

# *Religion and Embodied Cognition*

with Fraser Watts, “Embodied Cognition and Religion”; John A. Teske, “From Embodied to Extended Cognition”; Daniel H. Weiss, “Embodied Cognition in Classical Rabbinic Literature”; Léon Turner, “Individuality in Theological Anthropology and Theories of Embodied Cognition”; and Warren S. Brown and Kevin S. Reimer, “Embodied Cognition, Character Formation, and Virtue.”

## EMBODIED COGNITION, CHARACTER FORMATION, AND VIRTUE

by Warren S. Brown and Kevin S. Reimer

*Abstract.* The theory of *embodied cognition* makes the claim that our cognitive processes are, at their core, sensorimotor, situated, and action-relevant. Our mental system is built primarily to control action, and so mind is formed by the nature of the body and its interactions with the world. In this paper we will explore the nature of virtue and its formation from the perspective of embodied cognition. We specifically describe exemplars of the virtue of compassion (caregivers of individuals with developmental disabilities in L’Arche communities), speculating as to what might have been the formative influences in their character development. Embodied formation is understood in the context of the openness of human cortical systems to formation by social interactions, and in terms of the openness to reorganization and change of complex dynamical systems. Specific formative influences explored include interpersonal imitation, social attachment, language, and story.

*Keywords:* character formation; complex systems; embodied cognition; virtue

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Discussions of science and religion within the context of biology and neuroscience have often centered around the concept of the *embodiment* of human nature. This position asserts that human beings are entirely physical beings without nonphysical parts like souls or minds. However, despite being wholly physical, humans have nonreducible, emergent, high-level cognitive and social properties of the whole person that are agential—that

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is, causes in their own right. This view is sometimes referred to as nonreductive physicalism or emergent monism.

While not a necessary outcome of the more encompassing theory of embodiment, *embodied cognition* adds to this claim an assertion about the nature of embodied mental life—that is, that our cognitive processes are, at their core, sensorimotor, situated, and action-relevant. Our mental system is built primarily to control action, and so mind is formed by the nature of the body and its interactions with the world. Thus, thoughts are elicitations, emulations, or simulations of action-relevant sensorimotor memories. “Mental” refers either to complex, on-line, time-extended interactions with the physical or social world, or various forms of off-line simulation of such interactions. Particularly important to the embodiment of our thinking is the implicit simulation of speech—something like imagining conversations with ourselves or others. In addition, an important aspect of our sensorimotor memories is the registration of our bodies’ autonomic status associated with remembered events and actions, adding bodily affective coloring to off-line action simulations.

Generally speaking, the alternative to embodied cognition is that mind is abstract and symbolic, and, as such, several encoding steps removed from sensorimotor activity. In this view, thinking is a matter of the manipulation of abstract, disembodied, symbolic information. For thinking to be action-relevant there must be some translation from the symbolic back to the premotor. This understanding of mental life is referred to as an information processing theory, and relies heavily on computer systems as the root metaphor for mind. In the case of language, for example, an information processing theory views hearing and speaking as merely input-output channels for an inner processor of abstract language symbols. This inner processor is presumed to provide a basis of thought without the necessity of direct elicitation of activity in the sensorimotor, input-output systems of language.

#### OBJECTIVE OF THIS ARTICLE

In this article we will explore the nature of virtue and its formation in persons, seen from the perspective of embodied cognition. The material we present is drawn from two main sources. The first source is the study of exemplars of virtue that we have been pursuing with several other colleagues.<sup>1</sup> In this research we are exploring whether exemplars have unique perceptions of themselves, social schemas, and/or neurobiological responses to morally relevant situations, as well as what might be the formative influences in the character development of exemplars. The second source is a book recently coauthored by Warren Brown and Brad Strawn entitled *The Physical Nature of Christian Life: Neuroscience, Psychology, and the Church* (2012). This book attempts to redescribe spiritual and religious formation

from the point of view of embodiment and embodied cognition. While the focus of this book is the Christian church, the principles of formation are general, also applying to the nature and formation of character and virtue.

