CHAPTER 1

Towards a Psychology of Knowing

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My understanding of children's cognitive development involved a series of progressive shifts in my understanding of what is involved in learning a language. Rather than language serving as a means of expressing and sharing existing thoughts, I came to see language as the exclusive means of creating thought itself. To my surprise I have become a sort of "Nominalist"; the view that language is the vehicle of thought itself.

I would describe my "field" as the cognitive development of children, with an emphasis on how education affects that development. I enrolled as an undergraduate at the University of Saskatchewan in 1953 with the intention of becoming a teacher. I was introduced to traditional psychological theories that explained human development in terms of intelligence and learning, the former seen as setting out the limits of one's ability, the other, one's achievements. My professor of Educational Psychology, Dr. Stan Clark, an excellent instructor, did his best to convince us, future educators and environmentalists to the core, that ability was largely inherited. After three years of teaching school, and on Clark's recommendation, I began graduate studies in the School of Education at the University of Alberta in 1960. Here I encountered an almost legendary group of professors, several recently recruited from Scotland, who had put together a book entitled *The Cognitive Processes: Readings* (Harper et al., 1964) Two of these professors, Charles Anderson and Clifford Christensen, had a significant influence on me. Anderson, in my view the most brilliant member of the department, interrupted himself in one of his seminars by saying, "I don't know why I am telling you these things, none of you will ever amount to anything anyway," and then laughed, we with him. He had exacting standards. He gave me a sixty-five on my first paper, an application of Piaget's stages of development to children's religious beliefs. He pointed out, correctly, that my account was self-justificatory rather than objective. Yet, he liked the argument, and he circulated the paper to his next year's students.

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But it was Clifford Christensen who put into my hands J. S. Bruner's *The Process of Education* as well as A. R. Luria's *The Role of Language in the Regulation of Behavior*; and I began to plan experiments that would explore that link (between language and behavior), at first in a kind of general way, talking aloud while thinking, which was the subject of my PhD dissertation, and later, more specifically, the way language conceptualized thought. Interestingly, none of my "cognitivist" professors actually devised a research program to explore these cognitive processes or learner's cognitive development. That I devised empirical methods, inspired by Bruner and Luria, to study children's "mental representations," was, I believe, an important advance on the cognitive perspective of my teachers. I graduated with a PhD in 1963.[1]

My first job as an Assistant Professor of Education at Dalhousie University allowed me to continue my research. As a requirement for my course on the Psychology of Education I required all the students to carry out an empirical piece of research, several of which were subsequently published! I wrote a letter to Jerome Bruner setting out my experimental attempts to get four- and five-year-olds to tell me what they were thinking as they tried to solve a discrimination task – for example, one child said, "I can't talk now, I have to press the balloon." Pressing the balloon to the correct stimulus was the discriminating response. The relation between the correct thought and its verbal expression was, admittedly, obscure. But on the basis of that letter, Bruner invited me to be a fellow at the newly formed Center for Cognitive Studies at Harvard. This was in 1964. There, surrounded by cognitivists Jerry Bruner, Roger Brown, and George Miller, as well as my peers Janellen Huttenlocher, Patricia Greenfield, Courtney Cazden, and Howard Gardner, I became a true "cognitive developmentalist." And, with Bruner I did a study that provided some evidence that even when children as young as four years old attempted to solve a problem, their attempts implied cognitive categories that they could sometimes verbalize. That paper was included in the book that more or less defined the field at that time – Bruner, Olver, and Greenfield's *Studies in Cognitive Growth* (1966). My chapter, heavily edited by Bruner, demonstrated that even quite young children's thinking could be explained on the basis of their "mental representations." Children were not merely learners; they were thinkers even if their thinking was limited in characteristic ways.

[1] See the final footnote below regarding my journey from teacher to academic.

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Lacunae

From Piaget I had learned that conventional theories of intelligence along the lines of Binet's mental measurements told us nothing about how the children were thinking, both when they give the correct answers and when they give wrong, but intelligent, responses. Each item of an intelligence test warranted careful study. For example, whereas Binet had shown that success in drawing diamonds was a mark of intelligence, Piaget showed that diamonds were more difficult to copy than squares and attributed this development to the coordination of action. Prompted by his perspective, I did numerous studies of children's developing ability to copy a model of a diagonal pattern by pressing the bulbs corresponding to the diagonal in a seven-by-seven array (and later to replace checkers in the diagonal slots of a five-by-five matrix). While they readily copied horizontal rows and vertical columns, they couldn't copy the diagonal until school age, and I attempted to explain why. The answer: They have to coordinate two dimensions – up-down and left-right – both of which they could do independently. That was the subject of my first book, *Spatial Cognition: The Child's Acquisition of Diagonality* (1970).

