

JONATHAN LEATHER AND JET VAN DAM

TOWARDS AN ECOLOGY OF LANGUAGE ACQUISITION

Like any other scientific enterprise, the study of language acquisition (LA) evolves: the issues which dominate its agenda, the consensus on what constitute its 'data', the hypotheses that motivate its research programmes—all wax and wane in the cycles we know and expect in human affairs. At the end of the 20th century thinking in language acquisition research was showing signs, we believe, of a new kind of convergence. This volume aims to explore how a number of contemporary approaches and insights in LA research might be coherently interrelated through a perspective that can be called *ecological*. While much research on LA continues to consider the individual acquirer largely in closed-system terms, there is growing attention to the acquirer's extensive interaction with their environment—spatial, social, cultural and so on. Recent studies in such diverse fields as discourse analysis, linguistic anthropology, robotics, and cognitive semantics underline the heuristic value of the perspective promised in our title: ecology of language acquisition. In this introductory chapter we first offer an ecological critique of some dominant paradigms of LA research. We then go on to suggest how an ecological perspective motivates new approaches to acquisition issues, and how it informs each of the contributed chapters which follow. Our hope is that readers of all theoretical persuasions will find in this volume ideas, arguments and insights which, even if not woven into a fully-fledged theoretical fabric, at least point a way to fruitful theoretical reassessment.

1. LANGUAGE ACQUISITION RESEARCH: ASSUMPTIONS TO BE QUESTIONED

We begin by examining a number of influential ideas which to a greater or lesser degree underlie most established approaches to the study of LA, even if they no longer clearly inform the theoretical disciplines upon which LA research draws. Because they have often tacitly underpinned research designs and interpretations, we will refer to these dominant ideas as assumptions.

Assumption 1: Languages are clearly distinct from one another, with monolingualism as the societal norm.

The conceptions of language which inform Western science reflect a Western monolingual view of society and socialization, as has been pointed out by, for example, Phillipson and Skutnabb-Kangas (1996) and Nayar (1994). This view has been traced continuously back to a Judeo-Christian (and biblically-enshrined) understanding of the ‘curse’ of Babel (Phillipson & Skutnabb-Kangas, 1996, pp. 437-438). The dominant Western understanding is captured in the maxim: “one person, one nation, one state, one language”—an ideological position which polarizes to the “mother-tongue fascism” elucidated by Hutton (1998). Coherent with this normative view is a concern with and drive towards language codification. As James Milroy (1999) points out, much of 19th- and 20th-century linguistics depended on the study of “major languages that have been regarded as existing in standard, ‘classical’ or canonical forms” (p. 16). Although it was made clear several decades ago (Weinreich, Labov & Herzog, 1968) that linguistic theory was in thrall to the idea that elements of a language are uniform (when in fact they are often variable), the belief in some invariant, authoritative form of any language has generally persisted in scholarship as well as in Western culture at large. However, such a belief may not be universal (again, see the discussion by Milroy, 1999, p. 17).

Against the background of a monolingual world view it is not surprising that most studies in language acquisition assume—if tacitly—a large measure of isomorphy between linguistic, political and cultural communities. A logical consequence is the essentially categorical distinction that is reflected in the terms ‘L1’ and ‘L2’ (...Ln). It is the monolingual who constitutes the ‘pure’ case for study (Chomsky, 1986, p.17). The tendency in much acquisition research has been to treat the ‘L1’ or mother-tongue as the object of ‘normal’ acquisition, while any other language in an acquirer’s life is seen as the occasion for acquisition experience of a different and potentially problematic kind.

Under the hegemony of monolingualism, the complexities of multilinguals’ language behavior are marginalized (Kachru, 1996). Yet statistically only a minority of the world’s children acquire language in an environment that is ‘monolingual’, and as Edwards (1994) puts it: “to be bilingual or multilingual is not the aberration supposed by many [...]; it is, rather, a normal and unremarkable necessity for the majority in the world today” (p. 1).