#### THE NATURE OF VIRTUE

Virtue theory is but one of several primary theories within moral philosophy. Put very simply, *consequentialists* suppose that morality is the outcome of rationally calculating the utilitarian outcome (costs and benefits) of various behaviors, and acting in accordance with the greatest good for the most people. The *deontological* school proposes that people should act justly based on preexisting principles of right and wrong—that is, do what one ought to do. *Sentimentalists* emphasize the elicitation of moral emotions that would motivate moral behavior. There are more recent versions of these theories that have emerged from recent neuroscience research, most of which make much of the contrasting role of rationality (presumed from cortical involvement) and emotion (presumed from activity occurring in the limbic system) in moral deliberation.<sup>2</sup>

In contrast, *virtue theory* supposes that moral and virtuous actions arise from basic character traits of individuals—that is, moral actions are, in most cases, habitual behaviors that are expressions of learned behavioral tendencies linked to particular social schemas. This perspective assumes a high degree of automaticity associated with virtuous moral action. In many (perhaps most) virtue-relevant situations, persons act automatically without resorting to conscious decision-making. Virtue is a particular way that certain persons habitually react, rather than the nature of the conscious decisions they make. While virtuous action can sometimes occur in association with moral reasoning, commitment to moral principles, and moral emotions, actions that index the virtue of a person cannot be reduced to reason, explicit principles, or emotion.

The importance of high-level, nonconscious cognitive operations was articulated a century ago in a famous statement by Alfred North Whitehead:

It is a profoundly erroneous truism . . . that we should cultivate the habit of thinking of what we are doing. The precise opposite is the case. Civilization advances by extending the number of operations which we can perform **without** thinking about them. Operations of thought are like cavalry charges in a battle – they are strictly limited in number, they require fresh horses, and must only be made at decisive moments. (Whitehead 1911)

Similarly, many in modern cognitive science believe that a large percent of our daily activity is played out without conscious decision-making—perhaps as little as 5% of daily behavior is initiated by conscious decisions, as opposed to elicited automatically by context (Bargh and Chartrand

1999, 462–79). Thus, virtue is a characteristic of the automatic social interactivity of some persons in some contexts.

#### EXEMPLARY VIRTUE

Based on this perspective, we believe that virtue is best understood by study of persons who manifest actions and commitments commonly recognizable as virtuously *exemplary*. With several colleagues, we have focused recent research on long-term caregivers of individuals with developmental disabilities in L'Arche (French, "the Ark") communities. L'Arche caregivers are widely considered virtuous exemplars of compassion and care (Brown et al. 2012). L'Arche is an international federation of homes for disabled adults founded by renowned Canadian humanitarian Jean Vanier. In L'Arche homes, people with developmental disabilities (known as *core members*) live in community with their caregivers (known as *assistants*). Assistants have 24-hour, 7-day-a-week responsibility for the care of persons with cognitive and physical disabilities. In some instances the level of disability is profound. Personal care in L'Arche is earthy, persistently demanding, and not the least bit glamorous.

In the United States, L'Arche communities typically exist on scarce financial resources. Besides room and board, caregiver assistant pay is minimal. Benefits (such as health insurance and retirement accounts) in some locations are thin, in other locations nonexistent. To serve as an assistant in a L'Arche community for an extended period of time offers little hope of financial gain, accumulation of possessions, or enhanced social status. Success as a long-term L'Arche caregiver involves deeply formed, habituated behaviors recognizable as virtuous compassion and care.

Novice and experienced L'Arche assistants were the focus of Reimer's earlier study involving extensive self-identity interviews (Reimer 2009). In their interview responses, caregiver assistants frequently aligned their own narratives with the virtuous example of disabled core members—noteworthy given that many of the disabled in L'Arche are nonverbal. Virtuous maturity, as modeled by nonverbal core members, might be considered elementally embodied, framed by social cues associated with bodies *in situ*. L'Arche assistants consistently referenced the disabled as *prophets* and *teachers* who routinely demonstrate surprising and sometimes extraordinary compassion. Core members provided formative virtuous influence on assistants, functioning as "local humanitarians" through cultivation of prosocial habits. By implication, compassion in L'Arche is learned in relationships between those who might be able to hide their brokenness (e.g., caregiver assistants) and those who cannot (e.g., disabled core members).

