BILINGUALISM IN DEVELOPMENT

Language, Literacy, and Cognition

Ellen Bialystok
York University

CAMBRIDGE
UNIVERSITY PRESS

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, UK
40 West 20th Street, New York, NY 10011-4211, USA
10 Stamford Road, Oakleigh, VIC 3166, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain
Dock House, The Waterfront, Cape Town 8001, South Africa

http://www.cambridge.org

First published 2001

Printed in the United States of America

Typeface Sabon 10/13 pt. *System* MagnaType™ [AG]

A catalog record for this book is available from the British Library.

Library of Congress Cataloging in Publication Data
Bialystok, Ellen.
Bilingualism in development / Ellen Bialystok.
p. cm.
Includes bibliographical references and index.
ISBN 0-521-63231-5 – ISBN 0-521-63507-1 (pb)
1. Bilingualism in children. 2. Language acquisition. 3. Language awareness in children. 4. Cognition in children. I. Title.
P115.2 .B5 2001
401′.93–dc21 00-045520

ISBN 0 521 63231 5 hardback
ISBN 0 521 63507 1 paperback

Contents

I

Faces of Bilingualism

Picture a bilingual child. What languages does this child speak? What kind of neighborhood does she live in? What are the educational arrangements that either support or demand bilingualism? Are any of the child's languages spoken in the community outside the home? What were the circumstances that led to her bilingualism? How long has the child been living in the present country? By changing even a single answer to this small sample of questions, the child being described is importantly different from one who would have elicited a different answer. Is there a common experience that unites this diversity of children? Is this common experience reflected in some deeply rooted element of their intellectual development? Does bilingualism in early childhood influence the nature of children's cognitive development?

These questions presuppose a more basic issue: How do we decide who is bilingual? We all know shreds of other languages although we would hesitate to include those imperfect systems as evidence for our bilingualism. Children's knowledge of any language is incomplete compared with that of an adult. At what point does a child have enough command of two languages to be declared bilingual? In part, the answer to that depends on how the two languages were learned and to what purposes they are put. But that does not solve the problem of deciding what is entailed by partial knowledge of one language for a child whose linguistic knowledge of *any* language is partial at best.

Experiencing Bilingualism

For adults, the idea of an "uncontaminated" monolingual is probably a fiction. At the lowest levels of knowledge and awareness, exposure to fragments of other languages is unavoidable. No language is immune to

intrusion from the barrage of words and phrases that rise out of one language and through their universal appeal deposit themselves squarely into the lexicons of another. The phenomenon can reflect cultural prestige (*blasé, rendezvous*), the seat of power for commerce (*computer, Big Mac*), the lineage to intellectual tradition (*Zeitgeist, Angst*), or the fascination with a slightly exotic culture (*chutzpah, schlep*). But we would resist describing the speakers who incorporate these terms into their conversations as bilingual. Often, many of these borrowed words are not even recognized for their linguistic origins.

More language knowledge surely follows from the ubiquitous foreign language requirements that most of us were required to complete at some point in our lives. This experience may have left us with many things, but fluent command of that language is probably not one of them. English-speaking students of Spanish would hardly qualify for an educational program conducted in Spanish, and Japanese-speaking students of English struggle to formulate the most rudimentary utterances in English. Nonetheless, each of these instructional experiences leaves the student with some facility in the language, perhaps more strongly developed for one modality (reading or speaking, for example), and a level of comfort in recognizing some forms and structures. Again, these students would be unlikely to describe themselves as bilinguals.

Some people live in home environments where the language of the extended family reveals an ethnic, cultural, or national background that is different from that of the community. Here the adults can function in two languages, and children born into these families may well learn some of that heritage language through familial interaction. In some of these situations, home bilinguals are created by the deliberate decision of parents to speak to the child in a different language, usually with one parent speaking each language. In other cases, casual knowledge that the child picks up in conversation can be supplemented by extra language classes – the familiar Saturday or Sunday schools organized by various communities. Often, however, there is little opportunity for formal study of this language and little expectation that the child will learn much of it, apart from that needed for ordinary domestic routines.

In some communities, bilingualism is simply expected. In these cases, the social organization of language at home and at school gently and irrevocably places children in the position of acquiring two languages. Some of this type of bilingualism is a legacy of colonialism. Following independence, many countries maintained the colonial language (notably, English, French, Portuguese, Spanish, or Dutch) in most of their social and

official functions even though it was not a first language for the majority of the population (Ellis, 1994). In Papua New Guinea, most children learn a local language and Tok Pisin, the standard vernacular, before they enter school where the language of instruction is English (Skutnabb-Kangas, 1981). In the Philippines, children may learn one of seventy languages in the home before being immersed into English and Filipino instruction at school (Galang, 1988). In Hong Kong where 99 percent of the population is Chinese-speaking, English remains prevalent (Wong, 1988). English is also the official language of Nigeria adopted from its colonial days, while for Zaire, it is French (Ellis, 1994). These situations all demand that children have high levels of proficiency in at least two languages.

