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Functional Categories in the Grammatical Development of Bilingual and Second language Children

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of Doctor of Philosophy in Psychology.

Preface

Faculty of Graduate Studies and Research guidelines for thesis preparation require that the following five paragraphs must be reproduced in full in the preface of the thesis.

Candidates have the option of including, as part of the thesis, the text of one or more papers submitted or to be submitted for publication, or the clearly-duplicated text of one or more published papers. These texts must be bound as an integral part of the thesis.

If this option is chosen, **connecting texts that provide logical bridges between the different papers are mandatory.** The thesis must be written in such a way that it is more than a mere collection of manuscripts: in other words, results of a series of papers must be integrated.

The thesis must still conform to all other requirements of the "Guidelines for Thesis Preparation". **The thesis must include:** A Table of Contents, an abstract in English and French, an introduction which clearly states the rationale and objectives of the study, a review of the literature, a final conclusions and summary, and a thorough bibliography or reference list.

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This dissertation consists of three articles which have been either published or submitted to journals. The format of each article has been altered from that required by each journal to conform to the style set out by the American Psychological Association, 1995 edition. The APA publication manual permits certain modifications to their manuscript style for dissertations in order to facilitate reading. The modifications I have made are as follows: Tables and figures appear in the text rather than at the end of the document; underlining has been replaced with italics, and references are presented with the authors' names flush with the margin and the other text indented.

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I would like to thank a number of people for their help in the realization of this dissertation. First, I would like to express my appreciation to my advisor, Fred Genesee. Dr. Genesee provided a perfect combination of supporting, encouraging and guiding my research while allowing me a good deal of independence at the same time, for which I am very grateful. I would also like to thank the other members of my lab, Liane Comeau, Matheiu LeCorre, Elena Nicoladis and Dean Sharpe, for their comments on and assistance with my work, as well as their moral support.

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Statement of Authorship

The three manuscripts included in this thesis were all co-authored with Fred Genesee. Dr. Genesee contributed in a supervisory capacity to these studies by assisting in the development of the hypotheses and conceptual framework for each study, and in the editing of the manuscripts. I contributed the initial ideas and rationales for each study. I also participated in the data collection, set up the coding schemes, conducted the analyses and drafted the manuscripts. Study 3 is co-authored with Mathieu LeCorre. Mr. LeCorre helped to code and analyse the data for this study under both my supervision and that of Dr. Genesee for his honours thesis. He contributed greatly to the adaptation of the coding scheme to the data set used in this study.

Statement of Original Contribution

The studies in this thesis make original methodological, empirical and theoretical contributions to research in the areas of bilingual and second language acquisition.

With respect to methodology, most research on bilingual first language acquisition that employs quantitative analyses has been focused on the lexicon or pragmatics (for example, Genesee, Nicoladis & Paradis, 1995; Pearson, Fernandez & Oller, 1993). In contrast, research on bilingual acquisition of the structural aspects of language, like syntax, has been based on the more qualitiative analyses found in the field of formal linguistics (for example, Meisel, 1990, 1994). Studies 1 and 2 bridge this methodological gap in the literature by including both a foundation in linguistic theory as well as quantitative anlayses of the data.

Also, each of the three studies adds a unique empirical finding to the field. The first study is one of very few studies examining language contact in preschool bilinguals on the level of syntax. Study 1 is the only syntax study to date that addresses this issue using systematic comparisons between bilingual and monolingual children in addition to within-language comparisons with the bilinguals. Study 2 is the only study to date whose main goal was to address the discontinuity-continuity debate on the ontological development of functional categories using bilinguals as crosslinguistic subjects. Finally, Study 3 is the first study looking at functional categories in second language acquisition whose primary focus is the emergence of tense and agreement, where these grammatical features are systematically treated separately.

On the theoretical level, Study 1 introduces the concept of autonomous development as separate from language differentiation in the acquisition of two languages simultaneously. Language differentiation refers to whether the child has one system or two; whereas, autonomous development refers to whether the two

systems interact with each other over the period of acquisition. Concerning Study 2, previous research has highlighted the relevance of bilingual first language acquisition to crosslinguistic research because a bilingual child is his/her own matched pair (De Houwer, 1990; Meisel, 1989). In Study 2, this logic was taken one step further by suggesting how bilingual children could make a *unique* contribution to addressing issues in crosslinguistic acquisition research. Because the two languages reside within one individual, bilingual children's acquisition patterns contribute uniquely to assessing the accuracy of claims that certain language acquisition milestones are driven by neurological maturation.

Abstract

The research for this dissertation is focused on the following two issues: (1) Can bilingual child language development be considered as 'two monolinguals in one', and (2) Can bilingual child language contribute uniquely to our understanding of the acquisition process in all children? Three studies examining functional categories in the grammatical development of bilingual and second language children were conducted in order to address these questions.

Study 1 investigates potential interference between the developing grammars of three French-English bilingual children. Naturalistic production data were collected from the children at six month intervals between approximately 2:0 and 3:0 years of age. The data were examined for the children's acquisition of INFL and these results were compared with extant findings for monolingual French and English-speaking children. The results indicate that these bilingual children showed no evidence of transfer, acceleration, or delay in acquisition and support the hypothesis that their grammars are acquired autonomously and like those of monolinguals.

The principle focus of Study 2 is an investigation of the continuity debate on functional category acquisition through an analysis of bilingual language development. In this study, the acquisition of INFL and DET by two French-English bilingual children was examined. These children were at an earlier stage of syntactic development than those in Study 1. Naturalistic production data were collected at two month intervals from the children, between approximately 2;0 to 3;0 years of age. The analyses indicate that INFL appeared at different times in the children's languages; whereas, DET appeared at the same time. The results are discussed with respect to the maturation and continuity views on the acquisition of functional categories. Because of the between-language discrepancy in the emergence of INFL, it is argued that these findings support a continuity

perspective. It is also argued that bilingual first language acquisition provides unique evidence bearing on the continuity debate.

The principal focus of Study 3 is also the continuity debate on functional category acquisition, but in contrast to Study 2, the children in this study were second language learners. In this study, the acquisition of features within INFL, agreement and tense, were examined separately to determine if they are acquired in sequence. Fifteen English-speaking learners of French and five monolingual francophone grade-mates participated in the study. A structured oral interview was given annually to each of the children from grade one to grade three, and the transcripts were analysed for the use of tense and agreement. The results revealed that items encoding agreement emerged before items encoding tense in the second language learners' speech, suggesting that these features emerge in sequence in their grammars. The findings are interpreted with respect to three prevailing views on continuity in the acquisition of functional phrase structure in second language acquisition. It is argued that a weak continuity position is best supported by the data.

Resumé

La recherche présentée dans cette thèse porte sur les deux questions suivantes: (1) Peut-on considérer le développement du langage chez les enfants bilingues comme étant l'équivalent de 'deux unilingues en une seule personne', et (2) L'étude de l'acquisition du langage chez les enfants bilingues peut-elle contribuer au domaine de l'acquisition du langage en général, et ce, au-delà des contributions qu'il est possible de faire à partir d'études sur des enfants unilingues? Trois études sur le développement de la grammaire, ayant pour objet les catégories fonctionnelles, ont été effectuées afin de répondre à ces questions.

Dans la première étude, il est question de l'interférence potentielle entre les deux grammaires en développement (soit celles du français et de l'anglais) de trois enfants bilingues âgés de 2;0 à 3;0 ans environ. L'analyse des données portait sur l'acquisition de INFL et les résultats obtenus ont été comparés avec les résultats d'études existantes sur des enfants unilingues parlant le français et l'anglais. Il n'y a aucune indication de transfert, d'accélération, ou de retard chez les enfants bilingues. Ces résultats sont donc en accord avec l'hypothèse que les deux grammaires des enfants bilingues sont acquises de façon autonome et à la manière des enfants unilingues.

Le but principal de la deuxième étude est d'examiner le débat touchant à la continuité dans l'acquisition des catégories fonctionnelles en faisant une analyse du développement du langage chez les enfants bilingues. Dans cette étude, l'acquisition de INFL et DET a été étudiée chez deux enfants acquérant le français et l'anglais. Le niveau de développement syntactique de ces enfants était plus bas que celui des enfants de la première étude. Les données consistent d'échantillons de langage recueillis en milieu naturel à des intervalles de 2 mois. Les enfants étaient âgés de 2;0 à 3;0 ans environ. Les résultats des analyses indiquent que INFL apparaît à des

moments différents dans chacune des deux langues des enfants alors que l'acquisition de DET se faisait simultanément. La discussion de ces résultats porte sur les points de vue de la maturation et de la continuité dans l'acquisition des catégories fonctionnelles. Étant donné la divergence en ce qui à trait à l'émergence de INFL, les résultats de cette étude favorisent le point de vue de la continuité. Des arguments portant sur l'originalité de la contribution de cette étude du langage des enfants bilingues sont aussi présentés.

La troisième étude porte aussi sur le débat touchant à l'acquisition des catégories fonctionnelles. Cependant, contrairement à la deuxième étude, les enfants de la présente étude faisaient l'apprentissage d'une langue seconde. L'acquisition de l'accord et du temps, deux composantes de INFL, a été étudiée afin de déterminer si ces composantes sont acquises en séquence. Quinze enfants anglohones apprenant le français et cinq enfants unilingues francophones du même niveau scolaire ont participé à cette étude. Un interview oral structuré a été administré annuellement à chaque enfant, de la première à la troisième année. La transcription de ces interviews a permis d'examiner l'utilisation de l'accord et du temps. Les analyses révèlent que l'accord est encodé plus tôt que le temps dans le parler d'enfants apprenant une langue seconde. Ceci suggère que l'accord émerge avant le temps dans la grammaire de ces enfants. Les résultats sont interprétés à partir de trois points de vue influents sur la continuité dans l'acquisition des structures fonctionnelles dans l'acquisition d'une langue seconde. Il est suggéré que les résutats obtenus supportent le point de vue de faible continuité.

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General Introduction

Language acquisition research in the past decade has focused on crosslinguistic data in order to validate and expand the mainly English language studies of previous research. Much of this crosslinguistic research has been concerned with documenting what is general or universal in the acquisition of all languages in contrast to what is specific to the acquisition of certain languages. In spite of the recent focus on crosslinguistic research, language acquisition in simultaneous and early successive bilingual children has received much less attention than comparisons between monolingual children acquiring different languages. Early childhood bilingualism is not a rare phenomenon world-wide; indeed it is the norm in certain communities (Genesee, 1988; Hakuta, 1986; Romaine, 1989). Moreover, children acquiring two languages simultaneously from birth are excellent subjects for crosslinguistic research because they can serve as their own controls and, thus, present no between-subject variation due to cognitive and social differences although they may present histories of language exposure that differ for the languages they are learning. However, bilingual children can only inform general theories of language acquisition if the acquisition of two languages simultaneously is parallel to the monolingual acquisition of each. Accordingly, the research for this dissertation is focused on the following two issues: (1) Can bilingual child language development be considered as 'two monolinguals in one', and (2) Can bilingual child language contribute uniquely to our understanding of the acquisition process in all children?

In order to investigate these issues, I have studied one component of grammatical development, namely functional categories. Section 1 of this introduction provides a broad overview of the syntactic theory assumed throughout this dissertation, and an explication of the functional component of grammar is presented in Section 2. In subsequent sections, some background to the issues

stated in questions (1) and (2) above is given. Section 3 on language contact presents a review of the issue of separation between the languages of bilinguals and second language learners, which pertains to the first question stated above. In Section 4, I discuss the issue of continuity in language development. The different positions on the continuity debate make different claims about what is universal and what depends on language specific structures in the acquisition of grammar. As bilingual language development has particular relevance to this debate, this section pertains to the second question stated above. Finally, an overview of the three studies in this dissertation is provided in Section 5.

The discussion in each of the sections is general in nature; technical aspects of French and English syntax and detailed reviews of the recent literature pertinent to each issue and study are provided in the Introduction to each study. Note that the terms 'acquisition', 'development' and 'learning' are used interchangeably to indicate growth in linguistic knowledge and abilities, without making claims about innate versus environmental sources for that knowledge (except references to learning as novel encoding). Also, early successive bilingual children are often referred to as second language learners, since this label is more typically used in the literature.

1. Theory of Universal Grammar

The theory of language assumed in this dissertation is based on Chomsky (1981, 1986, 1992). According to this theory, language is an innate, domain-specific, species-specific form of knowledge known as Universal Grammar (UG). UG consists of a set of principles and parameters from which individual languages are formed. Also, language is considered to be a generative system where an infinite number of sentences is created by a finite set of principles and parameters. UG is an abstract form of knowledge characterizing an idealized speaker/hearer's linguistic competence. The implementation or realization of this knowledge in use

is referred to as performance. Linguistic theory does not attempt to describe all aspects of language as it is concerned mainly with competence. The specifics of processing, variation in performance between individuals, or external influences on language use are not the concern of generative linguistic theory. Furthermore, to date, linguistic theory does not include explicit accounts of the neural architecture and functions of UG.

While the set of principles and parameters posited by UG is considered to be universal, it is obvious to a casual observer that languages differ greatly in their grammatical structures. This apparent paradox can be resolved by keeping in mind that the goal of this theory is to describe and explain the fundamental properties from which all languages are based at a more abstract level of representation than the surface form. Thus, some differences between languages on the surface might not correspond to underlying differences in syntactic organization. Furthermore, differences between languages in underlying syntactic organization follow certain limited options described by UG. Some highly idiosyncratic rules may still appear in individual languages, but the core of every language should be based on Universal Grammar.

The Principles and Parameters model is a departure from a rule-based characterization of linguistic knowledge where sentences are generated by a set of complex and ordered procedural rules. Principles and Parameters theory resembles a constraint-satisfaction model where licit output structures must satisfy a number of restrictions on morpheme combinations and relations. Principles are those constraints that hold for all languages, for example all lexical noun phrases (NP's) must have case, overtly or covertly. In contrast, parameters have a fixed choice of settings or values upon which languages vary. In effect, parameters form the basis of crosslinguistic differences. A basic example of a parameter would be whether the verb is in final position in the verb phrase (VP), or in first position. In English

the latter setting has been taken, but in Japanese it is the former. This parameter setting results in English having SVO (subject-object-verb) word order, and Japanese SOV word order. The choices for parameter settings are usually binary, and once a parameter is set for a language, all grammatical sentences must satisfy that specification.

The theory of UG has important implications for language acquisition. Because language learners begin the process with domain-specific, innate knowledge, grammatical development is not the product of general cognitive processes of analogy and induction. This does not mean that these processes play no role; it means that they alone do not determine the final state grammar. It is thought that acquisition of a particular grammar consists mainly of the interaction of the input with UG, resulting in the triggering of appropriate parameter settings. In this way, language acquisition is guided and constrained by UG so that hypotheses about how to match the internal grammar with the input are limited. For instance, if only two settings are available for a parameter, then these are the only hypotheses available to the learner. However, not all aspects of language are acquired through triggering innate knowledge. For example, novel encoding or learning is invoked to explain acquisition of the specific lexical items of the target language, as well as idiosyncratic, language-specific rules that are not part of the core grammar.

There has been a debate over the role of UG in L2 acquisition where some have argued that it does not play a role (Clahsen & Muysken, 1986, for example). The hypothesis that UG is no longer available is related to the critical period hypothesis which states that language acquisition, either primary or secondary, must take place before a certain age because the brain mechanisms responsible for it atrophy afterwards. The children studied in this dissertation were acquiring two languages simultaneously in early infancy (2;0 to 3;0) or in succession in early childhood (5;0 to 8;0). I have not been concerned with a critical period because the end is usually

set at adolescence (Lennenberg, 1967; Johnson & Newport, 1989; but see Neville-Fox & Weber, in press, for evidence of a possible earlier critical period) and therefore, I have assumed that UG plays a role in L2 acquisition in childhood.

In all three studies in this dissertation, the component of UG investigated is functional categories and the movement properties associated with them. Motivation for the focus on functional categories is twofold: This component of syntactic theory has received a great deal of attention in the current theoretical and acquisition research, and the properties of certain functional categories operate differently in French and English, the two languages being acquired by the children in the studies that follow.

2. Functional categories: Their role in language and acquisition

In the study of language a distinction has traditionally been made between functional elements, such as auxiliary verbs or inflections marking tense, and lexical elements, such as nouns and main verbs. The terms functional and lexical categories refer to the phrasal categories and properties associated with these categories in generative, Chomsykan syntax. However, the split between functional and lexical elements is also captured by more theory-neutral terminology, such as the distinction between functor and content words, or between open and closed class morphemes. These pairs of terms do not identify exactly the same set of items, but there is a great deal of overlap in the categories they define. In general, functional elements can be characterized as follows. Functional elements typically express grammatical relations, like case (subject or object of the verb) or agreement, and abstract concepts like definiteness, number or tense, whereas content words generally have referential meaning. New functional items are not easily added to the lexicon of a language; whereas, new content words can be and are.

Using English as an example, the sentence *The girl is carrying her toys* has the following breakdown between lexical and functional morphemes. Lexical morphemes are: *girl, carry, toy*. Functional morphemes are: *the* (determiner), *is* (auxiliary: tense, agreement with third person plural subject), *-ing* (aspect), *her* (possessive), *-s* (plural). Note that the basic, referential meaning in terms of participants and action is conveyed by the lexical morphemes. It is the functional morphemes which give information about agreement, tense/aspect, number, and definiteness. In English, information about case is given through word order. In other languages, like German, this functional information is encoded by morphemes affixed to the nouns.

Research in domains outside of linguistic theory have found evidence for the distinct status of functional elements. Neurolinguistic evidence can be found in the different forms of aphasia. For example, agrammatic Broca's aphasics, paragrammatic Wernicke's aphasics and deep dyslexics typically have closed class item deficits in both production and comprehension; whereas, patients with other forms of aphasia may not (Garrett, 1992; Zurif, 1990). There is also evidence from normal, nonaphasic populations that closed class morphemes form a distinct group. For instance, closed class morphemes undergo different error patterns than open class morphemes and have some processing differences from open class morphemes (Garrett, 1990; McKee, 1994). Finally, special reference is often made to functional elements or the relations they encode in models of language production describing both monolingual (Kempen & Hoenkamp, 1987; Levelt, 1989) and bilingual performance (Meyers-Scotton, 1993).

According to most current versions of linguistic theory, functional categories hold not only a distinct but a primary place in determining language-specific syntactic structure. It is thought that crosslinguistic variation is determined by the properties of the functional categories of a language; whereas, the properties of

lexical categories are largely universal. This strong position has been challenged by research indicating that the semantically-determined argument structure properties of verbs are a systematic source of crosslinguistic variation (Juffs, 1995; Levin & Hovav, 1995; Pinker, 1989). Gentner (1988) argues for a continuum of categories from those with more invariant or universal properties to those with highly language-specific properties, for example, a continuum from nouns to verbs to functors. Even on this weaker position, functional categories are still the greatest source of crosslinguistic variation in syntax. In the process of language learning, much of the language-specific information a learner acquires is in the functional categories.

Let us discuss a simplified example of how the functional layer of grammar can determine important crosslinguistic differences. If a language has overt morphemes marking the case of nouns, that language will often tend to have free word order or some scrambling from a canonical order, for example, Japanese. Conversely, if a language does not mark case relations overtly with morphemes, then case is deduced from structural relations, and word order is usually fixed. In this way, a language's 'choice' about functional categories determines fundamental aspects of surface word order.