Research on L'Arche caregivers suggests that both *apparent* and *genuine* virtue exists in these communities, with most short-term or novice caregivers representing the former group. We believe that genuine compassion

emerges in long-term caregivers through significant personal transformation which comes about in sustained contact with, and care for, core members. What became clear in these interviews is that recognition of one's own shame as mirrored in the experiences of those with disabilities contributes to reordered appraisals of self and other. These appraisals were subsequently coupled with revised goals associated with the emergence of exemplary compassion manifest in long-term service to the disabled. We believe that study of such exemplars of compassion will yield important progress in the understanding of virtue. With respect to the implications of embodied cognition for questions of science and religion, understanding the exemplary virtue expressed by L'Arche assistants is an important challenge.

#### VIRTUE AS EMBODIED COGNITION

Within the theory of embodied cognition, virtue exists in the form of sensorimotor interactional memories and action–outcome schemas. These memories and models are derived from previous experiences involving interactions with the social world, either in the form of actual behavioral interactions or vicarious actions triggered by imitation or narrative. To further explore the nature of virtue within embodied cognition, it is worthwhile to look at some of the *fundamental principles* of embodied cognition, and think about how virtue might be seen with respect to these dimensions.

- (1) *Situatedness*: This principle asserts that cognition (thinking) takes place with respect to real-world contexts and involves task-relevant, ongoing, perception–action loops—real or simulated. Contexts and their relevant perceptions and actions may sometimes be imagined based on past memories, yet the cognitive activity remains a situated simulation of real-world interactions. With respect to virtue, situatedness would suggest that virtue exists as a form of interaction tendency with respect to specific sorts of situations. Thus virtue, as a matter of character, denotes a form of action regularly taken in certain social, interpersonal contexts, often without conscious deliberation. Virtue is a form of contextually situated, action-relevant social schema. Although virtue may be assigned specific valuations (e.g., compassion, charity), these labels are not required for action expressed out of the social schemas of L'Arche assistants.
- (2) *Cognition is for action*: The basic task of mind is to guide situation-appropriate *action*. Thinking is fundamentally for doing, and the content of thought is always rooted in some form of action-simulation and perceptual memory. What is necessary for cognition

to proceed is a prior history of interaction with the world that forms action-relevant schemas to draw upon. Virtue (or its absence), as embodied cognition, is but one form of situated action-tendency that involves qualities like compassion, generosity, justice, and so forth.

- (3) *The meaning of language is based in sensorimotor experience*: This point has been persuasively articulated by Lakoff and Johnson (1999). By way of example, although we might be able to think about a principle of virtuous action such as “It is better to give than to receive,” this statement would have no meaning outside of sensorimotor memories about what it is like to give and to receive, and the bodily affective social meaning of “better,” as well as the memory traces of prior contexts in which we might have heard this statement. The meaning of the sentence is the perceptual memories and action-relevant *simulations* which constitute and are associated with the sentence coming to mind. Albert Einstein famously said that abstract concepts became meaningful to him “only through their connection with sense-experiences” (Einstein 1979). According to this view of language, linguistically coded moral principles have no meaning without being implicated with specific forms of behavioral interaction with the world. The reciprocal relationship between life action and semantic reference we found to be evident in the inclusion of more explicitly meaningful, self-important moral concepts in the narratives of long-term L’Arche caregivers when compared to novice or short-term peers (Reimer et al. 2011, 36–44).
- (4) *Time-pressured*: Life generally does not allow persons to pause to engage in abstract thoughts about the utility or the relevance of moral principles to immediate behavior. Sensorimotor interactions with the physical and social world are subject to temporal pressures—they unfold across time, the timing and sequencing of behavior plays a critical role, and ongoing feedback with respect to outcome leads to continuous behavioral adjustments. Similarly, thinking, as rehearsal of action, involves timing and sequencing, even though imagined. In this respect, virtue would necessarily involve the timing and sequence of interactions in the social world. It is not constituted by static principles, such as “do this because it is compassionate,” nor by *a priori* calculation of utility. Rather, virtue is a certain form of habitual behavioral repertoire involving temporal sequences of social interactions which can be characterized by descriptors that signal virtue.
- (5) Cognition is inescapably enmeshed in *recurrent situational feedback*: We can seldom (if ever) truly halt engagement with the

