Introduction

This special issue of *Bilingualism: Language and Cognition* is devoted to syntactic aspects of bilingual acquisition. For the purposes of this issue, bilingual acquisition is defined as the acquisition of two languages during the period of primary language development, extending from birth onward. Bilingual acquisition can entail the acquisition of more than two languages (see Cenoz and Jessner, 2000) as well as the acquisition of a spoken and signed language (e.g., Richmond-Welty and Siple, 1999) or of two spoken languages; only studies of the simultaneous acquisition of two spoken languages are reported in this volume. An ideal definition of bilingual acquisition would include not only reference to the age of first exposure to two languages, but also reference to the regularity and extent of exposure to each language. While such stipulations are not necessary in defining the context for monolingual acquisition since virtually all children receive sufficient language exposure to fully acquire one language, they are important considerations in cases of bilingual acquisition since some children have insufficient exposure to two languages, either in terms of amount or continuity, to attain full bilingual proficiency. Arguably, studies of such children could yield different results and lead to different insights about acquisition than studies of children who become fully bilingual, although this is an empirical question. While an understanding of the exposure conditions necessary to attain full bilingual proficiency is worthwhile and, thus, justifies the study of even children who are exposed to two languages but do not ultimately attain proficiency in both, most researchers of bilingual acquisition are interested in those children whom we presume are on their way to full bilingual competence. The dilemma is that we do not know, as yet, what constitutes "sufficient bilingual exposure", either with respect to quantity or regularity, nor do we know how to assess these aspects of exposure with enough validity to be confident in our judgements. The adequacy of exposure is often best judged retrospectively, when the children are older and demonstrate mastery of both languages. This complicates the life of the researcher who cannot wait until his or her subjects are older to decide if they are suitable for intensive investigation. In short, a great deal of judgement is called for when it comes to selecting bilingual children for research purposes to ensure the inclusion of children who actually become fully bilingual.

Caveats aside, the study of bilingual acquisition has had a remarkably long history. The first scientific study of a bilingual child was reported by Ronjat in 1913 and, of course, the classic study by Werner Leopold of his two bilingual daughters was published in four volumes between 1939 and 1949. Relative to what is generally considered to be the beginnings of research on monolingual acquisition – that is, the work of Roger Brown in 1958, this represents an early start for the study of the simultaneous acquisition of two languages. Despite the early work of Ronjat and Leopold, further research remained sparse until the 1980s. We have witnessed a veritable explosion of research activity in the field since the mid-1980s, and it appears to be continuing unabated. Even casual perusal of reference lists in recent books on bilingualism or bilingual acquisition reveals that the vast majority of work is very recent (e.g., De-Houwer, 1990; Hoffmann, 1991; Romaine, 1995; Lanza, 1997a; Deuchar and Quay, 2000).

The surge in interest in bilingual acquisition can be attributed to several factors. First, there is the recognition that contrary to the zeitgeist implicit in linguistic and psycholinguistic research, simultaneous acquisition of two, or more, languages is not uncommon. While we lack definitive statistics, it has been speculated that there are as many or even more children who grow up bilingual as monolingual (Tucker, 1998). Therefore, documentation of the facts of bilingual acquisition and the development of theories to explain these facts are worthy in their own right. Second, theories of language acquisition, which currently are based largely on monolingual children, must ultimately incorporate the "facts" of bilingual acquisition if they are to be comprehensive. Much more research is needed to uncover these facts. Moreover, there is an emerging appreciation among language acquisition theorists that bilingual children provide unique test cases for important issues arising from general theories of acquisition. Slobin demonstrated the power of cross-linguistic research for our understanding of the acquisition of different languages and his work continues to be influential (Slobin, 1997). The study of simultaneous bilinguals

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pushes the power of cross-linguistic research further since bilingual children are their own controls on a number of variables (such as personality, age, cognitive ability, etc) that can confound studies of monolingual children. Indeed, some of the studies in this volume address issues pertinent to general language-acquisition theory – Granfeldt discusses variations of the weak versus strong continuity hypotheses; Juan-Garau and Pérez-Vidal discuss the notion of default parameter settings with respect to subject realization; and Paradis, Nicoladis and Genesee discuss the existence of syntax structures prior to their manifestation in the child's language productions. In short, studies of simultaneous bilingual acquisition can contribute significantly to the development of a general theory of language acquisition.

While bilingual infants and children make unique subjects for language acquisition research, they are not always ideal. In addition to all of the inter-individual variation that monolingual children exhibit, bilingual children bring their own unique sources of variation to research – bilingual children's history in each language can be frustratingly different so that direct comparison of the child's acquisition in each language can be problematic, for example, in cases where developmental progress is significantly skewed towards one language relative to the other. Such variation argues for caution in generalizing the results of single case studies and for the inclusion of multiple-subject designs, where feasible. Careful documentation of the child's language exposure and of the child's general level of language development at critical points in longitudinal studies is also advisable, when possible.