It is perhaps because functional elements are important to determining language-specific structure that they have played a prominent role in research on language acquisition. Some of the first contemporary research on functional elements took the form of morpheme order studies on first (L1) and second (L2) language acquisition (Brown, 1973; Dulay & Burt, 1974a; de Villiers & de Villiers, 1973, among others). Researchers documented the sequence in which certain verbal and nominal inflections were acquired in English as a first and second language. These morpheme order studies have certain limitations with respect to more contemporary questions about how the functional layer emerges in developing grammars. First,

the researchers looked at the acquisition rates of specific inflections rather than the grammatical categories they represent. For example, they looked at increasing learner accuracy in producing the third person singular present tense inflection, *-s* as in *He walks*, and not at the emerging use of tense or agreement markers in general. The exclusive focus on specific morphemes diminishes the ability to make generalizations about the acquisition of more abstract grammatical categories both within one language and for the purpose of crosslinguistic comparisons. A further limitation of the morpheme order studies is that the researchers offer no explicit account of how learners' grammars were organized as a whole at each stage in development, possibly because this work was not couched in a particular syntactic theory.

Recent interest in the acquisition of functional categories has arisen among researchers whose work is informed by generative syntactic theory, beginning with Radford (1988, 1990) and Pierce (1989, 1992), for example. While the current research often documents learners' use of specific functional morphemes, this does not constitute the goal of the studies. In general, researchers are concerned with explaining the acquisition of the functional categories the morphemes are associated with, building accounts of the learner's grammar as a whole at various stages of development, and making crosslinguistic comparisons. Moreover, in current versions of syntactic theory, functional categories are not only phrases headed by functional morphemes, they also have properties which determine basic word order and other distributional contingencies. Thus, investigations of functional categories in generative syntax go far beyond investigations of functional morpheme acquisition. The studies in this dissertation were carried out within this current paradigm.

The functional morphemes and distributional contingencies examined in each of the three studies are those that pertain to the grammatical features of finiteness,

tense and agreement, which are subsumed in the category INFL (inflection). The properties of INFL differ parametrically between French and English. In Studies 1 and 2, the simultaneous acquisition of French and English by two year old children is investigated, while in Study 3, the acquisition of French by English-speaking children aged six to eight is examined. In focusing on the properties of INFL in French and English, the influence of one language on the other, as well as variations in crosslinguistic patterns of acquisition can be observed because of the parametric difference between the two languages.

3. Language contact in representation

By examining the acquisition of functional categories within the framework of Principles and Parameters theory, the studies in this dissertation address issues specific to bilingual development alone and to language development in general. Addressing the issue of language contact between the grammars of young bilinguals is an essential first step because if bilingual children do not have separate linguistic systems, as has been suggested by some researchers, their acquisition patterns would not be parallel to 'two monolinguals in one', and their value as subjects for crosslinguistic comparisons would be limited.

Language contact is a general term referring to interactions between two languages within a bilingual person or a bilingual community (Romaine, 1989). Within the individual, it can pertain to on-line interactions between languages in production, like code-switching. Language contact also pertains to interactions at the level of representation, such as the degree of fusion or the presence of interference between the systems. It is the representational sense that concerns us here.

Contemporary hypotheses regarding the degree of fusion of the linguistic representations of bilinguals began with Weinreich (1953). Weinreich proposed three possible structures for the bilingual lexicon: compound, coordinate and

subordinate. In the coordinate lexicon, there is a one-to-one mapping between concepts and lexical items in the two languages so that there is one 'signified' for every 'signifier'. For example, even translation equivalents like *book* and *livre* 'book', would be associated with separate concepts. Thus, a coordinate bilingual lexicon could be likened to two monolingual lexicons in one individual. In contrast, compound and subordinate bilingual lexicons have some fusion. A compound lexicon consists of a one-to-many mapping between concepts and lexical items, respectively. For example, a compound bilingual would have one 'signified' linked to two 'signifiers', so the lexical items *book* and *livre* would be linked to one concept, BOOK. A subordinate bilingual lexicon also consists of one to many mappings, but the route to the concept is mediated through the lexical item of the dominant language; whereas, in the case of the compound, there is equal access to the concept from both lexical items. Researchers continue to investigate the degree of fusion between the conceptual and lexical level of the bilingual lexicon(s) (De Groot, 1993; De Bot & Schreuder, 1993, for example).

While Weinreich's proposal pertained to interlingual links in the bilingual lexicon, the notion that a bilingual's entire linguistic representation could be fused has also been proposed. Researchers have claimed that simultaneous bilinguals, children acquiring two languages from birth, initially establish a unified representation for their dual language input, which later differentiates into two systems by approximately three years of age (Leopold, 1949/70; Redlinger & Park, 1980; Volterra & Taeschner, 1978, among others). Volterra & Taeschner (1978) propose a three stage model of the shift from a unified to a dual system. At stage one, bilingual infants have one language representation for their lexicon and their syntactic system. At stage two, the children's lexicon has divided into two representations, but the syntactic systems remain unified. At stage three, the syntactic systems separate. In contrast to the unitary system hypothesis, some

researchers argue for differentiated representations as early as two years of age (De Houwer, 1990; Genesee, Nicoladis & Paradis, 1995; Meisel, 1989). Thus, there is an ongoing debate regarding the extent of language contact in the developing linguistic systems of young bilinguals.

In contrast to simultaneous bilinguals, the presence of some contact between the languages of a successive bilingual, or second language learner, is not a controversial issue (except see Dulay, Burt & Krashen, 1982). The degree to which grammatical properties of the L1 transfer to or interfere with the developing grammar of the L2 has been the focus of much research. One of the first contemporary theories of L2 acquisition is in the behaviourist tradition. In behaviourist thinking, language learning consists of learning habits, and in the case of L2 learning, the habits of the L1 will interfere with those of the L2 (Lado, 1964). It is thought that by comparing the surface grammar of both the L1 and the L2 to discover where they contrast, one can predict where interference will take place (Ellis, 1986, Chapter 2). Thus, the behaviourist/contrastive analysis perspective assumes a strong influence of the L1 on L2 acquisition.

As non-behaviorist theories of language representation and language learning developed, so did new views on the role of the L1 in L2 acquisition. Chomsky's theory of linguistic knowledge stood in sharp contrast to the behavourist view (Chomsky, 1959). On this theory, an internal system underlying linguistic behaviour is posited rather than a mere set of habits. The interlanguage hypothesis regarding L2 acquisition (Selinker, 1972) is consistent with a Chomskyan perspective. Interlanguage refers to the L2 learner's internal grammar, which is systematic and dynamic in that it changes or becomes revised over time via exposure to target language input. Thus, interlanguage consists of a sequence of intermediate grammars on a continuum towards the target.

On the view that the L2 grammar comprises its own system, not all errors or deviations from the target language need to be attributed to L1 influence. Dulay, Burt & Krashen (1982)'s theory of L2 acquisition provides an extreme example of this position. In their model, the role of transfer from the L1 is minimized, and an independent, natural order of L2 interlanguage stages is proposed instead. Key evidence for their position includes the findings that learners from a variety of L1 backgrounds acquire certain inflectional morphemes in a similar order for the same L2 (Dulay & Burt, 1974a), with few errors attributable to the L1 (Dulay & Burt, 1974b). However, these sources of evidence are not unproblematic. As Ellis points out, much higher rates of L1-origin errors have been found by other researchers, and there is no agreed-upon definition of what constitutes an L1-origin error (Ellis, 1986, Chapter 2). Furthermore, a role for L1 influence is not incompatible with a consistent acquisition sequence for target language morphemes because it might not be expected that learners would transfer specific morphemes from L1 to L2. Rather, transfer would be more likely to take place at a more abstract level of grammatical representation.

Not all theories of L2 acquisition in a Chomskyan perspective diminish or disregard potential L1 interference. Within the framework of the Principles and Parameters theory of grammar some specific proposals about the role of L1 in L2 acquisition have been formulated (White, 1989). Recall that on this view the acquisition of grammar consists of setting parameters on the basis of target language input. Assuming that UG is operative in L2 acquisition, the same process should apply. Hence, the main influence of the L1 should be at the level of parameter values, and the transfer of L1 parameter settings could be observable in early L2 interlanguage. Studies of French-speaking L2 learners of English demonstrate such an influence in adverb placement with respect to the verb, a

property subsumed by the verb movement parameter which has different settings in French and English (White, 1990/91, 1991).

Study 1 addresses the issue of language contact in the developing grammars of simultaneous French-English bilinguals. Unlike other studies of early bilinguals, the language contact issue investigated is not a unitary versus differentiated system, but is rather the degree of autonomy between the developing systems. Differentiation has been typically viewed as a binary construct, meaning that the languages are either unified or separate at a given stage (except, see Redlinger & Park, 1980). Even in Volterra & Taeschner's (1978) three stage model, absolute fusion or separation of the different components of language is assumed at each stage. In contrast, the notion of autonomy refers to potential interactions between the two languages, for example, whether there is transfer, delay or acceleration caused by the parallel acquisition of two languages. Thus, this notion brings aspects of language contact pertaining to L2 acquisition into the study of bilingual L1 acquisition. Also, autonomy has a more dynamic component than differentiation. Specifically, autonomy can be viewed in terms of different points of contact that can change over time between two developing grammars; whereas, a grammar is either fused or differentiated. Finally, because the concept of autonomy subsumes a variety of language contact possibilities and consequences, it is more directly relevant to the question whether bilingual development is akin to two monolinguals in one.

Most prior research addressing the issue of language contact in young bilinguals use a within-child design where performance in the two languages of bilinguals is compared (Genesee, Nicoladis & Paradis, 1995; Meisel, ed., 1990, 1994; Quay, 1995, for example). In contrast, Study 1 investigates this issue by comparing performance both within bilinguals and between bilinguals and monolinguals. In this study, the acquisition of the functional category INFL is examined and

compared to extant findings for French and English monolinguals. As with the focus on autonomy, this methodological distinction from the prior research renders the study a more direct investigation of how bilinguals compare to their monolingual counterparts.

4. Continuity-discontinuity

Whether development is autonomous or interdependent is not only relevant to bilingual acquisition, but also to crosslinguistic acquisition research. If bilingual acquisition is autonomous, then bilingual children constitute their own 'matched pairs' (De Houwer, 1990) and would be valuable subjects for research examining universal and language-specific aspects of acquisition. One issue where there is debate about universality and language-specific effects is that of continuity in the acquisition of functional categories. Before reviewing this debate directly, let us first discuss the developmental issue of continuity-discontinuity more generally.

Continuity and discontinuity refer to two hypotheses for characterizing and explaining changes in development. On the one hand, development can be described as a smooth, gradual process where each new change builds on prior knowledge and experience. On this continuity view, changes in behaviour are the result of incremental, quantitative changes in the underlying system. Alternatively, development can be characterized in terms of discrete and unique stages where change from one stage to the next reflects a fundamental reorganization of knowledge. Thus, on the discontinuity view, changes in behaviour are the result of qualitative shifts in the underlying system. For example, it has been observed that young children are only capable of thinking concretely, but eventually develop the capacity to think in more abstract terms when they grow older. The question is, does this change arise from a gradual construction of the ability to think abstractly based on interactions with the environment, or does it result from a radical reorganization of cognitive structures, due perhaps to neurological maturation?

On the theoretical approach assumed in this dissertation, the continuity-discontinuity debate with respect to language acquisition can be described as follows. There are three components to consider: the innate language endowment or UG, the particular language grammar being acquired via interactions between UG and the input, and the external manifestations of that grammar in performance, i.e., comprehension and production. Changes in language learners' performance is obvious, but the debate centers on how to explain these changes. Regarding first language acquisition, researchers have asked whether UG is fully available at birth (continuity), or whether some or all parts of UG mature as the child's brain matures (discontinuity). On the continuity position, the changes in linguistic performance are achieved through gradual changes in the particular grammar, while UG remains constant. On the discontinuity position, changes in performance reflect discrete stages where absence of adult-like grammatical components are the result of an immature UG.

Borer & Wexler (1987) argue in favour of a discontinuity or maturation view of the acquisition process. In their view, the constant nature of the external environment or input together with the changing nature of the child's linguistic knowledge argues for internal mechanisms underlying these changes. They claim that language to children does not include ordered input, and there are seldom independent linguistic reasons for assuming that one structure should have priority over another in acquisition, and yet there are regularities in the acquisition sequence between children. Thus, they put forth the hypothesis that UG is not fully available at birth, but matures in stages (see also Felix, 1984). As parts of UG mature, the child is capable of analysing the input, which has remained constant, in a different way, and hence his/her particular grammar develops towards an adult system. Pinker (1984) offers an opposing view of continuity in language development, where at any given stage the particular grammar should be related to the adult

system, in other words, a system whose categories and rules are based on UG. Pinker notes that positing an interim linguistic system that is not based on categories and rules of the adult system may appear to be the most parsimonious account of a child's language at a certain stage, but it does not necessarily offer the best explanation of the entire acquisition process. This is because positing an idiosyncratic and temporary child language system, as in a strong maturation account, demands both an explanation of why it takes the unique shape it does, and what specific changes take place at each stage as the child's system shifts towards the adult's. It is important to note that Pinker advocates the assumption of continuity as the null hypothesis, but he does not rule out the possibility of maturational influences on acquisition.

Evidence from crosslinguistic patterns of acquisition is essential to resolving this debate. For example, on the one hand, if a stage in child language emerges relatively abruptly, shows a break with the previous stage, and occurs at the same time regardless of what language is being acquired, it could be argued that this change is due to maturation of UG. On the other hand, if such a stage occurs at different times depending on the language being acquired, it could be argued that language-specific input plays a role in determining the emergence of that linguistic ability rather than a shift in internal mechanisms, like maturation. For instance, Borer & Wexler's (1987) proposal for maturation of UG is based primarily on the emergence of verbal passive structures in the acquisition of English and Hebrew. It has been observed that even though children must hear some passive constructions before a certain age, their ability to comprehend and produce them before this time is limited or nonexistent. Borer & Wexler (1987) suggest that the ability to comprehend and produce verbal passives is controlled by the maturation of a UG principle, specifically, the ability to form A-chains. However, the emergence of the ability to construct verbal passives does not occur at the same time in the learning of

all languages. Allen & Crago (1996) have shown that children acquiring Inuktitut as a first language produce verbal passives at a much younger age than English-speaking children do. They suggest that the structure of Inuktitut and the frequency of adult use of passives may contribute to this earlier emergence in children's speech. Thus, crosslinguistic evidence argues in favour of a continuity view for the acquisition of passives.

While the continuity-discontinuity debate was not initiated within the research on functional category acquisition, it has played a key role in these investigations. Specifically, many researchers have asked whether functional categories are fully or partially absent from learners' initial state grammars. It has been observed that inflections and other functional morphemes are infrequent in children's speech at early stages (Brown, 1973; Stern, 1924). Radford (1998, 1990) found that not only the morphemes but also the properties associated with functional categories seemed to be absent from initial grammars of English-speaking children, and hypothesized that the functional layer of the grammar emerged via maturation of UG. He proposes two discrete stages in early grammatical development, a stage with lexical categories only, and another with both lexical and functional categories.

Evidence from functional category development in other languages has led some researchers to propose alternative views to the maturation (discontinuity) hypothesis. Some researchers found that the timetable of emergence of the morphemes and movement operations associated with functional categories varied with the language being acquired (Pierce, 1992; Poeppel & Wexler, 1993, for example). Alternative positions have been proposed, ranging from weak continuity to strong continuity. The weak continuity position corresponds closely to the continuity assumptions put forth in Pinker (1984). On this view, it is thought that the ability to include functional categories in a grammar is always available from UG, but the fully developed adult system of functional categories may not be

present during the early stages in the child's particular grammar, and tends to emerge gradually rather than in two discrete stages (Clahsen, Eisenbiess & Vainikka, 1994, for example). In contrast, advocates of strong continuity argue that not only is the ability to project functional categories always available, but also children's underlying syntactic representations contain the full complement of functional categories in the initial state (Poeppel & Wexler, 1993, for example). On this view, the variable production of functional morphemes and operations in children's speech must be due to factors outside of syntactic competence.

The continuity and maturation positions on functional category development make different predictions with respect to the universal or language-specific nature of this process. The maturation position is universalist in that it predicts two universal, discrete stages in grammatical development. On the other hand, weak continuity predicts the possibility of between-language variation in the establishment of functional categories in particular grammars because this is thought to be a process based on both internal factors, UG, and external factors, the input. The strong continuity position is universalist in terms of underlying representation, but it is compatible with language-specific variation in the realization of functional morphemes in so far as this variation is due to non-syntactic factors. The goal of Study 2 is to test each of these hypotheses on functional category acquisition using crosslinguistic evidence from French-English bilingual children. Evidence from bilingual children is especially relevant for addressing the question of neurological maturation because the two languages reside within one individual, and thus, manifestations of neurological maturation should appear at the same time in both languages. As with Study 1, the emergence of the functional category INFL is examined in Study 2, as well as the category DET (determiner).

The continuity-discontinuity debate has also been applied to L2 acquisition. Successive bilinguals or L2 learners, even young children, show variable

production of functional morphemes (Grondin & White, 1996; Lakshmanan, 1994). Therefore, similar questions regarding the status of functional categories in early grammars have been asked. However, because L2 learners even as young as four years old have passed the age when the hypothesized maturation has taken place, neurological change cannot be invoked to explain an absence of functional categories in the L2. Therefore, the debate with respect to L2 acquisition lies between the two remaining positions of weak and strong continuity. Also, researchers have considered L1 transfer to be an initial source of functional categories in early L2 grammars. Thus, a strong continuity position would assume that the L2 initial state includes the full complement of functional categories, via the L1 (Schwartz & Sprouse, 1996). The term continuity applies because such a L2 grammar is continuous with or is a 'possible' final state grammar. In contrast, others have argued that there is only limited transfer of the L1 functional layer, so that the L2 initial state is missing some functional categories or their features (Eubank, 1996; Vainikka & Young-Scholten, 1996a). This latter perspective corresponds roughly to weak continuity because while it is assumed that UG is available and guiding acquisition, the initial state grammar is not a possible final state grammar, and functional structure can be acquired gradually.

As with L1 acquisition, the presence of crosslinguistic evidence is essential in determining the descriptive adequacy of these positions for L2 acquisition. In Study 3, the emergence of tense and agreement features of INFL are examined in English-speaking children aged six to eight acquiring French as a L2. Most of the research on the continuity issue in L2 acquisition has been conducted with learners of English or German (Eubank, 1996; Lakshmanan & Selinker, 1994; Schwartz & Sprouse, 1996; Vainikka & Young-Scholten, 1996a, for example). Evidence from learners of French can test how universal the early functional structure of L2 grammars is. Furthermore, few researchers have examined the possibility of

gradual development *within* INFL, i.e., examining tense and agreement separately (except see Eubank, 1996). In examining acquisition within INFL, Study 3 goes beyond the basic question of whether functional categories are present or absent in early grammars. Functional categories may not be entirely absent, but at the same time may not contain all the features present in the final state system, and moreover, these features may emerge gradually. Finally, the findings from Study 3 are relevant to those of Study 2. For example, Study 3 can be viewed as a crossvalidation of Study 2 in a different acquisitional context. If both studies support the same position on the acquisition of functional categories, this provides strong evidence for that position as the best account of the acquisition process in all circumstances.