Children who encounter another language in these ways experience different kinds of interactions with each language, interact in different types of social situations with each, encounter different opportunities for formal study, and may also develop different kinds of attitudes to each language. For these reasons, the various configurations that lead to bilingualism leave children with different levels of competence in each of the languages. When we think of bilingual children, we think of those who appear to function equally in two languages, move effortlessly between them, and adopt the appropriate sociocultural stance for each. Indeed, it is an impressive sight to observe a young child, perhaps four or five years old, engaged in conversation in different languages, controlling both, and not struggling at the first sign that the language needs to change to accommodate some benighted monolingual in the group. Even these children, however, may have experienced a broad range of circumstances that importantly alter the nature of their bilingualism.

Romaine (1995) describes six patterns of home language bilingualism, each one different, and each difference relevant. These patterns combine values on social and linguistic dimensions, taking account of both the minority or majority status of each language and the linguistic input received by the child. The six types are:

Type 1: one person, one language
Type 2: nondominant home language/one language, one environment
Type 3: nondominant home language without community support
Type 4: double nondominant home language without community support
Type 5: nonnative parents
Type 6: mixed languages

In each case, she identifies the relevant differences and lists the major research studies. This is a useful inventory of the circumstances children experience in bilingual language acquisition. All these children become bilingual at home, but all of them are learning their languages under different conditions that undoubtedly lead to different levels of competence in each. These differences are not pursued here but considered as variants of the experience of learning two languages in the home.

The proficiency achieved from different experiences can vary on other dimensions besides absolute competence. Dopke (1992) distinguishes between productive bilinguals and receptive bilinguals. The first is the familiar configuration of speaking two languages to some degree of competence; the second is the common but less often acknowledged arrangement in which an individual can understand or possibly even read a second language without being able to produce it.

Who Is Bilingual?

Who shall we include in the study of development in bilingual children? Is there a formal criterion for proficiency that will point to the relevant group of children? Academic speculation on this matter does not solve the dilemma. Views vary from Bloomfield's (1933) insistence that a bilingual has full fluency in two languages to the more pragmatic assertion by Grosjean (1989) that a bilingual is someone who can function in each language according to given needs. We return to this problem of defining proficiency below.

Begin with the formalities that are necessary for deciding about proficiency in a language. There is less consensual agreement about the structural formalisms of language than we might wish. For example, as speakers of English we feel confident that we understand the definitional criteria for what constitutes a *word*. Yet speakers of some other languages, notably Chinese, have little understanding of what we mean by word since that unit essentially does not exist in Chinese. When native speakers of Chinese were asked to divide a Chinese sentence into words, they first complained that the instruction made no sense and then produced a highly variable set of responses (Miller, Zhang, & Zhang, 1999). This example illustrates that we cannot take for granted the absolute and universal structure of language; our categorical and objective notions of what languages look like are not necessarily accurate.

It is not only the problem of setting identifiable limits on speaker's proficiency that blurs the boundaries of a clear notion of bilingual. An-

other aspect of uncertainty is introduced by examining the particular languages in the bilingual mix. We think of bilingual individuals as those people who are able to speak two (or more) languages, to some level of proficiency, but identifying what counts as a language is not a straightforward judgment. We take for granted that we know what languages are – where one stops and the next one starts. That notion, too, is illusory: the delineation of individual languages is often a matter of decree. The formal differences that divide some languages, such as Dutch and Flemish or Hindi and Urdu, are far smaller than those that divide dialects of the same language, such as versions of Chinese or Arabic (Fabbro, 1999; Spolsky, 1998). In China, it is normal for people to know both an official language and a dialect. These variants can be significantly different from each other. Some languages, such as Arabic and Malasian, are diglossic. In these cases, different styles of language are required in different settings, but the differences between the styles can be as great as the differences between acknowledged languages. In diglossia, one form of the language is used as the vernacular for informal and social purposes and another is used as the institutional form for formal, educational, or religious functions.

Children can also become bilingual by learning only one spoken language. In these cases, children might learn a spoken language (perhaps English) and a sign language (perhaps ASL), a system that is the same as a natural language in every respect (Klima & Bellugi, 1979). It is normal for hearing children of deaf parents to learn these two languages simultaneously in childhood, acquiring both in a completely natural manner from their environment. Additionally, some children learn two or more sign languages either with or without any spoken languages. Although there is little research on these situations, the data that do exist confirm that the bilingual acquisition of two languages, one signed and one spoken, by young children has precisely the same in pattern and trajectory as that for the acquisition of two spoken languages (Johnson, Watkins, & Rice, 1992).

Bilingualism also carries a psychosocial dimension that can itself profoundly affect children. The language we speak is instrumental in forming our identity, and being required to speak a language that is not completely natural may interfere with the child's construction of self. Children who are bilingual because of relocation, particularly unwanted relocation, may resent the new community language they have learned in spite of their proficiency with it. Appel and Muysken (1987) describe how some of these factors affect bilingual children by accounting for the attitudes to the language and the role of language in establishing ethnic and cultural

affiliations. These factors undoubtedly have a strong causal role in determining how competent children ultimately become in each of their languages and the purposes for which they are eventually willing to use each.

