Education and "Mind Games"

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Current global controversies over political ideologies, economic interests, and democratic aims are among the factors that have generated another predictable push for changes in emphases in teacher preparation programs in the practice of teaching. The new emphases include the importance of fostering understanding, the exercise of judgment, empathy for different perspectives, and desirable qualities of character.

The idealistic (or perhaps merely optimistic) philosopher of education could see this development as "humanistic," signifying a public acknowledgement of the importance of the central tenets of a liberal education. But it can also be seen as "practical," simply requiring different "thinking processes," "metacognitive strategies and skills," and other "cognitive tools."[1] Many educators hold that these are the same sort of response or, if different, lead to the same outcomes. This essay takes the alternative position that the responses differ fundamentally, and entail disparate if not opposing outcomes.

The idea that we can resolve controversial issues by means of "problem-solving processes" and "metacognitive strategies" relies for its justification on the widely held view that the human mind is in fact an information-processing mechanism, not unlike that of a computer program. Support for this view is found in the research from the fields of cognitive science and cognitive psychology. However, recent work in these fields suggest that this view of mind is highly questionable.[2]

Notwithstanding, many contemporary educators base their practice on research which assumes a complex theory of mind or "mind game," the rules of which are neither clearly understood nor subjected to critical examination by those who (wittingly or unwittingly) are "playing the game." Without such clarification and critical examination, it is difficult to determine whether following the rules of a "mind game" yields some sort of educational truth or whether it leads to some potentially miseducational consequences.

This essay first outlines the central features of mind games and highlights what are essentially the scientific "rules of play." It then points out some questionable "truths" about the mind that are assumed by some contemporary educators and notes the "mis-educational" consequences that follow. Finally the essay posits an alternative to "mind games" — a way of thinking about mind which may better satisfy the current push for changes in teaching practice.

Disciplinary "Rules of Play"

A mind game is a complex "theory" of mind based on particular disciplinary assumptions and methodologies. The game is concerned with what the mind is and how it functions. Although we commonly speak of "the mind" in ordinary language, for example, "I can't make up my mind" or "it's all in your mind," we cannot point to any particular *thing* and say, "this is what I am talking about." Mind games are

supposed to clarify what we take to be a mysterious feature of humans by characterizing the mind as something more concrete, something we all know and understand. Mind is expressed as a metaphor, the salient features of which explain and clarify the workings or functions of the mind. Typically, the metaphors chosen to represent the human mind reflect the available technologies, scientific advances and ideals of the prevailing society. The metaphors of mind used in mind games are often examples of reification, that is, they treat an abstract concept as a "real" thing, ascribing to it various physical attributes. Not only do these metaphors imply that the mind has some sort of ontological status, they are what Eva Berger calls "guiding metaphors of mind," that is, the metaphors shape and direct our thinking about those human activities that are related to mind.[3] The activities of education serve as a paradigm case.

In the history of educational thought we find examples of metaphors of mind in Plato's "deep well of knowledge," Locke's "blank slate or empty room," and Dewey's "biological apparatus." Plato's rationalist mind game is played according to the rules of philosophy. Locke's empirical mind game is similarly philosophical, yet clearly influenced by the emergence of the scientific method. Dewey's pragmatic mind game is a mixture of philosophy, psychology, and biological naturalism. In common, however, each thinker recognized an important relationship between his particular conception of mind and his conceptions of knowledge and education.[4]

The mind game assumed by current research on teaching practice is known as "information-processing" (IP).[5] The point of this game is to discover and explain by *scientific methods* how the human mind functions. The IP mind game is played according to the rules of cognitive science, psychology, and philosophical functionalism. The IP metaphor of mind is often referred to as the computational analogy. On this metaphor, the operations of the human mind are taken to be analogous to those of a computer. The brain is compared to the hardware and mental operations are compared to the software or operating programs used in the computer. The IP game is focused on the "mental" level of description that is explained by means of models and simulations. IP is a *functional* or operational view of mind that is concerned with *how* the mind functions as a system to access and process information and to produce knowledge.[6]

With the introduction of IP onto the playing field, the "rules of play" in mind games were significantly revised. On the revised rules, we can best (only) understand how the mind functions through scientific research on the brain and mental models that simulate the workings of the human mind. The hypotheses generated by the research must be confirmed or disconfirmed by means of empirical tests in the field of cognitive psychology. Such tests require human subjects to respond to written and oral test questions and to examine (through introspection) the workings of their own minds. The IP rules further stipulate that empirical research alone counts as evidence for or against the scientific hypotheses and that only such evidence leads to greater understanding of the human mind. In other words, to master the IP mind game, one must be concerned solely with the scientific rules of the game and must not be influenced by the rules of any other.