5. Overview of the Studies

Study 1 investigates potential interference between the developing grammars of three French-English bilingual children. Naturalistic spontaneous speech data were collected with audio and video tape from the children at six month intervals between approximately 2;0 and 3;0 years of age. The data were examined for the children's acquisition of INFL and its properties (finiteness and agreement, and verb movement) and these results were compared with extant findings for monolingual French and English-speaking children. The results indicate that the bilingual children show no evidence of transfer, acceleration, or delay in acquisition and support the hypothesis that their grammars are acquired autonomously. Some implications of these findings for the debate on continuity in the emergence of functional categories are discussed.

The principle focus of Study 2 is an investigation of the continuity debate through an analysis of bilingual language development. In this study, the acquisition of INFL and its properties (finiteness, agreement and verb movement) and the acquisition of the category DET by two French-English bilingual children is

examined. These children were at an earlier stage of development than those in Study 1, at Brown's Stage I (MLU < 2.00) for the duration of the study. As with Study 1, longitudinal, naturalistic production data were collected with audio and video tape from the children, between approximately 2;0 to 3;0 years of age. The data were collected on average at two month intervals throughout the year. The results are discussed with respect to the maturation and continuity views on the acquisition of functional categories. The analyses indicate that INFL appeared at different times in the children's languages; whereas, DET appeared at the same time. Because of the between-language discrepancy in the emergence of INFL, it is argued that these findings support a continuity perspective.

The principle focus of Study 3 is also the continuity debate on functional category acquisition, but in contrast to Study 2, the children in this study were successive bilinguals. Furthermore, in this study, the acquisition of features within INFL, agreement and tense, are examined separately to determine if they are acquired in sequence. Fifteen English-speaking L2 learners of French and five monolingual francophone grade-mates participated in the study. The same structured oral interview was given annually to each of the children from grade one to grade three and was recorded on audiotape. The data were analysed for the productive use of morphosyntax items that encode tense and agreement. The results revealed that items encoding agreement emerged before items encoding tense in the L2 learners' speech, suggesting that these features emerge in sequence in their grammars. The findings are interpreted with respect to three prevailing views on the acquisition of functional phrase structure in L2 acquisition. Two of these can be classified as weak continuity positions: the Lexical Transfer/Minimal Trees hypothesis (Vainikka & Young- Scholten, 1996a) and the Weak Transfer/Valueless Features hypothesis (Eubank, 1996). The third position, the Full Transfer/Full

Access hypothesis, corresponds to strong continuity (Schwartz & Sprouse, 1996). It is argued that the Valueless Features hypothesis is best supported by the data.

Study 1

Syntactic Acquisition in Bilingual Children: Autonomous or Interdependent?

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Abstract

Recent research on pragmatic and syntactic development in bilingual two year olds has shown that these children have differentiated language systems. However, it remains to be shown whether their grammars develop autonomously or interdependently from two years onward. The present study investigates the potential interference between the grammars of French-English bilingual children, aged two to three years. We examined their acquisition of functional categories, specifically the properties of INFL (finiteness and agreement) and negation, as these grammatical properties differ in both adult French and English and child French and English. Our results indicate that the bilingual children show no evidence of transfer, acceleration, or delay in acquisition and support the hypothesis that their grammars are acquired autonomously. Some implications of these findings for the debate on continuity in the emergence of functional categories are discussed.

Syntactic Acquisition in Bilingual Children: Autonomous or Interdependent?

Differentiation and autonomy

For the past two decades the issue of language differentiation has been prominent in research on children acquiring two or more languages simultaneously. Arnberg (1987), Leopold (1949/70), Redlinger and Park (1980), Swain (1972), Taeschner (1983), Toribio and Brown (1994), Volterra and Taeschner (1978) and Vihman, (1982, 1985), for example, have argued that bilingual children begin the acquisition process with one language system, which later separates, or differentiates, into two systems, usually between the ages of two to three years (except Vihman, 1985, who posits two years of age). Their hypothesis is based mainly on the presence of intra- and interutterance code-mixing in the children's speech (except Swain, 1972). Genesee (1989) dubs this the Unitary Language System (ULS) hypothesis.

The ULS hypothesis has been challenged on both methodological and empirical grounds. First, it is questionable whether code-mixing is a valid measure of an underlying unitary system. The presence or absence of code-mixing in a bilingual's speech is governed by pragmatic or sociolinguistic competence, which should be distinguished from grammatical competence (De Houwer, 1990; Meisel, 1989, 1994b; Nicoladis, 1994). Lack of separation at the pragmatic level is not necessarily an indication of fusion at the level of grammatical representation. Second, Genesee (1989) points out that there is a circularity in the reasoning linking the ULS hypothesis and code-mixing, namely that code-mixing is used as evidence for the ULS hypothesis, and at the same time the ULS hypothesis is used as an explanation for code-mixing. In addition, Genesee (1989) has criticized much of the research supporting the ULS hypothesis for only providing anecdotal examples of code-mixing and for not systematically studying the children's language use in

context. Incomplete reports on the presence of code-mixing do not provide a meaningful account of the child's linguistic performance as a whole (cf. De Houwer, 1995).

Contrary to the ULS hypothesis, there is evidence that even bilingual two year olds do not code-mix profusely within utterances (Bergman, 1976; Genesee, Nicoladis & Paradis, in press; Goodz, 1989, 1994; Lindholm & Padilla, 1978; Nicoladis, 1994; Padilla & Liebman, 1975). Furthermore, while two-year-old bilingual children do code-mix between utterances, overall they can use the appropriate language most of the time (Genesee, Nicoladis & Paradis, 1995; Köppe & Meisel, in press; Lanza, 1992; Nicoladis, 1994; Quay, 1992). In sum, there is evidence that young bilinguals can separate their languages at the pragmatic level. Whereas pragmatic separation does not provide direct evidence for differentiation of the underlying representation, it would be difficult to explain how bilingual children could achieve pragmatic separation without differentiated representations of their languages.

Bilingual children have also been shown to possess early language differentiation at the syntactic level. From the emergence of functional categories, around two years of age, French-German bilingual children have separate verb placement, agreement and tense and case marking in their two languages (Kaiser, 1994; Meisel, 1989, 1990; Parodi, 1990). These findings not only cast doubt on the ULS hypothesis as a whole, but they are particularly inconsistent with Volterra and Taeschner's (1978) proposal that bilingual children go through a unified stage in their syntactic development after they have achieved differentiation between the two lexicons.

If we accept that by two years of age bilingual children have differentiated linguistic systems, this still leaves open the question of whether these systems interact over the course of acquisition. It is possible that the two grammars do not

interact at all, in which case a bilingual child's syntactic development resembles that of two monolinguals. However, it is also possible that the two grammars interact with each other during acquisition, causing a bilingual child to look different from monolingual children acquiring each language.[1] These divergent outcomes can be referred to as autonomous and interdependent development, respectively. Interdependence has also been called interference (Bergman, 1976) or intrusion (Vihman & McLaughlin, 1982). More precisely, we define interdependence as being 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 monolinguals. Note that the notions of autonomy and interdependence presuppose the existence of two linguistic representations.

That the influence of one grammar on the other must be systemic is a key aspect of our definition of interdependence. By systemic, we mean influence at the level of representation or competence, sustained over a period of time. As mentioned above, one shortcoming of some research supporting the ULS hypothesis is the use of episodic code-mixing as evidence for the child's linguistic representation as a whole. In this kind of code-mixing, the items that are mixed, the structures they appear in, and the frequency of appearance all vary. In our view, this kind of code-mixing indicates an "on-line" interaction between the two languages in performance and does not necessarily indicate systemic interaction at the level of competence.

In contrast with code-mixing, we identify three potential manifestations of interdependence: transfer, acceleration and delay. Transfer consists of the incorporation of a grammatical property into one language from the other. Transfer is most likely to occur if the child has reached a more advanced level of syntactic complexity in one language than in the other. Such a discrepancy could occur because it is typical in the monolingual acquisition of the two languages, or because

the bilingual child is more dominant in one of his or her languages. Bubenik (1978), Imedaze (1967), Swain and Wesche (1975), and Vihman (1982) have reported instances of transfer. However, they do not indicate how systematic and frequent the constructions with transferred elements were, nor do they provide information on the alternation of these mixed constructions with single-language constructions of similar meaning where the transferred element was not present. In the absence of this information, there is no way to determine if such cases are examples of episodic interference or code-mixing or examples of interdependence. In contrast, De Houwer (1990) systematically examined morphosyntactic separation in a Dutch-English bilingual three year old and found no instances of transfer. However, it is still unknown whether interdependent development takes place prior to the age De Houwer studied, and if her findings are generalizable to more than one child.

Interdependent development could also accelerate the acquisition of certain properties in one of a bilingual's languges. Acceleration means that a certain property emerges in the grammar earlier than would be the norm in monolingual acquisition. As with transfer, we consider this form of interdependence to be principally motivated by the child having achieved a more advanced level of syntactic complexity in one language than in the other. As discussed in detail in the following subsection, finiteness appears earlier in child French than in child English. It might be expected that a French-English bilingual's acquisition of finiteness in English would be accelerated due to the influence of French. While we have found no instances reported of this kind of interdependence, a related phenomenon has been reported. Gawlitzek-Maiwald and Tracy (1994) studied a German-English bilingual child whose code-mixing regularly consisted of German functional elements in English utterances. The period of this kind of code-mixing followed the emergence of functional elements in German and preceded the

emergence of functional elements in English. They suggest that this child "pools her resources, taking and combining what is available to her" (p. 25). It is possible that acceleration is a similar form of pooling resources.

The third potential manifestation of interdependence involves the overall rate of acquisition. It is possible that the burden of acquiring two languages could slow down the acquisition process in bilinguals, causing them to be behind monolinguals in their overall progress in grammatical development. There is no consensus among researchers on this issue. Bubenik (1978), Murrell (1966), Swain (1972) and Vihman (1982) argue that bilingual children's development of morphology and syntax is delayed. In contrast, Padilla & Leibman (1975), Nicoladis (1994), and De Houwer (1990) conclude that the bilingual children they studied fell within the range of grammatical development that is considered normal for monolinguals in each language. Certain shortcomings are apparent in some of this research, such as the lack of adequate monolingual comparison data (Bubenik, 1978; Murrel, 1966; Vihman, 1982), the use of anecdotal examples only (Padilla & Liebman, 1975), and the absence of in-depth grammatical analyses (Nicoladis, 1994; Padilla & Liebman, 1975). Therefore, it is worthwhile to further investigate the rates of grammatical development in bilingual children, addressing these shortcomings.

In sum, the purpose of the present study was to examine autonomy in the syntactic acquisition of French-English bilinguals from the ages of two to three years. In particular, we looked at the emergence of functional elements in the grammars of French-English bilingual children in order to determine if transfer, acceleration, or delay was occurring.

Some differences between English and French child language

In order to investigate whether bilingual children's languages develop separately and autonomously, it is necessary to look at aspects of their languages that differ, as aspects that are the same would be ambiguous with regard to a unified or

differentiated representation. Most important, these aspects must differ in the child's version of the language because what appears to be transfer could be a typical stage in the monolingual acquisition of the language (cf. Meisel, 1989, 1990; Vihman & McLaughlin, 1982). For example, Meisel and Müller (1992) identify a structure that appeared to be an instance of transfer from French into German; however, they concluded that transfer was an unlikely explanation since a similar phenomenon could be found in the monolingual acquisition of German (see also Bubenik, 1978; De Houwer, 1995).

Accordingly, the present study drew on recent research on French and English child language by Déprez and Pierce (1993, 1994) and Pierce (1989, 1992). French and English child language differs in the emergence and use of finite verbs, the developmental stages of negation, and the distribution of pronominal subjects. Employing the principles and parameters theory of syntax, following Chomsky (1981) and subsequent work, Déprez and Pierce and Pierce offer an analysis in which these differences are shown to be interrelated and attributable to abstract grammatical properties of each language. In this section, we examine each difference between child French and English, along with the theoretical explanation of that difference, in sequence.

French-speaking children as young as two produce many, if not a majority of, utterances with inflected or finite verbs. In contrast, finite verbs emerge later in child English and, in fact, until about 3 years of age, the majority of English-speaking children's utterances have uninflected or nonfinite main verbs. The examples in (1a) and (1b) are nonfinite utterances, and (1c) and (1d) are finite utterances from French-speaking children approximately two years old. Examples of nonfinite English utterances from two year olds are given in (1e) and (1f). These examples illustrate that at this stage, finite and nonfinite utterances are in alternation in child French, but in child English, finiteness is absent. Data sources are

summarized in Pierce (1989, 1992). Criteria for determining finiteness are discussed in the Method section.

(1) a. *La poupée dormir.* (Nathalie, 2;1)
'The doll sleeping.'
b. *Moi dessiner la mer.* (Daniel, 1;10)
'Me drawing the sea.'
c. *Elle tombe.* (Philippe, 2;2)
'She is falling.'
d. *Poupée doit faire dodo.* (Nathalie, 2;2)
'Doll has to go to sleep.'
e. I going down and see Fraser. (Eve, 2;0)
f. He bite my fingers. (Nina, 2;0)

Déprez and Pierce (1993, 1994) and Pierce (1989, 1992) argue that this discrepancy in the use of finiteness in the children's utterances is a result of differences in verb movement between French and English. According to current versions of syntactic theory (for a review, see Pierce, 1992), inflectional affixation, like tense and agreement, is a process that occurs in the syntax via movement. Movement must take place in order for the verb to attach affixes for tense and agreement, which are part of the constituent INFL (inflection). In French all verbs raise to INFL, whereas in English the affixes in INFL lower onto main verbs, the verbs *have* and *be* raise to INFL, and modals are base-generated in INFL. Figure 1 illustrates the D-structure of a sentence in French or English. The COMP projection CP, which dominates IP, is omitted because it is not relevant to our discussion.

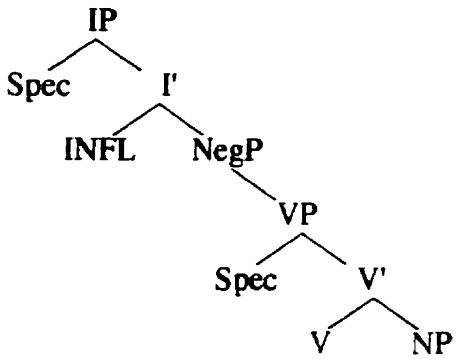


Figure 1. *English and French D-structure (based on Déprez & Pierce, 1994).*

Déprez and Pierce and Pierce assume that there is no movement in the initial state of child syntax. The nonfinite verbs in both child French and child English are the result of a lack of verb-raising or affix-lowering. As mastery of the nonfinite-finite distinction is not instantaneous, children go through a stage where utterances with both finite and nonfinite verbs are coextensive in their speech. Pierce (1992) invokes two possible reasons for why finite verbs emerge earlier and are used more frequently in child French than in English. First, verb-raising is less derivationally complex than affix-lowering. According to the 'condition of least effort,' properties that are more derivationally complex will be acquired later in development (Pierce, 1992, p. 12). Second, the late emergence of affix-lowering may be due to the impoverished nature of verbal inflections in English. Pierce suggests that verbal inflections are part of the core in a language like French but part of the periphery in a language like English. Because peripheral parts of the grammar are considered to be acquired late, the process that enables inflections to appear, affix-lowering, is acquired late.

The developmental stages of negation also differ in French and English child language. The earliest negatives in child French are formed with the negator, *pas*, in the preverbal position, as shown in (2a). In (2b), where the verb is finite, the

negator is in the postverbal position, as in adult French. In contrast, the negative markers in child English always appear preverbally. The earliest negative utterances are formed with sentence-initial negators, as in (2c). This stage is followed by one where the negator is positioned after the subject of the sentence, shown in (2d). Note that in both (2c) and (2d) the verb is nonfinite in English, and neither utterance is adultlike. Data sources are summarized in Déprez and Pierce (1993, 1994) and Pierce (1992).

(2) a. *Pas chercher les voitures.* (Philippe, 2;1)
'No look for the cars.'
b. *Ça tourne pas.* (Philippe, 2;1)
'That isn't turning.'
c. No Leila have a turn. (Nina, 2;1)
d. Me no go home. (Peter, 2;1)

Déprez and Pierce and Pierce argue that the above patterns can be explained through two kinds of movment. The first kind is verb movement, where the verb raisies to INFL, over the NegP, as in (2b). Thus, in (2a), the verb is in the VP. The second kind of movement is subject-raising. These researchers assume that subject NPs originate in [Spec, VP] at D-Structure and must move to [Spec, IP] at S-Structure, over the NegP, for reasons of case assignment (for a review of these theoretical proposals, see Déprez & Pierce, 1993, 1994). In English, a negator appears in initial position with an unraised, VP-internal subject, for example, (2c), and in second position if the subject has raised to [Spec, IP], for example, (2d). In the case of an unraised subject and an unraised verb in French, the negator appears in inital position. We have no examples of utterances like these in our data, but such forms have been attested: See for example, Déprez and Pierce (1993, 1994). Finally, null subject utterances are considered to contain a pro subject in a VP-internal position, and thus are similar in structure to an utterance with an overt, unmoved NP subject. Pierce (1992) found that unraised subjects with finite main verbs are not common in child English, possibly because subject-raising emerges

earlier than affix-lowering. A correlation between the decline in null and unraised subjects and the increased use of verbal inflection has been found by other researchers (see Hyams & Wexler, 1993, for review).

In addition to the development of finite and negative utterances, French and English child language also differ in the distribution of pronominal subjects. In French, there are two kinds of pronouns, weak pronouns (*je, tu, il, elle, on, nous, vous, ils, elles* , for example) and strong pronouns (*moi, toi, lui, elle, eux, elles* , for example). In child French, there is a contingency between the appearance of weak pronouns and finite verbs, whereas strong pronouns can appear with both finite and nonfinite verbs. There is no weak-strong distinction in English, and there are no restrictions on pronominal subjects and nonfinite verbs. The utterances in (3a) and (3b) illustrate how in child French a weak pronoun may only appear with a finite verb. Examples (3c) and (3d) show that there is no such restriction on strong pronouns in French. The utterances in (3e) and (3f) demonstrate how either nominative or accusative pronouns can appear with nonfinite verbs in English (see Vainikka, 1993/94, for the acquisition of case and pronominal subjects in English). Data sources for (3) are summarized in Pierce (1992).

(3) a. *Elle dort.* (Daniel, 1;8)
'She is sleeping.'
b. **Il manger.*[2]
'He eating.'
c. *Moi pousser.* (Daniel, 1;9)
'Me pushing.'
d. *Moi fais tout seul moi.* (Grégoire, 2;1)
'Me is doing it all by myself.'
e. I washing. (Naomi, 1;10)
f. Her holding a balloon. (Nina, 2:0)

The distributional restrictions on weak pronouns in French is explained by assuming that these pronouns are agreement clitics, part of INFL, and not NPs (for a review of this analysis of weak pronouns, see Pierce, 1992). In contrast, English

pronouns, whether nominative or accusative, are NPs, as are the French strong pronouns. The contingency between the presence of a weak pronoun and a finite verb in French is due to the fact that an unraised verb cannot attach clitics, as in (3b). Since English pronouns and French strong pronouns are not located in INFL, they can appear with nonfinite verbs.

