FREE WILL ACCORDING TO JOHN DUNS SCOTUS AND NEUROSCIENCE

by Sally K. Severino

Abstract. This paper examines two views of free will. It looks first at the fourteenth-century religious insights of John Duns Scotus, one of history's seminal thinkers about free will. It then examines what current neuroscience tells us about free will. Finally, it summarizes the past and present views and concludes by answering two questions: Does free will refer to an absence of external constraint, or does it refer to a human ability to decide in an acausal manner?

Keywords: embodied simulation; empathy; free will; intellect/cognition; intersubjectivity; theory of mind

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As Professor of History Richard Olson acknowledges, "During most of the past century and a half, public understanding of the interactions between scientific activities and knowledge on the one hand and religious attitudes and beliefs on the other has been dominated by the image of conflict and warfare" (Olson 2011, 65–66). This paper describes one area of overlap between science and religion: the area of free will. In this area—according to the two views examined here—agreement predominates instead of conflict.

Free Will According to John Duns Scotus

John Duns Scotus stands as one of Western history's seminal thinkers about free will. According to him, free will is not *just* willpower, not *just* self-control, and not *just* thinking, although it may include these. For Scotus, free will is the innate capacity of human beings to choose whether or not to love.[1] More specifically, he defines free will as the innate capacity to choose whether or not to love God (Wolter [1986] 1997, 31–46, 127–66). Sometimes Scotus refers to the will as an agent that does something—as will be seen in subsequent quotations from Scotus's works. However, in discussing Scotus's free will in this paper, it is the capacity to choose that is emphasized.

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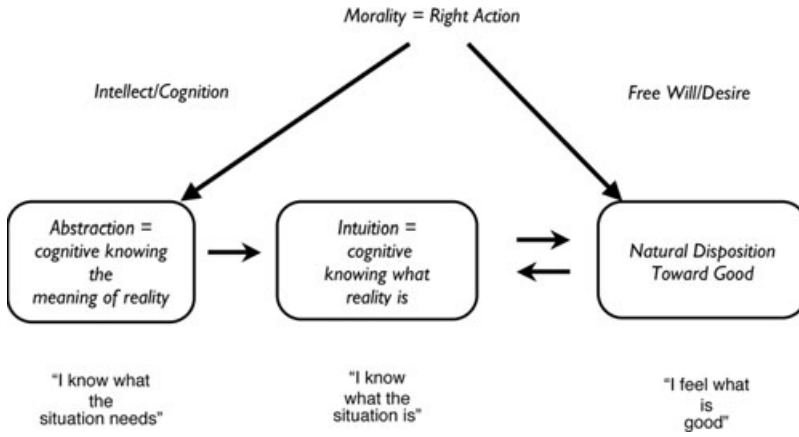

Figure 1. Schematic of Morality.

Adapted from Allan B. Wolter, OFM, *Duns Scotus: On the Will and Morality*, rev. ed. (Washington, DC: The Catholic University of America Press, 1997).

Free Will. Scotus envisions free will as one of two dimensions of morality: free will/desire and intellect/cognition (Wolter [1986] 1997, 39). A diagram of Scotus's view of morality might look like Figure 1.

Free will has two inclinations that he calls "affections." The affection for the advantageous is human *desire* focused inward to love self. The affection for justice is human *desire* focused outward to love others. These two affections exist in the will, which Scotus envisions is the seat of love (Ingham 2002). Throughout life, human beings strive to unite these two affections such that the morally good act is a beautiful whole. In other words, people are truly themselves when they "bring love for the self into harmony with love for the good [the other]" (Ingham 2002, 101). Within this beautiful whole, human beings live with integrity of character, which is their source of happiness (Wolter [1986] 1997, 155–62) and dignity. Ordered love, thus, is definitive of human dignity.

Scotus distinguishes between will and desire in the following way. The *will* chooses action motivated by desire. *Desire* loves self (*affectio commodi* = affection for the advantageous) or other (*affectio iustitiae* = affection for justice).

When viewed through the lens of the will, Scotus considers a person to be one who desires, loves, and chooses.

The will, however, is not *merely* affective response to what should be done. The will is also rational. By rational, Scotus means what is noncontradictory, what is logically and internally consistent. Rationality "involves the capacity for understanding [what is good] and [the capacity

for] free choice" (Ingham 2003, 74). A chosen act of the will is always free, but if it chooses an act, it must choose in accord with one of the will's two inclinations toward good: its affection for the advantageous and its affection for justice.

The will's affection for the advantageous (*affectio commodi*)—human desire focused inward—is an inclination for self-preservation, self-perfection, and happiness; it is "the disposition whereby the will is drawn to love goods that bring pleasure and enjoyment to the self" (Ingham 2003, 226). To quote Scotus's *Ordinatio* III, suppl., dist. 46, "The other act [of wanting something for oneself] pertains to the will inasmuch as it has an affection for the advantageous" (Wolter [1986] 1997, 153). *Affectio commodi* is perfected by hope.

