Exploring the Relation between Aristotelian Moral Philosophy, Moral Psychology, and Contemporary Neurosciences

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Introduction

The main purpose of this essay is to explore the relation between the Aristotelian theories of ethics and moral development, and recent theories in neurosciences. Particularly, this essay focuses on the psychological basis of moral behavior and how the course of moral development depicted in Aristotelian ethics (Sanderse, 2014) actually occurs at the biological level. The main purpose of this essay, an exploration of the relation between Aristotelian ethics and contemporary neurosciences, may sound awkward because of the huge time gap between the era of Aristotle and the present day; however, given recent moral philosophers' accounts of the nature of Aristotle's ethics, this essay may not be completely far-fetched. In fact, those philosophers have argued that the standpoint of Aristotelian moral philosophy is basically naturalistic, and its ideas of moral virtue and moral development can be supported better by empirical psychological evidence than by other rule-centered moral theories, such as Kantian ethics (Jacobs, 2014; Kristjansson, 2007). Thus, this exploration will support Aristotelian virtue ethics by demonstrating that it can explain the mechanisms of moral behavior and development in reality with scientific evidence (Jeong & Han, 2013).

To achieve this purpose, I consider how the review of recent neuroscientific research can shed light on Aristotelian ethics by focusing on moral judgment and development. The main body of this essay consists of two parts dealing with the core philosophical basis (first part) and developmental processes (second part) proposed by Aristotelian ethics. First, this essay discusses

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whether the core philosophical element of Aristotelian moral philosophy, that is, motivational externalism (Kristjánsson, 2012), which argues the necessity of emotional and motivational elements, which are independent from moral reasoning for moral action (Zagzebski, 1996), can be supported by recent neuroscientific evidence. Second, I discuss whether findings in developmental neuroscience correspond to the model of moral developmental theory proposed by Aristotelian ethics, which especially underscores the habituation of virtue as well as the cultivation of practical wisdom (*phronesis*) (Hursthouse, 2012; Kristjánsson, 2014).

Motivational Externalism and Social Neuroscience

Recent findings in social neuroscience suggest that motivation for moral behavior does not originate directly from the result of moral judgment, as argued by motivational internalists. Instead, the findings imply that other psychological processes, particularly affective and rewarding processes, are inevitably involved in the formation of moral motivation and action, as proposed by motivational externalists. Thus, I shall start my argument with a brief critical review of the main assumptions and arguments of motivational internalism. Motivational internalism argues, "a person cannot sincerely make a moral judgment without being motivated at least to some degree to abide by her judgment" (Rosati, 2006). Although there are two types of internalism, strong and weak, both acknowledge that moral judgment is necessary in moral motivation and action (Rosati, 2006). Several neuroscientific experiments are not consistent with those standpoints.

First, several brain lesion studies focusing on human morality significantly threaten the validity of strong internalism. First of all, the case study of Phineas Gage demonstrated that the lesion in the prefrontal cortex caused significant deficiency in socio-moral adjustment (Barker, 1995). Although Gage's intellectual ability to make judgments was intact, his socio-moral character and

behavioral tendency were severely regressed (Kihlstrom, 2010). Moreover, a recent experiment investigated more directly the association between the lesion in the medial prefrontal cortex, which deals with affection, and the integration of motivational force (Tranel, 2002), moral reasoning, and moral motivation (Saver & Damasio, 1991). This experiment demonstrated that, for patients whose medial prefrontal cortex was damaged during their adulthood, although their average moral judgment score was not significantly worse than that of normal participants, they showed severe socio-moral maladjustment, embodied by a morally inappropriate behavioral tendency. Given these experiments, strong motivational internalism can be refuted, because although those presented patients were able to make sound moral judgments and their moral reasoning was intact, their moral motivation and behavioral tendency were significantly deficient. Thus, moral judgment cannot be a sufficient condition for moral motivation and behavior.