Predicting and determining interdependence

These three contrasting properties of child English and child French can be summed up by stating that French children acquire the properties of INFL earlier than English children do. This makes the combination of French and English a powerful test for examining autonomous development between the two languages of a bilingual child. Other language combinations are less informative. For example, in French and German functional categories emerge at roughly the same time in monolinguals (Meisel, 1994a). Research on the syntactic acquisition of French-German bilinguals implicitly supports the autonomy hypothesis, as no significant influence of one language on the other is reported (Kaiser, 1994; Meisel, 1989, 1990, 1994a; Meisel & Müller, 1992). However, the motivation for transfer or acceleration of acquisition may not exist between French and German as it does between French and English.

Potential causes and manifestations of interdependent development in French-English bilingual children are as follows. The early appearance and pervasiveness of verb-raising in French, together with the evidence of verb-raising for *be* and *have* in English, could result in the temporary transfer of verb-raising for English main verbs.[3] Children could assume that all verbs raise in both languages, or that raising is at least an option in English for all verbs (cf. White, 1990/91). Such transfer has been attested in the childhood L2 acquisition of English by francophones (White, 1990/91, 1991). Evidence of the transfer of verb-raising in our data takes two forms: (a) The production of a greater number of finite

utterances in English than would be found in monolingual agemates, in close parallel to the production of finite verbs in French, and (b) the presence of postverbal negators in both English and French. Examples of postverbal negators have been attested in French-English bilinguals (Swain & Wesche, 1975), but no indication is given of how systematic these constructions were in the children's speech. Interdependence may not involve the transfer of verb-raising but instead the transfer of the knowledge of the finite-nonfinite distinction. Thus, the presence of French might accelerate the emergence and use of affix-lowering in English, the mechanism for marking this distinction. As with transfer of verb- raising, evidence of such an influence could be found in the earlier and more pervasive use of finite verbs in the children's English in tandem with their French. Transfer in the form of miscategorization might also occur for pronominal subjects. The status of strong pronouns in French and all pronouns in English as NPs may influence the children to treat French clitic pronouns similarly, resulting in their appearance with nonfinite verbs in French. Finally, if the entire acquisition process is delayed by the bilingual experience, then we would expect all aspects of the children's grammars involving movement and INFL to emerge later than they would in monolinguals'.

Further implications

The implications of evidence for autonomous development reach beyond issues concerning bilinguals alone. If their acquisition is autonomous, bilingual children make excellent subjects for cross-linguistic research because they eliminate between-subject variation (De Houwer, 1990, 1995; Meisel, 1990). In particular, bilingual language acquisition has implications for aspects of acquisition considered to be universal across languages.

In the theoretical framework assumed in this study, linguistic knowledge is considered to be an innate, domain-specific capacity referred to as Universal Grammar (UG). UG is comprised of principles that hold in all languages and

parameters that are highly constrained options on which languages can vary. In this view, the acquisition process consists mainly of the selection of the appropriate parameters for the target language. Thus, language acquisition is selective and not instructive in that experience with language input selects or triggers a priori knowledge rather than instructing a modifiable system (Lightfoot, 1989). An item that is learned by selection or triggering can be acquired with less frequency of input than an item that is learned in the conventional sense of novel encoding (Carroll, 1989) . It seems reasonable to conjecture that bilingual children have their input space divided, so their frequency of exposure to each language at any given time is smaller than that of monolinguals acquiring each language. Therefore, if bilingual children demonstrate the same rate of syntactic development as monolinguals, this could argue for a process of development through selection or triggering, as opposed to learning.

Furthermore, the simultaneous acquisition of English and French by young children has implications for the current debate on the ontological development of functional categories. Based on the phenomenon of telegraphic speech, it has been proposed that functional categories are universally absent from children's early grammars, and the ability to project functional categories matures at approximately 2;0 to 2;6 (Guilfoyle & Noonan, 1992; Meisel, 1994a, 1994b; Meisel & Müller, 1992; Platzack, 1990; Radford, 1988, 1990; Wakefield & Wilcox, 1994). In this perspective, it is assumed that a lexical category grammar emerges first, upon which a functional layer is built.

The maturation hypothesis has been opposed by researchers arguing that there is evidence for functional categories in early syntax, in spite of the instances of 'telegraphese'. Proponents of strong continuity (cf. Pinker, 1984) argue that the full complement of functional categories, or at least an IP projection, is universally present in children's grammars from the onset of syntactic acquisition (Déprez &

Pierce, 1993, 1994; Ferdinand, 1994; Hyams, 1994; Poeppel & Wexler, 1993; Toribio & Brown, 1994; Wexler, 1994). According to this hypothesis, if certain inflections appear to be partially or fully absent from children's productions, this is due to other factors, such as the lack of knowledge of the grammatical feature tense (Wexler, 1994) or phonological constraints on output (Demuth, 1994; Gerken, 1994; Gerken & McIntosh, 1993).

An intermediate position known as weak continuity has also been proposed (Clahsen, 1990/91; Clahsen, Eisenbeiss, & Penke, 1994; Clahsen, Eisenbeiss, & Vainikka, 1994; Vainikka, 1993/94). Like the maturational perspective, weak continuity is a structure-building approach to grammatical acquisition. Unlike the maturational perspective, weak continuity does not assume that there is a stage where functional categories are biologically unavailable to developing grammars. Instead, it is thought that children project structure based on the lexical properties of the elements they have acquired. For example, children will not project CP until they have acquired complementizers and wh-elements (Clahsen, Eisenbeiss, & Vainikka, 1994). Acquisition of phrase structure, including phrases with functional heads, is gradual and is based on the interaction of UG and language-specific input. Note that an early grammar based on purely lexical maximal projections is not impossible in this view; it is the maturation of principles of UG that is not compatible with this view.

Each of the three positions makes different predictions concerning language-specific differences in the emergence of functional categories. In the maturation view, they are universally unavailable in all languages, then universally available. In the strong continuity view, they are always present, even covertly, regardless of the language being acquired. In the weak continuity view, their appearance in the grammar varies depending on the particular language being acquired. Data from

bilingual children could be informative in the determination of the language-specific and language-universal properties of early functional category acquisition.

Method

Subjects

We studied three children who each had an English-speaking mother and a French-speaking father. All three fathers are native speakers of Quebec French. The families resided in Montreal, Canada, which is a majority francophone city with a large anglophone minority and many bilingual neighborhoods. The families claimed to be using the so-called rule of Grammont, the 'one parent, one language' style of presentation. Our observations of each family confirmed their claims in general, but it was observed that the parents occasionally spoke their nonnative language to the child and code-switched intrasententially.

Each of the children in the study was different with respect to their exposure to each language. William was exposed to more English than French. He spent weekdays at home with his mother and only received input in French from his father during evenings and on weekends. Gene was exposed to both languages relatively equally, with slightly more exposure to French. His parents shared most of the child care between themselves, but occasionally Gene had a French-speaking babysitter. Olivier's exposure pattern changed over the course of the study. At intervals one and two, he attended a French daycare center on weekdays and was equally exposed to French and English at home during evenings and on weekends. At this time, he received more French input. At interval three, Olivier had begun to stay home with his English-speaking mother during the day because she was on maternity leave.

Procedure

We filmed the children in their homes in hour-long naturalistic play sessions with their parents. There were three play sessions: with the mother alone, the

father alone, and both parents together. All three sessions made up one interval. The study consisted of three intervals across the children's third year of life, roughly corresponding to the ages 2;0, 2;6 and 3;0. We were not always able to film the child at exactly the desired age due to difficulties arising from family commitments, child illnesses, and so forth. We transcribed twenty minutes of each hour-long session, except that in William's case the entire hour was transcribed because he was not very talkative. All transcripts were coded in accordance with the CHAT system (MacWhinney, 1991). The data used for our analysis are taken from these transcripts. Information about the children's ages, the number of utterances in the sample and the children's MLUs in each language is shown in Table 1. MLUs were calculated as an average utterance length for the three sessions combined. We only counted morphemes that were used productively, which could result in an underestimation of the children's MLUs. The child William was slower in his language development than the other three. He has consistently lower MLUs and a smaller vocabulary in each language (vocabulary data not reported here). However, we have included him in the study as his acquisition of functional categories displays the same patterns as the others. Note that William is three months older than the other children at each interval.

Table 1. *Sample Information: Age, Number of Utterances, MLU*

Interval 1

Child	Age	Utterances[a]	French MLU	English MLU
William	2;2	314	1.26	1.29
Gene	1;11	351	1.92	2.04
Olivier	1;11	261	2.32	1.55

Interval 2

Child	Age	Utterances	French MLU	English MLU
William	2;10	557	1.35	1.54
Gene	2;7	528	2.12	2.17
Olivier	2;6	424	2.59	2.18

Interval 3

Child	Age	No of utterances	French MLU	English MLU
William	3;3	960	1.60	2.19
Gene	3;1	598	2.36	2.44
Olivier	2;10	676	2.40	2.31

[a]Numbers are averaged over the three sessions. The number of utterances equals the total number of French, English, and mixed utterances.

Analysis

We selected a subset of utterances for analysis from the corpora at each interval. We only included utterances with verbs. From this set of utterances, we excluded imperatives on the grounds that they might inflate the numbers of nonfinite, null subject utterances (cf. Pierce, 1992 and Poeppel & Wexler, 1993). We also excluded repetitions of adult utterances and self-repetitions as the former would not

represent the child's grammar and the latter would inflate the data set. In addition, we excluded mixed utterances, except utterances in which the mixed element was peripheral to the part of the sentence we were concerned with. For instance, an English sentence with the French discourse marker mixed at the end, *Truck go brmmbrmm, là* was included in the set of English utterances. Such utterances comprise 3% of the data for this study. For the negative utterances, only nonanaphoric negatives were included. Anaphoric negatives are utterances with an initial negative marker like *no* which refers to a previous utterance in the discourse, for example, *No, I want apple juice* in response to the question *Do you want some orange juice*?. After these selection procedures, our data set consisted of 902 utterances, 416 in English and 486 in French.

In the first phase of our analysis, the utterances were classified as finite or nonfinite. Our classification was based on morphological, contextual, and syntactic criteria. Morphologically, nonfinite French verbs are those forms that appear to be either past participles or infinitives.[4] Syntactically, they are produced without a tensed auxiliary and to the right of a negative marker. Contextually, they are often adjectival in meaning with no consistent time reference (for similar classification, see Grondin & White, in press; Pierce, 1992; White, in press). In contrast, finite verbs are adult-like in morphological form, appearing to the left of a negator and with a tensed auxiliary if in the past. In English, morphosyntactic criteria delineate two principal forms of nonfinite verbs: (a) verbs in the present continuous form (verb-*ing*)[5] without a tensed auxiliary, and (b) verbs in the present simple, without the obligatory *-s* for third person. Also, verbs that appear in the root form in a context where the present continuous was required were classified as nonfinite. Other than in the third person singular, the present simple is identical to the root form, and context is essential to determining finiteness in this case (cf. Pierce, 1989, 1992).

There are some verbs in English that are ambiguous with regard to finiteness, even in context. For example, *want* in *I want juice* is ambiguous because the verb never takes the present continuous form, and no inflections are attached to the root for the first person. Also, an utterance like *I don't know* is ambiguous because it could be an unanalysed chunk. We have considered examples like these to be finite, in spite of the ambiguity, in order to make our test for autonomy more difficult. As shown in the following section, to test for autonomy we looked for a discrepancy in the number of finite utterances in each language. Allowing the set of finite utterances in English to be as large as possible diminished this discrepancy. We indicated where ambiguous utterances form a significant proportion of a child's finite utterances in English. After classifying utterances as finite or nonfinite, we carried out our main analysis, the details of which are presented here.

Results

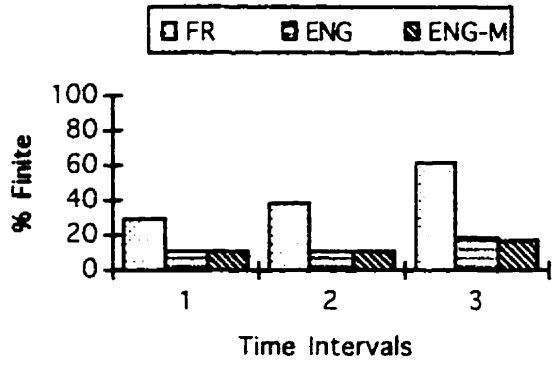
Finiteness

We calculated the percentage of finite utterances in each language, based on the total number of utterances with verbs in each language, for each time interval. Additional calculation was done for English in order to see whether it is the finite-nonfinite distinction that is acquired more slowly in English, or simply affix-lowering. We recalculated the percentage of finite utterances in English using finite main verbs only, excluding utterances with *have*, *be* and modals. The results of both calculations are presented in Figure 2.

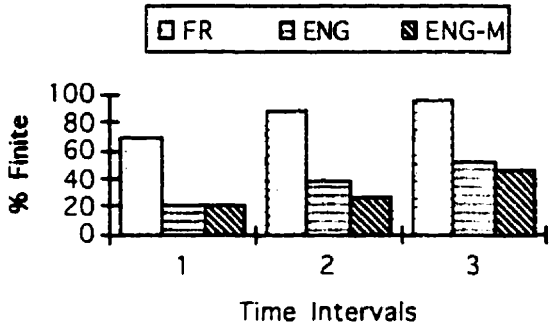
For each child, the proportion of finite utterances is greater in French at each interval. For both Gene and William, all finite English utterances at interval one are ambiguous, as defined in the previous section, so it is possible that none of the children produced genuine finite utterances in English at that point. Comparing the proportion of finite utterances in English with all verbs and main verbs only (English-M), it is clear that the proportions are identical or English-M is slightly

lower. It might have been expected that the English-M proportions would be substantially lower, because verb-raising emerges earlier than affix- lowering. Is it possible that these finite main verbs are finite via verb-raising, indicating transfer? This is unlikely because the proportion of finite verbs in English is too low to suggest the pervasive use of verb-raising, and, as shown in the following subsection, there is no syntactic evidence for transfer of verb-raising.

William



Gene



Olivier

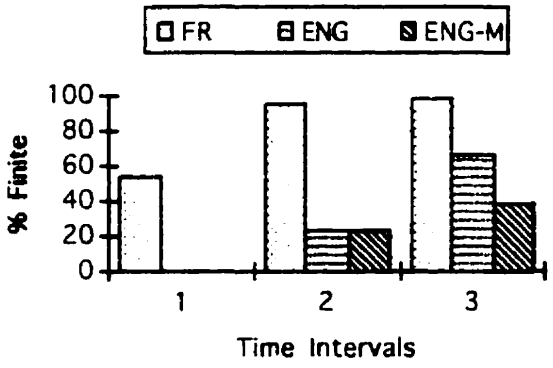


Figure 2. *Percentage of finite utterances out of the number of utterances with verbs in each language, at interval 1, interval 2 and interval 3. English-M represents the percentage of finite utterances in English with main verbs only.*

The percentage of finite verbs, averaged across the three children, for each language at each time interval is given in Table 2. A chi-square analysis confirms that the difference between the proportion of finite verbs in English and French is significant over time ($\underline{X}^2 = 7.087$, $\underline{p} < .03$). Thus, it appears that acquiring French simultaneously with English is not accelerating the use of finiteness in English.

Table 2. *Mean Percentage of French and English Finite Utterances at Each Time Interval*

Language	Interval 1-%	Interval 2-%	Interval 3-%
English	10	24	44
French	51	74	85

Note. $\underline{X}^2 = 7.087$, $\underline{p} < .03$

We next examined whether the children were acquiring finite verbs at the same rate as their monolingual counterparts, regardless of the difference between their languages. Table 3 shows the percentage of finite verbs produced around two years of age for the four monolingual French children Pierce (1992) studied and for our three bilingual children. The group mean for the bilinguals is lower (51% versus 61%); however, it is doubtful that means are a meaningful comparison measure for such a small number of children, especially given that some variation between agemates is common. We believe that a comparison based on ranges of variation is more meaningful. Note that none of the bilinguals are as advanced in their production of finite verbs as Daniel or Philippe, but they are certainly comparable to Grégoire and Nathalie. It is not surprising that William's proportion is so low; as mentioned above, his overall development rate is slower than the other bilinguals. This comparison suggests that these bilingual children were developing

along a timetable within the range of monolingual children, although not at the upper bound of that range. Pierce (1992) does not provide precise information on the proportion of finite verbs present in the speech of her English-speaking subjects.[6] Rate of acquisition for our bilingual children's English is examined in detail for the development of negatives.

Table 3. *Percentage of French Finite Utterances: Monolinguals and Bilinguals*

Mono-lingual	Age	Finite verbs-%[a]	Bilingual	Age	Finite verbs-%
Grégoire	2;0	51	William	2;3	29
Nathalie	2;0	34	Gene	1;11	69
Daniel	1;11	78	Olivier	1;11	54
Philippe	2;1	79			

Note. Monolingual data are from Pierce (1992).
[a]Percentage is calculated out of all utterances with verbs.

Negation

The development of negative utterances has different implications regarding interdependence in French and English. In French, the position of the negator with respect to the verb is syntactic evidence of the child's use of finite verbs because it is an indication of verb-raising. In contrast, the placement of the negator to the right of a finite verb in English is syntactic evidence of transfer. Also, the position of the negator with respect to the subject is evidence for the use of subject-raising. Since the frequency of subject-raising in a bilingual child's English increases from age two to three years, it can be used as an indicator of rate of development.

We first examine the position of the negator with respect to the verb in French and English. As the children in this study did not produce a large number of negative utterances in either language, part of the data in this section is presented in example form. The utterances in (4) demonstrate that the children are using verb-raising in French, as the negator appears to the right of the finite verb. The example from William's speech includes an English noun *people*, referring to figurines, that he generally used instead of the French term, *bonhommes* . The presence of this noun is not relevant to the position of the negator. Utterances like those in (4) represent 91% of the children's French negatives. Recall that Déprez and Pierce (1993, 1994) and Pierce (1992) found that there was a contingency between preverbal negators and nonfinite verbs and postverbal negators and finite verbs. We cannot assess the strength of this contingency in our data because there is only one example of a nonfinite negative utterance, although this example fits the monolingual pattern as the negator appears preverbally. The paucity of nonfinite negatives in our French data could be a result of the age of our children. Déprez and Pierce (1993, 1994) and Pierce (1992) examined data from children as young as 1;8, and most of their examples of nonfinite utterances come from the earliest speech.

(4) a. People *là, va pas là.* (William, 2;10)
'The people don't go there.'
b. *Je peux pas dire quoi.* (Gene, 2;7)
'I can't say what.'
c. *Je veux pas parler à Papa.* (Olivier, 2;6)
'I don't want to talk to Daddy.'

It is clear that the predominant pattern of French negative utterances are those with finite verbs and postverbal negatives; however, a few counter-examples occurred in our data, shown in (5). The two examples from William's corpus, (5a) and (5b), look superficically like examples of transfer from English because he used *non* as a negative marker in a French sentence. Déprez and Pierce (1993)

state that French monolingual children never use *non* as a negative marker. As William is exposed to more English, it is possible that English is interfering with his French. However, he does produce more sentences with *pas* overall. Furthermore, William's utterances in (5) display the appropriate pattern reagrding verb-raising, where a negative is placed after a finite verb, as in (5a) and before a nonfinite verb, as in (5b). It is more likely that (5a) and (5b) are examples of code-mixing of the negative form, rather than syntactic transfer. The examples from Gene in (5c) and (5d) appear to be lacking verb movement.[7] Could these be examples of English influence? This conclusion is unlikely for at least two reasons. First, like William's, the majority of Gene's negative utterances have the structure of those in (4). Second, Pierce (1992) also found a marginal number of utterances with preverbal negatives and finite verbs. These aberrant examples are most likely performance errors.