The will's affection for justice (*affectio iustitiae*)—human desire focused outward—is an inclination to love; it is the "disposition whereby the will is drawn to love the good because of its intrinsic value . . . and not because of any personal gain" (Ingham 2003, 225). In Scotus's words, "To love something in itself [or for its own sake] is more an act of giving or sharing and is a freer act than is desiring that object for oneself. As such it is an act more appropriate to the will, as the seat of this innate justice at least" (Wolter [1986] 1997, 153). *Affectio iustitiae* is perfected by charity.

To repeat Scotus's conceptualization of free will: "Either it [the will] wills the good as an intrinsic value in itself [*affectio iustitiae*] or it seeks the good as something advantageous for self or nature [*affectio commodi*]" (Wolter [1986] 1997, 105).

> The affection for justice, however, is the higher and more perfect of the two. For the affection for the advantageous only seeks a good as a means to a further end which, in turn, is desired for its own sake. The affection for justice, by contrast, always seeks a thing *for its own sake*. That is to say, it tends towards that end in a special way. For it seeks to do justice to its intrinsic worth, its objective value. In another respect, the inclination for justice is superior to the affection the will has for what is advantageous. The latter inclination can be immoderate, especially as regards those things that pertain to one's own welfare and happiness. The affection for justice, however, is never intemperate, inordinate, or unreasonable, and even when directed toward one's self is never an exaggerated self-love, but always in accord with right reason. And where God is concerned or the welfare of loved ones or the community is at stake, the affection for justice can transcend self-interest, and be truly unselfish and altruistic. Both these affections can be directed to God, and in loving him they find their most complete fulfillment. One inclines us to love God because he is our good, the other because he is good and loveable in himself. (Wolter and O'Neill 1993, 40)

Furthermore, "if the will elicits an act in regard to good, it is free only to love it or abstain from loving it, but not to hate it qua good. Similarly, in the presence of evil it is still free to hate or turn away from it or not, but it is not free to love it" (Wolter [1986] 1997, 105–06).

As an aside that clarifies Scotus's conceptualization of free will, Scotus presented his understanding of freedom as an alternative to that of Thomas Aquinas, who died when Scotus was a child. Aquinas conceptualized the will as an intellectual appetite that is free because it deals with universals. The human will is rational. The will is the same as intellectual appetite. For Scotus, however, intellectual appetite is only one part of the will. The will is motivated by the two affections *affectio commodi* and *affectio iustitiae*. The will is a free potency (libera potentia) with the implication that a human being can consciously choose a lesser good because this is the person's free choice.

Free Will's Helper. Free will needs a helper, which is Scotus's other dimension of morality: the intellect/cognition. More explicitly, before a person can exercise the capacity to freely choose, a person requires enlightenment by the intellect. The intellect includes two acts: abstraction (cognitive knowing the meaning of reality) and intuition (cognitive knowing what reality is).

Abstraction, for Scotus, refers to cognition, "the act by which the mind knows reality [the meaning of an object] via sense perception" (Ingham 2003, 225). It is what can be abstracted from sense encounters. In other words, it is knowledge based on comparing what is sensed with previously sensed or described images (Bartol 2008). Information gained through bodily senses is transferred to the imagination, which then works to provide a representational image for the mind. "In the act of abstraction, the intellect and this image give birth to the higher order concept for understanding. This understanding is revealed in judgments [assessments] expressed in language" (Ingham 2003, 58–59). Abstraction is the perceptual counterpart of intuition (Wolter 1990a).

Intuition is also cognition; it is "certain knowledge" of reality [that an object exists]" (Ingham 2003, 229). Scotus describes intuitive cognition as a form of simple [nonjudgmental] awareness of an object as existing. It is the mind in direct contact with what is known (Wolter 1990a). It is direct connection with the truth. Intuition is "certain knowledge of a present and existing object or person in its existence, unmediated by images or mental pictures" (Bartol 2008, 222). A person has "an immediate existential grasp of any existing reality in its existence" (Ingham 2003, 61).

When viewed through the lens of the intellect, Scotus considers a person to be one who knows and understands.

Scotus summarizes his conceptualization of the intellect in *Lectura* II, d. 3, nn. 285, 287–288:

> Know that an intellect is capable of two sorts of knowledge and intellection, for it can have one that abstracts from all existence, and another of a thing present in its own existence. . . . The first sort of knowledge, according to which the intellect

abstracts from all existence, is called "abstractive," whereas the other, according to which the intellect sees the thing in its existence, is called "intuitive." It is not called "intuitive" because it is not "discursive," however, but rather because it is distinguished from that abstractive knowledge, which knows a thing in itself through a species. (Wolter 1990a, 107)

Here, again, a comparison of Scotus's and Aquinas's thinking may clarify Scotus's conceptualization. In his understanding of the intellect/cognition, Scotus differs from Aquinas. Aquinas emphasizes knowing through intellectual abstraction. Only secondarily is the intellectual form linked with sense perception to form a mental representation. Scotus, on the other hand, sees that human beings can know directly through intuition.

