PREFACE: PEREGRINATIONS DOWN MEMORY LANE

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In 1960 I was looking for an interesting thesis topic. My advisor, Professor Harold Hand of the University of Illinois, suggested that I combine my two interests of language teaching and psychology and gave me a month to research the possibilities in this area. After a concentrated period of reading and searching, I gathered together my 3 by 5 cards and went to see Professor Hand. I reported to him that, from my reading, it was clear that, in the present state of the field, it would be impossible to apply the psychologists' theories to the processes of language learning and teaching. To this he replied "Then you go and do it."

I have always enjoyed responding to a challenge, so off I went to research anything I could find that might link psychological research to the learning and teaching of a second language. In 1960, behaviorist psychology, with its mechanistic emphasis on behavior as being acquired through the rewarding (reinforcement) of actions and the gradual building up of complex behavior through the combination of these simple elements, was still the dominant paradigm in most university departments. The basic process in operant conditioning, as it was called, was considered to be the stimulus-response or S-R unit. Skinner's William James Lectures on *Verbal Behavior*, given at Harvard in 1948, had finally been published in hardcover in 1957. In this book, Skinner maintained that learning a language was not essentially different from learning any other form of behavior; it was a matter of forming habits by conditioning through reinforcement, albeit most frequently secondary reinforcement. *Verbal Behavior* did not have the impact it might have had earlier, since the tide in psychological thinking was beginning to turn.

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In psychology textbooks current at the time, it was rare to find discussions of personal characteristics such as emotional response or motivation. The chief motives in operant conditioning were hunger, thirst, and sex, as demonstrated in animal experiments. These seemed to have little application to the learner in the regular classroom, although some teachers did go to the lengths of giving out candy as rewards for correct responses. There had to be a better way, it seemed to me.

Throughout the 1950s, structuralism had held sway in the relatively few Linguistics Departments in the United States. In response to war needs in the forties, leading linguists had created the Army (later the audiolingual) Method of teaching languages. In the post-war years this approach had spread to the universities and schools, supported as it was by the National Defense Education Act (NDEA, 1958), which funded institutes for teaching teachers audiolingual tenets and practice. The method laid great emphasis on habit formation to a point of automatic response. It underplayed the expression of personal meaning in favor of learning structural patterns of the language. In this way it was compatible with the prevailing behaviorist paradigm, as well as the approach of structural linguists to the description of language. In vogue too was Shannon and Weaver's Information Theory (1949), with its mathematical underpinnings, the information processing of cognitive psychology only just appearing on the horizon. John Carroll's seminal book on the *Study of Language* (1953) had been a light in a gray dawn, as he endeavored, with a great deal of common sense, to bring linguistic theory to the attention of scholars in other fields.

From the point of view of psychology and classroom language teaching, the only book available at the time was by Huse (1931). This book was very dated and bore no relationship to the level of psychological knowledge in 1960. The promoters of the audiolingual method, however, asserted that their procedures were based on modern psychological theory. The interesting questions were: Were they? Was the psychological theory they espoused consonant with our increasing knowledge of language and language interiorization processes? They certainly emphasized the production of linguistic responses to stimuli by imitation and repetition in pattern drills and in memorized dialogues containing the common patterns of social discourse. They also emphasized habit formation through the secondary reinforcement provided by immediate knowledge of the correctness or incorrectness of the learner's response, in conformance with operant conditioning theory. They recommended that teachers should respond only to questions of *How*? (rarely *Why*?), since learning by analogy should replace cognitive analysis. Hence, in classroom practice, questions from students about the language were to be discouraged. Emphasis was put on rote memorization of spoken language, with as

little recourse as possible to written material until the aural material had been absorbed and could be repeated. In this way theorists were relying short-term memory, without paying much attention to the way long-term memory processes operated.

All learners were expected to be able to learn in the same way; differences in learning preferences were completely ignored. After all, it was believed, human beings had learned their first language aurally and effortlessly by imitation and repetition of their mother's speech, so why should they not be able to learn a second language the same way? In 1960 scholars did not have access to the numerous longitudinal studies of first language acquisition that are now well established. Ruth Weir's pioneering research on *Language in the Crib*, which showed the amount of cognitive effort the child put into the first language, was not published until 1962. A plethora of studies from distinguished scholars like Bloom (1970), Braine (1971), Ervin-Tripp (1971), Slobin (1971a,b), Brown (1973), and their associates have since shown how individual and varied are the efforts of children in learning their first language, let alone their second.

