, the primary adaptation of which was to explain and predict behavior. In other words, although it might not have been the driving force behind mind-reading competencies in the species, it nevertheless prospered in its own right and in its own domain as it came to have increasing adaptive utility.

The argument is thus: Nearly every culture, if not all, has established religious institutions or (at least) endorses specific religious beliefs that are often seamlessly woven into the social structure of the community (Boyer, 1994; Crook, 1995; Hinde, 1999). Religious attitudes govern everything from the establishment of marriage rituals to the methods of slaughtering animals. The extent to which societal mores and religious beliefs are fluid and disparate across cultures has nearly everything to do with the social ecology of the particular culture. Religions inform their adherents of what they ought and ought not do; these determinations are not based arbitrarily on some limitless pool of human imagination but exist because proscribed behaviors are maladaptive for the individual in the context of the culture.

Among the Sukumu of Tanzania, for instance, religious specialists encourage the killing of deformed or retarded offspring, because such children are taken to be evil tokens representing an ancestor's displeasure (Cory, 1951). In contrast, many Catholics in the United States view such children as a special gift from God meant to test their religious faith (Zuk, Miller, Bartram, & Kling, 1961). To them, killing infants is an atrocious act. Why the disparity? Reynolds and Tanner (1995) made an excellent point when they stated that "ethical abhorrence

³ Anthropologists would be hard put, however, to find cultures in which there does not exist some grouping of "second-tier" nonbiologic psychological agents, such as ghosts, angels, demons, antestral relatives, and so forth.

of infanticide occurs against a background of general affluence" (p. 91). That is, the particular opinions of the gods on the matter of infanticide depend in large measure on whether parents can support such children without incurring both economic and social burdens that interfere with their reproductive success. Americans are more likely able to shoulder the burden and increase their social status by doing so, whereas, from a strictly evolutionary psychological perspective, it would simply be maladaptive in the case of people of less affluent societies to allow these children to live. Therefore, in some hunter-gatherer societies infanticide can be committed without the participants feeling any guilt or shame. A Western mother who kills her infant, in contrast, can expect to feel these emotions unimaginably strongly and will have a tough go in finding another mate. In both cases, religion inserts itself, but just as the believers speak different languages, so too do their gods. We are told that good things happen to good people, but goodness, to the evolutionist, is not absolute.

EToM, then, may function as an adaptive mechanism in the sense that it serves to regulate fluid morality in the social ecology. The fact that immanent justice and just world biases are entrenched in the tenets of world religions hints at this regulation (see Gilbert, 1998). Actions that are maladaptive for the individual are often those that cause disharmony in the group, such as theft or adultery (Cosmides, 1989). When such actions are labeled "profane" (Wilson, 1978) and against the will of the gods, individuals become less likely to engage in them, because doing so might be met with inauspicious events in their lives, such as sickness or financial ruin. Thus, individuals' task in society is largely to determine which behaviors have been deemed wicked, not so much by their peers (because they may believe that they can get away with these things unbeknownst to their peers) but, rather, by their omniscient gods, who have the power to mete out experiential repercussions in response to social transgressions. The system can therefore be viewed as added enforcement against individuals committing those actions that might lead to declines in status, castigation, imprisonment, execution, and other sundry social punishments that cut into their reproductive success. By working in the deontic, EToM may have therefore enabled the explication of the implicit forces governing

behavioral natural selection. As such, EToM is, I argue, an adapted system, albeit a co-opted one, rather than a useless by-product of theory of mind.

In line with this, the classes of experience that employ EToM, then, should have some functional bearing on the preceding. I suspect that EToM should be activated to the extent that a life event is unexpected and (a) either deviates from or conforms to culturally scripted just world expectations and (b) triggers significant affect-related change. The "unexpected" aspect is logistically necessary in that, because the communication between believer and agency exists only in principle, it could not have evolved by means of every social action being met immediately with like consequences in the domain of experience. (This may have, incidentally, enforced its effects by promoting intermittent belief confirmation.) To the extent that it operates in a different domain and can therefore be conceived as an independent system bootstrapped to theory of mind, there also is the possibility of a sort of *existential autism*. This would occur insofar as there are individuals who have clearly articulated theories of mind in the domain of behavior that did not generalize to the domain of life experience.

EToM and Atheism

Through EToM, individuals are able to adopt the position that their experiences are intentionally guided and are occurring for a reason; it would be difficult for them to view themselves as "dust in the wind" even if they wanted to. By reflecting back on the salient events of our own autobiographies—the outcomes of choices made, the unanticipated hazards that derailed us from a planned track, ironic encounters with future mates, the deaths of loved ones—it is exceedingly difficult not to see some intentional propulsion behind their occurrences (for an interesting discussion, see McAdams, 2001). These are the events that lead to the construction of our current selves and subsequently give our lives meaning. Underlying all of this, of course, is a very basic representation of mind behind messages perceived to be intentionally communicated.

Such sensitivity to external meaning may, to some limited extent, be forcefully unattended to in adulthood, but the forceful shedding of

EToM will probably lead to a period of intense psychological suffering and the pangs of existential crises (Frankl, 1963; May, 1960; Yalom, 1980). People must adapt a meaning-based explanatory system that is wholly reliant upon their own attribution of purpose to their experiences. William James (1902/1994) eloquently described individuals' initial perception of a meaningless existence: "The world now looks remote, strange, sinister, uncanny. Its color is gone, its breath is cold, there is no speculation in the eyes it glares with" (p. 170). No longer is there a transcendent explanation behind natural events. When this agency is killed off, people perceive the same phenomena as they did as EToM users, but they can no longer decode the intentional messages attached to their experiences. What contributes mostly to their dysphoria is the loss of ultimate meaning that their life once had. They encounter the same type of dilemma faced by solipsists in their questioning of the reality of other human minds. If no other human minds exist, how can the behaviors of others have any meaning attached? Likewise, if there is no mind behind our existence, so to speak, then how can we find purpose or meaning in the things that happen to us and, more generally, in our lives?