While research on child bilingual acquisition can contribute to general theories of acquisition, current work on bilingual acquisition is also informed by and benefits from recent developments in linguistic and psycholinguistic theory for example, Döpke's analyses in this volume are motivated by the Competition Model (Bates and MacWhinney, 1987; MacWhinney, 1987), and Hulk and Müller's and Granfeldt's work is motivated and guided by theoretical arguments derived from current theories of Universal Grammar (Poeppel and Wexler, 1993; Platzack, 1999). Such cross-fertilization of research domains has not always been evident, but is a welcome development in research on bilingual acquisition, one that will pave the way for greater dialogue between those interested in monolingual first language acquisition and those interested in bilingual first language acquisition.

Research on children acquiring two languages simultaneously can make a unique contribution to our understanding of the human language faculty and by extension the human mind because it permits us to examine the limits of the mind's capacity to acquire and use language. While most theories of language acquisition do not exclude the possibility of bilingual acquisition, nor do they address it explicitly or in detail – they are largely silent with respect to the acquisition of two languages simultaneously. The capacity of the human mind to represent two or more linguistic systems, sometimes with radically different structural properties (e.g., English and Inuktitut in Allen, 1996), in functionally compatible ways has implications for our conceptualization of the neurocognitive architecture that makes this possible. In addition, as we shall see from the Paradis et al. report in this volume, the capacity of bilinguals, children and adults alike, to coordinate their languages in systematic ways during intra-sentential code-mixing speaks of a language capacity that is unique to bi- and multilinguals, although it could be argued that individuals who speak different dialects of a language and use alternative registers of the same language have similar capacities. In any event, there are implications for our conceptualization of mind and brain that are linked to bilingualism and bilingual acquisition that are only beginning to be explored. Further research on bilingual acquisition is critical in these explorations.

Current work on bilingual acquisition is broad in scope and encompasses most facets of language development, including pre-verbal speech perception (Bosch and Sebastian-Galles, in press), emerging phonology (Paradis, 1996, in press; Deuchar and Quay, 2000), early lexical development (Quay, 1995) and socio-pragmatic or communicative aspects of bilingual development (Genesee, Boivin and Nicoladis, 1996; Comeau and Genesee, in press; Lanza, 1997a). The focus of the current volume is morpho-syntactic aspects of bilingual acquisition. Many early studies on bilingual acquisition, although not all (see, for example, Bergman, 1976; Lindholm and Padilla, 1978) argued that bilingual children go through an initial stage in development when they possess one linguistic system (see Genesee, 1989, and Meisel, 1989, for reviews). The most explicit formulation of this hypothesis and the one that made the clearest reference to syntax was that by Volterra and Taeschner (1978) in their now famous three-stage model. According to this model, bilingual children do not possess distinct syntactic systems until the third stage of development (p. 322). Volterra and Taeschner were not alone in holding to such a conceptualization (in addition, see Mürrell, 1966; Leopold, 1978; Redlinger and Park, 1980). It is now generally accepted that children learning two languages simultaneously have differentiated linguistic

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systems from at least the stage of first words, and possibly earlier. Evidence for early differentiation is attested in studies of bilingual children's pragmatic (e.g. Genesee, Nicoladis and Paradis, 1995) and syntactic performance (e.g., Paradis and Genesee, 1996; Meisel, 1989, 1990, in press) as well as in phonological characteristics of their early word productions (e.g., Paradis, 1996; Deuchar and Quay, 2000).

Although the languages of bilingual children may be represented in a differentiated fashion early in acquisition, questions remain concerning the extent and nature of interactions between their developing systems. In other words, differentiated representation could entail developmental autonomy or interdependence. Paradis and Genesee define interdependence as "the systemic influence of the grammar of one language on the grammar of the other language during acquisition, causing differences in a bilingual's patterns and rates of development in comparison with a monolingual's". They go on to explain that "By systemic, we mean influence at the level of representation or competence, sustained over a period of time" (1996, p. 3). Thus, isolated or episodic examples of the influence of one language on performance in the other is insufficient to demonstrate systemic interdependence. This is important in studies where single, isolated examples from a child's corpus at one point in time are often used to make inferences about the child's underlying grammatical system. Clearly, such evidence is inadequate. Paradis and Genesee suggest that there are at least three ways in which interdependent development might be manifested: acceleration, delay or transfer. Briefly, acceleration would manifest itself in precocious development in one domain of one of the bilingual's languages relative to normal development of that language in monolinguals as a result of influences from the other language. Acceleration is likely to occur when a specific property of one of the bilingual child's languages (e.g., finiteness) is acquired in advance of the corresponding property in the other language with the effect that the former precipitates acquisition of the latter before it would normally be acquired. Acceleration could occur even when the child is balanced in his/her development in each language; that is to say, it is not necessarily an effect of dominance (cf. Gawlitzek-Maiwald and Tracy, 1996, for a discussion of how dominance may lead to cross-linguistic bootstrapping). It is well established that certain features are acquired earlier in some languages than in others in normally developing children (see Allen, 1996, for a discussion of Inuktitut versus English acquisition); it is these features of language that are likely candidates for acceleration in bilingual acquisition.