Second, the validity of weak internalism can also be criticized by evidence from recent scientific studies. Although weak internalism endorses that mental illness or another motivational force can override the result of sound moral judgment, it still maintains the position that sound moral judgment is at least a necessary condition for moral motivation and behavior (Brink, 1997). Thus, counterexamples, demonstrating that moral motivation and behavior can be generated without moral judgment, can threaten this version of internalism. In fact, behavioral and developmental neurosciences focusing on moral motivation and behavior in infancy show us the possibility of moral motivation and behavior without sophisticated formal moral judgment (Decety & Howard, 2013). For instance, even very young infants, such as 3-months-olds (Hamlin, Wynn, & Bloom, 2010) or 6-months-olds (Hamlin, Wynn, & Bloom, 2007), are motivated to prefer prosocial and moral behavior over antisocial and anti-moral behavior, although they are not capable of making sound and sophisticated moral judgments (Kohlberg, 1984; Piaget, 1948). Scholars suggest that

this phenomenon occurs due to the presence of hard-wired morality in infants' brains (Bloom, 2012). Because Aristotelian virtue ethics acknowledges that children can have rudimentary forms of moral virtues, although those virtues are not full virtues moderated by *phronesis* (Kraut, 2014), the results of these scientific experiments may indicate that moral motivation and behavior, at least in their rudimentary forms, can exist even among infants. Hence, those counterexamples can threaten the validity of weak motivational internalism, and support the core of Aristotelian ethics, that is, motivational externalism.

Development of Moral Virtue and Developmental Neuroscience

Findings in recent developmental neurosciences also correspond well to and support the developmental model of Aristotelian ethicists. Both early habituation and internalization of moral virtue, as well as cultivation of *phronesis,* which moderates motivational forces to be appropriately exerted in a given situation, are necessary for the achievement of the ultimate purpose of human life, that is, *eudaimonia* (Aristotle, 2009; Kristjánsson, 2014; Wall, 2003), according to Aristotelian perspective. I shall discuss how neurosciences show that those two developmental processes actually occur at the neural level.

First of all, the lesion study introduced in the previous section is revisited. It demonstrated that the average moral judgment interview score among patients with early-onset prefrontal damage was significantly worse than that of normal participants. This study proposed that patients with such damage were not able to internalize moral norms into their brain reward system, hindering their further development of moral reasoning, given the somatic marker hypothesis (Damasio, 1994; Saver & Damasio, 1991). It can support the standpoint of Aristotelian moral development, which emphasizes the importance of early habituation of moral norms for the acquisition of moral virtue and *eudaimonia.* This theory has been relatively undervalued by other theoretical

frameworks of moral development based on rule-based ethics. Of course, a continent person, who has developed moral reasoning without early-habituation of moral virtue, can behave morally because she knows well what is morally appropriate (Fowers, 2014; Kristjánsson, 2013); however, because moral norm and affection are not completely integrated into her selfhood, they become a sort of external imperative for her, not a natural trait, and can hardly serve for her moral flourishing and happiness (Stocker, 2003). Thus, the neuroscientific investigation corresponds to this Aristotelian account on moral development, which emphasizes the importance of early internalization of moral virtue for the future development of moral character, including moral reasoning.

In addition, developmental brain studies have shown that the Aristotelian version of the moral developmental course, which consists of the habituation of norms and cultivation of wisdom, may occur in the physical reality. According to this idea, the early habituation and internalization of moral norms through repetitive behavioral training, followed by the cultivation of *phronesis*, are required for the development of moral character (Carr, 2008; Kristjánsson, 2014). Some neuroimaging studies have demonstrated that one of the most salient aspects of moral development at the neural level during early-childhood through early-adolescence is that brain regions associated with the motivational and reward system (e.g., amygdala, nucleus accumbens, orbitofrontal cortex, ventral striatum), which engages in the habituation and internalization of rules (Blair, 2007; Wilson & Rolls, 2005), develop earlier than regions associated with sophisticated reasoning (Decety, Michalska, & Kinzler, 2012; Galvan et al., 2006; Hare et al., 2008). Then, in regions correlated with reasoning based on prudence, self-control, and sophisticated self-reflective processes (e.g., lateral prefrontal cortex, posterior cingulate cortex) (Buckner, Andrews-Hanna, & Schacter, 2008; Immordino-Yang, Christodoulou, & Singh, 2012;