(5) a. *Y a non picots.* (William, 2;10)
'There isn't a rash.'
b. *Non manger!* (William, 2;3)
'No eat!' (= I don't want to eat!)
c. *Il pas joue dehors.* (Gene, 1;11)
'He NEG play outside.'
d. *Pas il va là.* (Gene, 2;7)
'NEG he go there.'

Finally, while the presence of postverbal negatives attests to the use of verb-raising in French, their absence in English indicates that transfer did not occur from French to English. We found no utterances in the corpora like *I play not truck.*

We now turn to the position of the subject in negative utterances in English. For the bilingual children to be acquiring negation like English monolinguals, we expect their earliest negatives to have sentence-initial negative markers, indicating an absence of subject- raising. A greater number of utterances with sentence-medial negative markers would appear in the language of children closer to three years of age. We calculated what proportion of the children's negative utterances contained

sentence-initial and sentence-medial negative markers at each time interval. Because there were few negative examples overall, and only two examples of English negative utterances at the first interval, we have combined the data from all the children in this analysis and collapsed intervals one and two. The results of this analysis are given in Table 4. It is clear that the children produced significantly more sentence-medial negatives at the third interval ($\underline{X}^2 = 4.496$, $\underline{p} < .03$), indicating that their acquisition patterns parallel those of monolinguals.

Table 4. *Mean Percentage of English Utterances with Sentence-Initial and Sentence-Medial Negators*

Utterance type	Interval 1 and 2	Interval 3
Sentence-Initial	12 (60%)	5 (26%)
Sentence-Medial	8 (40%)	14 (74%)

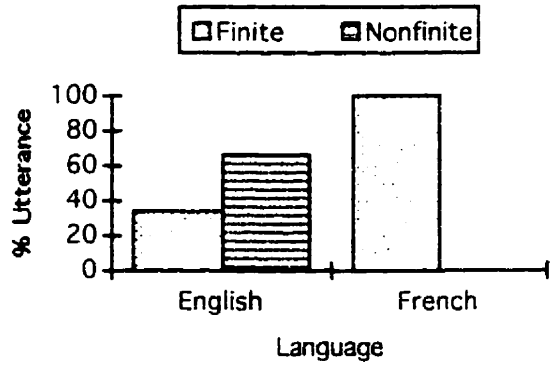
Note. $\underline{X}^2 = 4.496$, $\underline{p} < .03$

We next examined the rate at which our bilingual children were using subject raising in English. We compared the proportion of sentence-medial negatives in our corpora with those from Déprez and Pierce's corpora, which overlaps with our first and second intervals. The average age of our children for intervals one and two combined is 2;5 (range=1;11 to 2;10), and 40% of their negative utterances at this time were sentence medial (from Table 4). Of the three monolinguals studied, the average age of the children was 2;1 (range= 1;10 to 2;4), and the percentage of sentence medial negatives ranged from 24% to 71%, with a mean of 48% (Déprez &Pierce, 1993, p. 35). On the basis of this limited comparison, it appears that the bilingual children are not substantially delayed in their use of subject-raising in English.

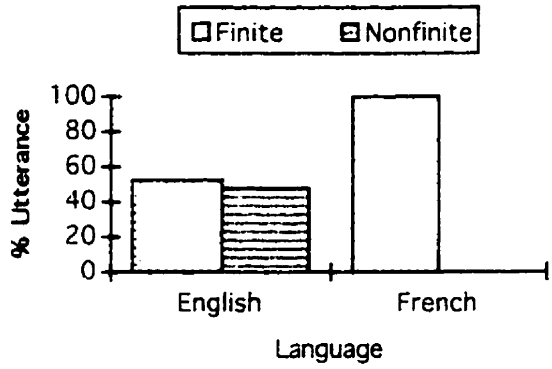
Pronominal subjects

The graphs in Figure 3 show the percentage of finite or nonfinite utterances with pronominal subjects (weak pronouns only in French) in each language for each child. The percentages represent combined data from all the time intervals. Notice that each of the children produced a similar proportion of finite and nonfinite utterances with pronominal subjects in English, but in French virtually 100% of their utterances with pronominal subjects are finite. It certainly appears that these children are aware that the French pronominal subjects are clitics and the English ones are not.

William



Gene



Olivier

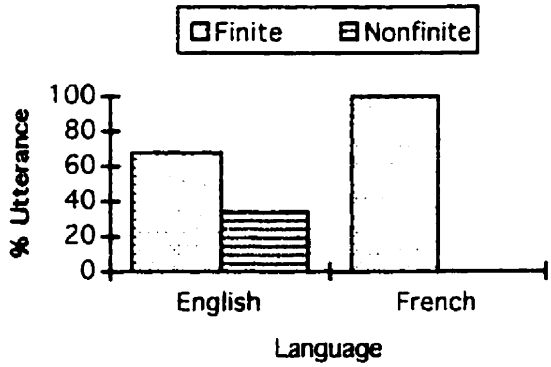


Figure 3. *Percentage of utterances with pronominal subjects (weak pronouns only in French) appearing with finite or nonfinite verbs in each language, out of the total number of utterances with pronominal subjects in each language, across the three time periods.*

Table 5 shows the proportional distribution of utterances with pronominal subjects for the combined corpora. The results of a chi-square analysis show that the difference between French and English utterances with pronominal subjects is significant ($\underline{X}^2 = 22.7$. $\underline{p} < .005$). If the children had transferred the properties of English into French, we would expect to see many utterances like *Il jouer* 'He play', where a clitic appears with a nonfinite verb. The two examples like this in our data are most likely performance errors, as they can occur marginally in monolingual's speech as well (Pierce, 1992). Furthermore, if the children had transferred the properties of French into English, we would see co-occurrence restrictions between subject pronouns and finite verbs in English. The nearly equal distribution of pronominal subjects in finite and nonfinite utterances in English in Figure 3 indicates that the children are not restricting their use of pronominal subjects to finite verbs in this language.

Table 5. *Percentage of Finite and Nonfinite Utterances in English and French with Pronominal Subjects*

Language	Finite-%[a]	Nonfinite-%
English	23.72	20.71
French	55.22	.35

Note. $\underline{X}^2 = 22.7, \underline{p} < .005$

[a] Percentages are calculated out of the total number of utterances with pronominal subjects in both languages from all the children.

Further evidence for the different status of pronominal subjects in English and French can be found in the code-mixed data. The mixed utterances in (6) have not appeared in our analysis so far. There is an asymmetry in the children's pattern of code-mixing with regard to pronominal subjects. The examples in (6a) to (6f) are

utterances in which Gene uses an English pronoun with a finite French verb. This kind of mix is permissible because the English pronouns are NPs. The utterances in (6g) and (6h) are examples of nonfinite French verbs with English pronouns, permissible for the same reason. In (6i) to (6k), the utterances have a French strong pronoun with a nonfinite English verb. This is permissible because French strong pronouns are NPs. The utterances in (6l) to (6n) have French subject clitics appearing with English main verbs, but notice that a French auxiliary verb appears with the pronoun. It seems as if the children have mixed an entire French inflectional complex, including tense and agreement, with an English VP. We found no utterances like (6o), where a French subject clitic appears with a nonfinite English verb. There are two possible explanations for why utterances like (6o) were not produced. First, the analysis we have adopted so far predicts that the children would not produce such utterances. If the English verb is nonfinite, it cannot attach inflectional affixes; thus it cannot attach a subject clitic like *je*. Second, the absence of such utterances may be due to the children's adherence to Poplack (1980)'s free morpheme constraint, which prohibits a code-switch after a bound morpheme like a clitic. Both Köppe and Meisel (in press) and Meisel (1994b) also found that French clitics were never or rarely attached to German verbs by French-German bilingual children.

(6) a. I *pousse là.* (Gene, 2;7)
'I am pushing there.'
b. He *a* eyes. (Gene, 2;7)
'He has eyes.'
c. You *mette* honey? (Gene, 3;1)
'You're putting honey?'
d. I *aime pas Maman* ! (Gene, 3;1)
'I don't love Mommy!'
e. I *peux pas* wash the *cou* me. (Gene, 3;1)
'I can't wash my neck.'
f. I *mette* bandaid *à 'tit bobo.* (Gene, 3;1)
'I'm putting a bandaid on the little booboo.'
g. They *manger bonbon.* (William, 2;10)
'They eating candy.'
h. He *manger.* (William, 2;10)
'He eating.'
i. *Moi* do it this, *moi.* (William, 3;3)
j. *Moi* play thing. (William, 3;3)
k. *Moi* play this. (William, 3;3)
l. *Il a* sitting in .... (Gene, 3;1)
m. *Il a* finish. (Gene, 3;1)
n. *J'ai* sit down. (Olivier, 2;6)
o. **je* find it.[2]

There appears to be no transfer between French and English with regard to pronouns, but do the bilingual children acquire weak pronouns in French at the same time as their monolingual counterparts? Unfortunately, Pierce (1992) does not provide figures on the proportions of clitics used in her French children's language. However, it is clear from her examples that these clitics can appear as early as 1;8. Heinen and Kadow (1990) have conducted a survey of reports on the acquisition of French as a first language. Although they do not provide precise numbers, the 17 children in their study used subject clitics productively from a mean age of 2;2, the range being 1;2 to 2;11.

For comparison purposes, we calculated the percentage of utterances with subject clitics out of the total number of finite utterances in French for our three bilingual children at the first interval. The total number of finite utterances includes those with clitic, lexical, and null subjects.[8] Gene and Olivier produced 96% and 71% of their French finite utterances with subject clitics, respectively. William produced no finite utterances in French with subject clitics; however, at interval

two, 67% of his finite utterances had subject clitics. This discrepancy is not surprising since William is slower in his development than the other two boys. Notice that his later onset is still within the range displayed by the monolinguals studied by Heinen and Kadow (1990). In sum, Gene and Olivier are certainly using subject clitics productively at interval one and William at interval two. There is no evidence that these children are significantly delayed as a group.

Discussion

The acquisition of finiteness, negation, and pronominal subjects in these bilingual children follows the same patterns as those of monolinguals. The large gap between French and English in the use of finite utterances and the absence of English utterances with postverbal negatives indicate that the children are not transferring the verb movement parameter from French into their English grammar, nor is the presence of French accelerating their acquisition of English syntax. Similarly, the distribution of pronominal subjects in each language shows that the children have correctly classified French weak pronouns as clitics, and French strong pronouns and English pronouns as NPs. We conclude that our bilingual children were acquiring French and English separately and autonomously. It is also evident from the children's use of finite main verbs in English that it is the finite-nonfinite distinction in general that is acquired more slowly in English, and not just affix-lowering.

Our conclusions are consistent with the research of De Houwer (1990), Kaiser (1994), Meisel (1989, 1990, 1994a), Meisel and Müller (1992), and Parodi (1990). More specifically, in the French of German-French bilinguals, subject clitics and finite verbs emerge productively at two years of age. There is a contingency between the appearance of subject clitics and finite verbs, and the negator consistently appears to the right of finite verbs (Kaiser, 1994; Meisel, 1989, 1990, 1994a; Meisel & Müller, 1992). Early classification of French weak

pronouns as clitics has also been observed in the acquisition of French as a second language by English-speaking children aged six to eight years old (Grondin & White, in press; White, in press). Thus, the acquisition of certain aspects of French syntax follows the same pattern whether French is being acquired alone, with German, with English, or as a second language in childhood.

In addition to showing the same patterns of acquisition as monolinguals, the bilingual children in our study seemed to be acquiring these aspects of French and English syntax at a rate similar to that of monolinguals. They fell within the range of variation shown by monolinguals for the emergence and use of verb movement and other properties related to INFL, although they do not appear at the upper bound of that range. Our findings support the position that bilingual children are not consistently slower than monolinguals (De Houwer, 1990; Nicoladis, 1994; Padilla & Liebman, 1975). However, due to the small number of bilingual children in this study, and the limited aspects of syntax examined, further research is necessary in order to determine conclusively what the norms of bilingual development are.

That bilingual children do not show an appreciable delay in their syntactic development is interesting considering they probably receive less input than monolinguals in each language. Furthermore, there is no reliable relationship between an individual child's relative exposure to each language and the particular patterns and rate of their grammatical development in those languages. For example, in spite of being exposed to more English, William used functional categories earlier and more frequently in French than in English, and within the normal range as defined by monolinguals. Also, even though Olivier's production of finite verbs in English increased when he received more input at interval three, he still produced more finite utterances in English than William at interval two.

These findings concerning input are predictable on the assumption that syntactic acquisition is based on triggering and not learning. The difference between triggering and learning in bilingual first language acquisition can be demonstrated by comparing our results with research on vocabulary growth, which involves the encoding of novel items. Pearson, Fernandez, and Oller (1993) have shown that for productive vocabulary, bilingual children have a smaller repertoire in each language when compared to monolinguals from 1;6 to 3;0. Furthermore, Pearson, Fernandez, Lewedeg, and Oller (1994) note that size of vocabulary in each language has a direct linear relationship to the proportion of input from each language. It is clear that amount of input exerts a stronger influence on vocabulary growth than on syntactic development. These differences between vocabulary and syntax suggest that the theoretical distinction between how these aspects of language are learned is psychologically real (cf. Meisel, 1994a; Pearson et al, 1994).

A second general implication of our findings concerns the maturation-continuity debate with respect to the acquisition of functional categories. The discrepancy between the emergence of INFL in the children's French and English is a potential problem for the maturation hypothesis. The presence of IP at the first interval in the children's French is uncontroversial. At interval one (when Gene and Olivier were both 1;11), 51% of the children's utterances were finite. The correct placement of the negator and the presence of subject clitics further attests to an INFL projection. For example, Gene used subject clitics with 96% of his finite utterances at interval one. In contrast, there is little convincing evidence for an INFL projection at interval one in any of the children's English. As discussed in the Results section, the presence of any finite verbs in the children's English is dubious, and the mean frequency of 10% is low. As raised subjects reside in [Spec, IP], the use of sentence-medial negators is evidence for IP. There are two examples of negative

utterances in English at interval one, and the negators are sentence-initial, indicating a lack of subject-raising. In the English corpora examined by Déprez and Pierce, only one child of the three had a substantial proportion (71%) of sentence-medial negatives by two years of age (1993, p. 35). The fact that INFL is present in one language and not in the other, within the same bilingual individual, would be difficult to explain under a maturation account where biological availability and instantiation into a child's grammar are assumed to occur at the same time. In contrast, Guilfoyle and Noonan (1992) argue that maturation and implementation are not the same process, and that once the ability to project functional categories matures, the rate at which these elements will be acquired depends on the necessary triggers in the input. Such an interpretation of the maturation hypothesis makes it more compatible with our data as it allows for some crosslinguistic variation in implementation. However, if it is shown that in languages like French there is no purely lexical stage beyond the one word stage, then it must be assumed that the ability to project functional categories matures universally before children use multiword utterances. In this case, the maturational hypothesis would have no more explanatory value than a non-maturational, structure-building perspective like weak continuity.

Our data appear compatible with some structure-building approach; thus, they do not appear compatible with the strong continuity hypothesis. If all functional categories are present from the onset of acquisition, why is there no evidence of an IP in the children's English at interval one? Moreover, why is there a discrepancy in the pervasiveness of functional category use between the children's French and English, even after there is evidence for an IP in English? Proponents of strong continuity argue that first productive use indicates acquisition (see Grondin & White, in press; White, in press) and that the instability of functional category appearance in speech is due to other, nonsyntactic factors, including phonological

constraints on productions. Demuth (1994), Gerken (1994), and Gerken and McIntosh (1994) argue that the variable production of functional categories in young children's speech is due to their tendency to omit unstressed syllables. Inflections and auxiliary verbs are typically unstressed. In this view, utterances with bare roots or bare present participles are reductions, sentences stripped of the unstressed parts.

Our data are not consistent with this explanation. First, while the children omitted unstressed functional elements in English, they easily produced the unstressed subject clitics in French. Second, our children consistently produced more utterances with *be* as a copula than present continuous utterances with *be* as an auxiliary, even though the prosodic environment is often similar. Compare the following utterances for Gene at interval two in (7). It appears that a grammatical explanation underlies these omissions, not a phonological one.

(7)
a.	That's his tail.	(Gene, 2;7)
b.	It's a ball!	(Gene, 2;7)
c.	It is mushroom.	(Gene, 2;7)
d.	There is Spock.	(Gene, 2;7)
e.	Papa's up.	(Gene, 2;7)
f.	Gene doing dodo?	(Gene, 2;7)
g.	He making a fish.	(Gene, 2;7)
h.	Johanne making cookie.	(Gene, 2;7)
i.	I sleeping!	(Gene, 2;7)

Furthermore, the apparent instability of functional projections in young children's grammars is evident not only from the omission of morphological items like auxiliaries and inflections. It is also evident from the presence of movement in the syntax. A phonological account does not explain the instability of subject-raising or verb-raising, indicated by the position of the negator. Any analysis of acquisition patterns not involving abstract grammatical properties fails to provide a unified account of the three superficially distinct phenomena in child English and French examined in this study. Finally, the claim that other factors are responsible for the

nonproduction of functional categories needs to take into account the consistent language-specific differences in timing of emergence and pervasiveness of use.

We consider these data to be most consistent with the weak continuity hypothesis. First, this perspective predicts language-specific differences in the timing of the emergence of functional elements, which is observable, for example, in the earlier presence of an IP in French in our data. Second, this perspective predicts gradualness of acquisition. In our data, full acquisition is gradual within each language, and differences in rate are observable between languages, for example in the acquisition of finiteness. See Paradis and Genesee (1995) for further discussion of the maturation-continuity debate and French-English bilingual children.

In conclusion, our results support the hypothesis that bilingual children acquire their languages autonomously, following the same patterns as monolinguals. Whereas this central finding is important, we have also shown that the implications of bilingual first language acquisition go beyond the issue of linguistic separation. Bilingual children provide a sensitive test of proposed universals and language-specific differences in acquisition.

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Endnotes

1. De Houwer (1995) suggests that it is theoretically possible for the acquisition errors made by bilingual children to be different from those of monolinguals and not be due to interlinguistic influence. However, she does not offer any specific examples of errors of this kind.

2. The asterisk indicates that the form is unattested in the corpus.

3. Transfer of the verb movement parameter may seem improbable because there are other properties of English in the input that would indicate to the child that English main verbs do not raise, that is, do-support and the placement of negatives and adverbs (cf. White, 1990/91, 1991, 1992). However, in the case of bilingual first language acquisition, it is still unknown how rigidly the children separate their input and their grammars. It is precisely the subject of this study to examine how separate or autonomous bilingual children's grammars are.

4. For the set of verbs in French whose infinitive form ends in *-er*, it is difficult to classify the children's productions as infinitives or bare past participles because the past participle is homophonous with the infinitive; for example, *dessiner* and *dessiné* are pronounced [desi'ne]. The second person plural indicative is also homophonous, but it is unlikely from context that the children were attempting this form. Whether the verb form is an infinitive or a past participle, it is still nonfinite (see Pierce, 1989).

5. Following Emonds (1985), Pierce (1992) assumes that verb-*ing* constructions are not formed in the syntax. We adopt this analysis as well.

6. The acquisition order of morphological suffixes in English has been studied extensively (Bloom, 1991; Brown, 1973; de Villiers & de Villiers, 1973); however, these findings are not easily rationalized with ours, since these authors are not concerned with emerging finiteness per se.