There were, of course, voices to be heard dissenting from the classical behaviorist paradigm. In 1951, the neuropsychologist Lashley had published an influential article on "The problem of serial order in behavior" in which he made the case for many interacting systems in the brain and nervous system, rather than the simple, additive connections operant conditioning would predicate. His was something of a voice crying in the wilderness, but the minority who appreciated Lashley's work recognized it as pointing in an important new direction. The Gestalt psychologists of the forties were still respected in 1960, although theirs was not the current bandwagon. Their emphasis on the individual's organization of perception so that the whole has a significance different than the sum of its parts and is individually interpreted prefigured the later theories of cognitive psychologists. In Canada the neuropsychologist Hebb was setting forth original views about thinking processes in relation to the organization of the brain (1949) and influencing such future leaders as Wallace Lambert. Hebb was interested in perceptual organization, as well as the conceptual growth that comes with maturation. Piaget's work in Switzerland, with its analysis of age differences in thinking and perception, was just beginning to interest American scholars, his book with Inhelder on *the Growth of Logical Thinking from Childhood to Adolescence* having appeared in the U.S. only in 1958.

At the University of Illinois, Mowrer (1960a, b) had broken ranks with classical behaviorist psychologists by emphasizing the importance of the emotions

of hope and fear in the study of human behavior. He maintained that habit was not a fixed, automatic, unconscious neural connection or bond between some stimulus and some response but that most behavior [was] under voluntary control (1960a; accompanying phonograph record). Osgood, to whom is attributed the invention of the term psycholinguistics, had in the early 50s updated the S-R formula to include an intervening fractional meaning response that mediated between the observable S and R and produced distinctive and very individual self-stimulation, thus furnishing the unobservable stimulus for the response (1953, p. 697). In this formulation Osgood was putting the individual back in the study of behavior. Moreover, Osgood devoted more than one-third of his 1953 book on *Method and Theory in Experimental Psychology* to perception and symbolic processes like problem-solving, thinking, and language behavior, while Hilgard (1956), a standard text at the time, had given these subjects all of six pages of explicit discussion in a book of more than 500 pages.

Considering that a book published in the mid-1960s was probably being written several years earlier, it is interesting to compare two books brought out by the same publisher in the same series just a year apart: Hilgard and Bower's *Theories of Learning*, 3rd edition (1966), and Neisser's *Cognitive Psychology* (1967). Both books were influential and widely read. Both were interested in "how learning goes on," as Hilgard and Bower stated in their preface. Hilgard and Bower were shoring up and updating traditional learning theory from Thorndike's Connectionism to Freud's Psychodynamics, with a brief nod towards neurophysiology and the neuronal networks involved in awareness, arousal, and memory processes, all still considered within a stimulus-response paradigm. Neisser's book, however, was breaking ground for a new approach. In his preface, he states that the sequence of the book "follows stimulus information inward from the organs of sense through many transformations and reconstructions, through to eventual use in memory and thought" (p. vii). He was interested in "*sensation, perception, imagery, retention, problem-solving, and thinking*" (his italics); for him "cognition is involved in everything a human being might possibly do," and consequently "every psychological phenomenon is a cognitive phenomenon" (p. 4). This is a far cry from theories based only on what is overtly observable and measurable.

Meanwhile, George Miller had been concentrating his attention on how people think and how they communicate. His *Language and Communication* (1951) was a beacon. Original combinations of elements are the lifeblood of language, he maintained (p. 79). This book contained the delightfully written and influential article on "The magical number seven, plus or minus two" (pp. 14-44).

Although still in the information theory mode, this article emphasized the importance of organizing and chunking in memory. I was delighted when Miller, Galanter, and Pribram's 1960 book, *Plans and the Structure of Behavior*, came out just as I was getting into deeper research for my dissertation topic. These researchers emphasized the way the individual processed information and transformed it into action through overall Plans, or strategy, that preceded and directed lower level Plans, or tactics (p. 16). This seemed to me very applicable to language use.

Chomsky and transformational-generative grammar were just coming on the scene in 1960. *Syntactic Structures* had been published in 1957; Chomsky's much quoted review of Skinner's *Verbal Behavior* appeared in *Language* in 1959. In this critique Chomsky stated categorically that "prediction of the behavior of a complex organism . . . would require, in addition to information about external stimulation, knowledge of the internal structure of the organism, the ways in which it processes input information, and organizes its own behavior. These characteristics, he further maintained, "are in general a complicated product of inborn structure, the genetically determined course of maturation, and past experience" (p. 27). This set out a diametrically opposed position to that of behaviorism. We were now beginning to hear about the Language Acquisition Device (LAD), and the bases were being laid for several decades of study of inborn language capacities. We were also hearing about systems of rules as basic to language production and the importance of hypothesis testing and learning from errors.