The situations described above indicate some of the multidimensional aspects of bilingualism and the complexity of defining the circumstances that point uniquely and unambiguously to a set of bilingual children. All the children in those examples are bilingual, even though their lives betray very little of that common experience.

Methodological Complications

The intention of this volume is to examine how bilingualism influences the linguistic and cognitive development of children. As we have seen, however, the designation of the subjects of study, namely, bilingual children, is not straightforward. Criteria are needed, but there is a potential circularity in specifying what those criteria might be. Consider, for example, that a decision is made to include all children who have even very limited competence in a second language as bilingual, and then study their development in contrast to absolute monolinguals. Using this approach, it may emerge that bilingualism has little impact on children's intellectual growth. That conclusion, however, may be too heavily weighted by the children whose second-language competence was restricted. If the research showed that limited competence in a second-language does not lead to the same consequences as more balanced mastery, then that would be grounds to eliminate marginally bilingual children from the inquiry. The problem is that we could not know that until the data were examined. Conversely, an early decision to apply restrictive criteria to the definition may exclude some children who were nonetheless affected by their linguistic background. Using a different approach, it may be discovered that even modest control over another language adjusts the dimensions of children's development. This conclusion would have been forfeited by an overly restrictive set of criteria. The problem is that the decision about who to include as bilingual must precede the evidence for what effect bilingualism has on these children, a situation that is logically reversed.

Nevertheless, restrictions must be made. The earlier examples of situations that lead to some small measure of control over another language for children illustrate the complexity of determining the parameters for childhood bilingualism. Children become bilingual for many reasons: immigration, education, extended family, temporary residence in another country, dislocation, or simply being born in a place where it is assumed that

bilingualism is normal. These precipitating conditions are often associated with a set of correlated social factors, such as education level of parents and parental expectations for children's education, degree and role of literacy in the home and the community, language proficiency in the dominant language, purposes for which the second language is used, community support for the second language, and identity with the group who speaks the second language. Children's development is affected by all of these factors. The constellation of social, economic, and political circumstances of life have a large bearing on how children will develop both linguistically and cognitively. If bilingual children differ from each other in these dimensions, as they surely do, then they will also differ in the way that their bilingualism has interacted with the highly variable dimensions of their linguistic and cognitive development. Therefore, any averaging of relevant developmental indices across the conditions for becoming bilingual will be confounded with an array of hidden factors that crucially influence development.

Another factor that complicates the equation is that languages can be used for different purposes. It is reasonable to suppose that, all else being equal, the uses for which a child must employ the second language will influence the way in which it impacts on cognitive development. Grosjean (1996) notes that this issue is partly responsible for the fact that bilinguals rarely develop equal fluency in their languages. He discusses how different causal factors, such as migration, nationalism and federalism, education, trade, and intermarriage, lead to different uses of each language in each setting. The proficiency that the child develops in each language, therefore, is a specific response to a set of needs and circumstances. Some of these specific functions become embedded as immutable aspects of language proficiency: bilingual adults routinely count and pray in the language in which they first learned these behaviors (Grosjean, 1996; Spolsky, 1998).

To understand the role of bilingualism in children's development, therefore, not only must bilingualism be defined precisely but also must it be separated from the myriad of social conditions with which it is correlated and linguistic contingencies with which it is confounded. This is not easily done. The procedure for discovering how bilingualism impacts on development is to engage in controlled research, but these definitional ambiguities mitigate against the creation of a clean empirical design.

In constructing research designs, the attempt is to identify the factors, or independent variables, that create potentially relevant groups. Sometimes the factors are included in order to dismiss their role in behavior, such as including gender in a design when it is hoped that no gender

differences emerge. In a balanced design, the differences between groups lead to simple inferential conclusions. If the difference between groups is not statistically reliable, then the conclusion is that the two groups are the same. For example, a set of results indicating that a group of male and female participants who are otherwise comparable scored the same on a concept formation task would lead to an acceptance of the null hypothesis, namely, that gender (the independent variable) is irrelevant to performance. Sometimes, as in the case of gender, it is desirable to be in a position to accept the null hypothesis.

The more interesting aspect of research design is in constructing the independent variables that we wish to use as a basis for rejecting the null hypothesis. We want a difference to emerge between groups and we would like statistical evidence that the difference is reliable. Usually, this is relatively straightforward. We may believe, for example, that a significant change in performance occurs at a certain age, or in a specific instructional program, or for speakers of a particular language. The procedure is then to assign participants to levels or groups determined by these independent variables, such as age, program, or language. The reason for this is probably due more to limitations of analytic sophistication than conceptual imagination. In other words, the procedures for analyzing the data require this categorical assignment to groups, even if our conceptual notions are more graduated. Simple judgments about membership in a level of the independent variable are central to carrying out the statistical analysis, an indispensable step toward making empirical conclusions.

There are two problems when this empirical model is applied to the study of bilingual children. The first is that bilingualism is not a categorical variable. Any assignment of children to a group labeled either bilingual or monolingual is an obfuscation of the complexity of the concept of bilingualism and a diminishment of the intricacy of children's language skills. Bilingualism is not like age, or gender, or grade, or any of the usual variables we use to classify children in developmental research. At best, bilingualism is a scale, moving from virtually no awareness that other languages exist to complete fluency in two languages. At what point on this scale do we declare children to be bilingual? How do we conduct research on the impact of a variable that we struggle to define?