7. It is possible that (5)d is an example of short movement to AGRP (see White, 1992).

8. We have included utterances with lexical subjects because in Quebec French, lexcial subjects and clitics can both appear in a sentence, for example, *Jean il va là* 'John is going there.' (cf. Kaiser, 1994). Utterances in the children's corpora which had such subject-doubled constructions were included in the numerator. However, such constructions were very rare in our data.

Connecting Text - Study 1 to Study 2

It was found in Study 1 that the three French-English bilingual children studied were acquiring the syntax of INFL separately and autonomously. An important implication of this finding is that data from bilingual children can inform our understanding of general acquisition issues, as these children can be viewed as 'two monolinguals in one', at least with respect to the aspects of syntactic acquisition studied. Accordingly, in Study 1, the data from the bilingual children were applied to the issue of triggering versus learning in language acquisition, and to the maturation-continuity debate on the acquisition of functional categories. The discussion of the latter issue and the application of the data were necessarily brief as this was a secondary consideration of the study. Furthermore, the children in the Study 1 were not at the initial stage of multiword combinations for the duration of the study (MLU < 2.00). Since this debate pertains to the period of 'First Syntax', it is preferable to examine children's language during this stage alone.

In Study 2, the continuity debate was investigated more thoroughly with different French-English bilingual children. In particular, explication of the different positions on this debate and discussion of the potential contribution of bilingual children are more extensive than in Study 1. In addition, the children in Study 2 differ from those in Study 1 in that they were in the period of First Syntax throughout the observation period.

The methodology in Study 2 is similar to that of Study 1. Naturalistic language production samples were taken from the children at various intervals for one year, and coded for use of functional categories. In contrast to Study 1, the children in Study 2 were observed at more frequent intervals within that year, in order to obtain a more detailed developmental curve of functional category use. Also, the children's acquisition of the category DET was investigated in addition to INFL. This was done to determine whether the patterns found in Study 1 for INFL could

be generalized to another functional category. Finally, in both studies, parametric differences between French and English with respect to INFL were focused on, but in Study 2 a more recent version of Principles and Parameters theory is assumed to explain how this difference is characterized in formal grammatical terms.

Both Studies 1 and 2 have small sample sizes, which is partially a result of the children belonging to a special population. However, the small sample sizes should not diminish the reliability of the findings for the following reasons. First, the questions posed in each study relate to the children's grammatical competence; they are concerned with what the children 'can do' rather than what they 'typically do'. Second, there is a great deal of overlap in the results of Studies 1 and 2 such that Study 2 can be considered a cross-validation of Study 1.

Study 2

On Continuity and the Emergence of Functional Categories in Bilingual First Language Acquisition

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Abstract

A variety of positions have been proposed to explain the ontological development of functional categories. These positions follow either a maturation or continuity perspective. We examined the acquisition of IP and DP in children acquiring French and English simultaneously in order to evaluate the descriptive adequacy of the two perspectives. Crosslinguistic comparisons are essential to testing maturation versus continuity and bilingual children are excellent subjects for crosslinguistic research because the two languages reside within one individual. We collected naturalistic production data from two bilingual children aged 1;9 to 2;11 and 1;11 to 3;0 who were at Brown's Stage 1 (MLU < 2.00). Our analyses indicate that the use of function morphemes associated with INFL appeared at different times in the children's languages; whereas, the use of determiners appeared at the same time. The between-language discrepancy in the emergence of INFL -associated items demonstrates the influence of external factors, such as specific language input, on the acquisition of functional categories. Thus, we argue that our results are most consistent with a continuity perspective.

On Continuity and the Emergence of Functional Categories in Bilingual First Language Acquisition

The Maturation-Continuity Debate

The ontological development of functional categories in child grammar has been the subject of recent debate. Functional categories are non-lexical, grammatical categories, like CP, IP (AGRP, TP), or DP. The variable appearance of the function morphemes and movement operations associated with these functional categories in children's speech has raised questions about their status in early grammars. A variety of positions have been proposed, each taking either a maturation or continuity perspective. These two perspectives make different claims about the nature of children's early syntactic representations and about the kinds of mechanisms that underlie developmental change. On a maturational perspective, a child's grammar can contain unique properties not present in an adult system. Developmental change in linguistic behaviour is explained by qualitative shifts in the system underlying these behaviours. In other words, changes in behaviour are driven by changes in internal mechanisms. In contrast, on a continuity perspective, the child's grammar is formed of the same categories and principles as an adult grammar (Pinker, 1984). Developmental change in linguistic behaviour is viewed in terms of quantitative, incremental alterations to the existing system, rather than in terms of discrete stages. External factors, or the interaction of external factors with the underlying system, can drive developmental changes on a continuity perspective.

Advocates of one maturation view have proposed that no functional categories are projected in children's earliest grammars (Aldridge, Borsley & Clack, 1995; Guilfoyle & Noonan, 1992; Meisel, 1994; Platzack, 1990; Radford, 1988, 1990, 1992, for example). These researchers conclude that the absence or limited use of

morphemes and distributional contingencies associated with functional categories constitutes evidence of deficits in underlying syntactic representation. According to Radford's (1988, 1990) maturation account, the initial stage in syntactic acquisition is a lexical grammar, where utterances consist of lexical category projections, such as, AP, NP, VP and PP. Radford argues that utterances during this stage of child language are structurally akin to adult small clauses rather than adult root clauses. As the name suggests, researchers supporting this position propose that the developmental shift permitting the projection of functional categories in children's grammars arises through neurological maturation between the ages of 2;0 to 2;6.

Rizzi (1993/94; 1994) and Wexler (1994, 1996) have put forth other maturation accounts. Wexler (1994, 1996) suggests that early grammars have an optional tense stage where the functional category TP is not projected in all clauses. When TP is not projected, the clause is nonfinite, with the verb in VP, and temporal reference is achieved through context. The knowledge that tense must be projected obligatorily in all root clauses is said to mature at approximately age 2;6, which signals the end of this optional infinitive stage. In a similar vein, Rizzi (1993/94; 1994) proposes that the initial grammar permits the child to freely generate truncated root clauses, some with and some without functional categories. Truncated clauses include the small clauses identified by Radford, as well as IP root clauses. Rizzi puts forth the hypothesis that at approximately age 2;6, a principle stating that root clauses must consist of a CP matures, and from this point onwards children do not produce truncated clauses. Both Wexler's and Rizzi's accounts differ from Radford's in that they do not claim that functional categories are generally absent at the earliest stage.

In contrast to the maturation perspectives, other researchers claim that the functional structure of children's initial grammars is continuous with adult grammars, although versions of the continuity perspective range from very strong

to weak with respect to how identical children's and adults' syntactic representations are hypothesized to be. In very strong versions, it has been argued that a child's earliest grammar contains the full complement of functional categories, irrespective of whether the function morphemes and operations associated with them appear in production (Borer & Rohrbacher, 1997; Ferdinand, 1994; Hyams, 1992, 1994; Valian, 1992; Whitman, 1994; Whitman, Lee & Lust, 1991). On other strong continuity accounts, researchers have claimed that the child's knowledge of functional categories can be considered adultlike because some functional elements are present and/or certain distributional contingencies are displayed in production (Déprez & Pierce, 1993; Guasti, 1993/94; Peoppel & Wexler, 1993; Pierce, 1992; Phillips, 1996; Verrips & Weissenborn, 1992, for example). All strong continuity accounts seem to assume the two following tenets, implicitly or explicitly: (1) The functional structure of a child's initial grammar is not significantly different from the functional structure of an adult grammar and does not undergo developmental change, and (2) Omissions of function morphemes in children's speech do not necessarily indicate deficits in underlying syntactic representation (see especially Borer & Rohrbacher, 1997; Hyams, 1992, 1994). Thus, proponents of strong continuity typically attribute the variable production of functional elements to causes other than deficits in syntactic representation. For example, it has been hypothesized that constraints on phonological production may explain variable use of functional elements (Demuth, 1994; Gerken, 1994; Gerken & McIntosh, 1993). Alternatively, Phillips (1996) has suggested that coordination difficulties between the morphology and the syntax may account for the variable production of functional items.

On other versions of the continuity perspective, it is not assumed that the child's initial representation of functional structure is necessarily identical to an adult system, although it is still assumed to be composed of categories and principles

found in the adult system. Proponents of less strong versions of continuity consider omissions of function morphemes and movement operations in children's speech to be possibly reflective of deficits in syntactic representation. However, on these views, changes in the underlying system throughout development are not brought about by a radical reorganization of competence via maturation, but instead are a product of the gradual interaction of UG and the ambient language input, which establishes the particular language grammar. One example of this viewpoint is the functional underspecification hypothesis (Déprez, 1994). In order to explain the apparent optionality of NP-movement and V-to-C movement in early grammars, Déprez suggests that functional categories are fully available in children's syntax, but that certain parameter-related features of those categories could be underspecified at first, leading to derivational differences between the adult's and the child's system. Similarly, Hoekstra, Hyams & Becker (1997) have suggested that the absence of morphosyntactic markers of tense and definiteness in early grammars might be attributable to the initial underspecification of specificity features in the nominal and verbal domains. Neither Déprez (1994) nor Hoekstra, Hyams & Becker (1997) provide an account of the mechanism that permits specification to occur eventually. Because they adopt a continuity perspective, one could presume that sufficient exposure to the input would eventually trigger the target feature specification.

The continuity position farthest from the very strong position is known as the weak continuity hypothesis. Advocates of weak continuity have posited different initial states for child grammar that are not identical to an adult representation. For instance, Clahsen (1990/91), Clahsen, Kursawe & Penke (1996), Clahsen & Penke (1992), Clahsen, Penke & Parodi (1993/94), Meisel & Müller (1992) and Rohrbacher & Vainikka (1995) assume that children initially have one functional category above VP, which may not be fully specified; whereas, Radford (1995) and

Vainikka (1993/94) argue that children can produce VP-only clauses initially. The weak continuity position includes the lexical learning hypothesis, which attempts to explain how functional categories and their specifications are instantiated into particular language grammars. According to the lexical learning hypothesis, children project functional structure based on the features of the morphemes/words they have acquired in their lexicons (Clahsen, Eisenbeiss & Vainikka, 1994; Clahsen, Kursawe & Penke, 1996; see also, Müller, 1994a, 1994b). In other words, children do not project a DP in the syntax unless they have acquired determiner morphemes and their features in their lexicons. Furthermore, when children do project a category above NP, it may not be fully-specified for all features, such as number, gender or definiteness, until the relevant contrasts in the paradigm have been entered in the lexicon. Thus, the projection of functional categories and the specification of category features in particular language grammars is viewed as an input-driven, stepwise process.

Because the maturation and continuity perspectives differ with respect to the contribution of internal and external mechanisms to the acquisition process, they differ in their claims and predictions concerning crosslinguistic variation in functional category development. Maturation accounts are essentially universalist. Each of the accounts presented above predicts that there is either a lexical, optional tense or truncated clause stage in all children's syntactic development. Since an internal mechanism, maturation of UG, governs the shift from the first stage to the next, the transition should be at roughly the same time in the acquisition of all languages. In contrast, continuity views are more compatible with crosslinguistic differences in functional category acquisition. For instance, the weak continuity position predicts the possibility that language-specific timetables and patterns of emergence could occur. This prediction arises from two aspects of this position. First, because it is assumed that lexical learning drives this process, the

development of particular language grammars would be sensitive to differences in language-specific input (Déprez, 1994; Radford, 1995). Second, the weak continuity hypothesis is founded on the widely-held theoretical assumption that the specifications of lexical categories are universal across languages while the specifications of functional categories are the layer of grammar upon which crosslinguistic variation is determined (except see Juffs, 1996; Kincade, 1983). Proponents assert that instantiation of the appropriate language-specific features for functional categories must await interaction with the input and cannot be initially fully-specified by UG (Clahsen, 1990/91; Clahsen & Penke, 1992; Clahsen, Eisenbeiss & Vainikka, 1994; Müller, 1994b). On this assumption, the lexical learning process is crucial in determining the individual structure of a specific language, and thus, emergence patterns may differ between languages.

Unlike weak continuity and maturation, the predictions made by the strong continuity perspective on this issue are less direct. On the one hand, strong continuity is universalist in that it claims functional categories are always available in children's initial grammars regardless of what language they are acquiring. On the other hand, advocates of this view assume that nonproduction or variable production of functional items in children's speech need not imply deficits in syntactic representation. Thus, strong continuity accounts are compatible with the presence of crosslinguistic differences in the *use* of lexical material associated with functional categories, although they do not necessarily predict such differences.

It is evident that crosslinguistic data are crucial in determining whether maturation or continuity perspectives best explain functional category acquisition. The goal of the present study was to examine the acquisition of functional categories in children acquiring French and English simultaneously in order to evaluate the adequacy of these perspectives. As we discuss below, bilingual children provide a powerful test of how sensitive acquisition processes are to

external factors like specific-language input, and thus, can contribute uniquely to the debate on this issue. Before discussing the relevance of bilingual first language acquisition, we first go over what we view as weaknesses in prior research on the maturation-continuity question.

Methodological Shortcomings in Previous Research

Several methodological shortcomings can be found in the previous research on the development of functional categories. First, one of the principle weaknesses has been the absence of an agreed-upon measure of stage in development. Researchers freely use terms like 'early syntax' or 'early word combinations' without defining precisely what period they are referring to. Furthermore, many researchers use age alone as a determinant of stage in development, usually considering two years of age to be the relevant period (see, for example, Déprez & Pierce, 1993, 1994; Guasti, 1993/94; Poeppel & Wexler, 1993; Radford, 1988, 1990, 1992). As De Villiers (1992) points out, stage of grammatical development as measured by MLU (mean length of utterance) varies immensely by age. Equating age with stage in development is a serious flaw for those researchers claiming empirical support for the strong continuity hypothesis; it is not enough to find children who seem to have functional categories operative at a certain age, one must demonstrate that they never passed through a stage without them. For example, Poeppel & Wexler (1993) used data from a German-speaking child, Andreas, aged 2;1. They argue that Andreas' data demonstrate that children's utterances are best analyzed as full clauses, or CP's, and not small clauses. They provide no MLU for their young subject; however, Andreas' transcripts are available on the CHILDES system, a publicly-accessible child language database (MacWhinney & Snow, 1985). An analysis of Andreas' transcripts reveals that at 2;1 his conservative MLU, counted with words instead of morphemes, was 2.65 (range=2.27-3.11) across the sessions. It is clear that Andreas was not at the stage

of his first word combinations at the time of observation. Similarly, only one of the three Italian-speaking children Guasti (1993/94) studied had an MLU less than 2.50. Furthermore, Platzack (1992) found a close relationship between MLU and functional category use at MLU's under 2.00 in child Swedish. Thus, a syntactic measure like MLU should be used together with age to identify a child's stage in development. One important implication of this lacuna in the research is that it is uncertain which studies actually address the question of whether functional categories are available during the earliest stage of word combinations (see also Clahsen, Penke & Parodi, 1993/94). Since in the present study we were interested in determining the nature of the child's initial grammar, we confined our analyses to data from children whose MLU's range from 1.10 to 2.00, encompassing Brown (1973)'s early and late Stage I. Henceforth, we call this period 'First Syntax', following Valian (1992)[1].

Focusing on First Syntax as the relevant period of investigation raises another methodological issue: whether distributional evidence is superior to morphological evidence in assessing the nature of children's underlying grammars (see for example, Borer & Rohrbacher, 1997; Hyams, 1992, 1994; Wexler, 1996). The logic for this preference is as follows. Distributional contingencies between morphological form and word order, like verb finiteness and the V2 position, provide overt linear indications that verb movement has taken place, and that the clause includes functional categories. In contrast, the presence of finite verbal morphology or auxiliary verbs alone can be considered ambiguous evidence for the presence of functional categories because there is no linear indicator of movement to IP. While recognizing the importance of distributional evidence, it is worth noting that exclusive reliance on this form of evidence may be problematic from a methodological standpoint. First, morphological evidence is not necessarily ambiguous from a minimal projection rather than a templatic perspective on how

syntactic structures are generated. It has been proposed that functional heads are not projected automatically in every clause as part of a template, but are only projected when licensed by lexical material like verbal morphology (Eubank, 1996; Grimshaw, 1994). On a minimal projection view, the presence or absence of finite morphology is an acceptable indicator of the presence or absence of INFL in a clause. Second, exclusive reliance on distributional evidence could bias findings in favour of strong continuity. Utterances of at least three words are necessary to assess many word order contingencies, and data from children with an MLU of greater than 2.00 would be required to obtain a sizable sample of utterances of this length. Since longer MLU's indicate a more advanced stage of development, there is a greater chance that functional categories would be established in the child's grammar. Furthermore, in languages like English where verb finiteness has fewer distributional contingencies than in languages like German, the strong continuity hypothesis would be difficult to falsify empirically. In the present study, we consider both morphological and distributional evidence to be relevant indicators of syntactic representation.

An additional methodological weakness found in the extant research is the use of example-based analyses (Aldridge, Borsley & Clack, 1995; Ferdinand, 1994; Guilfoyle & Noonan, 1992; Hyams, 1992, 1994; Radford, 1988, 1990, 1992; Whitman, 1994). Individual examples can be unreliable representative structures of a developing grammar. An example chosen from a corpus at any given time in development could be more typical of a previous stage or a future stage and not the one in question. It could also be an idiosyncratic structure, a transcription or performance error. To present an adequate picture of a child's grammar at a given stage, quantitative measures of frequency, productivity and use in obligatory context are essential (see also Clahsen & Penke, 1992; Grondin & White, 1996).

This leads us to a fourth methodological problem which is the absence of an agreed-upon definition of what constitutes acquisition, in other words, when a functional category can be considered instantiated in a child's grammar. Grondin & White (1996) argue that the first productive use of functional morphology and distributional contingencies signals the acquisition of the associated category, even if the use occurs in a small minority of obligatory contexts. Similar views seem to be implicit in Guasti (1993/94), Poeppel & Wexler (1993) and Wexler (1994), among others. This position stands in sharp contrast to the 90 percent acquisition criteria advocated by Brown (1973) and used in much subsequent psycholinguistic work. Vainikka & Young-Scholten (1994) use a 60 percent correct usage for their criteria of acquisition in second language learners. There appears to be a confound between researchers' definition of acquisition and their position in the maturation-continuity debate. For example, setting the criteria for acquisition at first productive use biases findings towards a strong continuity position since only a 5 or 10 percent usage rate would be necessary for a functional category to be considered part of the grammar. Furthermore, choosing first use as a criterion implies that acquisition is instantaneous and that once an item comes into use a few times, its nonusage or incorrect usage in obligatory contexts cannot easily be attributed to intermediate grammars or any component of syntactic competence. However, setting a mid-range number as an acquisition criterion is also problematic; it is essentially arbitrary and invites interpretation problems along the lines of 'Is the glass half full or half empty?'. We propose to side step this issue at the present time and view acquisition as a continuous process from first use until use in obligatory context is nearly 100 percent, with no intermediate cut off point beyond which acquisition is said to have taken place. To distinguish the process of acquisition from initial use of an item, we refer to the latter as emergence.