In contrast, delay would manifest itself in a lag in the development of one or both of the bilingual's languages relative to that of the corresponding monolinguals. While a lag might be attested in the overall development of language, it is most likely to manifest itself in structure-specific ways. In fact, to date, there is no evidence that bilingual children exhibit delays in overall syntactic development (see Meisel, in press, for an overview). From a strictly syntactic theoretic point of view, structure-specific effects are of particular interest because they reveal the structure-dependent nature of cross-linguistic effects in bilingual acquisition. In both cases, delay and acceleration, the bilingual child would differ from the monolingual child in speed or rate of development but not in terms of the structural characteristics of their respective languages.

Transfer, however, consists of the incorporation of a grammatical property of one language into the other. To substantiate claims of true transfer, it is necessary to document systemic effects, not simply episodic performance effects. In comparison to acceleration and delay, the bilingual child's developing grammar(s) will differ from that of monolinguals as a result of transfer, at least temporarily.

Autonomy and interdependence are not likely to be all or nothing – to the extent that interdependence does occur, we can probably expect it to occur in some bilinguals and only in certain domains or features of their developing grammars while the rest of their grammars develop autonomously (see Paradis and Genesee, 1996, for an example of autonomous development and Döpke and Hulk and Müller, this volume, for putative cases of interdependent development in specific domains of grammar). The question arises of under what linguistic conditions interdependent development occurs and in which domains of grammar. The first four contributions to this volume examine these and related issues.

Juan-Garau and Pérez-Vidal and Yip and Matthews extend the investigation of language differentiation in two case studies of language pairs that have not been reported before, Catalan–English and Chinese–English, respectively. The Juan-Garau and Pérez-Vidal study is noteworthy in documenting the development of a contrasting property of Catalan and English (suppliance of subject pronouns) against a description of other major milestones in this child's syntactic development from 1;3 to 4;2. In so doing, the authors not only provide a comprehensive account of a specific feature of this child's development, but they also examine arguments that suppliance of subjects is developmentally related to the emergence of other aspects of grammar and in particular INFL, as has been argued by Wexler

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(1994) and others (Berman and Weissenborn, 1991). Yip and Matthews conduct a longitudinal analysis of three contrasting features of Chinese and English: wh-interrogatives, suppliance of objects, and relative clauses in a bilingual child from 1;5 to 3;6. In contrast to Juan-Garau and Pérez-Vidal, Yip and Matthews report extensive transfer of all three features from Chinese to English and cite dominance and ambiguity in the input as possible explanations. Both of these studies, along with others in this volume, illustrate the importance of getting beyond the use of isolated utterances and specific structures to presenting a comprehensive account of all relevant data in a corpus in the context of the child's overall language development. This has not always been, and is not always, the case, but is highly desirable if we are to provide truly representative accounts of bilingual children's developing systems. Investigation of additional language combinations, like those examined in these two studies, will continue to play an important role in research on bilingual acquisition as we seek to extend our understanding of linguistic differentiation and interdependence.

The contributions by Döpke and by Hulk and Müller assume differentiation of the bilingual child's developing grammars and focus on putative instances of cross-linguistic transfer. Most importantly, they seek to identify the linguistic conditions that precipitate transfer and, thereby, to formulate explanations for such transfer. The formulation of explicit explanations of transfer is a critical first step in making principled predictions of transfer and in conducting studies that can validate the proposed explanations; otherwise, we are left to ad hoc explorations. Döpke focuses on verb order phenomena in four German–English children (2;0 to 4;1 years of age) and, in particular, the children's overgeneralization of V–O order in their German. Working within the Competition Model (Bates and MacWhinney, 1987), Döpke argues that children learning German and English simultaneously are prone to overgeneralize the V–O order in their German, even though German uses both SVO and SOV depending on the clausal structure, because the SVO order is reinforced on the surface of both the German and the English input they hear. As Döpke points out, instances of transfer of a structure or structures from one language system to another speak to the linguistic creativity of bilingual children since these constructions are not evidenced to the same extent or in the same way in the input addressed to the child. Thus, we gain insights into the linguistic–cognitive creativity of the bilingual child, like the monolingual child, through the non-target-like constructions that they produce. Because bilingual children are exposed to two target systems and their at times divergent structural properties (e.g., head-first versus head-final), there is the possibility of even greater creativity than is attested in monolingual children. In this sense then, bilingual children permit us to examine the limits of the mind's linguistic creativity.