In the ideal research design that compares performance across groups, the two groups are exactly the same except for the single independent variable we have chosen to study. This clear divide between the groups is necessary if we are to interpret any performance differences that emerge between them. With everything else being equal and controlled, signifi-

cant differences in performance that may emerge can be attributed only to the single dimension that divides the otherwise equivalent samples. It is then a straight line from examining the data to interpreting the meaning conveyed by those results.

The second problem is in the equivalency of the groups, even if categorical placements can be achieved. Bilingual children are never *exactly* the same as an otherwise comparable group of monolingual children except for the number of languages they speak. In some inevitable sense, bilingual children live different lives than their friends and neighbors who may be socially, economically, and politically similar but speak only one language. Bilingual children may have different home arrangements, perhaps being cared for by an extended family member who speaks another language. Bilingual children may travel more than monolinguals, making family visits to some other homeland. Bilingual children may spend more time than monolinguals in formal schooling, attending after school or weekend classes in their other language. Any of these differences that come with the bilingual experience may itself have an impact on aspects of language and cognitive development, aside from the bilingualism per se.

This situation presents an immense challenge to research. Controlled investigation of the impact that bilingualism might have on children's development requires that bilingual children are compared with equivalent monolinguals on specific aspects of performance. In the absence of a truly ideal control group, every effort must be made to assure that the experiences encountered by the two groups of children in the study are as comparable as possible. Additionally, it is imperative that an assessment of broad intellectual functioning take place to provide empirical confirmation that, on important developmental indices, the two groups are operating at the same cognitive level. The approach to handling this design problem is to make every effort to minimize the effect of extraneous variance by being scrupulous in designing the research studies. The only alternative would be to maintain an excessively purist attitude and refuse to participate in research that did not conform to the most rigorous definition of design control. That option, which would paralyze any scientific examination of the development of bilingual children, seems to be both unnecessary and indefensible.

Where the Research Looks

Research on bilingualism probably fails to reflect its diverse reality. The considerations that constrain research studies normally prevent many

types of bilingual children from being included in scientific inquiry. An important source of evidence for how bilingual children develop language and cognitive skills comes from carefully recorded diary studies. Such accounts were among the first evidence for the nature of bilingual development, beginning with Ronjat (1913), reaching an important level with Leopold (1939–49), and proliferating greatly after that (Arnberg, 1979; Fantini, 1985; Hoffman, 1985; Saunders, 1982; Taeschner, 1983; Vihman, 1985; Volterra & Taeschner, 1978). These studies form an essential part of the database. They cover diverse languages, different home arrangements, and together include a reasonably large number of children. The majority of these accounts, however, reflect a single reality: an educated middle-class family that has made a conscious decision to raise the children with two languages. Although this does not undermine the reliability of the descriptions produced by these studies, it does leave open a question about their generalizability to other social contexts. This issue is discussed in Chapter 8.

Proficiency; or, When Is Enough *Enough?*

The problem of knowing who is bilingual conceals a more basic question: how much is enough? Who among us does not know pieces of some other language – words or phrases, perhaps a rule or two, and some social routines for greeting, toasting drinks, or asking directions? These fragments hardly count as competence in the language, but how much more is required before some implicit threshold is reached? Accepting the standard assumption that no bilingual is ever equally competent in both languages, how much language is needed before we agree that a person is bilingual?

The answer depends on how we define language proficiency. We talk about language as though it had concrete existence and could be measured by scientific instruments. We describe the acquisition of language as though we move irrevocably from a state of innocence to one of mastery along a predictable path. We identify language impairment, language delay, and language precocity without ever specifying the standard against which these cases are to be judged. We use "language" in research designs as both a dependent and an independent variable, choosing fragments to serve as stimuli but concluding truths that define the domain. But what is the norm for language competence? What do we mean by language proficiency? What are its components and what is the range of acceptable variation? Although these questions may seem to be prior to any use of

language as a research instrument or conclusion about language ability in individuals, they rarely if ever are explicitly addressed.

There is an intuitive sense in which the question of judging proficiency seems trivial: we find the task of rating speakers along various dimensions, for example, for their pronunciation or grammatical correctness, to be straightforward and meaningful. These judgments, however, tend to be based on holistic impressions, the details of which elude us. What features of language are most important? Joseph Conrad obviously had masterful command of English grammar but reputedly appalling phonology. Skilled mimics can sound like a native speaker of anything while producing virtual gibberish. How can a term that has such wide application be so lacking in definitional rigor?

For a theoretician, a definition is specific to an epistemology, a set of assumptions and principles about what language is, how it is learned, and what is entailed when it is used. Different classes of linguistic theories are derived from different epistemologies and therefore lead to different conceptions of language proficiency. The two major perspectives in linguistic theory are formal and functional approaches. These theories differ in many ways, but their assumptions regarding the mechanisms for language acquisition and the nature of language proficiency are strikingly disparate. In general terms, formal theories posit endogenous mechanisms for language acquisition that lead to uniform and universally prescribed rule systems. Functional theories posit exogenous factors for acquisition based on social interactions that lead to specific linguistic forms being extracted from these encounters and building up over time into more formal linguistic rules. A more detailed comparison of these theoretical orientations is presented in Chapter 2. For the present purpose, the important point is that each perspective considers different linguistic dimensions to be essential. Therefore, for each orientation, the criteria for determining language proficiency are rooted in different domains.