Both Scotus and Aquinas emphasize that moral choices are a combination of reason and desire. But they differ about what makes choices moral or immoral. Aquinas believes that once the intellect judges what is the appropriate moral act, the will as the rational appetite must choose it. Scotus believes that the senses present multiple options for action at each moment of choice. The individual consciously chooses one particular moral act.

Right Moral Action. According to Scotus, when cognition (the intellect) and desire (the will) function as a single agent, they produce a single, rational choice (Ingham 2003, 95). When Scotus affirms the will as morally rational, this means "self-control and self-determination [the will], according to the light of reflection [the intellect]" (Ingham 2003, 96).

When viewed through the lens of the will/desire as rational and the intellect/cognition as helper, Scotus's vision of the person is holistic.

Scotus uses Augustine's simile of the horse and the rider to clarify what he means (Wolter [1986] 1997, 94). Comparing the horse to the will and the rider to charity, the horse is free to throw its rider (destroy charity through mortal sin), or to choose not to follow the guidance of the rider (commit indifferent or venially sinful action), or to choose to follow where charity leads (act meritoriously). Thus, moral goodness is not something absolute; it is a relationship—of horse and rider, of will and charity. Goodness is an agreement of the act with right reason. It is the capacity to freely choose that is enlightened by the intellect/cognition.

Both the will and the intellect are required for right moral action. But the will is always free. A person can know with certainty—through his double capacity for knowing: abstraction and intuition (Ingham 2003, 94–96)—what is the right thing to do, and still not do it if the will does not choose it. Morality reaches its fullest perfection when will (the capacity to love and to choose) is aided by intellect (the ability to control oneself). The "fullest perfection of the human person as rational involves loving in the way God loves" (Ingham 2003, 28).

In summary, Scotus stresses that the exercise of free will is a necessary condition for any action to have a moral value. Being free to disregard the inclination for self-indulgence and to follow the dictates of right reason—in terms of the goal the action attains, the effort expended, and the consequences of the action—a person can be praised or blamed, rewarded or punished for the results from the action. Freedom and responsibility go hand in hand (Wolter 1990b). "Thus to be morally good an act must be perfect in its morality. It must be a free act elicited as the result of a moral choice, in accordance with the judgment of right reason, and on the responsibility of the individual's own deliberation" (Harris 1927, 310–11).

The Wind Chime Analog. Mary Beth Ingham, CSJ, has conceptualized John Duns Scotus's religious insight about morality as a wind chime (Ingham 1996, 145–147). The wind chime consists of individual pieces—symbolic of Scotus's insight about people in community—that must hang in appropriate relationship to one another for the chime to be visually beautiful and to sound musically harmonious. The chime must also be balanced. Balance symbolizes the end of the moral journey, which is communion, not autonomy.

At the center of every wind chime is a disk, which Ingham likens to Scotus's central element of morality: the freedom of the will. It is weighted by the desire that focuses inward and the desire that focuses outward. But it is free enough to be moved by the circumstances in which it lives. Just as the disk moves to touch the chimes, the will of each person functions in context touching other people.

The chimes surrounding the disc represent not only other people, but also their moral virtues—their practical habits resulting in morally good acts that are set in time, place, manner, and circumstances. The will, according to Scotus, could not function properly without people and their virtues. Together they function best when they function in harmony. "Together, the human goods of balance and harmony constitute that inner peace which gives rise to joy within the heart of the formed moral agent" (Ingham 1996, 147). The moral agent—like the wind chime—responds to what circumstances demand.

For Scotus, freedom and reason are not fundamental opposites. "The reason of nature and action, of . . . morality, unfold within *the architectonic form of freedom*" (Wolter [1986] 1997, *x*). Freedom has its own order and is the glue of the universe. What actually exists in the world finds its reason in the logic of the will's freedom. This can be so because of Scotus's theory of personhood: human beings are naturally good with a potential for right action. When human beings will in accordance with the assessment of right reason, then the resultant action expresses love—both human love and also the divine love that created the universe.

Free Will According to Neuroscience

In neuroscience, discussions of free will commonly begin with the experiments of Benjamin Libet in the 1980s and 1990s. He attached surface electrodes to the scalp of research subjects to monitor their brain activity. Subjects sat with their hands on a tabletop. Libet asked them to flick their wrists whenever they wanted to. He also designed a large clock that allowed subjects to report fractions of a second. Subjects reported when they decided to move their wrist. The results of Libet's studies indicated that on average, the subjects' brains were nonconsciously working on the motor processes that would result in flicking their wrists 350 milliseconds before they consciously decided to do so. Then, there was still approximately 150 milliseconds of brain activity after subjects were conscious of their decisions and before they flicked their wrists. The 150 milliseconds, according to Libet, represents the time free will can work.