Few researchers have proposed views of the interrelations between languages through their acquisition and use in ‘multilingual’ environments. Haugen (1972) underlined the importance of seeing ‘a’ language as existing only in and through its speakers, calling attention to what he called “the life environments of languages”, and proposing the notion of the “ecology of language” (p. 343)—a notion since taken up by several scholars including Edwards (1994, p. 136) and Mühlhäusler (1996). However, the programme outlined by Haugen remained essentially taxonomic, without addressing acquisition. He concluded his discussion with a number of “ecological questions” for any given “language”, of which the first is: “What is its classification in relation to other languages?” (1972, p. 336). He further proposed a “typology of ecological classification” to relate a language to the others in the world (*ibid.*, p. 337).

The monolingual view is reflected in the theoretical proposals of generativists, who—following Chomsky (1965; 1986)—have framed the goal of primary language

acquisition as the (undifferentiated) ‘competence’ of a speaker in a particular language without considering the variety of meanings such a concept might have for members of a particular social group. Children may be encouraged or discouraged in the acquisition of a particular vernacular or *lingua franca*, depending on the ideologies and personal preferences of parents, peers and communities. The acquisition of the correct phonology, lexis and morphosyntactic forms of a language is therefore in large measure a result, not of individual motivations, but of the particular socially and culturally concerted activities in which children participate and which make language a *normative* phenomenon (Itkonen, 1991).

Assumption 2: Language acquisition is a human ability that is to an important extent preprogrammed in the human brain.

Lenneberg (1967) saw human language as a species-specific activity, with biologically determined mechanisms of perception, categorization, and so forth. This notion informed much of the research on language ability in the decades which ensued. In some of the speech research the claim was advanced that human speech ability is based in a neurobiologically separate ‘module’ (see e.g. Fodor, 1983). Whether the ‘specialized language engine’ hypothesis is more or less strongly formulated, it was a dominant paradigm in late 20th-century linguistics, finding its most influential expression in Chomsky’s *Universal Grammar* (UG). UG simultaneously addresses the essential form of human languages and the process by which in childhood they are acquired. The UG theory claims that children “know innately” the principles of various possible subsystems that human languages may possess, the manner in which they interact, and the parameters associated with them (Chomsky, 1986, p. 150). UG is thus the language faculty of the child’s mind which processes real-world language data and outputs a grammar of the particular language instantiated in the child’s environment. UG’s concentration on commonalities among the natural languages is forcefully underlined in the claim: “there is only one human language, apart from the lexicon, and language acquisition is in essence a matter of determining lexical idiosyncrasies” (Chomsky, 1989, p. 44). While UG is not explicitly concerned with the acquisition of second or subsequent languages, the possibility that post-primary acquisition proceeds in essentially the same fashion has been explored at some length (see e.g. White, 1989; Cook, 1985; Broselow & Finer, 1991; Flynn, 1993), with recent discussions according UG a full role in post-primary acquisition (e.g. Epstein, Flynn & Martohardjono, 1996). However, as Deacon (1997) has convincingly argued, the characteristics of UG need not be attributed to an evolutionarily anomalous ‘language module’, but to a species-specific general symbolic capability resulting from the co-evolution of language and the human brain. Cognitive linguistics emphasizes that language is grounded in our particular experience and embodiment (e.g. Ungerer & Schmid, 1996). A further alternative approach to explaining language acquisition is that it arises from the exposure of comparatively simple developmental mechanisms to a complex total environment (see Ellis, 1998).

MARK FETTES

CRITICAL REALISM, ECOLOGICAL PSYCHOLOGY,
AND IMAGINED COMMUNITIES

Foundations for a naturalist theory of language acquisition

1. INTRODUCTION

Ecological thinking does not come readily or unproblematically to us moderns, for reasons to be examined in a moment. As in certain kinds of optical illusion, one must learn the trick of seeing familiar things in a new way. This gets easier with practice—but not *that* easy.

As in many other kinds of learning, one of the greatest aids to the development of the ecological imagination may be what Vygotsky called “psychological tools”, consisting of words, symbols, images and other external devices for the guidance of thought and awareness. A theory is really a collection of such devices, arranged so that they reinforce one another and increase the likelihood of their productive use. That is the intent of this chapter, in which ecological perspectives on mind, knowledge, imagination, communication, language, genre, discourse and community are briefly described and interrelated. Situating subsequent chapters within this broad theoretical context may help make visible their connections, their sometimes tacit assumptions, and directions in which they might fruitfully be extended.