Hulk and Müller also seek to explain and, thus, predict cross-linguistic transfer. They hypothesize that "syntactic cross-linguistic influence is expected only if Language A has a syntactic construction that may seem to allow more than one syntactic analysis and Language B contains evidence for one of these two possible analyses. In other words, there has to be a certain overlap of the two systems at the surface level." Both Döpke and Hulk and Müller postulate that overlap in the surface structure forms of the two languages plays a critical role in cross-linguistic transfer. Hulk and Müller go on to propose that another condition is necessary for cross-linguistic transfer to occur: "Cross-linguistic influence may be expected at the interface between two modules of grammar and, more particularly, at the interface between pragmatics and syntax, the so-called C-domain". In earlier work, Hulk and Müller showed that cross-linguistic effects are attested when these two conditions are present (Müller, Hulk, and Jakubowicz, 1999). The current report complements these studies by showing that cross-linguistic effects are not realized in a domain (Root Infinitives) where one of these two conditions does not obtain. While null results can be equivocal, the study by Hulk and Müller which predicts null effects provides a desirable cross-validation of their hypotheses concerning cross-linguistic transfer; more precisely, it demonstrates the importance of the specific conditions that comprise their theoretical explanation for cross-linguistic transfer. It will be critical for both Döpke's and Hulk and Müller's hypotheses to cross-validate these results further by examining additional language combinations that satisfy the conditions that they argue underlie transfer, and in different language acquisition contexts (when there is overlap or ambiguity in the relationship between the surface forms and underlying structure). Both of these are landmark studies that move us beyond simple arguments of one versus two languages by examining in both empirical and theoretical terms likely instances of cross-linguistic interdependence (see Paradis, in press, for an example from phonological development).

While the preceding contributions examine potential interrelationships in the developing grammars of bilinguals in terms of their underlying abstract representations, Paradis, Nicoladis, and Genesee examine on-line interrelationships of the bilinguals' developing grammars during code-mixing. Bilingual code-

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mixing is the use of elements and structures from two languages in the same utterances or conversations. Paradis, Nicoladis, and Genesee examine the intra-sentential (or intra-utterance) code-mixing in 15 French–English bilingual children from approximately 2;0 to 3:6 years of age with a view to ascertaining whether their mixing is grammatically constrained in the same way as adult bilingual code-mixing and how early in development such constraints are evidenced. Investigations of grammatical constraints on child bilingual code-mixing are important since they permit us to examine the nature of the bilingual child's underlying grammars and their on-line inter-relationship during language use. It is well documented that code-mixing by proficient adult bilinguals is both socio-pragmatically and grammatically constrained. With the exception of studies by Lanza (1997b), Meisel (1994), and Vihman (1998), we have limited understanding of the grammatical properties of child bilingual code-mixing and its development. This is yet another domain of research on bilingual acquisition that will benefit from further research based on additional language combinations and analytic frameworks.

Finally, Grandfeldt reports the results of analyses of the development of the French Determiner Phrase in three Swedish–French bilingual children (from 1;10 to 4;2 years of age). This study is especially interesting in its comparison of simultaneous child bilinguals during the period of primary language acquisition with adults who were learning French as second language while knowing Swedish as a first language. This elegant design permits Granfeldt not only to document the development of language-specific structures in these children and, thereby, to explicate the nature of their developing grammatical systems, but also to address the debate between the Strong and Weak Continuity Hypotheses which have been tested primarily in monolingual learners (see also Paradis and Genesee, 1997). Granfeldt's analysis also permits him to compare transfer effects in adult second language learners to those documented by Döpke, Hulk, and Müller and others in simultaneous bilinguals. I am sure that we will see more examples of the creative approach that Granfeldt has used here as other researchers seek to understand the nature of acquisition by different learners monolingual/bilingual, first/second language and even normal/impaired.

In conclusion, the contributions to this inaugural Special Issue of *Bilingualism language and cognition* represent important developments in research on bilingual acquisition. Like other important studies in the field, they will raise more questions than they will answer, but in so doing they will stimulate further important explorations of children who acquire two, or more, languages simultaneously.

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