A final shortcoming we would like to discuss regards the use of certain arguments as evidence for the presence of functional categories in early grammars. While some researchers base their support for strong continuity on empirical findings (for example Guasti, 1993/94; Poeppel & Wexler, 1993), others defend this view with less tangible evidence. For example, some researchers appear to draw on the notion of parsimony in defense of strong continuity (see also De Villiers, 1992). The position that strong continuity is more parsimonious presumably follows this logic: If first clauses are CP's, there is no need to posit differences between adult and child grammars, and no need to consider mechanisms, such as maturation or lexical learning, to explain how the child's grammar develops. Indeed, Valian (1992), Hyams (1992, 1994), Whitman, Lee & Lust (1991) suggest that any position other than strong continuity poses learnability problems. In contrast to this view, we argue that the assumption of strong continuity raises many questions about learning and learnability, rather than putting them to rest.

More specifically, some proponents of strong continuity have appealed to the presence of templates with empty nodes or null morphemes in children's grammars in order to preserve the claim that functional categories are always present underlyingly in children's clauses from the outset of production even when there is little or no evidence for the use of associated functional elements (Borer & Rohrbacher, 1997; Ferdinand, 1994; Hyams, 1992, 1994; Valian; 1992; Whitman, 1994; Whitman, Lee & Lust, 1991, for example). A number of questions arise from such analyses. If the initial state of the child's grammar is one in which the child freely generates empty nodes, how does the child retreat from this analysis to the target grammar where an empty INFL is not permitted, not even optionally? What are the default settings for parameters associated with empty functional categories and how do children reset the parameter if the target language demands

it? Furthermore, the existence of an empty functional template is particularly problematic when faced with accounts where IP consists of multiple functional categories, not one. The hierarchical order of these categories may vary crosslinguistically, and some categories may appear in certain languages only (see Webelhuth, 1995, for a review). This begs the question of what is included in the initial child language template.

We acknowledge that many questions arise from other positions as well. For example, with respect to the maturation perspective, where is the independent evidence to support the alleged maturation of a specific principle of UG at one precise point in development? It is not sufficient to identify one specific language development fact during a particular period of neurological growth to conclude a causal relationship. A bridging theory is needed to show the link between the developing neural architecture in question and the linguistic phenomenon (Braine, 1994). Regarding the lexical learning hypothesis, what are the crucial elements that cause the grammar to project a functional category? Are they specific triggers in the input, or a critical mass of morphemes in the lexicon? How and why does the process vary with input from different languages? In short, our point is that the templatic/null morpheme version of strong continuity requires as much further explication as other positions and therefore, should be not considered intrinsically more parsimonious.

Contribution of Bilingual First Language Acquisition

Bilingual children can inform us about the ontological development of functional categories in all children because crosslinguistic data are important in determining which perspective best accounts for the nature of First Syntax. Bilingual children provide excellent subjects for crosslinguistic research because each child is his/her own 'matched pair', thereby reducing intersubject variation due to cognitive or situational differences (De Houwer, 1990, 1995; see also Meisel, 1990). In other

words, bilingual children demonstrate how two languages are acquired by one brain in one context. Thus, bilingual children can make a unique contribution to our understanding of the sensitivity of language acquisition processes to specific-language input. Although it has been hypothesized that children acquiring two languages simultaneously have a unitary syntactic system at this age (Redlinger & Park, 1980; Volterra & Taeschner, 1978, for example), more recent research suggests that bilingual children have differentiated and autonomous linguistic representations from the outset of syntactic acquisition (De Houwer, 1995; Meisel, 1989, 1990; Paradis & Genesee, 1996). Therefore, we do not consider interlanguage contact at the level of grammatical representation to be a factor in these children's language development.

As discussed above, the maturation and continuity perspectives make different predictions about universal and language-specific properties of the emergence of functional categories in child grammar. The maturation hypothesis predicts that there is a universal lexical, optional tense or truncated clause stage in children's syntactic development. If this claim is true, this stage should appear in both languages of a bilingual child. Furthermore, since neurological maturation is the proposed mechanism of change, the shift from this stage to the next should occur at the same time in both a bilingual's languages because the maturation would take place within one individual. In contrast, continuity perspectives do not predict universality in the use patterns of functional items in children's First Syntax. The weak continuity position in particular predicts the possibility of language-specific patterns in the emergence of functional categories. Therefore, if consistent interlanguage differences are observed in bilingual children's use of functional categories at First Syntax, we can conclude that external factors, like language-specific input, are instrumental in the acquisition process, and that a continuity perspective is best supported.

In previous research, we have found robust language-specific differences in the use of IP clauses in French-English bilingual children (Paradis & Genesee, 1996). But, two of the three children in our study were beyond the period of First Syntax. Accordingly, in the present study we used data from French-English bilingual children at the stage of First Syntax. We examined the emergence and use of INFL-associated and DET-associated items in the children's language for one year, and quantitative analyses were done wherever possible. We included DET in order to determine if the language-specific differences in the emergence of INFL could be generalized to other functional categories. Before presenting the study, we discuss some theoretical assumptions which underlie our analysis.

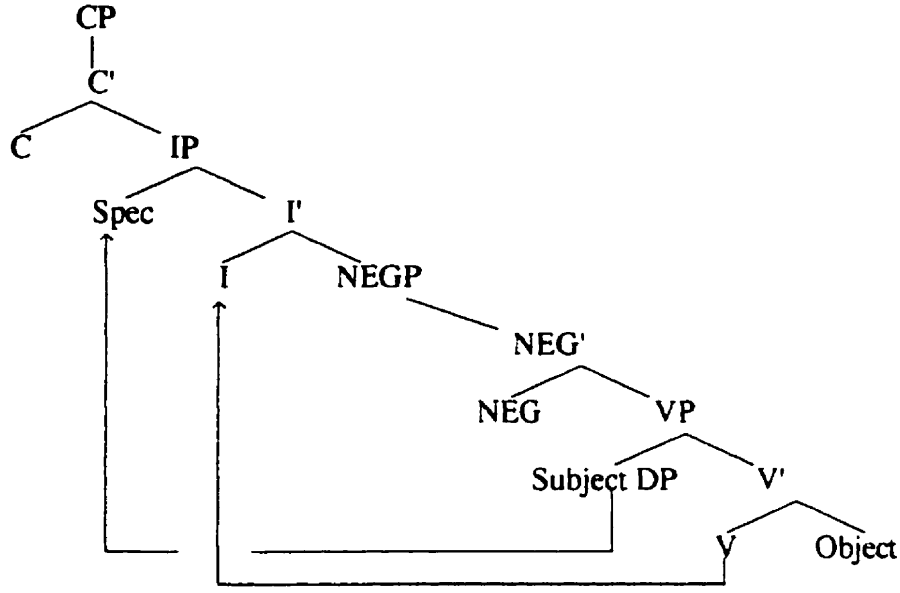
Some Aspects of French and English Morphosyntax

We assume a Minimalist version of Principles and Parameters (P&P) theory (Chomsky, 1992). Even though we have referred to IP as one projection, in some analyses it is assumed that multiple heads, specifically AGRP and TP, replace IP (Chomsky, 1992; Pollock, 1989, for example). Because we are not concerned with differences between tense and agreement, we continue to use IP as a convenient label. There are two movement operations relevant to our analyses, subject raising and verb movement. In contrast to earlier versions of P&P theory, verbs and nouns enter the computational system fully inflected, so movement to functional heads is to check features, not to attach affixes. If a language is one where the features are strong, the movement takes place before Spell-Out (overt movement), and if they are weak, the movement takes place at LF (covert movement).

In English and French, N features in IP are strong, so subject DP's move to [Spec, IP] to check their features before Spell-Out. In contrast to subject raising, verb movement occurs at different stages in French and English syntax. In French, V features in IP are strong, so all finite verbs raise to IP to check these features

before Spell-Out. In the case of auxiliary + participle constructions, the auxiliary raises to IP. In English, V features in IP are weak, thus main verbs do not raise before Spell-Out. However, the copula and auxiliaries *be* and *have* raise before Spell-Out. Chomsky (1992) suggests that they must move before LF because they are semantically vacuous. Both subject raising and verb movement are illustrated in (1).

(1)



When the subject DP and verb raise in a clause with a negative marker, the movement is attested by a subject-verb-NEG surface word order. If the main verb remains in the VP, the surface word order is NEG-verb. The examples in (2) show the word order differences in French and English negatives . In French, the finite main verb or auxiliary verb appears to the left of the negative marker as in (2a, b). Note that the *ne* is rarely used in spoken Canadian French, and thus the true negator is *pas* (see also Déprez & Pierce, 1993). In English, the main verb *see* appears to the right of the negative marker; however, *do* in do-insertion, auxiliaries and modals appear to the left of the negative, as in (2c, d, e).

(2) a. *Le lion (ne) voit pas l'éléphant.*
the lion see-pres not the elephant
'The lion does not see the elephant.'
b. *Le lion (n') a pas vu l'éléphant.*
the lion aux not see-past-part the elephant
'The lion did not see the elephant.'
c. The lion does not see the elephant.
d. The lion has not seen the elephant.
e. The lion can not see the elephant.

Another relevant difference between French and English is the presence of subject clitics in French. In more traditional terminology, French has strong pronouns, for example, *moi*, (1st pers. sing.), *toi*, (2nd pers. sing.), *lui*, (3rd pers. sing. masc.) and weak pronouns, for example, *je*, (1st pers. sing.), *tu*, (2nd pers. sing.), *il*, (3rd pers. sing. masc.). Weak pronouns are clitics which attach to verbs, whereas, strong pronouns behave syntactically like DP's, as do English pronouns (Kayne, 1975). There is no consensus among researchers concerning the theoretical status of clitics. For example, Sportiche (1992) suggests that clitics head their own functional projections within IP. In contrast, analyses looking specifically at Canadian French tend to argue that subject clitics in this dialect are agreement affixes, whose use is possibly in the process of becoming obligatory (Auger, 1995; Cummins and Roberge 1993, for example). We adopt the morphological analysis because the children in our study were acquiring Canadian French. As agreement affixes, subject clitics in French are INFL-associated elements; whereas, subject pronouns in English occupy argument positions.

With respect to DP's, we assume that DET contains features related to nouns in much the same way that INFL contains features related to verbs (Abney, 1987; Müller, 1994a). In both French and English, determiners contain the features definiteness and number. In French they also include gender. English and French differ in how the feature plural is realized within a DP. In English, plural is marked overtly on the noun and not on the determiner; for example, compare *The dog* with *The dogs*. In contrast, the plural feature is usually marked overtly on the

determiner rather than the noun in French; for example, compare *Le chien* 'The dog' with *Les chiens* 'The dogs' (The final *-s* in *chiens* is silent). Finally, possessives like *my* in *my dog* can be analyzed as residing in DET in both French and English (Grondin & White, 1996; Radford, 1990), and we have included them in this category for our analyses.

Method

Subjects

We analyzed naturalistic speech data from two children who were acquiring French and English simultaneously in the home. Both children resided in Montréal, Canada, and both were acquiring Canadian French and English. One of the children, Yann, had an English-speaking father and a French-speaking mother. The other child, Mathieu, had a French-speaking father and an English-speaking mother. Yann and Mathieu differed with respect to their relative exposure to each language. Yann was enrolled in bilingual daycare, thus he had fairly balanced exposure to French and English. In contrast, Mathieu had more exposure to English, as his mother stayed home with him during the day. The dominance in each language for these two children has been previously analyzed in Nicoladis (1995), using subjective and statistical procedures. The procedures included the following: informal parental report of daily exposure to each language, researcher's impressions of dominance during visits, and a linear discriminant function analysis of various structural measures such as proportions of multi-morphemic utterances and lexical types (for further details, see Nicoladis, 1995). According to this analysis, Yann was considered to be either balanced or slightly French dominant for most sessions. Mathieu was difficult to classify as the subjective criteria did not concur with the statistical criteria. According to the former, he was English dominant at each session. According to the latter, his dominance vacillated between French and English.

Procedure

The children were video and audio taped in their homes during hour-long naturalistic play sessions with their parents. There were three kinds of play sessions: with the mother alone, the father alone, and with both parents together. Two to three play sessions make up an interval of data taken at a certain age. When only two sessions were taped, they consisted of the mother-alone and father-alone conditions. Twenty minutes were transcribed from each hour-long session. All transcripts were coded according to CHAT (MacWhinney, 1991), a standardized coding and transcription system for naturalistic speech data. The data used for our analysis are taken from these transcripts. Information about the children's ages, the number of utterances in the sample at each interval, and the children's MLU's in each language are shown in Table 1. MLU's were calculated as an average utterance length for the two or three sessions at each interval. We calculated MLU's using words not morphemes. Our reason for doing so is as follows. This study focuses on the emergence of functional categories, which are often realized as inflections. Because we are using MLU as a measure of stage of development, it would confound this measure to include inflections in it. Because the children were at First Syntax, they did not use many inflections, so there is not a large difference between their word and morpheme-based MLU's. Table 1 shows that the children were at First Syntax in both French and English through the period of the study.

Table 1. *Ages, MLU's (mean length of utterance in words), total number of utterances and total number of utterances with verbs for each child.*

Yann

Age	English MLU	French MLU	Combined MLU[a]	Total utterances	Total utts. with verbs
1;11	1.16	1.4	1.26	134	9
2;3	1.49	1.58	1.57	151	9
2;5	1.45	1.43	1.46	277	58
2;7	1.33	1.39	1.39	207	20
2;10	1.55	1.47	1.57	454	67
3;0	1.44	1.96	1.80	556	90

Mathieu

Age	English MLU	French MLU	Combined MLU[a]	Total utterances	Total utts. with verbs
1;9	1.071	1.58	1.27	162	19
1;11	1.25	1.49	1.37	185	28
2;1	1.45	1.58	1.59	310	25
2;3	1.22	1.60	1.36	349	39
2;11	1.96	1.50	1.90	432	116

[a]Combined MLU is calculated from the total of French, English and mixed utterances

Analysis

Determining Evidence for IP. There are four components to our analysis: frequency of finite clause use, productivity of INFL-elements, movement over the negative marker, and frequency of verbless utterances. Overall frequencies in finite clause use by each child in each language provide evidence of how and when

INFL-associated items emerge in French and English. The productivity analysis complements the frequency analysis in that it provides information on the variety rather than quantity of INFL-elements available in the children's repertoires. In order to assess the productivity of INFL, we looked at alternations between finite verb types and the appearance of other INFL-elements, such as auxiliaries, do-insertion, modals and subject clitics. In addition to the finiteness value of the clause, another source of evidence for the presence of INFL is movement over the negative marker. Recall that two kinds of movement are relevant, subject raising and verb movement. In negative utterances, raised subjects and verbs should appear to the left of the negative marker. If such word orders obtain, this constitutes evidence for the presence of an INFL projection (Déprez & Pierce, 1993, 1994). Finally, we also examined the overall prevalence of clauses with verbs, both nonfinite and finite, by looking at the entire range of utterance structures produced by the children at this stage. It has been noted that verbless propositions and referential expressions constitute a distinguishing characteristic of First Syntax (Meisel, 1994; Radford, 1988, 1990; Rizzi, 1994).

Before examining the results of these analyses, let us discuss our criteria for data selection and for determining finiteness. For the first three analyses, we selected all utterances with verbs from the children's corpora, excluding repetitions of adult utterances and self-repetitions. Single word utterances with verbs were included because they can in principle be inflected. While the majority of utterances so selected were composed of words from only one language, we included some mixed utterances. We decided to include mixed utterances if the mixed element was not a verbal inflection or an auxiliary verb. In fact, we found no mixed utterances of this type. Most of the utterances included had a mixed subject NP. Mixed utterances were assigned to the language of the verb present in the utterance. We eliminated mixed utterances with a negative marker from one language and a verb

from the other because of the difficulty in determining whether movement should be according to the language of the negative marker, or the language of the verb. Mixed utterances comprised very few of the total number of utterances from the sample, 5.8% for Mathieu and 6% for Yann. Finally, for the analysis concerning the overall prevalence of clauses with verbs, the entire corpora were included and not just a subset of utterances with verbs.

Next, we classified the utterances with verbs as finite or nonfinite. If a clause is finite, there is overt evidence for the presence of INFL. In French, we used verbal morphology as the criterion for classifying finite and nonfinite clauses. Nonfinite verbs appear in either the infinitive or the bare past participle form. In contrast, finite verbs are adult-like in morphological form, usually in the present tense. We also used the presence of a clitic subject with the verb as an additional morphological indicator of INFL. Since we found that clitics appeared exclusively with finite verbs in these children's speech, as is typical of child French (Paradis & Genesee, 1996; Pierce, 1992), there was never any conflict in assigning a clitic+verb construction to the finite or nonfinite category.

In English, utterances were classified as finite, nonfinite, and ambiguous. We used morphosyntactic and contextual criteria to determine finiteness, although the impoverished inflectional system for English verbs made classification more complex than in French. Clauses classified as finite were those with a tensed copula or auxiliary verb, a modal, or do-insertion. Clauses with a verb bearing the third person singular present habitual *-s* inflection were also considered finite. There were three principal kinds of nonfinite verbs: (a) verbs in the present participle/gerund form (verb-*ing*) without a tensed auxiliary; (b) verbs in the present habitual without the obligatory *-s* for third person, and (c) verbs that appeared in the root form in a context where the present continuous was required. Other than for the third person singular, present habitual verb forms are identical to root forms,

and context is essential to determining finiteness in these cases (see also Pierce, 1992).

There were some utterances in English that were ambiguous with regard to finiteness, even in context. For example, perceptual or stative verbs which never take the continuous aspect in the present tense, such as, *see* or *want* , are ambiguous in first and second person. Also, affirmative imperatives are ambiguous because the verb form is identical to the root. For these reasons, our classification includes an ambiguous category for English[2].

Determining Evidence for DP . As in the previous analyses, we examined both the frequency of determiner use in obligatory context and the productivity of determiners. For the analyses, we selected all utterances with nominals from the corpus of each child, including nominals from mixed utterances. We excluded mixed utterances where mixing occurred within a DP. Nominals without a determiner were included for the calculation of obligatory context. Obligatory context was defined as a structure in which a determiner would be used in the adult language.

Results

Frequency of IP Clauses

We calculated the percentage of finite utterances, nonfinite utterances, and ambiguous utterances in each language out of the total number of utterances with verbs in each language across the intervals. Since the children were at the stage of First Syntax throughout the observation period, we felt it was justifiable to collapse across intervals. Table 2 shows that both children produced significantly more utterances with overt evidence for INFL in French than in English ($\underline{X^2}$ = 89.855, $\underline{p}$ < .0001 for Yann; $\underline{X^2}$ = 73.826, $\underline{p}$ < .0001 for Mathieu). Note that even though clauses with verbs are much less frequent in French than in English in Mathieu's

corpus, half of these clauses showed evidence of IP. So, the lack of finite clauses in Yann's English corpus cannot be attributed to the low frequency of verb use.

It could be argued that once unambiguously finite clauses appear in a child's English, the ambiguous ones should be considered finite as well. Let us consider reclassifying Mathieu's ambiguous utterances from Table 2. If we consider the ambiguous utterances at the final interval as finite, the overall percentage for finite verb use increases from 10% to 45%. Notice that even with this adjustment, Mathieu still produced more finite verbs in French, 51%.

Table 2. *Proportion of utterances with INFL, without INFL and with ambiguous evidence for INFL out of the total number of utterances with verbs in each language.*

Yann

Clause Type	English - %	French - %
INFL	0 (0/35)[a]	62 (116/188)
No INFL	100 (35/35)	38 (72/188)
Ambiguous[b]	0	0

Note. $\underline{X^2} = 89.855$, $p < .0001$

Mathieu

Clause Type	English - %	French - %
INFL	10 (16/156)	51 (25/49)
No INFL	44 (72/156)	49 (24/49)
Ambiguous	46 (68/156)	0

Note. $\underline{X^2} = 73.826$, $p < .0001$

[a]Raw frequencies are in parentheses
[b]Scores in this row were not included in the chisquare analysis.