There are many ways into any theory. The key is to find an idea or a metaphor that resonates with one’s own experience or tacit theories of the world, and then to follow the connections made by the author to less familiar, more challenging ideas. Linearity is not required. Perhaps, after reading other chapters in this volume, you will be struck by different aspects of the argument than on first acquaintance. Whatever is the case, more than one reading is highly recommended.

As with all human endeavors, this theoretical orientation comes embedded in a social and historical context. Since the onset of the modern era in Europe, some 350 years ago, theories of language have been strongly influenced by what Mikhail Bakhtin referred to as the “centripetal forces” in society (Bakhtin, 1981). The conception of ‘languages’ as unitary and autonomous systems was made plausible by the invention of such modern technologies as the monolingual dictionary and the logic-based grammar (Harris, 1980; 1981), and has been elaborated and reinforced by ideological practices of ‘facticity’, i.e. normative ways of producing and interpreting textual representations of the world (Smith, 1990). Such technologies of

linguistic normalization have played a key part in the evolution of modern societies, away from diversified, stratified and relatively static forms in which order derives from the ties of kinship, place and mind (Tönnies, 1957), towards fluid and turbulent forms in which order derives from the accumulation of material and cultural capital (Bourdieu, 1990; 1991).

Today modernity is widely regarded as a universal and irreversible process of social development, and theories of language premised on its ideals continue to be held up as models of scientific explanation. Yet as asserted by Bakhtin and elaborated in the postmodern sociology of Zygmunt Bauman, the focus on unity and autonomy has also worked to draw attention away from the conflict, change, and uncertainty endemic to all human affairs, in language as elsewhere (Bakhtin, 1981; Bauman, 1992). Among linguists working in English, Paul Friedrich has argued a particularly compelling case for “a more relativistic view” of linguistic order, in which discreteness can make room for continuity, exact meaning for associative meaning, passive reproduction for active creativity, the generic ‘native speaker’ for the unique individual, and in which “the rage for order” can concede an enduring place for chaos (Friedrich, 1985). For this, we need a theory that explains how linguistic order can emerge from the interaction of speakers displaying a wide variety of abilities, beliefs, and purposes, rather than taking such order as the primary reality from which speakers are viewed as deviating.

This, then, is the type of theory sketched in this chapter, with some consideration of its implications for language acquisition. In the available space, I will have to touch rather lightly on a number of important and contentious issues, none of which is likely to be fully resolved soon. Nonetheless, the studies collected in this volume demonstrate the need to make a start in delineating the *kind* of theory an ecological view of language entails. This chapter takes up the challenge, particularly in regard to *epistemology*, the relationship of language to knowledge, and *ontology*, the kind of thing language is.

2. MIND

In much modern discourse, ‘mind’ is routinely equated with ‘brain’—for instance, in the title (and contents) of Stephen Pinker’s *How the mind works* (1997). A great deal of work in modern philosophy and psychology has relied upon this idea of mind as a physical organ of thought, Descartes’ *res cogitans*, distinct from both the non-thinking, mechanically reactive body and the external, mechanically determined environment. The mind is *contained* in the brain, and is itself a *container* of knowledge: this simple metaphor has infiltrated a huge range of disciplines, so that the concept of “language acquisition”, for example, suggests a process whereby an external object, “language”, is taken up and held by the mind of the learner.

There are many problems with the container paradigm, of which I will mention only three. First, it has proven impossible to reconcile with philosophical realism, since there is no way to show that “meaning in the head” corresponds to “meaning in the world” (Millikan, 1984). Rather than arguing that realism is at fault, as late 20th-century philosophers have been wont to do, it seems more plausible to suggest

that our basic metaphor of mind is wrong (Ben-Ze'ev, 1995). Second, the container metaphor is easily appropriated by the prescriptive factual practices of the apostles of legislative reason to marginalize the everyday knowledge of individuals (Bauman, 1987; Smith, 1990). If the purpose of 'mind' is to receive and hold externally defined truths about the world, it falls to people with access to the social mechanisms of truth production (philosophers, scientists, teachers, among others) to decide what counts as true knowledge and what as error. In this way the container metaphor helps sustain the characteristically modern power/knowledge dynamic theorized by Foucault (1980). Third, in its incarnation as the "banking theory" of learning (Freire, 1972) this conception of mind continues to sustain a hugely inefficient and alienating educational system which works to the particular disadvantage of minority and working-class students (Corson, 1998). Both in order to understand this system and in order to change it, new guiding ideas of mind and knowledge are required (Corson, 1997; Egan, in press; Goodman & Fisher, 1995).