Summarizing the conception that arises from each position, we have the following. For formal linguistic theories, language proficiency is the reflection of circumscribed and specialized knowledge that is an elaboration of an abstract template. This template is part of the inheritance of humans and develops with little need for social manipulation, provided children are placed in normally functioning environments where a community language is heard. It is frequently related to cognitive theories in which many such specialized modules coexist, each with their own dedicated knowledge and procedural specifications. For functional linguistic theories, language proficiency is the reflection of cognitive processes that

extract regularities from the environment and record those generalities as knowledge. In this sense, linguistic knowledge is no different from other kinds of knowledge of the world – knowledge about the nature of objects and categories, for example – and becomes part of the child's knowledge. The mental representations for language are equivalent to the mental representations for any other aspect of children's knowledge of the world. Interaction is crucial for the accrual of this knowledge.

There is no doubt that these are different conceptions of language proficiency. Does one provide the correct description? For formalists, language is defined by its structure; for functionalists, it is defined by its meanings. Is there a way of measuring one or both of these aspects that will yield an objective assessment of language proficiency?

Measuring Proficiency

If language proficiency is entailed by both of these perspectives, then it may result in a concept so broad that it serves only to deposit a nightmarish disarray at the door of those whose responsibility is language testing and assessment. However, the strategy of excluding parts of the story leaves researchers in a worse situation. Should the criteria for proficiency be based on broad abstractions or concrete details? To recast the question in Chomskian terms, are the correct criteria the abstract formalisms of competence or the actual rules revealed through performance?

Part of the resolution to the measurement problem is in the difference between criterion-referenced and norm-referenced assessment. In criterion-referenced evaluations, performance is compared with a known standard having objective levels and limits. Progress is easily tracked as learners move gradually along the scale toward the objectives that signal higher levels of competence. Higher scores mean higher competence, and there is usually a level of perfection that additionally defines mastery. Using a trivial example, height can be measured on a criterion-referenced scale showing growth from childhood into adulthood, the eventual goal. The approach also has wide application in language research. The objective judgments about a language learner's mastery of the standard rules of structure, morphology, and pronunciation are part of the observable progress that signals the process of language learning.

The "nativeness" of the learner's speech is another matter and is not so easily captured by lists of features and sets of criteria. Assessments that are outside the boundaries of purely formal prescriptions cannot be conducted through consultation to a set of rules. One of the problems is that

the prescriptive rules provide an incomplete and somewhat inaccurate account of what native speakers really do with language. "Performance" is not simply different from "competence"; it is systematically different. Speech communities adopt characteristic styles of speech and accept specific digressions from the rules. The only option for evaluating language learners on these grounds is to make subjective comparisons that estimate how close the learner comes to behaving as a native speaker. These judgments must be made by norm-referenced evaluation. For this, there are no absolute criteria for performance that exist outside the use of the system by a group. Norm-referenced evaluation compares an individual with the other members of a particular class, group, or community. Using height again, adults can be described by their height relative to other adults.

How do we arrive at the standards that define the norm-referenced criteria? Consider the problem of deciding about standard native-speaker English. The easiest way to do this is to construct a mental model of the prototypical native speaker and use that mold as the template for judging other speakers. But will different judges create the same template? The received pronunciation versions of English that are broadcast on the nightly news by the BBC in Britain, the CBC in Canada, NBC in the United States, and ABC in Australia, to name just a few, are identifiably different from each other. The problem becomes even more complex when we move from the acknowledged purveyors of linguistic standards, namely, news anchors, to the great unwashed territory of real people. Looking only at England, the disparity between the language spoken by the BBC broadcaster, a clerk in Yorkshire, a farmer in Devon, and a teacher in East London is undoubtedly greater than that among the international examples listed above. What is the appropriate yardstick against which we should measure learners of English as a second language? At what point would we decide that a learner's proficiency is so advanced that they have achieved native-speaker competence? These are difficult questions but neglecting to address them does not eradicate the problem.

A Process Approach

We need to make the construct of language proficiency stand still long enough to be a meaningful measure of the knowledge and skill individuals have with language. We need to establish fixed criteria that supersede the theoretical squabbles and point to critical landmarks in language mastery. These are lofty goals, but without some framework for evaluating progress it is impossible to produce meaningful descriptions of the acquisi-

tion of language, let alone its potential impact on development. The intention here is not to solve the problem but rather to simply point to approaches that may eventually provide a fruitful resolution.

Ultimately, language proficiency must include both formal structure and communicative application; it must evolve from a prepared mind and be nurtured by a supportive context; it must set clear standards of use and include disparate (but systematic) variations of the rules. We need a way of organizing this multiplicity into a coherent statement about the human potential to learn and use language. If there is no agreement about what is included in language proficiency, then any explanation that attempts to probe some of the more profound mysteries of language will be incomplete.