Philosopher Shaun Gallagher, however, argues that free will is a longer-term phenomenon that depends on consciousness and that applies to intentional actions. He understands Libet's nonconscious brain activity to represent embodied mechanisms that enable the exercise of free will. They enable free will to the extent that we are not required to consciously deliberate about autonomic processes and can, therefore, direct our deliberations to the larger system of body-environment-intersubjectivity. In Gallagher's words:

> Non-conscious embodied processes, including the kind of neurological events described by Libet, . . . are, as I have indicated, essential to a free will that is specifically human. All such relevant processes are structured and regulated by my intentional goals as much as they also limit and enable my action. When I decide to reach . . . for a drink, all the appropriate physical movements fall into place. These embodied mechanisms thus enable the exercise of free will. And to the extent that we are not required consciously to deliberate about bodily movement and autonomic processes, our deliberation can be directed at the more meaningful level of intentional action (Gallagher 2005, 242).

Please note that nonconscious processes, which influence free will, are a consistent theme throughout the neuroscientific perspective on free will. These nonconscious processes, however, can be educated. Behavioral neurologist Antonio Damasio addresses what he calls the *educated cognitive unconscious*. "The conscious-unconscious cooperative interplay also applies in full to moral behaviors. Moral behaviors are a skill set, acquired over repeated practice sessions and over a long time, informed by consciously articulated principles and reasons but otherwise 'second natured' into the cognitive unconscious" (Damasio 2010, 271). He cites research findings that suggest "that nonconscious processes are capable of some sort of reasoning, far more than they are usually thought to be, and that this reasoning, once it has been properly trained by past experience and when

time is scarce, may lead to beneficial decisions" (Damasio 2010, 274). He recommends that educating the cognitive unconscious requires bringing consciously deliberated decisions "into the cognitive unconscious in order to permeate the action machinery—and we need to facilitate that influence. One way to transpose the hurdle would be the intense conscious rehearsal of the procedures and action we wish to see nonconsciously realized, a process of repeated practice that results in mastering a *performing skill*, a consciously composed psychological action program gone underground" (Damasio 2010, 281).

Nonconscious Bodily Movement. In the past several decades, neuroscientists have discovered mirror neurons in the premotor cortex of our brains. Mirror neurons are thought to be the way we represent the mental states of another by unconsciously matching those states with resonant states of our own (Gallese 2005). We not only represent mental states but also bodily movement.

Neuroimaging studies demonstrate that when people watch mouth, hand, and foot movements, their premotor cortex activates as if they were performing those actions (Blakemore and Decety 2001). Mirror neurons in the premotor cortex are thought to be mediators of this coding for actions performed by the self and by another person (Gallese 2001; Rizzolatti and Craighero 2004). What is going on is more than the preparation for and production of actions. Direct bodily understanding also includes recognizing, anticipating, predicting, and interpreting the actions of others. It is the way human beings directly understand another's intentions without reflecting on them. "It may be necessary to mirror action (at the premotor level) to understand it. Finally, . . . the MNS [motor neuron system] is active when the observed individual is *about* to perform an action, suggesting that it could also serve as a detector of others' intentions" (Konner 2010, 151–52).

This process—the process whereby human beings nonconsciously experience direct bodily understanding of another—is called embodied simulation. Embodied simulation is how we understand another by unconsciously matching the states we see in another with resonant states of our own. To the extent that embodied simulation influences free will, the prefrontal cortex is implicated as a possible site for the process of free will.

Autonomic Processes. All living beings have nonconscious mechanisms for assessing their environment for safety or danger, and responding accordingly. Neurophysiologist Stephen Porges (Porges 2001, 2004, 2011) proposes that human beings have three primary mechanisms, which he calls neuroception. Neuroception mechanisms are governed differently by our brain and body:

(1) *Mobilization*, enabling us to fight or flee;

(2) *Immobilization*, enabling us to go unseen, appear dead, or dissociate from pain and terror; and

(3) *Social engagement*, enabling us to connect with others to feel safe, remain calm, and access higher brain functioning to resolve situations.

Mobilization (fight or flight) occurs when our bodies react to perceived threat by aggressing, standing our ground, or moving away from danger toward safety. This physiological body-state of fear is mediated by our sympathetic autonomic nervous system. *Immobilization* (freeze) is an immediate way to preserve our life or to minimize pain if death is inevitable. This physiological body-state of fear is mediated by our unmyelinated parasympathetic autonomic nervous system, predominantly the unmyelinated branch of the vagus nerve. Mobilization and immobilization are essential when confronted with genuine external danger. *Social engagement* is our newest evolutionary option for responding to safety and threat. It involves a complex system of neural, facial, and visceral circuitry that physiologically calms our body and readies us for proximity to, reliance upon, and connection with others. This physiological body-state of calm is mediated by our myelinated parasympathetic autonomic nervous system, predominantly the myelinated branch of the vagus nerve.

Depending on how our body nonconsciously assesses our environment, our body's resultant physiological state shapes our freedom of will and what we choose to do in the world. Our will is most free when we are in a physiological body-state of calm where we have access to our higher brain functioning to resolve situations (Perry and Szalavitz 2006, 249). Even though neuroception is a nonconscious process, once human beings understand that we live in different body-states, we can learn to bring ourselves back into an emotionally regulated state that enables our capacity for free will.