As Chomsky's generative grammar moved on through Government and Binding to Minimalist Syntax, this inborn language faculty based on Universal Grammar (UG) and hypothesis testing, resulting in parameter setting and resetting, remained basic and continued to influence much research in first and second language acquisition. In *Words and Things* (1958), Roger Brown had already drawn attention to the fact that children learn to produce new responses that they have not practiced specifically, but which conform to the system of the language they have interiorized. Brown's view undercut the prevailing notion that rote memorization of many useful sentences of the language in dialogues, and even as examples of patterns in drills, was sufficient to produce a communicating individual. His approach was compatible with Chomsky's assertion that language is generative, as shown by the fact that we are continually producing comprehensible sentences that we have never heard before (including this one!). All use of language, Chomsky maintained, is creative (1966). George Miller later encapsulated this idea in his unforgettable way, stating that "it would take

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100,000,000,000 centuries (one thousand times the age of the earth) to utter all the admissible twenty-word sentences of English (1967, p. 80). So much for trying to memorize the sentences of target language! Unless it is a cliché, Miller continued, every sentence must come to us as a novel combination of morphemes. Fortunately, all this creativity is rule-governed, or we would not understand each other. As Chomsky reiterated in 1988, real creativity is free action, but always within a system of rules.

Cognitive psychology and psycholinguistics had now taken off, and we could learn from the work of Broadbent (1968) and Bever (1970), who centered their research on perception. Psychologists, however, found a marriage to the linguists in psycholinguistics to be a rocky road, in part because linguistics, being a young science, kept changing its theoretical bases, not only across schools of thought but within schools of thought as well. This led psychologists to declare their independence in clear terms. In his introduction to *Psycholinguistics* (1970), Roger Brown complained about the rapid clip at which linguistic theory changed, finding that this posed real difficulties for the psychologist who wants to use linguistic theory in his own work (p. ix). Slobin declared that it was not the work of psychologists to be toolmaker to the linguist; they had their own work to do (1971a, p. 24). Already Neisser had pointed out that the cognitive theorist could not make assumptions casually since they had to conform to the results of 100 years of experimentation (1967, pp. 4-5). Bever spoke for other cognitive psychologists when he expressed doubts about the existence of a specialized Language Acquisition Device, preferring to see as innate various cognitive structures which enable humans to acquire language as well as to perform other cognitive operations (1970, p. 352). This independent mindset was liberating in that it enabled psycholinguists to do work that would not become immediately obsolete because of linguistic changes over the weekend. Psycholinguists are able to supply data that help linguists to refine their theories, but they are also interested in developing theoretical ideas of their own that may help linguists to see whether their proposals are supported by facts of the real world.

In the 1970s, psycholinguistic research began to drift away from the dominant Chomskyan linguistic theory. Many psycholinguists found the theories of Fillmore (1968) in Case Grammar, G. Lakoff (1971) in Generative Semantics, Chafe (1970) in Relational Grammar, and Halliday (1973) in Functionalism more useful for their work; all of these theoretical positions were based more on semantics than syntax. Others like Schlesinger (1977) developed their own theories from their research. As the century moved into the 80s there was a flurry of publications setting forth the latest research on the brain. Psycholinguists became

very interested in neuropsychology: how the brain perceives, organizes, stores, and interconnects information from its environment (both the inner environment of its own emotions and intentions and the outer environment of the physical context); how it changes and restructures this information; how it uses in performance what it has retrieved; and why at acts as it does, thus raising the question of motivation. (Schumann, in this volume, applies such information in his discussion of the amygdala as the seat of emotion and its effect on learning.) Coming from another direction, a cybernetic approach to cognitive processes led to the development of parallel distributed processing, or PDP (Hinton & Anderson, 1989). The possiblity of multiple parallel processing had already been proposed by Hebb (1949). Rivers (1990) discussed the application of PDP to language teaching.

In 1960, second language acquisition studies, as we now know them, were nowhere in sight. When I was appointed to the Department of Romance Languages and Literatures at Harvard in 1974, I was delighted to find a group of students at the Graduate School of Education studying with Courtney Cazden, a first language acquisition researcher (1968), and Catherine Snow, who had already carried out her well-known research with Hofnagel-Höhle (1978) on age differences in the learning of second languages. Cazden and Snow were mentoring students who were writing pioneer theses on second language acquisition. Those of us with this common interest gathered at brown bag lunches to discuss exciting new ideas arising from the students' research; among the group were John Schumann, Kenji Hakuta, Herlinda Cancino, Ellen Rosansky, and Ellen Rintell, with some participation from Marina Burt and Heidi Dulay who were already developing their Creative Construction theory (1974). Pit Corder, a pioneer in error analysis (1967) with whom Selinker had worked while elaborating his influential theory on interlanguage (1972), also visited us from Edinburgh and was most interested to know these discussions were proceeding. Roger Brown, also at Harvard, had published an important book on the acquisition of a first language in 1973; his ideas inspired others to examine second language acquisition at the same level of detail. One of Brown's insights was the natural order of acquisition of grammatical morphemes, which later generated many research projects. Hakuta collaborated with John (Haj) Ross at MIT on the first course in second language acquisition. It was a very exciting time to be in the profession.