I should acknowledge that I was slow to recognize what would serve as a cognitive explanation. I told George Miller that young children could not copy my diagonal pattern "because they had limited spatial ability." He scowled, "But what are they *doing*?" Behavior, for him, was to be explained by an explicit description of what the children were thinking, their mental representations, not by some vague appeal to "processes" or "abilities." At that point I became more convinced that thinking was essentially a matter of talking to oneself. But this opened up a whole new set of questions: What about children who lacked the ability to talk to themselves? Talking to oneself depends upon the available lexicon and grammar. One answer: There are few or no such children; they are talkers to themselves from very early in their development. Those are the mental representations!

A second question was also taking shape during those early years at the Harvard Center. Bruner and Patricia Greenfield had done important research on the effects of schooling, primarily learning to read and write, on the ability to form abstractions such as "toys," "tools," "furniture," and the like. Roger Brown in *Words and Things* (1958) had distinguished knowledge of a language from metalinguistic knowledge about language, and I began to interpret Bruner's abstraction problems in metalinguistic terms, that is, the shift in children's thinking from thinking about things to thinking about the language representing those

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things; from horse to "horse." Only the latter allows for puns, opposites, synonyms, and definitions.

There was some precedent for such a distinction. Linguists had discovered a shift in children's responses in a word association test from syntagmatic (i.e., sentence forming) relations (horse-barn) to paradigmatic (i.e., substitutable in a fixed syntactic frame) relations (horse-cow, big-small) that bore on the problem. At the time I failed to see the distinction as relevant; only later did I reinterpret that distinction in linguistic versus metalinguistic terms. That is to say, in response to the word horse, young children think primarily in terms of the animal, where it lives, works, and so on. Older children think about the word "horse," its definition, its relation to other words, its grammatical form, and so on. I saw this development as the development of consciousness of language, a consciousness greatly enhanced by learning to read and write. Indeed, even the Stanford-Binet test awards more points for defining words in terms of other words than for describing the referent. More generally, and importantly, my relations with Bruner and with the other fellows at the Center were undoubtedly the longest lasting and most important influences in my academic life.

On the recommendation of the educational philosopher Israel Scheffler, a frequent visitor to the Center, I was offered a position in the newly formed Ontario Institute for the Study of Education, a graduate program at the University of Toronto in 1966. There I continued my research on the role of language in children's thinking but now with a research program on children's ability to think about aspects of their language, their so-called metalinguistic awareness. Linguistic awareness, for example, awareness of phonemes, was important to learning to read as well as to making what I called the "say-mean" distinction. Indeed, I spent much of my career trying to show that awareness of language was in a large part linked to the history of a literate tradition, first, through the invention of writing systems that culminated in the alphabet, and later for vaulting the literal meaning over poetic and metaphorical meanings, the so-called "enlightenment project." This was the subject of what I still think of as my major book, *The World on Paper* (1994) and its sequel *The Mind on Paper* (2016). My current assessment of the so-called "literacy hypothesis," the great divide theory first advanced by Jack Goody, Walter Ong, Eric Havelock, and Marshall McLuhan, was set out on my reception of the Walter Ong Award that was later published as "Two cheers for literacy: Walter Ong, President Trump and the literate mind" (*Explorations in Media Ecology*, 2022b). I concluded that Ong's "literate man was not merely literate, but scholarly."

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Current and Future Work

The "say-mean" distinction took an important step when "mean" was differentiated into a more specific analysis of what is meant by what we say – what we think, intend, believe, know, and remember. A pivotal advance came with Wimmer and Perner's finding that children could not cope with false belief,[2] a competence marked by the acquisition of the concept expressed by the word "think." These more specific intentional states, beginning with "think," have come to define what we describe as children's "theory of mind." Beginning in the 1990s, several of my graduate students, most notably Janet Astington, Joan Peskin, and Ted Ruffman, began studies of young children's ability to ascribe mental states such as "promising" and "thinking" to themselves and others. The concern was less with our adult ability to ascribe understanding to children than with how the children themselves learned to attribute such states to others. In a simple case, young children could be surprised, but they could not reliably predict that another would be surprised (especially when that child knew the surprise outcome themselves).