Empathy. Free will involves nonconscious embodied processes such as bodily movement and autonomic processes; it also involves emotional awareness such as empathy. The term *empathy* is only about a hundred years old.[2]

The term "empathy" is derived from the German work *Einfühlung*, coined by Robert Vischer in 1872 and used in German aesthetics. . . . In 1909, the American psychologist E. B. Tichener translated *Einfühlung* into a new word, "empathy." Tichener had studied with Wilhelm Wundt, the father of modern psychology, while in Europe. Like many young psychologists in the field, Titchener was primarily interested in the key concept of introspection, the process by which a person examines his or her own inner feelings and drives, emotions, and thoughts to gain a sense of personal understanding about the formation of his or her identity

and selfhood. The "pathy" in empathy suggests that we enter into the emotional state of another's suffering and feel his or her pain as if it were our own. (Rifkin 2009, 12)

Empathy used here refers to the capacity to experience another's internal state as if it were one's own. Its prerequisite appears in the first year of life as children experience positive human interactions and help from caregivers for coping with stress (Carter, Harris, and Porges 2009). In these experiences, infants experience resonance with the good parent's empathic responses to their needs (Porges 2009). When caregivers meet children with empathic resonance, caregivers and children cocreate secure attachment bonds that become the template for the child's future relationships (Bowlby 1969; Ainsworth et al. 1978; Porges 2003) and their capacity for empathy. Empathy is an essential prerequisite to later moral development (Eisenberg and Miller 1987).

The anterior insula (AI) and the anterior cingulate cortex (ACC) are implicated in empathic processes (Decety and Moriguchi 2007). Neuroscientists Vinod Menon and Lucina Uddin have proposed that the AI is "the hub of a 'salience network'" (Menon and Uddin 2010, 656). The "salience network" functions to identify the most relevant stimuli to guide behavior. In other words, the insula is sensitive to salient internal and extrapersonal events, which it selects for additional processing. Because the insula strongly couples with the ACC, it has access to the motor system. Working together, the insula marks salient stimuli for the ACC that guides behavior. The insula and the ACC, thus, may be some of the neural correlates of empathy. As we will see later in this paper, empathy is implicated in free will. Thus, the insula and the ACC may be some of the neural correlates of free will.

Furthermore, Menon and Uddin say, "In the human brain, the AI and ACC contain a specialized class of neurons with distinctive anatomical and functional features: the von Economo neurons (VENs). The VENs have large axons, which facilitate rapid relay of AI and ACC signals to other cortical regions. . . . We speculate that VENs may constitute the neuronal basis of fast control signals generated by the AI and ACC" (Menon and Uddin 2010, 661). There seem to be more VENs in the right-brain hemisphere than in the left, which "may be related to asymmetry in the autonomic nervous system in which the right hemisphere is preferentially involved in sympathetic activation . . . ; the left hemisphere is preferentially involved in parasympathetic activity associated with reduced tension or calming responses" (Allman et al. 2010, 512).

Dr. Simone Shamay-Tsoory (2009), Department of Psychology at the University of Haifa, has proposed a neural model of empathy (Figure 2). Empathy is experienced when the neural networks mediating both cognitive empathy and also affective empathy are activated. Separate,

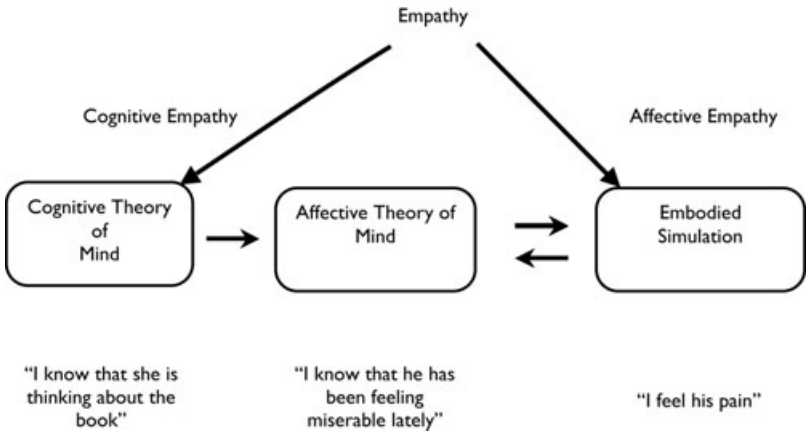

Figure 2. Schematic of Empathy.

Adapted from Jean Decety and William Ickes (eds.), *The Social Neuroscience of Empathy,* Figure 16.3. ©2009 Massachusetts Institute of Technology, by permission of MIT Press.

albeit interacting, processes mediate these two components of empathy. Embodied simulation underlies affective empathy—a function of neural networks located mostly in the right-brain hemisphere. An example of affective empathy is "I feel his pain." Neuroimaging studies indicate that the neural networks mediating embodied simulation reside in the following brain areas: the ACC, the amygdala, the insula, and possibly the mirror neuron system in the inferior frontal gyrus.