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Of Truths and Consequences

Some formidable challenges have been raised about theories of mind in general and IP in particular. Three such challenges are worthy of our attention, as they raise questions about the possible truths yielded by the computational metaphor of mind, as well as the application of scientific methodology to human thought and action more generally.

The first challenge is aimed at the veracity of the fundamental assumptions of the IP mind game, which John Searle claims is "the worst mistake in cognitive science."[7] Searle argues that the computer analogy requires that we accept that humans and machines "operate" by means of an intrinsic syntax (language of thought) that has been "discovered" by means of scientific methods. Searle shows that such a discovery of such a language of thought is logically impossible. The analogy requires that we accept that a "rule-based interaction" between an internal homunculus and the posited symbolic language of thought causes intentionality (gives meaning to our everyday actions). Searle points out that there can be no such actual entity as an internal homunculus, no such syntax, no such interaction, and thus, no such causality. Finally, the analogy requires that we accept that what we mean by the human mind, our beliefs, desires, and intentions is in some way *explained* by the computational analogy.

The second challenge to IP is directed toward the conceptual clarity, the scientific methods, and the "proof" about the human mind assumed by some cognitive researchers and educators. What is at issue here is the general coherence of the IP game and the rules by which it is played. Vague and often undefended technical terms such as "internal mental processes," cognitive "mechanisms," "introspection," "metacognition," "intelligence," and the "homunculus" are significant features of arguments for IP in the literature of cognitive psychology, cognitive science, and philosophical functionalism. Vagueness and conceptual confusion are particularly evident in the work of metacognitive researchers attempting to explain the intricacies of introspection. For example, metacognition is variously described as "thinking about one's own thinking," "one's knowledge concerning one's own cognitive processes and products or anything related to them," "exerting executive control over one's first order thinking processes," and "specific realizations of control processes that are sometimes collectively (and loosely) referred to as the 'executive' or the 'homunculus.'" Significantly, metacognition is described by one advocate as a "many-headed monster of obscure parentage."[8]

The conceptual confusion is exacerbated when metacognition is linked to the notion of intelligence. The concept of intelligence is far from conceptually clear. It is variously argued that intelligence is a "capacity," a "disposition," or an "ability." Debates are waged over the degree to which intelligence is innate versus nurtured and influenced by different environments. Also controversial is whether intelligence is the sort of thing that can be measured and, if so, what it is in fact that is measured.

The value of mental models for generating hypotheses is questionable. Denis Phillips notes some misleading aspects of models that are particularly relevant to

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study of the mind and points out that such work is subject to circularity. Phillips argues,

> the crude model or metaphor influences the specific theory, the design, and the type of data that will be collected; these then shape or constrain the nature of any results that will be found; which in turn will be published and so reinforce faith in the validity and fruitfulness of the original model or metaphor![9]

The assumption that IP researchers can provide law-like explanations of the nature and workings of the human mind is suspect. Elizabeth Valentine characterizes psychological explanations as being "pragmatic," that is, the explanations are related to the "subjective satisfaction" of the investigator. Further, explanations will vary in respect to who asks the question, what the question is aimed at, and who gives the answer.[10] The practical problems with this type of explanation, according to Valentine, include the need to account for memory errors and interference from other intellectual tasks, difficulty in communication, and intentional or unintentional deception.

The instruments by means of which cognitive scientists hope to arrive at the truth are subject to significant limitations. The accepted methods of analysis are either quantitative, qualitative, or a combination of the two. Quantitative analysis is constrained by small sample size — huge representative samples are impossible to obtain and impractical to assess. Thus, statistically significant findings are often based on small groups that are not representative of anything in particular. Qualitative analysis is constrained by its design. That is, the researcher posits hypotheses and chooses methods by means of which the hypotheses can be tested for confirmation or disconfirmation. The choice of method is constrained by the theory and what is not chosen is particularly significant in that it might be a disconfirming factor. Finally, the reification of mind is challenged by philosophers such as Gilbert Ryle and Ludwig Wittgenstein, who claim that any conception of mind as a concrete metaphor — "a thing" (either physical or immaterial) — is confused, misleading, and unwarranted.[11]