One way to take account of these perspectives is to adopt a process-oriented approach to language proficiency based on identifiable cognitive operations. This method would ideally set the boundaries of proficiency, acknowledge variability, but still provide some metric for gauging a learner's position, preferably on a number of dimensions.

Cognitive Dimensions of Language Proficiency

A framework proposed in earlier work for considering the relation among different uses of language and their underlying cognitive requirements may provide a starting point (e.g., Bialystok, 1991a). This framework is described more fully in Chapter 5. Two cognitive processes, analysis of representational structure and control of attention, are set out as orthogonal axes which define a Cartesian space indicating their degree of involvement in each quadrant. Language tasks, or language use situations, can be located in the Cartesian space to indicate their relative reliance on each of these cognitive processes.

The cognitive process of analysis refers to the level of explicit structure and organization that is represented with knowledge. A significant change with development is that mental representations of knowledge become more explicit and more structured. Children increasingly are able to know not only unrelated facts but also the relationship among various concepts and ideas. Other theoretical perspectives have described this development in different terms; for example, Karmiloff-Smith (1992) points to representational redescription as the fundamental cognitive change for children, and Zelazo and Frye (1997) describe cognitive complexity as the mechanism for cognitive development. Both of these perspectives describe a process similar to the role that analysis of representational structures plays in building up mental representations. Control refers to the level of

attention and inhibition recruited during cognitive processing. These mechanisms of attention regulate the access to and activation of the mental representations that are involved in performing various tasks. It bears some resemblance to the notion of agency described by Russell (1996).

As a first rough measure, three broad domains of language use – oral, literate, and metalinguistic – can be positioned in terms of their cognitive demands, giving the impression of a linear development from the first to the last. Each subsequent domain roughly requires higher levels of both analysis and control. This progression is shown in Figure 1.1. The linear impression is created because the underlying cognitive processes increase equivalently with each transition. The domains are only broad categories and conceal great variability within each, so a more detailed array can be constructed for each domain.

Imagine now a closeup of the domains individually. Under a larger magnification, a single domain could be expanded to fill the space of the whole matrix, because it too consists of graduated variability along both cognitive dimensions. For example, the oral domain could be spread out with various oral language activities dispersing across the space. Oral language uses include highly skilled functions such as lecturing and more common activities such as casual conversation. This diversity is illustrated in Figure 1.2. The cognitive demands, and hence the degree and nature of language proficiency involved, are strikingly different in these two cases. Similarly, children's conversations, consisting of short utterances situated in the "here-and-now," make the lowest demands on cognitive processes, but conversations in a second language require both more formal knowledge and highly skilled attention to perform at a reasonable level of proficiency.

The same exercise can magnify and expand the variation concealed by each of the other two broad domains. For literacy tasks, reading and writing at different levels of competence (for example, beginning vs. fluent reading), for different purposes (for example, studying vs. skimming), or in different genres (for example, fiction vs. poetry) are based on different levels of these underlying cognitive processes and convey different levels of language proficiency. These are shown in Figure 1.3. Finally, metalinguistic tasks, often used as the quintessential evidence for language proficiency, also differ among themselves in these ways. Some examples of these tasks and their relative placement in this matrix are shown in Figure 1.4.

A framework still needs to be integrated with a set of formal criteria. The procedure would be to include some of the product-oriented sets of

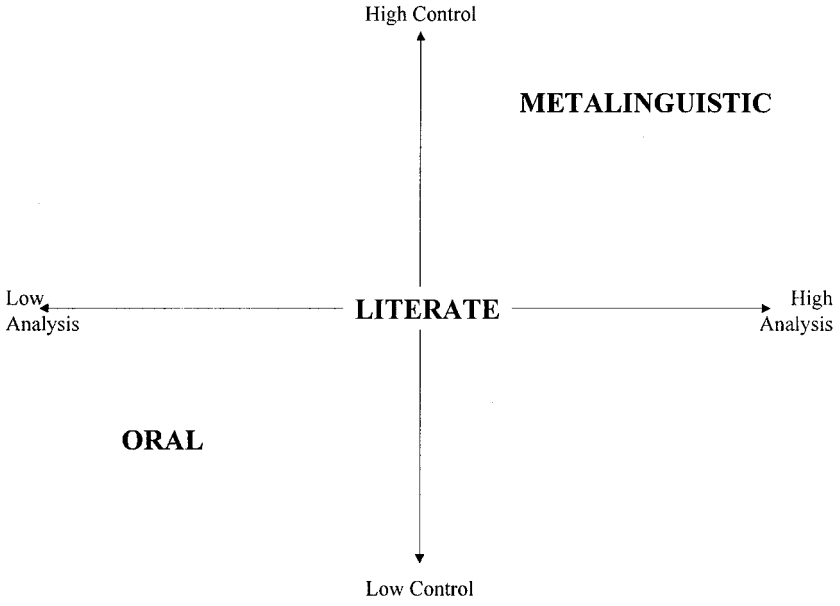

Figure 1.1. Three domains of language use indicating values on analysis and control.