environment in order to make completely disengaged abstract decisions. Rather, using criteria of outcome evaluation that are nested in our action-schemas, we continually make subconscious adjustments given feedback from interactions with the world. Even when sitting in an easy chair contemplating important academic concepts (like virtue), one cannot escape the cycle of imagined action and feedback—such as imagining expressing an idea that comes to mind and then imagining (even feeling) the likely feedback from colleagues, students, reviewers, etc.

- (6) Cognitive work is often *off-loaded into the environment*: As Andy Clark once wrote, “We make the world smart so that we can be dumb in peace” (Clark 1997, 180). In this respect, virtue cannot simply be the characterological possession of an isolated individual, but would encompass virtue-eliciting and virtue-allowing affordances within specific environmental and social contexts which a virtuous person participates in creating, or chooses to inhabit. For example, L’Arche homes might elicit virtues of care and compassion in assistants that they have not yet learned to express in other contexts. Virtue is a person-context coupling. We create L’Arche homes or soup kitchens or other service venues as contexts which evoke virtue. The affordances provided by the context are a part of the virtue-relevant cognitive system.

#### NEURAL OPENNESS TO FORMATION

Given this understanding of the nature of moral action as virtue (that is, more habitual and automatic), and of virtue as an aspect of embodied cognition (that is, body-based and action-relevant), how does a history of ongoing interactions with the world (particularly the social world) build behavioral tendencies describable as virtue into the mental/neural structures of persons?

The first thing to recognize is that the human cerebral cortex is largely an “open program.” Certainly genetic preprogramming has a general influence on the formation of our mental systems. However, human infants are born with a cerebral cortex that is markedly immature at the level of number of neurons, complexity of dendritic branches, connections between neurons (synapses), and the myelination of long-distant axon pathways. The human cerebral cortex also takes significantly longer to complete its physical development than the cortex of chimpanzees or other primates. For example, the human prefrontal cortex does not reach full adult maturity with respect to cortical thickness or axon myelination until late in the second decade of life, while the chimpanzee prefrontal cortex matures within 2 to 3 years of birth.

This remarkably slow development of the human brain (compared to other primates) means that for nearly two decades brain structure and its functional consequences are particularly open to being shaped by life experiences. Openness to experience allows for greater flexibility and variety in our formation, particularly the formation of important aspects of our most human characteristics: intelligence, personality, and character, as well as assimilation of cultural modes of thought and behavior. Steven Quartz and Terrence Sejnowski, in their book *Liars, Lovers, and Heroes*, express this idea as follows:

We were intrigued by the fact that the prefrontal cortex is the last part of our brain to mature during development, not reaching its full function until after puberty. Perhaps we literally build our sense of self as our human culture helps us build our prefrontal cortex. If this were so, then mind would be supremely flexible not because it has somehow unfettered itself from biology, but because of our biology. . . . Humans are the result of the most complex collaborative project in history, whose two equal partners are our biology and the human culture we are immersed in. (Quartz and Sejnowski 2002, 31)

What is more, the microstructure of our brains, involving patterns of synaptic connectivity, remains dynamic throughout life. One study found that, compared with 50-year-olds, the dendritic branches of neurons in the memory systems of healthy 80-year-olds were 35% *more* complex (Buell and Coleman 1981, 23–41). The reality of extensive plasticity in the adult brain is also illustrated by the widely cited study of the hippocampal systems of London taxi drivers. Since London streets are not laid out in a grid, but are a complex maze of streets running every which way (including many one-way streets), driving a taxi makes constant demands on spatial memory. It was found that the posterior hippocampus became progressively larger the longer a person works as a taxi driver in London (Maguire et al. 2006, 1091–1101).

Thus, human infants and children are remarkably open to formation of their cognitive, emotional, and behavior systems via their interactions with the environment. Less remarkably (but nevertheless significantly), sufficient openness exists throughout life for adult experiences and social relationships to continuously re-form us when necessary.