Theory of mind (ToM)[3] underlies cognitive empathy—a function of neural networks located in the right and possibly the left-brain hemispheres. Cognitive empathy has two components: a cognitive ToM (e.g., "I know that she is thinking about the book") and an affective ToM (e.g., "I know that he has been feeling miserable lately"). The neural networks mediating ToM reside in the following brain areas: the medial prefrontal cortex, the superior temporal sulcus, the temporal poles, and the ventromedial prefrontal cortex. Empathy occurs when both the cognitive and the affective networks are activated (Shamay-Tsoory 2009; Shamay-Tsoory, Aharon-Peretz, and Perry 2009). To the extent that empathy is implicated in free will, all of the neural networks mediating empathy may be neural correlates of free will.

Intersubjectivity. Intersubjectivity—defined in the 1970s—is interpersonal communion. It is a "*sharing of experiential content (e.g., feelings, perceptions, thoughts, and linguistic meanings) among a plurality of subjects*" (Zlatev et al. 2008, 1). Educational psychologist Ann Cale Kruger writes,

"Sharing psychological states with others is more than, but may include, empathy (a matching of moods), perspective-taking (a shared reference), embodied synchrony (a mirroring of behaviors), theory of mind (an imputation of mental states), or common ground (shared background knowledge). It is having joint thoughts and feelings with another person about some aspect of reality when each is aware of the other's role in the commonality" (Kruger 2011, 113). In short, intersubjectivity is a "*sharing of experiences*" (Brinck 2008, 116). It is the sharing of physiological states, which then drive the cognitive state.

Three layers of intersubjectivity—two occurring in human development before and one occurring after language acquisition—have been distinguished by researchers working from a simulation perspective (Bråten and Trevarthen 2007). *Primary intersubjectivity* is direct resonance with another's expression of feelings in a reciprocal subject-to-subject contact. This dance-like proto-conversation can be seen from the first months of life as infant's facial imitation of another. Indeed, it has been observed in an infant forty-two minutes old. This is the expression of the innate tendency of all human beings to connect with another. It is our "deepest moral core" (Hundeide 2007, 253). *Secondary intersubjectivity* is where an object is the focus of joint attention and emotional referencing within the trusting relationship. It appears from about nine months of age. It is a "cooperative awareness" (Trevarthen 2005, 70) of the world we share. *Tertiary intersubjectivity*—attained in the second year of life—is symbolic conversation sharing goals and unspoken intentions with others. Other researchers from a perspective of Intentional Relations Theory have identified a fourth level that is achieved in year four when the number of VENs are reaching their peak (Allman, Watson, Tetreault, and Hakeem 2005). Now children not only *share* minds, but they *understand* minds (Baressi and Moore 2008).

Our neurobiology depends on these layers of intersubjective encounters—even primary and secondary intersubjectivity where the right hemispheres of people (cortical and subcortical neural networks) are nonverbally communicating with and between each other (Bråten 2007). The right hemisphere's communication is emotional and nonverbal (facial expression, prosody, gesture). Intersubjective communication is the process whereby the subjective experience of one person has an impact on the subjective experience of another, and vice versa. It is a reciprocal process of acting on each other physiologically that is experienced as emotions.

In other words, nonconsciously detecting the emotions expressed nonverbally by another triggers the same neurons in the perceivers' brains that fire when they have those emotions. The perceiver "mirrors" the physiology of the other and experiences the emotions of the other, and vice versa. This is the process of intersubjectivity.

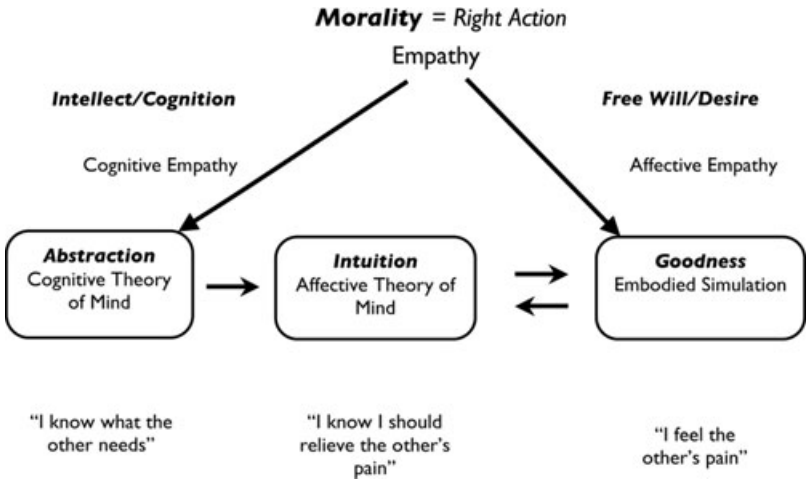

Figure 3. Schematic of Intersubjective Morality.