Moll et al., 2007), that correspond to the concept of *phronesis* in Aristotelian philosophy, the activity becomes salient beyond adolescence (Casey, Jones, & Hare, 2008; Harenski, Harenski, Shane, & Kiehl, 2012; Wright, Matlen, Baym, Ferrer, & Bunge, 2007). This neural-level developmental trend suggests that the moral developmental course proposed by Aristotelian ethics may actually occur in the human brain.

Then, can the moral educational program of Aristotelian virtue ethics, which emphasizes both habituation and development of reasoning (Han, 2014b), also be supported by neurosciences? Although there have been no neuroscientific studies that directly focused on the neural-level effect of moral educational interventions, some experiments can shed light on this issue. First, training programs designed for the habituation of certain actions, such as juggling, induced myelination in regions associated with the function (Scholz, Klein, Behrens, & Johansen-Berg, 2009). Second, even for the cultivation of reasoning, which is more sophisticated than the case of habituation, interventions, such as board games (Lee et al., 2010), reasoning exercises (Mackey, Whitaker, & Bunge, 2012), working memory training (Olesen, Westerberg, & Klingberg, 2004; Takeuchi et al., 2010), and meditation programs (Lazar et al., 2005), promoted significant structural changes in brain regions associated with cognition and reasoning. These results would support, at least indirectly, the idea that Aristotelian ways for moral education—i.e., habituation and *phronesis* cultivation—would actually influence the brain structure according to the idea of neuroplasticity (LeDoux, 2002).

Conclusion

This essay considered whether recent findings in neurosciences could empirically support moral philosophical and developmental models proposed by Aristotelian ethics. Because Aristotelian ethics is naturalistic, and attempts to seek a connection to empirical evidence, the exploration of

this essay would be meaningful for the sophistication and improvement of developmental and moral psychological ideas of Aristotelian ethics. Compared with the traditional paradigm of moral development and moral education—that is, the Kohlbergian model based on the moral philosophy of Kant and Rawls (Kohlberg, 1981)—, Aristotelian ethics seems to be better supported by recent findings. First, the philosophical basis of the traditional paradigm proposes motivational internalism, so it would hardly be consistent with neuroscientific evidence supporting externalism. In addition, the Kohlbergian model cannot fully embrace the mechanisms of moral development—i.e., habituation and cultivation of reasoning—demonstrated by neuroscientific experiments; only the development of reasoning can be covered by this paradigm. Therefore, I shall conclude that Aristotelian ethics and its developmental model can be supported better by neurosciences, and establish the conceptual basis for future neuroscientific investigations on moral development and moral education compared to the traditional paradigm.

Of course, although scientific findings seem to support Aristotelian moral philosophy and psychology, we must not attempt merely to reduce the philosophical and developmental theories into activity of biological substances, or incautiously equate philosophy, psychology, and natural sciences. Then, what would be appropriate ways to arrange a meeting between the old person, Aristotelian ethics, and the young person, neuropsychology? First, Aristotelian moral philosophy can provide ideas to establish hypotheses for neuroscientific investigations on morality, while neurosciences can support empirically the philosophical and developmental assumptions of Aristotelian ethics (Han, 2014a). Second, moral philosophically justified and psychologically effective moral educational interventions can be developed through the cooperation between Aristotelian moral philosophy, moral psychology, and neurosciences (e.g., neuroimaging

experiments examining the effects of virtue ethics-based moral education) (Han, 2014a; Jeong & Han, 2013). Through these methods, Aristotelian ethics and neurosciences dealing with morality will be able to benefit each other synergistically.

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