#### DYNAMICAL SYSTEMS AND VIRTUE

The remarkable openness of human neurocognitive systems, coupled with the hypercomplex interconnective architecture of the brain, suggests that the *theory of complex dynamical systems* can be helpful in understanding how interactions with the environment shape cognition and character. This theory, originating in applied mathematics, has advanced our understanding of the nature of very complex, open, and self-organizing systems



(such as biological organisms, human societies, and economies). It is a technical theory about how really complex characteristics (like minds and personalities) can emerge from myriads of ongoing interactions between the millions of parts (like neurons) making up a system (like an organism or person). This theory is also about adaptability and change.

An ant colony is a helpful example that is often used to illustrate a *dynamical system*. Consider each ant as one of the many *parts* with the colony as the whole *system*. Because of the constant, ongoing interactions between all of the individual ants, the colony self-organizes and comes to function as a whole unified dynamical system. Because it is a system (rather than a loose assemblage of individual ants), the colony interacts with its surrounding environment as a single organism. The colony comes to have whole-system characteristics that cannot be attributed to the characteristics of individual ants (just as human beings have characteristics as persons that cannot be attributed to individual brain cells or brain systems). Colonies do things (such as building and maintaining nests, tending the queen, or going on mass foraging expeditions) that are not due to the plans or decisions of any individual ant. The activity pattern of the colony emerges not just from something about individual ants, but from the interactive patterns that come to characterize the colony—patterns constituted by the entrainment of a massive quantity of small physical and chemical interactions across tens of thousands of individual ants.

What is most important to our current discussion is that the characteristics of such systems enlighten the nature of human formation and change. One important characteristic of dynamical systems is that they always retain the potential to reorganize in ways that result in new system characteristics. This happens whenever the system is destabilized by an inability to successfully interact with its surroundings. To continue, for the moment, the analogy of an ant colony, a change in the nature of the local food supply can cause the colony to adapt and learn (literally “learn” as a system) new strategies for finding and gathering food. The system characteristics of the colony change in ways that meet the new challenge. Interestingly, newer (younger) dynamical systems (including ant colonies and human bodies) reorganize readily, but older systems, although they are still capable of reorganization, are more robust and less likely to change significantly, except in the case of a major destabilization.

Situations that force reorganization are called, in the parlance of dynamical systems theory, “catastrophes”—a technical word that merely refers to a significant mismatch between a system and its surroundings. As already mentioned, an ant colony will change its behavior due to changes in the availability of certain foods—a catastrophe from the point of view of the colony as an organized system. Catastrophes in the lives of persons (e.g., coping with a change in the demands of one’s job, the birth of a child, loss of a treasured L’Arche core member) can force reorganization of the person

in major or minor ways, depending on what is demanded by the challenges of the new situation. Behavior that is no longer adequate to the physical or social context (a catastrophe) causes dynamical system reorganization.

With respect to the continued reorganization of dynamical systems, philosopher Alicia Juarero has written, “The higher level of organization, whether thermodynamic, psychological, or social, possesses a qualitatively different repertoire of states and behavior than the earlier level, as well as greater degrees of freedom” (Juarero 1999, 145). To summarize, the very nature of the kind of complex and open physical systems that constitute us as human beings means that we are largely self-organizing with respect to the nature of our highest human properties, and continually able to change and reform, even as adults. Changes are prompted by “catastrophes,” in which our current self is no longer able to deal adequately with our circumstances. The younger the person, the more likely are personal reorganizations, but older systems still change. Changes that take place generally preserve most of the characteristics of our previous system, allowing for growth but with the continued preservation of system integrity, including the integrity of ourselves as particular persons.

#### FORMATION OF EMBODIED VIRTUE

The embodied nature of important mental, psychological, and social processes, the unusual degree of openness of human systems to change, and the relevance of dynamical systems theory, all have implications for the formation of personality, character, virtue, wisdom, and even religiousness. Formation of these characteristics is not the accumulation of a rich bank of abstract ideas which one can manipulate off-line to understand the world and act appropriately. Rather, formation occurs in relation to action and feedback, and is preserved in sensorimotor memories that have implications for future actions, most of which exist in the domain of action schemas and habit. In the best cases, these formative processes lead to traits of the person that might be described as virtuous.