The alternative I will develop in this paper abandons all of the classic dichotomies of Cartesian philosophy: mind-body, spirit-life, human-animal, person-world. It is an ecological or systems perspective, in that the central reality is construed as relationships *between* things, the latter being viewed as emergent structures, in and through which the relationships are realized. One particularly important source of insight has been Edward Reed's ecological psychology, which offers a radically naturalist, non-Cartesian account of mind and agency (1996a). According to Reed's theory, as life has evolved, natural selection has ensured the development of mechanisms for perceiving and responding to *persistently available information* in the environment: this he calls "the effort after meaning." People, and frogs, and earthworms, all demonstrate such adaptive awareness of their surroundings—awareness conceived not as a private internal state, but as a constantly shifting active relationship between the organism and its surroundings. As complex animals have evolved, they have developed increasingly sophisticated forms of retrospective and prospective awareness: that is, the ability to recall past relationships with the world, compare them with the present, and thereby project the most likely developments in the immediate future. Such ecological knowledge is not *given*, but *achieved* by the individual-in-environment, employing and modifying adaptive strategies developed by communities and species over vast stretches of time. Mind, in this view, is not reducible to any particular set of physical structures, in the brain or elsewhere. Mind is the active integrative *process* of coordinating organism with environment, by seeking for, interpreting and responding to adaptively significant forms of order in the world.

3. KNOWLEDGE

Such a redefinition of mind reveals hidden complications in our everyday notions of meaning and knowledge. What Reed calls the "effort after meaning" can be construed as the endeavor of each individual to 'know' their world, a dynamic, diachronic and never-completed process of discovery employing and refining what Vygotsky (1978) and others (e.g. Egan, 1997) call psychological or cognitive *tools*.

LEO VAN LIER

A TALE OF TWO COMPUTER CLASSROOMS

The ecology of project-based language learning

1. INTRODUCTION

The research into the use of educational technology to date shows widely varying, inconclusive and often contradictory results. For example, Dillon and Gabbard (1998) conducted a survey of quantitative studies, searching under the keywords “hypermedia” and “hypertext” (thus missing any research that did not have these words in the title). They netted 97 articles and were able to select 25 for detailed review. Their general verdict was that “the value of hypermedia in pedagogy is limited” (p. 345). They further noted that the variables involved are enormously complex, and that identifying relevant variables and controlling them is especially difficult in this area. In another survey of the research literature, Kirkpatrick and Cuban (1998) divided studies into “positive”, “mixed”, and “negative”, and came up with roughly equal numbers in each category. Thus, research on the benefits of computers is rather equivocal. The reasons for this are not very difficult to find. The role of technology in education is changing so fast that, as Mandinach and Cline report, “new and flexible methodologies are needed to capture the effects of [technology-based] learning environments on teaching, learning, and classroom dynamics” (1997).

Whether or not computers will be used in schools and classrooms, including language classrooms, is no longer the question. They are being used now, and will be used in the future in some shape or form. All other questions remain on the table, and it is our task as researchers and practitioners of language education to address them in all their complexity. It is worth noting that most of the effort in educational technology seems to be going into the development of infrastructure (often obsolete by the time it is in place) and instructional software, with an emphasis more on technical than on pedagogical challenges. It is thus quite possible that Cuban is right when he says that educational technology is “oversold and underused” (2001). I would add that when used, its full potential is often not exploited.

In this chapter I will explore the use of technology in context, focusing on the language classroom in which computers are used during language lessons. The reader will note, perhaps with some surprise, that the discussion is more about project-based teaching in general than about the use of technology *per se*. This is intentional. The message is that technology, if it is to be a positive force in

education, should not be cast as an alternative to classroom teaching, or as replacing the teacher, but as a tool that facilitates meaningful and challenging classroom work. The project work illustrated below could have been conducted without computers, but it would not have provided the same opportunities for peer scaffolding. I suggest, then, that computer use can enhance classroom work. Such integration of technology into project-based teaching is not problem-free, of course, but it brings certain rewards in terms of creativity and the development of autonomy and collaborative skills. I will give two examples from practice.