Certainly, there are individuals (not least among them scientists!) who claim not to subscribe to such seemingly romantic workings of the mind, but it is my impression that we would be hard pressed to discover an individual of normal cognitive functioning who has never exercised his or her EToM. Imagine the following: You are on a crowded bus, lost in the newspaper before you, when suddenly you are caught in a dizzying fury of screams, blackness, and crushing metal. Your bus has crashed and flipped over a steep embankment. You crawl out a window, dust yourself off, and realize that you are the sole survivor out of dozens of other passengers. If a week from now, or a year or decade later, you find yourself asking "Why me?" then quite simply you have an intact EToM. Even if you brush such questions aside because you consider them rather foolish, you still betray your EToM insofar as you can entertain this type of question in the current context.

To reiterate: We are dealing in the domain of experience, not behavior. Individuals may very well be ideological atheists, and I do not doubt

their sincerity on the matter; however, much as solipsists cannot switch off theory of mind mechanisms, neither can EToM be totally disengaged in response to our acquired views on religion. Indeed, experimental data (Weeks & Lupfer, 2000) reveal that individuals professing to be nonreligious are just as likely to make intentional attributions in the domain of experience as religious people are. The only difference is that whereas believers turn to God in explaining ironic or life-altering events, nonbelievers turn to a belief repertoire including such elements as fate and immanent justice. In addition, these nonreligious immaterial belief structures are found cross culturally (Pepitone, 1997).

An analogy may be helpful. Much as people the world over have different religious beliefs, so too do they have different stylistic preferences, and thus they decorate their homes with different styles of furniture. Some prefer modern design, others like Victorian furniture only, and still others are eclectic and prefer a wide mixture of different furniture styles. When it comes time to sit or sleep, or eat or study, the occupants of each home use the furniture that they have chosen to perform these functions. A Victorian chair and a modern chair might look very different next to each other, but, in the end, they are both expert at doing what they were designed to do.

What about prisoners living in a barren prison cell, however? When it comes time for them to sit down, as it surely will; they will do so. But they will not sit down on anything in particular. Nevertheless, the constraints on their body to sit will override the fact that they have no specialized furniture to accommodate their needs. Similarly, individuals who have not been exposed to (or have not accepted) religious beliefs or stored these beliefs for later retrieval face the same cognitive constraints as those who have and will probably still perceive psychological agency as driving their experiences in some generic fashion. Simply because these individuals do not have specific religious beliefs to accommodate a core causal attribution style does little to wear away the core. The human brain is designed to see meaning behind random events, even under the wary, conscious eye of an intellect that thinks it knows better.

Concluding Remarks

Only by examining alternative ways of perceiving behavior, such as in other species or in autism, are we able to recognize how the human cognitive system was specially adapted to represent mental agency as driving action. At some point in evolutionary history after the human lineage split from the African apes, I have argued, the intentionality framework expanded to include those ambient life experiences that humans had little or no control over. Just as it is almost impossible to predict what another person is going to do or to be certain of why someone has just behaved in a particular way, it is similarly impossible to predict what nature has in store for us or to understand why we have just experienced something that may alter the course of our lives. EToM functions as a philosophical-religious explanatory system that allows us to see meaning in some of the things that happen to us, affords us some sense of perceived psychological control over what is likely to happen, enforces cultural mores that adapt the individual to the group, and guards against those behaviors that are maladaptive.

It is perhaps wise, given the subject matter of this article, to remember that the naturalistic fallacy is a double-edged sword. Just as atheism may not exist except in principle, the gods may not either. My intention has merely been to show that life events are often perceived to be products of mental causality. EToM is a co-opted-by-product of natural selection and occurs inside our heads. Comfortable in my scientist skin, I will remain mute as to whether I believe such perceptions are philosophically justified.

Nevertheless, such a large theory as the one I am offering demands a large bed of data to support it, and I have done little but try to work in experimental evidence and case reports that, more often than not, only indirectly corroborate my claims. Fortunately, the hypotheses embedded in this article are fully testable, and determining the merit of these arguments should not be impossible. For instance, whether the religious experiences of people with autism are qualitatively different from those of people without the disorder is an empirical question open for exploration.

I have only now to summarize some of the points addressed in this article with a hypothetical example that should, I hope, clarify any

remaining confusion: If we are given four cases of mothers—a language-trained chimpanzee mother, an autistic mother, a religious mother, and a nonreligious mother—and told that each of them has just sadly lost her infant as a result of a disease, we might expect the following responses (or something similar) after asking them why the death occurred. The chimpanzee would grieve for the loss but otherwise look at us blankly; the autistic mother would speculate that cancerous lesions had gotten a stronghold on her baby's immunosuppressive system; the religious mother would tell us that it was the will of God; and the nonreligious mother would tell us that her baby died so that she could help other bereaved mothers.

Whether this rings true for particular readers will rest, I believe, on whether or not they have found the general arguments presented in this article to be convincing. But even if they find these ideas still wanting, I would hope that the questions raised here continue to be asked and that evolutionary cognitive science opens its doors wider for such inquiry, because these issues truly strike at the heart of what it means to be human. Above all else, we are a species whose members are ravenous to understand the drama of our own lives.

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