Adapted from Allan B. Wolter, OFM, *Duns Scotus: On the Will and Morality*, rev. ed. (Washington, DC: The Catholic University of America Press, 1997).

Adapted from Jean Decety and William Ickes (eds.), *The Social Neuroscience of Empathy,* Figure 16.3. ©2009 Massachusetts Institute of Technology, by permission of MIT Press.

The Combined Vision of John Duns Scotus and Neuroscience

If we superimpose Scotus's philosophical vision of morality on Shamay-Tsoory's neuroscientific model of empathy, we create a conceptual schematic that shows their combined vision (Figure 3). Combining the two conceptualizations broadens Shamay-Tsoory's model of our body-based capacity for empathy to include Scotus's model of the will/desire as our rational capacity that is helped toward action by our intellect/cognition. Thus, our body-based capacity for empathy by way of intersubjectivity mediated by mirror neurons/VENs involves both free will and intellect.

Free Will. Scotus's "will/desire" approximates what neuroscience calls "affective empathy." Empathy is other oriented. This is true of Scotus's two inclinations of the will toward good. It is obviously true for his affection for justice (*affectio iustitiae*), which is the inclination to love the good in others. It is less obviously true for his affection for the advantageous (*affectio commodi*), which is the inclination to love what brings pleasure to the self. This conceptualization need not, however, preclude other orientedness because what brings pleasure to the self is seeing the other's pleasure in us. We are intersubjectively constituted.

What is also true of Scotus's two inclinations of the will is that both incline toward good. Sometimes justice (Scotus's *affectio iustitiae*) is seen

to be disinterested. But given what we now know neuroscientifically about intersubjectivity, human beings cannot be disinterested. They can be neurophysiologically disregulated, which will affect the freedom of their will. But they cannot be disconnected and their will cannot be disinterested.

Because Scotus's "will/desire" approximates what neuroscience calls "affective empathy," it is possible that free will involves embodied simulation and is mediated by neural networks in the ACC, the amygdala, the insula, and possibly the mirror neuron system in the inferior frontal gyrus.

Intellect. Although the word *empathy* did not exist in medieval theology, Scotus's thinking describes it. His cognition/intellect includes two acts: abstraction—what can be sensed about reality—and intuition—the simple knowing of reality. His "cognition/intellect" thus approximates what neuroscience calls "cognitive empathy."

In its acts of knowing "The intellect is capable of both perfect and imperfect cognitional activity. A perfect act of cognition would have to do with an object present and existing (that is what Scotus calls 'intuition'). An imperfect act of cognition would have to do with a future event or a memory of the past (Scotus calls memories of perfect acts, 'imperfect intuitions'). But I think he would also consider an act of abstraction somewhat 'imperfect,' since it can continue in the absence of the object" (Ingham 2010). By choosing one act of cognition, the will confirms and intends that act (Wolter 1990a).

According to Scotus, the intellect refers to the person considered as one who knows and understands. According to neuroscience, ToM is how one person understands and interrelates with another person. We can now begin to see how Scotus's insight about the intellect finds significant verification in contemporary scientific studies of human experience. To do so, we must look at ToM in more depth.

The role of the ventromedial prefrontal cortex within neural networks mediating *affective* ToM is well documented (Shamay-Tsoory, Aharon-Peretz and Perry 2009). Recently, however, neural correlates of *cognitive* ToM have been identified. Findings in a repetitive transcranial magnetic stimulation study of cognitive and affective ToM tasks in healthy male subjects point to an important role of the right dorsolateral prefrontal cortex within neural networks mediating cognitive ToM (Kalbe et al. 2010). The right dorsolateral prefrontal cortex, therefore, can be added to the possible brain sites implicated in mediating free will.

Shaun Gallagher, who is cited earlier, gives evidence that understanding another person is a form of embodied practice. He says, "To imitate a facial gesture that it sees . . . the infant . . . is already simulating it on its own face. Its own body is already in communication with the other's body at prenoetic [nonconscious] and perceptual levels that are sufficient for intersubjective

interaction" (Gallagher 2005, 223). What the infant is doing constitutes a primary embodied practice.

A Summary of the Past and Present Convergent Views

Scotus and neuroscience converge in their views with regard to three aspects of free will: relationship, nonconscious determinants, and responsibility.

Relationship. Scotus emphasizes that moral goodness is a relationship of free will/desire with the help of intellect/cognition. He also emphasizes that the will of each person functions in relationship with other people and their moral virtues. They function best when they function in harmony.

Neuroscience underscores how relationships can urge or impede free will depending on autonomic processes for assessing environment, empathic resonance, and intersubjectivity for establishing attachment bonds, and the working together of each individual's insula (marks salient stimuli) with the ACC (guides behavior).