Contemporary educators are influenced by mind games in several ways. For example, mind games are seminal theories in cognitive psychology — the discipline which currently exerts a profound influence on educational theory and practice.[12] Further, the current emphasis on computer technology, in particular, has lead to the use of "computational-talk" that has become pervasive in teachers' vocabularies. Consequently, terms such as "processing," "accessing information," "student input," and "performance outcomes" are becoming common terms of reference in discussions about the development of students' mental abilities, thus lending credibility to the notion that humans are, in fact, computational mechanisms. Finally, education is, in an important sense, the development of mind. An uncritical educator might expect to gain insights from the current mind game into what "it" is that is being developed. Such (alleged) insights as might be gained are not without some serious consequences.

The more critical educator might note that cognitive development on the IP view is concerned with a "qualitatively particular" sort of mind that performs mental

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operations similar to those of a machine. Researchers advocate techniques for "inculcating and training" those "sequences or patterns of operations" that are assumed to be "better processes" for promoting cognitive development.

Significantly, Carl Bereiter notes that cognitive research "seems to be converging on one or two coherent envisionments" which are concerned with, "things that might be called cognitive approaches" to education.[13] As might be expected from its label, this approach holds that what humans achieve through education can be explained in terms of what can be taught to a machine. For example, "Expert systems embody experts' knowledge in rules, which, since they have in a sense been taught to a machine, can potentially be taught to human learners."[14]

IP differs significantly from its historical precedents in terms of the conception of knowledge that follows from its central metaphor. The task of cognitive research is to provide generalizable explanations of how we develop the necessary cognitive skills to acquire and manipulate information. In other words, in the IP game, the development of mind is an account of the relationship between mind and *information*, rather than between mind and *knowledge* as was the case in the historical examples. One researcher describes the relationship in the following way:

> Humans attend to information, transforming it into a mental representation of some sort, compare it with information already in the system, assign meaning to it, and store it. *Automatization* occurs as mental procedures are practiced and are more efficiently executed. These procedures, along with an increasing speed of processing and increasing capacity, drive cognitive development.[15]

In summary, the assumption that IP offers some truths about the human mind potentially leads to some troublesome consequences. First, our so-called educational decisions are based on a theory of mind that is deemed fallible by those who posited the theory in the first place and the basic assumptions of which have been shown to be fallacious. Next, to accept the existence of homunculi, cognitive mechanisms, and introspection (all associated with our ability to view the workings of our own minds) is to accept that education is in essence some sort of cognitive programming.

Finally, to accept that the theoretical models and assessment instruments provide reliable means by which to establish the existence of a "thing" that is the human mind is to accept that what is important for our students to develop is their innate capacity to think like a machine.

An Alternative to "Truths and Consequences"

The consequences of the IP mind game shed new light on the current push for teaching and teacher education that emphasizes understanding, the exercise of judgement, empathy for different perspectives, and the development of desirable qualities of character. Given the prevailing influence of the cognitive revolution, it is not surprising that many graduates of our public schools lack such qualities. To state the obvious — these are important human qualities of mind that are beyond the capabilities of machines. It is interesting that to avoid the consequences of the cognitive revolution it is not necessary to call for yet another reform movement in public education. Rather, we can simply give serious consideration to the human aspects

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of education with which most educators are intuitively aligned. We can distinguish the concepts of mind and intentionality from scientific metaphors of mind and thus avoid reifying the human mind. We can recognize the significance of language acquisition and conceptual development as educational pursuits. We can acknowledge the necessity of worthwhile knowledge and understanding for the transformation of beliefs. Finally, we can emphasize the human qualities of educated persons.

This is not to suggest that educators ought not give serious attention to the current and future mind games arising from the fields of cognitive science and psychology.[16] In fact, I would advocate an interest on the part of individual educators in the "spectator" sense. That is, they ought to be or become intelligent observers of the various games. On the other hand, I strongly caution against educators becoming players in the game, constantly revising educational theory and practice to accommodate the prevailing metaphor of mind. Rather, I would suggest an alternative that rests on what we mean by mind (in ordinary language) in the first place. On this view, mind is not "a thing" in either the material or immaterial sense. To discuss human minds is to discuss complex interrelationships that cannot be captured by a simple picture of a concrete object such as a well, a slate, or a machine. For example, Michael Oakeshott argues,