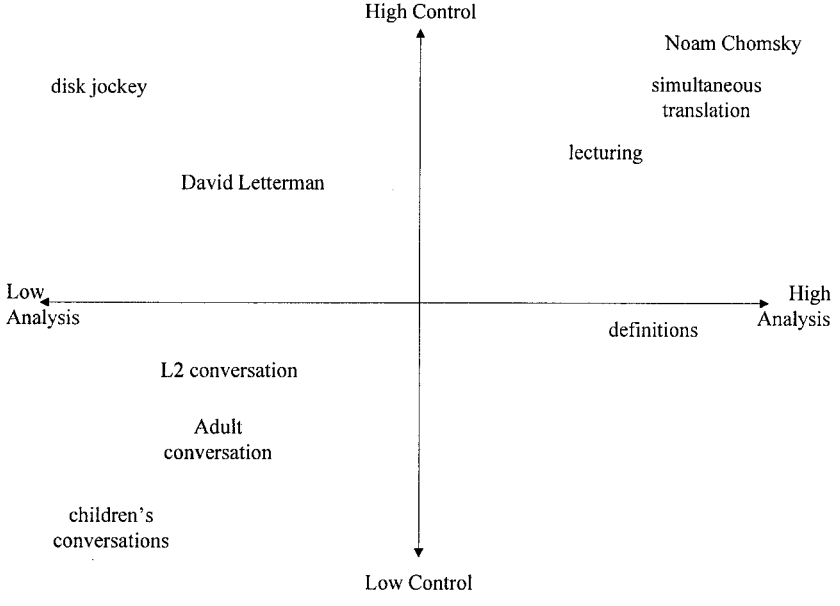

Figure 1.2. Tasks included in oral uses of language indicating their demands for analysis and control.

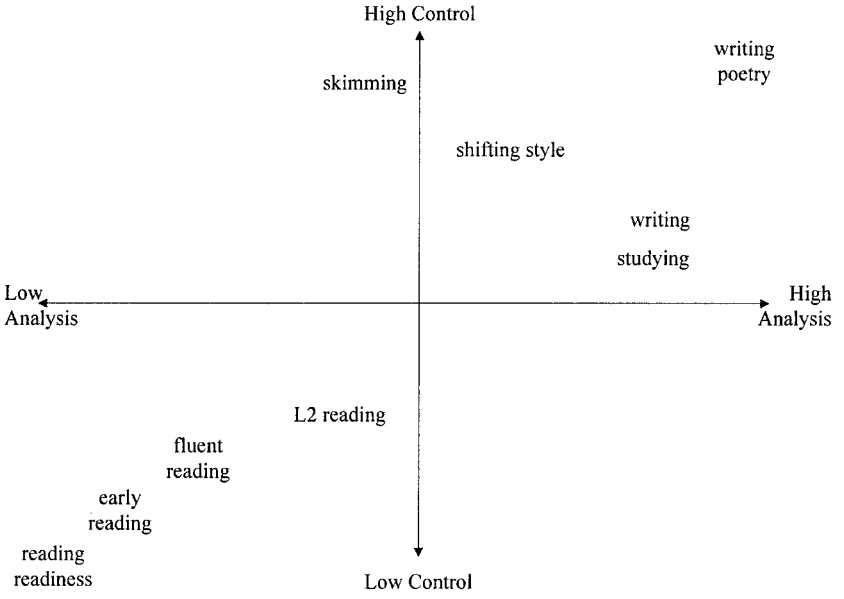

Figure 1.3. Tasks included in literate uses of language indicating their demands for anlysis and control (L2 = second language).

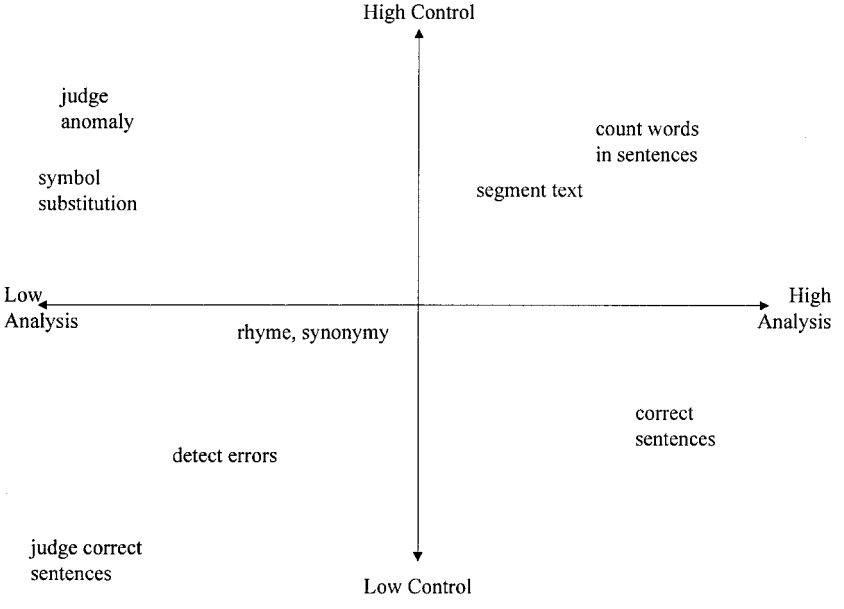

Figure 1.4. Tasks included in metalinguistic uses of language indicating their demands for analysis and control.