In their book *The Physical Nature of Christian Life*, Brown and Strawn (2012) explore some very concrete processes involved in religious formation, but which also apply to the formation of virtue. Among the formative influences they describe are secure attachment, imitation, language, and narrative.

*Attachment:* While dynamical systems theory suggests that change happens in the face of life catastrophes, a person’s ability to be open to change-promoting feedback (particularly in the social domain) is highly influenced by the kind of attachment style they learned in childhood and subsequently embody as adults. Individuals with secure attachment styles are more open to change, while those with insecure, avoidant, or disorganized styles are less open to change and may even exhibit rigidity (Bowlby 1969, 1973,

1980; Brown and Strawn 2012, ch. 4, 5, 6). For example, a formative response in a novice L'Arche caregiver to new situations demanding persistent compassionate acts will be facilitated by a history of secure relationships with other persons, as well as secure relations with other caregivers and core members in the current situation. It is more difficult for individuals who suffer from insecure attachment styles to trust enough to be open to learning from others, and to trust themselves sufficiently to incorporate new thoughts and try out new behaviors.

*Imitation:* There is a large body of research that has demonstrated the human proclivity toward automatic, or unconscious, imitation (Bargh et al. 1996, 230–44; Bargh et al. 2001, 1014–27; Dijksterhuis and van Knippenberg 1998, 865–77).<sup>3</sup> For example, investigators have described what they call the “chameleon effect,” which refers to our imitation of the postures, mannerisms, and facial expressions of the people around us (Chartrand and Bargh 1999, 893–910). We unconsciously and unintentionally change our actions to match those of the people we are around. In most cases, the influence goes directly from what we see to what we do without conscious deliberative processes in between. For this reason, the imitative process is referred to in psychology as the “perception-behavior expressway . . . the mere perception of another’s behavior automatically increases the likelihood of engaging in that behavior oneself.” (Dijksterhuis and Bargh 2001, 1–40) Meltzoff has demonstrated that imitation is a fundamental way by which infants and children interact with the social world and learn to adapt to the world around them (Meltzoff 2007, 26–43; Meltzoff and Decety 2003, 491–500). Rene Girard argues that we imitate the *desires* of others, not simply their behavior (Girard 1978, 1987).

Through the activity of “mirror neurons,”<sup>4</sup> action simulations automatically occur in the motor and perceptual systems of an observer, providing a means of understanding the behavior of others being observed. A by-product of understanding through implicit (inner) simulation is that the observer is now primed to engage in the same behavior as that observed, either immediately or when a similar situation occurs in the future (Iacoboni 2012).

Reciprocal imitation (that is, I imitate you while you are also imitating me, and both of us are imitating those around us, who also are imitating us) means that we are enmeshed in social networks of constant formative mimetic influence. Thus, merely observing the virtuous behavior of others creates tendencies to act accordingly.

*Language:* As previously noted, even seemingly very abstract concepts are metaphoric extensions of sensorimotor experience. The abstract concept of “time,” for example, is expressed in thought and language via embodied metaphors of spatial movement (as in, time “passes,” “races,” “drags,” “flies,” etc.). If we understand the meaning of language via our activities in the world, then language has an implicit link back to the shaping

of behavior. Choice of language, and thus choice of action metaphors, to describe and reference a particular situation can foster (or not) the expression of virtue in others and ourselves in the form of language-linked action-schemas understood to be relevant to that sort of context.

*Narrative:* Language used for story telling has a very particular and significant formative influence. It allows us to know vicariously the experiences of others, and can open to us new ways of experiencing the world, as well as teaching values and virtues. Stories have this sort of cognitive power because they cause hearers to implicitly simulate the behaviors that are described in the narrative (McAdams 1993).<sup>5</sup> As the theory of embodied cognition suggests, a story is comprehended by implicitly simulating in one's own sensorimotor systems the actions being narrated. Like imitation, these simulations can form behavioral schemas for future action.