> Mind is made of perceptions, recognitions, thoughts of all kinds; of emotions, sentiments, affections, deliberations and purposes, and of actions which are responses to what is understood to be going on. It is the author not only of the intelligible world in which a human being lives but also of his self-conscious relationship to that world, a self-consciousness which may rise to the condition of self-understanding.[17]

In contrast to the IP position that the mind is a thing such that it has functions, processes and mechanisms, the alternative position holds that mind is a term used in our ordinary language to refer to the beliefs, desires, fears, intentions, and goals which characterize human thought. In other words, when we talk about mind we are simply expressing an abstract concept, similar to truth, beauty, justice, and, more to the point, knowledge and education. The concept of mind central to the alternative approach is similar in some respects to the intentional view of mind held by some philosophers of mind.[18] It is also related to what has been called a "commonsense" view of mind or (to use Ryle's analogy) a map of the "logical geography" of mind. A common sense view of mind is not a *theory* of mind in the scientific sense. Rather, it is an *account* of mind that uses the grammar of our language to note the important criteria or features of mind and the distinctions that we make when we talk about mind.[19] Lynn Rudder Baker argues that a common sense conception of mind functions as a "cognitive background" for our practical affairs, "from formulating our personal ambitions to explaining and predicting behaviour, to developing laws and institutions, to devising theories." According to Baker:

> A commonsense conception is a conception of reality that one learns in learning a natural language. It reflects the world as encountered — the world of medium-sized objects, artefacts as well as natural objects; of persons with propositional attitudes and various character-traits; and of conventions and obligations.[20]

The purpose or function of mind on the common sense view, is to direct action and, "ultimately, to allow us to flourish as human beings." Baker argues that common

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sense is "embodied in natural language," it is the "sea in which we all swim — scientist and nonscientist alike." She argues further that "the commonsense understanding of mentality, which is characterized by beliefs, desires, and intentions, requires no special validation by the sciences."[21]

It is useful and perhaps necessary for educators to recognize the important distinction between two different sorts of explanation in respect to the development of mind. The first is scientific mind games — theories of the activities of the human brain which allegedly explain (in physical terms) how we are "hard-wired" to acquire beliefs, desires, and intentions in the first place. The second sort of explanation is an account of the various ways in which human beliefs and intentions are developed from the naive beliefs and unreasonable intentions of early childhood into the sophisticated and reasonable beliefs of adulthood. The former seems to be the task of neuro and cognitive science. The latter refers, at least in part, to the task of educators.

The transformation from naive beliefs to informed knowledge and understanding involves the development of our human capacity to use language (the ability to conceptualize), the development of our rational capacity (the ability to reason), and our social capacity (to experience, reflect on and be transformed by social interactions). This transformation is not achieved by simply finding out how the mind works and making the appropriate adjustments. The transformation also requires consideration of what is necessary to know and understand in order to develop these human capacities. In other words, educators should not be solely concerned with *how* students can become better thinkers, but also with *what* they ought to think about in order to become educated persons. Educators ought to be concerned with identifying the central qualities of the educated persons and with consideration of what sorts of knowledge and understanding mark such a person. This is not accomplished by playing a currently popular mind game, for example, by improving students' abilities to "process information," or to "employ metacognitive strategies" for the purpose of "introspection." The ideal information processor is not educated in the sense that we want our young to be educated. Education is not about becoming machine-like in our abilities. It is a uniquely human endeavour.

A traditional task of philosophers of education is the critical examination of various theories of human thought and action that influence what we take to be educational practice. The current global controversies require that such practice acknowledge and emphasize the demands of understanding with respect to complex and controversial human issues. Information-processing theory is an inadequate, misleading, and potentially pernicious set of assumptions for educators to use as a basis for addressing the challenging problems of the twenty-first century. Israel Scheffler's cautionary note on this topic serves as an apt reminder and concluding note. Scheffler argues that "education" is a normative concept. He says that "when I describe myself as educating, I am typically making a claim of value with respect to my goals; I am speaking *normatively* rather than *descriptively*."[22] Scheffler specifically notes the contrast between education and information. He points out that this contrast is particularly important in the present period "in which the computer

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model of education has become so prevalent." Scheffler argues further that, "the notion of education as consisting in a treasury of information, that is, in a so-called database, which can be called up at will by the student, or metaphorically by the mind of the student, is detrimental to any likely view of education as requiring understanding. Scheffler cautions:

