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## Metarepresentation and the Great Cognitive Divide: A Commentary on Henriques' "Psychology Defined"

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I locate the discontinuity between humans and other animals a bit differently than Henriques (this issue, pp. 1207–1221)—in metarepresentational abilities. However, I do think that the justification process might have played a critical role in the development of these metarepresentational abilities. © 2004 Wiley Periodicals, Inc. *J Clin Psychol* 60: 1263–1266, 2004.

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There is much I agree with in Henriques' "Psychology Defined" (this issue, pp. 1207–1221). I am especially in tune with the idea that the combination of Behavioral Investment Theory (BIT) and the Justification Hypothesis (JH) yields the idea of a mental architecture consisting of two broad domains (parallel and logical-analytic). I agree that the discontinuity between humans and other animals is a central issue for psychology, although I locate the source of the discontinuity a bit differently—in metarepresentational abilities (Stanovich, 2004). Nonetheless, I think that the justification process might have played a critical role in the development of metarepresentational abilities. I will take up each of these points in turn.

Henriques is right to stress that a two-domain view of human cognitive architecture has become fundamental in psychology. In a recent book (Stanovich, 2004), I presented a table of 22 so-called dual-process theories in a far from exhaustive list. What is important are not the nuanced differences between these theories but instead their commonalities. Such theories stress the evidence from cognitive neuroscience and cognitive psychology indicating that the functioning of the brain can be characterized by two different types of cognitive systems: the autonomous set of systems (known as TASS; see Stanovich, 2004) and the analytic system. The autonomous set of systems (TASS) is referred to as autonomous because (a) their execution is rapid, (b) their execution is

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mandatory when the triggering stimuli are encountered, (c) they are not under conscious control, and (d) they are not dependent on input from the analytic system. Included in TASS are processes of implicit and instrumental learning, overlearned associations, processes of behavioral regulation by the emotions, and the encapsulated modules for solving specific adaptive problems that have been posited by the evolutionary psychologists. Most TASS processes can operate in parallel with each other and with the analytic system.

In contrast, the analytic system carries out critical processes of abstraction, decoupling, decontextualization, and second-order self-regulation (see Stanovich, 2004, for the importance of such processes in determining rational thought and action—and indeed, for achieving an examined life). These are the functions of the analytical processing system that support hypothetical thinking of all types. Hypothetical reasoning involves representing possible states of the world rather than actual states of affairs and it is involved in myriad reasoning tasks, from deductive reasoning, to decision making, to scientific thinking (Carruthers, Stich, & Siegal, 2002; Currie & Ravenscroft, 2002; Evans & Over, 1999; Sterelny, 2001). Many theorists have argued that a key early focus of hypothetical thinking might have been the minds (hypothesized intentional states) of other individuals (e.g., Bogdan, 2000; Dennett, 1996; Humphrey, 1976; Mithen, 1996; Tomasello, 1999; Zelazo, Astington, & Olson, 1999).

To reason hypothetically, a person must be able to represent a belief as separate from the world it is representing. Numerous cognitive scientists have discussed so-called decoupling skills—the mental abilities that allow us to mark a belief as a hypothetical state of the world rather than a real one (e.g., Carruthers, 2002; Cosmides & Tooby, 2000; Dienes & Perner, 1999; Glenberg, 1997; Jackendoff, 1996; Leslie, 1987; Lillard, 2001; Perner, 1991). Decoupling abilities prevent our representations of the real world from becoming confused with representations of imaginary situations that we create on a temporary basis to predict the effects of future actions or think about causal models of the world that are different from those we currently hold. Decoupling—outside of certain domains such as behavioral prediction (so-called “theory of mind”)—is a cognitively demanding operation. It is often carried out by the serial, capacity-demanding analytic system.

Thus, decoupling processes enable one to distance oneself from representations of the world so that they can be reflected upon and potentially improved. Decoupling abilities vary in their recursiveness and complexity. A very basic type is necessary for creating what Perner (1991) calls secondary representations—the decoupled representations that are the multiple models of the world that enable hypothetical thought. At a certain level of development, decoupling becomes used for so-called metarepresentation—thinking about thinking itself (there are many subtleties surrounding the concept of metarepresentation; see Dennett, 1984; Perner, 1991; Sperber 2000; Suddendorf & Whiten, 2001; Whiten, 2001). Metarepresentation—the representation of one’s own representations—is what enables the self-critical stances that are a unique aspect of human cognition. Beliefs about how well we are forming beliefs become possible because of metarepresentation, as does the ability to evaluate one’s own desires (to desire to desire differently; see Stanovich, 2004).

Metarepresentational abilities represent the great cognitive divide between humans and other animals, I conjecture (following many others of course, see Povinelli & Bering, 2002; Povinelli & Giambrone, 2001). But justification processes might well have been centrally involved in the development of metarepresentational abilities. For example, philosopher Robert Nozick (1993) has argued that the justification heuristic “believe for reasons” plays just such a role. The argument begins by assuming that what humans really need are mechanisms for revealing what is true about the world. But in prehistory, when such mechanisms were few, a crude route to reliable knowledge might have been

just to demand reasons for assertions by conspecifics. True propositions might have been supported by more reasons and by reasons of better quality. In a related proposal, Sperber (2000) posits that we have a logico-argumentative module that is an evolutionary adaptation for checking the consistency of the statements of other people to enable us to develop “the proper calibration of trust” (p. 135).

These reason-checking procedures might bootstrap metarepresentational abilities into existence because they encourage self evaluation for purposes of internal consistency assessment. Additionally, Dennett (1996, pp. 126–127) has argued that the need to respond to the justification queries of other conspecifics helped shape the internal mental inquiry processes in the direction of discrete categories—categories that mesh well with the properties of language-based thought. These discrete categories fostered by language then become an ideal medium for representing one’s own thoughts to oneself. Language thus provides the discrete representational medium that greatly enables hypotheticality to flourish as a mode of thought.

In short, there are many theoretical views in cognitive science that would support Henriques’ highlighting of the importance of justification processes. I see a crucial role for justification processes in the types of cognition that are most likely to discretely separate the mentation of humans from that of other animals.

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