abstract linguistic features that define formal linguistic theories in this process-oriented account. In that way, the absolute, formal, or criterion-referenced standards would be stated separately for situations that share a functional and processing context. Research questions, then, could be made precise enough for the appropriate measures of proficiency to be constructed. For example, research that has ostensibly examined the viability of the critical period hypothesis for second-language acquisition (see discussion in Chapter 3) has usually examined only one or two aspects of language proficiency but made claims about the question at large. A more differentiated approach to explaining proficiency would allow us to say what it would mean to function like a native speaker across several domains and then to evaluate the success with which language learners approximate those performances. This approach would likely eliminate simplistic conclusions that force a choice between two opposing positions and compel us to consider a more complete set of factors in our conception of language learning. Allowing for a more nuanced explanation by removing false dichotomies and incorporating degrees of variation along specified dimensions will advance theorizing around many questions (Bialystok, 1998).

Toward a Definition

Where does this leave a definition of language proficiency? The primary consequence of this process-oriented approach is that it eliminates the possibility of constructing an overriding definition that includes the range of skills arrayed on these matrices. There can be no single statement that captures the multidimensionality conveyed in this view. Instead, the definition needs to set constraints and limits, pointing to critical areas. Language proficiency is the ability to function in a situation that is defined by specific cognitive and linguistic demands, to a level of performance indicated by either objective criteria or normative standards. The proficiency displayed by children as they learn language is just as valid as the proficiency of a highly skilled native speaker engaged in a formal debate, but the demands of each situation are different in ways that can be systematically captured.

This sets out two agendas for assessment. The first is to establish the criterion-referenced achievements that provide a guideline by which we can assess the proficiency of language learners. The second is to embed these descriptions into a context that is sensitive to the age, proficiency level of the learner, and the linguistic functions they are required to carry out. This embedded inventory is the norm-referenced protocol. These

tasks are complementary, and it is difficult to think that one could be achieved independently of the other. Advances in testing sophistication, developmental psycholinguistics, and sociolinguistic frameworks are the background against which these assessments will emerge. Ultimately, the aim is to have an objective means by which we can judge the bilingual proficiency, as opposed to the monolingual proficiency, of young children.

Those pronouncements about the mandate for test developers are intended to set out a long-term project that will introduce rigor into the description of language proficiency. It would allow us to know, for example, that the reading comprehension of a ten-year-old who has been studying English in school for three years should be at a specific level, or the oral conversational fluency of an eight-year-old with a particular background in English should be at some other level. But that is a different point from the need to have formal criteria for deciding on who is to be included in the category of bilingual. Most research takes a rather casual approach to this question. In case study research that tracks the development of children's two languages, the amount of input in each and consequently the amount of language acquired in each is very different. In cross-sectional designs that compare bilinguals and monolinguals, parental report is often the only indicator of the children's language competence. More carefully designed studies include some proficiency testing in both languages, but this is not always done.

So we come full circle. Having strongly asserted that a proper definition of language proficiency is at the core of investigations of language, we have avoided confronting it in any serious way. At present, at least, there are no objective tests or accepted standards. Children cannot be subjected to a simple assessment and classified for their position on some absolute scale of bilingualism. The insurmountable problem from a methodological perspective is simply that bilingualism is not a categorical variable.

What we need to do is to constantly be aware of the issues. Research with bilingual children must minimally specify how the important variables distribute in the sample and how they have been controlled in the selection of research participants. Participants need to be comparable on the dimensions that matter – monolinguals and bilinguals must represent similar social backgrounds, and bilinguals must use their two languages in the same types of contexts. Ideally, proficiency tests that assess competence in the same type of language use that is being tested in the research should be routinely administered to participants, and the bilinguals should be assessed in both languages. Clearly, this is not always feasible.

For the most part, the studies reviewed in this volume consider that the

bilingual children have functional fluency in both languages. Using formal criteria, especially the type that underlie criterion-referenced tests, this proficiency would probably not be the same for the two languages, and probably not the same as monolingual speakers of either. For example, it is normally the case that bilingual children have a larger productive vocabulary in one of their languages, and that their vocabulary in each language is less than that of a comparable monolingual speaker (see Chapter 3). Still, their functional proficiency in the two languages is equivalent – they can carry on conversations and engage in the same kinds of activities. Vague though this may be, it is an implicit acknowledgement of the myriad factors that comprise fluency. It may in fact be as close as one can come to equating underlying proficiency in two languages as a first step to evaluating the impact of that proficiency on children's development.

Finally, research on the effect of bilingualism on children's development has both a universal and unique dimension. The universal information is that which we can extrapolate to all bilingual children; the unique information follows from the individual circumstances of the children studied in the investigation. We need both, and we need a means of integrating them. The purpose of this volume, however, is to focus on the universal: how do bilingual children learn two languages and what happens to them in early development?