> The normative conception of education implies that you must not merely be able to formulate a question to which an item of known information might be relevant…a whole panoply of competencies surrounds any bit of information and its omission trivializes the normative notion of education…you need to include these competencies if you are not to *distort the concept beyond recognition*.[23]

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1. The "practical" response is arguably one of the results of the so-called "cognitive revolution" that subtly yet profoundly changed the way academics, educators, and the general public think about the human mind. For a detailed discussion of the changes, see Carl Bereiter and Marlene Scardemalia, "Cognition and Curriculum," in *AERA Handbook of Research on Curriculum*, ed. P. Jackson (New York: MacMillan, 1992).

2. See Shelby Sheppard, "Does Mind Matter? Education and Conceptions of Mind," *Educational Theory* 51, no. 2 (2001): 243–258.

3. Eva Berger, *Metaphor, Mind and Machine* (PhD diss., New York University, 1991), 296.

4. Sheppard, "Does Mind Matter," 244–246.

5. The use of "current" here refers to the research on teacher practice noted by Bereiter and Scardemalia, "Cognition and Curriculum." It is not intended to suggest that IP is the current paradigm in cognitive psychology or cognitive science. I thank an anonymous reviewer for pointing out this possible misinterpretation.

6. See Shelby L. Sheppard, "Education and the Cognitive Revolution: Something to Think About," in *Philosophy of Education 1997*, ed. Susan Laird (Urbana, Ill.: Philosophy of Education Society, 1998), 378–386, for further discussion of the functional view of mind.

7. John Searle, *The Rediscovery of the Mind* (Cambridge: MIT Press, 1992), 215. For an analysis of Searle's argument, see Sheppard, "Does Mind Matter," 246–251.

8. A. Brown, J. Bransford, R. Ferrara, and J.C. Campione, "Learning, Remembering and Understanding," in *Handbook of Child Psychology*, vol. 3, ed. P.H. Mussen (New York: Wiley, 1983), 22, 124, 140.

9. D.C. Phillips, "Philosophical Perspectives," in *APA Handbook on Research in Educational Psychology* (1996), chap. 33.

10. Elizabeth Valentine, *Conceptual Issues in Psychology* (London: Routledge, 1992), 105–108.

11. See, for example, Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Blackwell, 1953); Gilbert Ryle, *The Concept of Mind* (Chicago: University of Chicago Press, 1949); and Michael Oakeshott, "A Place of Learning," in *The Voice of Liberal Learning*, ed. Timothy Fuller (New Haven and London: Yale University Press, 1989).

12. Sheppard, "Education and the Cognitive Revolution," 380–383. This influence is discussed in some detail.

13. Bereiter and Scardemalia, "Cognition and Curriculum," 532.

14. Ibid., 534.

15. J. Flavell, P. Miller, and S. Miller, eds., *Cognitive Development* (New Jersey: Prentice-Hall, 1993), 20.

16. A potential replacement for IP is "connectionism." See Carl Bereiter, *Education and Mind in the Knowledge Age* (Mahwah, N.J.: Lawrence Erlbaum, 2002), chap. 12.

17. Oakeshott, "A Place of Learning," 19.

18. Although "intentionality" is related to human beliefs, desires, fears, goals, and the like, the notion is controversial and subject to various interpretations. See, for example, John Searle, *The Construction*

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of Social Reality (New York: The Free Press, 1995); Lynn Baker, *Explaining Attitudes* (Cambridge: Cambridge University Press, 1995); and David Armstrong, "The Causal Theory of the Mind," in *Modern Philosophy of Mind*, ed. William Lyons (London: J.M. Dent, 1995).

19. See, for example, Ludwig Wittgenstein, *Philosophical Investigations*, trans. G.E.M. Anscombe (Oxford: Blackwell, 1953); P.M.S. Hacker, *Wittgenstein: Meaning and Mind (Part I)* (Oxford: Blackwell, 1990); and Gilbert Ryle, *The Concept of Mind* (Chicago: University of Chicago Press, 1949).

20. Baker, *Explaining Attitudes,* 221.

21. Ibid., 89, 223.

22. Vernon A. Howard and Israel Scheffler, *Work, Education and Leadership* (New York: Peter Lang, 1995), 82. See also chapter 5, "The Concept of the Educated Person."

23. Ibid. (emphasis added).

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