Language theorists in the 1970s began to realize the importance of social psychology for their work, and sociolinguistics moved rapidly forward. Labov (1972) studied how language is actually used in different social contexts, and Hymes defined "communicative competence" as "what a speaker needs to know to communicate effectively in culturally significant settings" (1968, p. vii). This work

made a lot of sense to language researchers and language teachers, counterbalancing Chomsky's continual emphasis on linguistic competence as being essentially syntax-based. Throughout this period there was an undercurrent of interest in Vygotsky's ideas, developed before his death in 1934, on the social development of the individual's thinking processes and their relationship to speech and language (Vygotsky, 1986). His profound insights came to the surface from time to time as translations of his work became more readily available; more recently, they have come to command much greater attention (see Smagorinsky, this volume).

Interest was aroused in the dynamics of groups and the social roles and rituals in interaction, highlighted in Goffman's work (1967), and language teachers attempted to develop a learning environment where students might acquire communicative and pragmatic competence. Such attempts to develop ability to communicate with others in culturally acceptable ways led to a realization of the importance of understanding the subtleties of other cultures. From the beginning, the structural linguists had formed strong ties with the anthropologists, Sapir's work (1921) being very influential. The anthropologists had identified the patterned nature of other cultures. In my dissertation, published in 1964 as *The Psychologist and the Foreign Language Teacher*, I devoted a complete chapter to the complex question of understanding other cultures. Linking this question with psychology, I had written in some detail about Osgood, Suci, and Tannenbaum's *Semantic Differential* (1957), which attempted to separate out the evaluative factor in judgments of meaning from the cognitive or denotative (factual) element. This differential was tested extensively across diverse cultures with interesting results. Applied linguists found a wealth of material to draw on in sociocultural studies such as those of Hall (1959, 1966, 1976). We are now very much aware of the importance of learning to cope in a culture other than our own (Robinson, 1981).

In the 1990s there has been much research centered on the individual learner, notably the work of Oxford and her associates on learning strategies (1990). Gardner's *Multiple Intelligences* (1993) has also required those interested in the learning of languages by students of all ages and backgrounds to rethink their approach. Once we recognize that intelligence is not purely intellectual, but also verbal, mathematical-logical, spatial, kinesthetic, musical, interpersonal, and intrapersonal, we have much work to do to adapt our teaching to students with differing learning styles.

A glance at the articles in this volume of the *Annual Review of Applied Linguistics* shows how some topics of preoccupation have remained constant and how much some have changed over forty years. We continue to seek developments

connecting psychology and linguistics (see Segalowitz, this volume); we continue to discuss the effect of syntactic structure on comprehension (Gass and Juffs chapters, this volume). We are now, however, also discussing much more personal, internal questions with regard to language learning. The individual learner is now solidly at the center of our research. We are now reconsidering language aptitude (Sparks and Ganschow), the importance of age in language learning (Singleton), and individual differences in learning styles; there is no longer a one size fits all mentality. Motivation (Dörnyei), language anxiety (Horwitz), and the role of emotion (Schumann) concern us, and we would like to know how and why what has been learned sometimes dissipates (Hansen). We are interested not only in the learning of first and second languages, but also in what takes place in the bilingual mind (Bialystok, Genesee). Reading research has made great strides and thrown much light on problems of literacy in first (Perfetti, Van Dyke, and Hart) and second (Geva and Wang) languages.

Why talk about these old things? I believe strongly that we should not forget our predecessors. Whether we are aware of it nor not, we are building on their foundations. Knowing where we have come from helps us to maintain perspective as we consider where we are going. It also helps us to avoid reinventing the wheel or repeating past mistakes. From our predecessors we can draw much data, as well as notions worth serious consideration in the light of new knowledge. Who does not value the work of that pioneer of longitudinal studies on the acquisition of two languages, Werner F. Leopold (1939-1949), who kept daily records of his daughter Hildegard s learning of English and German until she was seven?

Even Thorndike, who concentrated mainly on overt features of physical behavior, did not ignore the role of emotion and individual characteristics. In 1956, Hilgard referred to the motivational features Thorndike had outlined in 1913: interest in the work, interest in improvement, significance, problem-attitude, attentiveness, absence of irrelevant emotion, and absence of worry (p. 21). These factors sound quite contemporary. Each article in this book draws on the work of predecessors. Recently, when reading a funding application from a young colleague who proposed to establish a data bank on worthwhile work in teaching methodology, I was shocked to discover the references limited strictly to the last decade. Knowledge does not grow like this; fruit hangs long to mature, and even after maturity it is relished in preserved form. Old wine is appreciated even longer. Surely the work of our forebears is more valuable to us than old wine. Let us savor and rejoice in it.

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