Story telling is particularly important in child development. Telling children fanciful imaginative tales or reading stories to them (often at bedtime) are wonderful ways to entertain and relate to children. But such story telling is also an important way of illustrating and teaching values and virtues that contribute to the development of their character. Story narrative allows children to vicariously imagine new situations, "try out" various behaviors, and safely experience their positive or negative consequences, forming rich impressions in their minds about what is good and bad, right and wrong, and conducive or not to the well-being of others.

For example, Aesop's Fables are stories that children love, but they also include important teaching about things like persistence ("The Hare and the Tortoise"), being fooled by appearances ("A Wolf in Sheep's Clothing"), the tendency to degrade what one cannot possess ("The Fox and the Grapes"), the problem of being dishonest ("The Boy who Cried Wolf"), and the potential future benefits of helping someone in need ("The Lion and the Mouse"). These stories are so deeply embedded in our cultural unconscious that the whole story scenario and its implications can be brought to mind by a simple phrase, such as "sour grapes" or "crying wolf."

The importance of stories in understanding the world and managing our lives is powerfully expressed by philosopher Alasdair MacIntyre.

It is through hearing stories about wicked stepmothers, lost children, good but misguided kings, wolves that suckle twin boys, youngest sons who receive no inheritance but must make their own way in the world and eldest sons who waste their inheritance on riotous living and go into exile to live with the swine, that children learn or mis-learn both what a child and what a parent is, what the cast of characters may be in the drama into which they have been born and what the ways of the world are. Deprive children of stories and you leave them unscripted, anxious stutterers in their actions as in their words. (MacIntyre 2007)

## CONCLUSION

There is obviously much yet to be learned about such a high-level, complex, and contextually nuanced human characteristic as virtue. Using the conceptual structure of embodied cognition, we have attempted to describe what might be the nature of virtue and the processes of its formation. We believe that the theory of embodied cognition provides a rich and robust conceptual structure from which to begin to understand the nature of virtuous exemplars such as person who spend years of their lives as caregivers for disabled persons within L'Arche communities:

My goals are downward mobility. I want to be more compassionate, I want my life to touch people, I want to grow and understand what it means to be spiritual. I live with a really deep sense of contentment. I was once pretty achievement oriented, before I came to L'Arche. Now my goal is to receive people as they are. The gift of L'Arche is that I had some amazing, paradigm-shifting experiences where my boxes and categories were demolished. I mean completely blown up. L'Arche is a place that pushes me out of my comfort zone. I feel that all the time. Every day is different. Labels don't tell you much about why people behave the way they do. It's better to put aside labels and let things unfold without expectations.<sup>6</sup>

## NOTES

A version of this article was presented at "Embodiment and Embodied Cognition: Scientific and Theological Perspectives," the conference of the International Society for Science and Religion (ISSR) in association with the Akademie Loccum, Germany, September 20–23, 2012.

1. Warren S. Brown, Michael Spezio, Kevin Reimer, James Van Slyke, and Greg Peterson, *The Rationality of Ultimate Value: Emotion, Awareness, and Causality in Virtue Ethics and Decision Neuroscience*, a research grant awarded by the Science and Transcendence Advanced Research Program (STARS) through the Center for Theology and Natural Science (Berkeley, CA). This project also goes by the title, *The HABITVS Project: Humane Archetypes—Biology, Intersubjectivity, and Transcendence in Virtue Science*.

2. These theories include a competing process theory (Joshua Greene), somatic marker hypothesis (Antonio Damasio), social intuition theory (Jonathan Haidt), and the idea of an innate moral module (Mark Hauser).

3. Many studies show the role of automatic imitation of behaviors, including such behaviors as walking slower or behaving rudely (Bargh et al. 1996, 230–44); performing better or worse on an intelligence test (Dijksterhuis and van Knippenberg 1998, 865–77); and competitiveness vs. cooperativeness (Bargh et al. 2001, 1014–27).

4. Research on mirror neurons and the mirroring the neural activity of the actions, sensations, and emotions of other persons is reviewed by Keyzers and Gazzola (2006).

5. Social perception and mirroring is discussed by Keyzers and Gazzola (2006).

6. Sriram, long-term L'Arche caregiver assistant (Reimer 2009, 19).

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