In the first example, children in a fourth-grade dual-immersion classroom are working on a collection of poetry, and use computers to construct a website to store and display the poetry. Here the computer (the website, more precisely) is an alternative to publishing the poetry in printed form. But using the computer involves much more than just changing from one medium to another: it brings about potentially huge changes in classroom processes.

In the second example, a group of young adults in an intensive ESL program use the technology to construct websites on a variety of cultural topics. What connects the two examples is the use of technology as a tool, and a project-based curriculum designed to take advantage of the possibilities for collaborative, challenging and motivating work that technology can offer. Thus, technology is here not treated as an alternative to classroom work (in the sense of lab versus classroom, or computer-mediated work versus face-to-face interaction); rather, the settings examined suggest that technology can be used to simply enhance good language teaching practices (if we assume that such practices include autonomy, meaningful interaction, challenge, and variety in linguistic expression and engagement). In a sense then, the issue is not to 'prove' that computers and other technologies are beneficial or detrimental but, to paraphrase Humpty Dumpty, the question is: who is to be master.

The two examples are similar in that they both illustrate project-based learning: students collaborate on long-term projects that are in some ways structured by the teachers, and to some extent allow students to choose their own topics, procedures, and goals. Beyond that commonality, the two settings also have huge differences. The first setting, a public elementary school in which both mainstream and language minority children are enrolled, faces a number of challenges that the second one does not. These challenges require that we examine wide-reaching features of the context, at the level of school, family, society and politics. The second setting, an intensive ESL program in a private university, can be described without such a mandatory scrutiny of the context, since it does not face the same challenges. In sum, then, how wide the net of contextual research is cast, within an ecological approach, depends very much on features of the setting and the participants.

A major question is whether findings in settings of type 1 have anything of relevance to say to setting 2, and vice versa. In many respects there may be severe limits on generalizability. However, at the level of classroom pedagogy and the practical procedures of project-based teaching and learning, there are many things that can be shared, and many more that may be transformed. I will return to some of these implications in the conclusion.

2. BEYOND INPUT/OUTPUT: A NOTE ON RESEARCH

I mentioned above that traditional types of research have not been able to show clear patterns in the effects of technology on learning contexts or on learning outcomes. How are we to conceptualize, frame, and carry out the “new and flexible methodologies” advocated by Mandinach and Cline (1997)? What are the principles for designing the types of studies that are needed?

One of the reasons that traditional research models do not work is that technology is a moving target: as soon as the description of a particular software or hardware appears in print, it is rendered obsolete by a new version or a totally different way of doing things. Research needs to reflect this ‘moving target’ aspect of technology. Therefore it cannot proceed by the traditional methods of measuring inputs and outputs, and isolating dependent and independent variables.

A more appropriate way of approaching the issues at hand is by looking at various kinds of contextualized research, action research, and recent advances in systems theory (such as the “soft systems” methodology of Peter Checkland, 1981) and chaos/complexity theory (Cutright, 2001; Godfrey-Smith, 1998). All these types of research (contextualized, action-including intervention, systems, and chaos/complexity) share elements that are compatible with an ecological approach to technology-mediated learning. But there are other elements that stand out in an ecological perspective: the fact that we are looking for relationships and processes rather than products and outcomes; our focus is on the ways in which new patterns of organization and knowledge emerge in a situation of change; we are concerned with the quality of the educational environment and the learning opportunities it affords—and explicitly with the values and ideals we wish to promote in our educational work. The view taken here is that research is never neutral, though it often pretends to be. Educational research cannot afford to be neutral: too much is at stake.

The characteristics of ecological research mentioned above together constitute a scientific outlook and a human world view which is quite different from the traditional researcher’s cause-effect, product-oriented, context-reduced, value-free and detached stance. In the following brief account of two different project-based classrooms, these principles of ecological research provide the backdrop to our discussion.

3. COMPUTER CLASSROOM RESEARCH

That teaching and learning in action are difficult to research, even without the new element of technology, is not new or surprising. The same was the case in the early days of classroom research (Chaudron, 1988; Van Lier, 1988; for a recent overview, see Allwright, 1997). Since then a number of ways of studying pedagogical activity in context have been proposed and implemented, following models from the social sciences (e.g. Engeström’s activity theory, 1996), and from contextualized research in general education, such as situated learning (Lave & Wenger, 1991), communities