To be more specific, over 700 years ago, Scotus conceptualized morality as internal relationships within individual subjectivity—the relationship of our capacity for free will/desire to choose right action in agreement with the dictates of our capacity for intellect/cognition. Neuroscience now shows us that these internal relationships are the product of our intersubjective interactions mediated by our mirror neurons. Because we are constituted by others through empathic intersubjective interactions mediated by mirror neurons, we can be constituted within secure attachments where we live in a physiology of calm and where we experience the greatest freedom of will to choose rightly. We can also, however, be constituted within insecure and disorganized attachments where we live in a physiology of anger or fear that influences our free will to choose wrongly. The degree to which caregivers can keep intersubjective interactions in right relationship influences how their children's brains are wired and how their bodies are regulated so that as adults they can do what Scotus envisioned. They can follow their moral reasoning that is born from their internalized interactions with others and shaped by their social environment.

Nonconscious Determinants. Scotus's description of intuition is one of his most prescient insights that neuroscience is now calling the feeling-of-knowing. Neural correlates for feeling-of-knowing have been found bilaterally in the AI/inferior frontal gyrus and the ACC (Craig 2009). Scotus's intuition is immediate nonconscious knowing. It, together with abstraction (knowing through the senses), helps people use their capacity to freely choose what to do.

Neuroscience confirms how mirror neurons mediate nonconscious bodily movement, how autonomic processes underpin nonconscious

mechanisms for accessing environmental danger or safety, and how the insula and the ACC may be parts of the neural correlates of empathy. All of these embodied processes enable or impede the exercise of free will.

To be more specific, the word *empathy* did not exist for Scotus. Yet, the lodestone for Scotus's view of morality is empathy—the mind in direct contact with what is known. The centrality of empathy plus the moral significance of freedom of the human will mark a distinct advance of Scotus's thinking upon his predecessors. Neuroscience proposes the Polyvagal Theory to explain how states of calm and fear nonconsciously affect our perceptions (safety, danger, or life-threat), our attachment patterns (secure, insecure, or disorganized), and our moral discernments (valuing or judging others and us). In other words, Scotus's dynamic of establishing physical relationships based on love is what neuroscience now calls physical relationships based on security that produce a physiology of calm, which enables the exercise of free will. Physical relationships based on danger or life threat produce a physiology of fear, which impedes the exercise of free will.

Responsibility. Scotus emphasizes that freedom and responsibility go hand in hand. A person can be praised or blamed, rewarded or punished for the results from the action. Neuroscience implies that because human beings are constituted to automatically imitate others, we must take responsibility for whom we choose to imitate. Furthermore, we must take responsibility for what we do that others will imitate.

Conclusion

Edwin C. Laurenson, the outgoing president of The Institute on Religion in an Age of Science, states, "Discussions of free will generally concentrate on two questions: Does free will (1) refer exclusively to an absence of external constraint . . . or (2) rather, to a human ability to decide in an acausal manner?" (Laurenson 2011, 118).

With regard to the second question, both Scotus and neuroscience agree that until we choose, we do not know what we are going to do. With regard to the first question, both Scotus and neuroscience agree that we are constrained by not only external but also internal processes. However, we are free to consider external constraints in our interactive decision-making process. We are also free to question what internal constraints may influence our choice. And we are free to change those constraints that are in our means to do so.

Notes

1. In his general audience on July 7, 2010, at Vatican City entitled "Duns Scotus: Cantor of the Incarnate Word," Pope Benedict XVI dedicated his catechesis to Blessed Duns Scotus,

including the following words, "Freedom . . . grows and is perfected, said Duns Scotus, when man opens himself to God . . . . When we listen to the divine revelation, to the Word of God, in order to accept it, then we receive a message which fills our lives with light and hope, and we are truly free" (Vatican Information Service 2010).

2. Currently the term *empathy* is applied to over a half-dozen phenomena: knowing another's internal state, including their thoughts and feelings; adopting the posture or matching the neural responses of an observed other; coming to feel as another feels; intuiting or projecting oneself into another's situation; imagining how another is thinking and feeling; imagining how one would think and feel in the other's place; feeling distress at witnessing another's suffering; and feeling for another who is suffering (Batson 2009).

3. Theory of Mind (ToM), coined in 1978 by David Premack and Guy Woodruff, is the ability to observe behavior and then infer the unobservable mental state causing it. Stated in reverse, it is our intuitive understanding of others' inner states and our intuitive understanding that their inner states cause behaviors. ToM—partially developed by two years old—is fully developed by four to five years of age. It is independent of IQ.

> One of [the] most well-known gauges for Theory of Mind in children is known as the Smarties test. In the Smarties test, Child A is shown a box of Smarties candy. The researcher asks the child what he or she thinks is in the box. The child naturally replies "candy." The researcher then shows the child that in fact there are pencils in the box. After putting the pencils back in the box, the researcher then asks the child, "Your friend, Child B, is about to come into the room. What will Child B think is in the box?" If the child responds "Pencils," she indicates a lack of understanding of the thinking, or mental state, of Child B. But if Child A can infer the mental state of Child B, the correct answer should be "Candy" (Keenan, Gallup, and Falk 2003, 94).

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