This "theory of ascriptions" has become central to my current work. My most recent book, *Making Sense: What It Means to Understand* (2022a), was an attempt to explain understanding, not so much as a cognitive problem as a linguistic one, namely, the ability to "ascribe" mental states to others. Ascription is obviously a linguistic process, knowing the meaning and uses of the word "understand." The emphasis falls not only on the states and processes ascribed to others, but also on the question of who is saying so, that is, who is doing the ascribing.

In the same vein, my most recent article, "Ascribing understanding to ourselves and others" (*American Psychologist*, 2023) is a final summing up of my "theory of ascriptions," presumably my last academic work on the topic. The theory places language at the core of our mental states with self-ascriptions being the key to consciousness of our mental lives. In this way, I preserve the key insights of William James on the importance of subjectively held conscious mental states while at the same time showing that these states are a product of self-ascription rather than an innate mental faculty.

Although I see that discussion as my last academic journal article, I continue to think about the relation between intention and action, including that between intention and saying. In line with my ascriptive

[2] See Josef Perner chapter – ed.

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view I suggest that our intentions offer a retrospective analysis of actions after the fact. Only then can these intentions be used to plan actions in the future. No doubt a controversial perspective.

Challenges

The primary challenge to the cognitive perspective on human development comes from the neurobiologists[3] and from AI researchers[4] who claim that the language processing system ChatGPT understands what it reads, including false beliefs. Both of these traditions explain action and thought in terms of reinforcement and make no appeal to conscious mental states. Their attempt is to put us out of business. Cognitivists, in contrast, see action as dependent on concepts invented by the culture and see development as a process of learning a natural language from adults. A natural language is generative, applicable to any context, publicly shared, and conscious. Our access to and control over both our speech and action are dependent, I would say, on our linguistic resources. Our very being as a person depends upon shared consciousness that is made possible by language. Admittedly, I find the writings of philosophers such as Elizabeth Anscombe's *Intention* (1957) and Donald Davidson's *Subjective, Intersubjective, Objective* (2001) more helpful than neurological research on the causes of action. For me, the central questions revolve around the meaning and truth of what we, and the children we study, think and say.

Final Words

The study of children's intellectual development, in my view, pays insufficient attention to the effects of schooling. Once children attend school, their development is better described in terms of grade level than chronological age and more in terms of acquired knowledge than mental growth. I see the increasing interest in describing development in terms of knowledge and belief rather than (or in addition to) mental skills and processes as a wave of the future. That means we shall all have to pay more attention to the structure and uses of ordinary language. I resist the notion that connectionism, whether as a theory of learning or computer modeling in the form of ChatGPT, renders the study of mind and consciousness

[3] For example, Robert Sapolsky in his recently published *Determined: A Science of Life Without Free Will*.

[4] Arcas, B. A. (2022). Do large language models understand us? *Daedalus*, *151*(2) 183–197.

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obsolete. Even modelers use ordinary language concepts in attributing intelligence and understanding to computers. These impressive technological achievements are dependent, in part, upon advances in the psychological understanding of how children and adults think, know, understand, remember, and intend, competencies that emerge from the mastery of ordinary language.

Suggested Reading[5]

Olson, D. R. (1996). *The World on Paper: The Conceptual and Cognitive Implications of Writing and Reading*. Cambridge: Cambridge University Press.
Olson, D. R. (2003). *Psychological Theory and Educational Reform: How School Remakes Mind and Society*. Cambridge: Cambridge University Press.
Olson, D. R. (2016). *The Mind on Paper: Reading, Consciousness, and Rationality*. Cambridge: Cambridge University Press.
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Olson D. R. (2022b). Two cheers for literacy: Walter Ong, President Trump and the literate mind. *Explorations in Media Ecology*, *21*, 37–41.
Olson, D. R. (2023). Ascribing understanding to ourselves and others. *American Psychologist*. Advance online publication. https://doi.org/10.1037/amp0001244.

[5] I have described my personal journey of becoming an academic in my self-published *A Mind in the Making: A Memoir*, Amazon Kindle, 2018. *If* the course of my career contains any "lessons" for younger scholars and students, I'm willing to note – at the insistence of the Editor! – that those might be found in that memoir.

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