In order to determine whether this discrepancy between French and English was constant throughout the observation period, we calculated the percentage of utterances with finite verbs in each language at each interval for each child, out of the total number of utterances with verbs in each language at that interval (see Figure 1). The raw frequencies for verb use at each interval are given in Table 1 for both languages combined. The low frequency of verbs used may have caused the high percentage of French finite verbs for Yann at the first two intervals, and thus accounts for the sharp drop in the percentage at 2;5. The drop in Mathieu's finite French verb use at 2;1 could be due to his repeated use of one nonfinite verb form, *fini* 'finished', during the sessions at this interval. Fluctuations notwithstanding, Figure 1 demonstrates a large discrepancy in finite verb use between French and English for both children at virtually all intervals. Yann's mean percentage of finite verb use in English was 0% and in French was 65%. Mathieu's mean percentage of finite verb use in English was 3% and in French was 43%. Paired t-tests reveal that this difference between English and French is significant for Yann (t = -5.204, p = .0035), and marginally significant for Mathieu (t = -2.616, p = .0590).

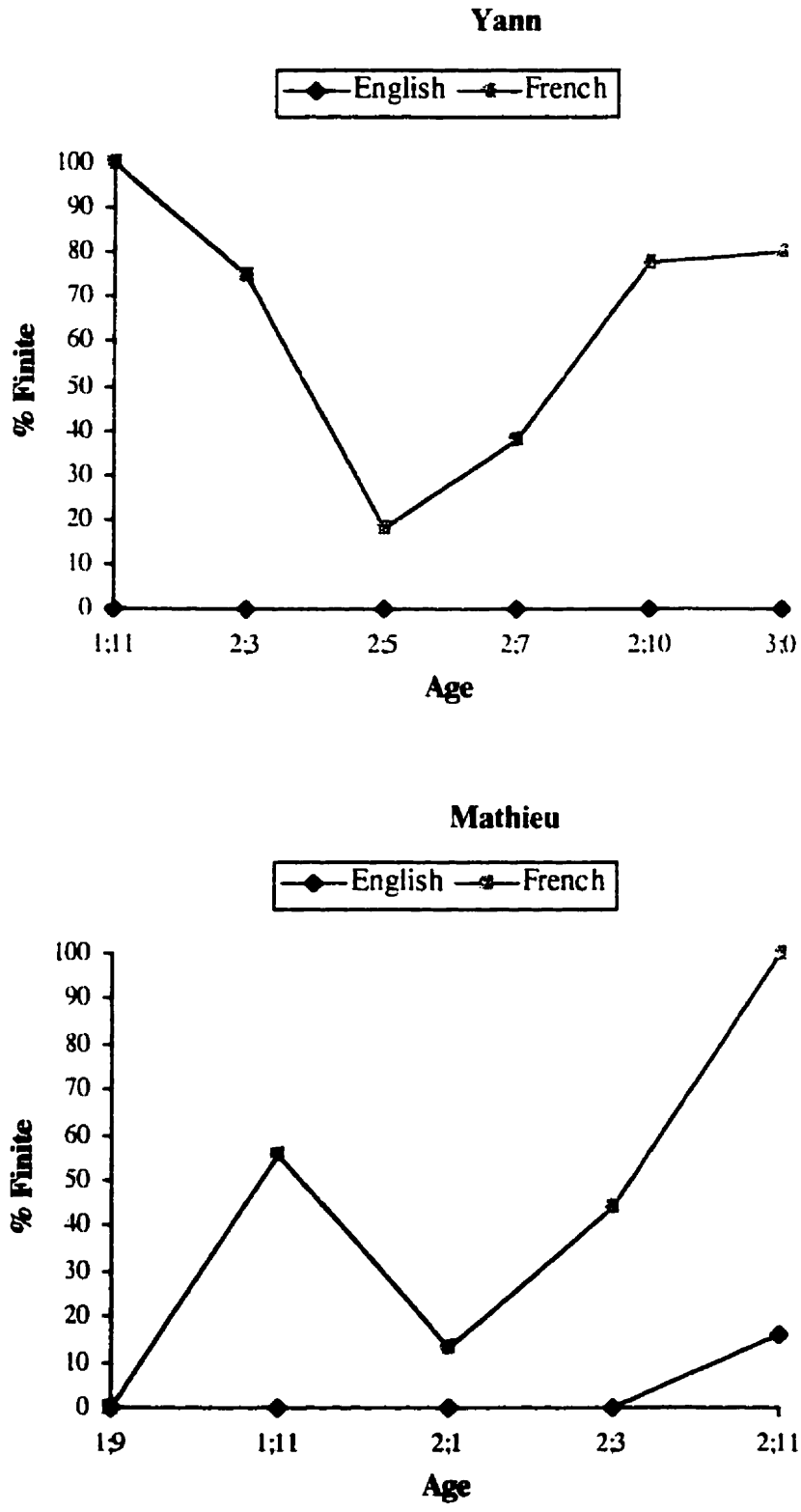


Figure 1. *Percentage Use of Finite Verbs in Each Language at Each Time Interval.*

There was not only a difference in the frequency of IP clause use between French and English, but also a difference in when INFL emerged in the two languages. IP clauses emerged earlier in French. As shown in Figure 1, the first examples of French utterances with finite verbs appeared in Yann's corpus at 1;11 (FrMLU = 1.40) and Mathieu's corpus at 1;11 (Fr MLU = 1.491). Also, the first instances of clitic use occurred in Yann's corpus at 2;3 (FrMLU = 1.58), and Mathieu's corpus at 2;3 (FrMLU = 1.60). In contrast, the first emergence of finite verbs in English appeared in Mathieu's corpus at 2;11 (EngMLU = 1.96), and no examples appeared in Yann's corpus. That use of IP clauses emerged earlier in Mathieu's French is particularly significant because he was exposed to more English input.

Productivity of INFL-elements

In this section we examine the variety of INFL-elements produced by the children in each language. The contrast in productivity between French and English further attests to the earlier establishment of INFL in the children's French grammars. Examples of the children's finite French utterances are presented in (3) and their nonfinite French utterances in (4). Both children used a range of finite verb types in French with a variety of subjects and objects, as shown in (3). For Mathieu, 73% (11/15) of all French verb types used during the observation period were in their finite form. For Yann, 77% (17/22) of French verb types appeared in finite form. The children's use of subject clitics in French, shown in (3c) to (3h), further attests to the presence of INFL in these finite clauses. Notice that Yann was using third person singular, first person singular, and first person plural clitics, as shown in (3e,f), (3g) and (3h), respectively.

(3)
a. *Ça va là bas.* (Mat 1;11)
'That's going over there.'
b. Daddy *pousse.* (Mat 2;1)
'Daddy is pushing.'
c. *Il va haut.* (Mat 2;3)
'It's going up.'
d. *Il recule, hein?* (Mat 2;11)
'He's backing up eh?'
e. *Il chante.* (Yan 2;3)
'He's singing.'
f. *Il travaille Babar.* (Yan 2;7)
'He is working Babar.'
g. *Je veux Papa.* (Yan 3;0)
'I want Papa.'
h. *On tourne.* (Yan 2;10)
'We are turning.'
i. Ernie *fait dodo debout.* (Yan 1;11)
'Ernie is sleeping standing up.'
j. *Babar met de l'eau oiseau.* (Yan 3;0)
'Babar is giving water bird.'
k. Me *a fait* booboo. (Yan 3;0) (past time reference)
'Me made booboo.'

(4)
a. No *assis.* (Mat 1;11)
'No sit down.'
b. *Parti vache.* (Mat 2;1)
'Cow gone.'
c. *Brisé autobus.* (Mat 2;3)
'Bus broken.'
d. *Yannie assis.* (Yan 2;5)
'Yann(ie) sitting.'
e. *Fini choochoo?* (Yan 2;5)
'Choochoo finish?'
f. *Lapin baigner dans lolo.* (Yan 3;0) (lolo = l'eau)
'Rabbit taking bath in water.'
g. *Manger* Nanny. (Yan 3;0)
'Eating Nanny.'

In contrast, the variety of IP clauses in English was more limited. Examples of finite English utterances are in (5), and nonfinite English utterances in (6). Yann did not produce any IP clauses in English during the observation period, and Mathieu produced IP clauses at the final interval only. Mathieu used the copula, shown in (5a) to (5c), and main verbs in the present habitual, shown in (5d) and (5e). The example in (5c) could be an unanalyzed chunk. Also, the examples given in (5d) and (5e) are the only examples in the corpus of INFLected main verbs in English. The utterance in (5f) could be an instance of correct past tense form,

but is actually ambiguous because the irregular past tense form is identical to the verb root for *put*. We found no examples of *be* used as an auxiliary in the present continuous in Mathieu's corpus, even in obligatory context, for instance (6a). We found one instance of do-insertion in obligatory context, shown below in (7d), but consider (7e) and the other examples in (7) below. We found no instances of modals in his corpus.

(5)	a. There it is.	(Mat 2;11)
	b. That's lots.	(Mat 2;11)
	c. I'm sorry Daddy.	(Mat 2;11)
	d. Goes crash!	(Mat 2;11)
	e. xxx works.	(Mat 2;11)
	f. He put the batteries inside.	(Mat 2;11) (past time reference)

(6)	a. Coming down.	(Mat 1;9)
	b. The birdy fall *là*.	(Mat 2;1)
	c. Me finish!	(Mat 2;11)
	d. Why you do this?	(Mat 2;11)
	e. Mommy play ball.	(Yan 2;5)
	f. Papa do.	(Yan 2;5)
	g. Read a book.	(Yan 2;7) (non-imperative)

Movement and Negative Markers

There were few examples of negative utterances with verbs in the children's corpora, and an even smaller subset that did not include either a code-mixed negative marker or verb. Consequently, our analysis is limited and example based.

Mathieu produced seven nonimperative negative utterances with verbs in English, some examples of which are given in (7). The utterances in (7a) to (7c) have sentence-initial negation and show an absence of do-insertion. The utterance in (7c) has an overt subject whose placement to the right of the negative further attests to the absence of IP. The context rules out the interpretation of *no one piece* as 'no one's piece' because Mathieu was talking about one piece as opposed to two pieces. In contrast, the utterances in (7d,e) have sentence medial negation, and (7d) has do-insertion, both indices of INFL. Note that all these utterances were

produced at 2;11 (EngMLU = 1.96), which is the interval where there is other evidence for variable IP use in Mathieu's English. Mathieu produced just one utterance with a French negative marker , *(y)n'a plus* 'There's no more' (2;11). The negative marker is in the correct postverbal position, but this utterance could be an unanalyzed chunk because it is a frequently used expression.

(7) a. No break it here. (Mat 2;11)
b. No working. (Mat 2;11)
c. No one piece go here. (Mat 2;11)
d. We don't take xxx. (Mat 2;11)
e. The truck no go. (Mat 2;11)

Examples of the ten nonimperative negative utterances from Yann's English corpus are given in (8). All of Yann's English negatives had sentence initial negation and no do-insertion. This is not surprising as we found no other evidence for IP use in his English during our observation period. There was only one example of an utterance with a French negative marker in his corpus, *bouge pas* 'Don't move' (3;0). The position of the negative marker indicates the presence of a moved verb, hence INFL.

(8) a. No eat. (Yan 2;3)
b. No eat my raisin. (Yan 2;10)
c. No need that. (Yan 2;10)
d. No bite me. (Yan 3;0)

Utterances without Verbs

The proportion of utterances with verbs (with or without overt markers of INFL) and the proportion of utterances with overt markers of INFL in each language for each child were calculated out of the total number of utterances in each language for the observation period (see Table 3). We used the total number of utterances in each language as the denominator, rather than multiword utterances, because there were one word utterances that consisted of a verb. The results from Table 3 show that verb use was low overall and that utterances with overt manifestations of INFL form a minuscule proportion of all utterances produced at this stage in development.

Table 3. *Proportion of utterances with verbs and utterances with INFL out of the total number of utterances in each language*

Yann

Language	Verb present - %	INFL present - %
English	4	0
French	24	15

Mathieu

Language	Verb present - %	INFL present - %
English	12	1/6[a]
French	7	4

[a] The second calculation was based on revised totals for utterances with INFL. All ambiguous utterances at 2;11 were included with utterances having unambiguous evidence for INFL.

Verbless multiword utterances were not confined to referential phrases, for e.g. *Pretty moon* (Mat 2;3) and *Deux chapeaux* 'Two hat(s)' (Yan 2;3), or locatives, like *à l'eau* 'in (the) water' (Mat 2;3). We also found many examples of what appear to be verbless propositions or XP's, utterances which have argument-predicate structure like a proposition, but no verb. Examples are given below in (9) and (10), from the French, English and mixed corpus for each child. For many of these utterances, it appears that a copula is missing, for instance (9e) or (10d). But, context indicates that other utterances appear to be missing the verb *have*, for example (9b) and (9c), or the verb *go* , for example (10a). In the utterance in (10f), the child is protesting against a toy being put in a container, thus, conceptually, the verbs *want/vouloir* and *put/mettre* could have been present.

(9)
a. There good-bye. (Yan 1;11)
b. I baseball. (Yan 2;3)
c. Mommy choochoo? (Yan 2;5)
d. Bambi *à l'eau*. (Yan 2;5)
'Bambi in (the) water."
e. That moo? (Yan 2;10)
f. *Bébé en haut avec Papa*. (Yan 3;0)
'Baby up with Papa.'

(10)
a. Up arm! (Mat 1;11)
b. *En bas chaise*. (Mat 2;3)
'Chair below.'
c. Funny you! (Mat 2;11)
d. Daddy at home. (Mat 2;1)
e. *Où oiseau*? (Mat 1;11)
'Where bird?'
f. No, no *dedans*. (Mat 1;9)
'No, no inside.'

Frequency of Determiner Use

We calculated the percentage of determiner use in obligatory contexts in French and English for each child at each interval (see Figure 2). Notice that both children show use of determiners by 1;11 in both languages, although they did not use them in the majority of obligatory contexts. The mean for determiner use for Yann was 30% in English and 24% in French. The mean for Mathieu's English was 18% and for his French is 15%. Paired t-tests reveal that there is no significant difference between the means for French and English in the children's use of determiners (Yann, $\underline{t}$ = .986, $\underline{p}$ =.3696; Mathieu, $\underline{t}$ = 1.00, $\underline{p}$ = .3739). However, Figure 2 shows that there is a between-child difference. Overall, Yann used more determiners in both languages than Mathieu. Note the sharp increase in Mathieu's determiner use in both languages at the last interval. This increase is most likely an artifact of the time gap between the fourth and fifth interval. In contrast to the use of IP clauses, the use of DP's did not seem to be governed by language-specific factors.

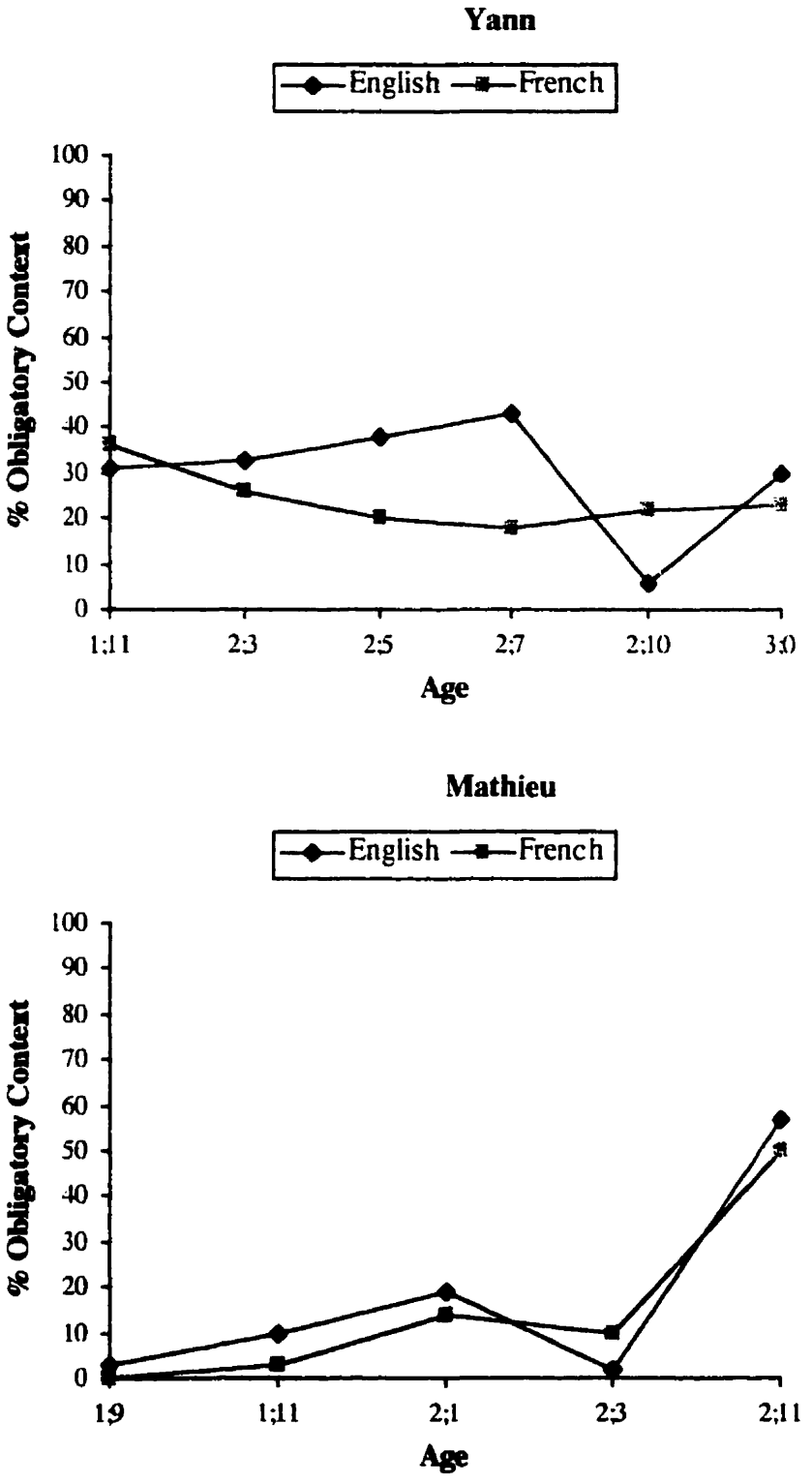


Figure 2. *Percentage use of determiners in obligatory context in each language at each time interval.*

Productivity of Determiners

The examples of DP's given in (11a) to (11d) show that Yann used definite and indefinite determiners in both French and English with a variety of nouns. There were no examples from Yann's corpus of feminine determiners in French. Also, he used no plural determiners in French or plural nouns with a determiner in English. The example in (11e) has no determiner, but shows the absence of plural markings on nouns. Thus, we can conjecture that his DP's did not include number distinctions at this point. Yann used only one possessive form, *my*, in both languages. An English-only example is given in (11f).

(11) a. *Le loup.* (Yan 1;11)
'A wolf'
b. *Un oiseau.* (Yan 2;3)
'A bird'
c. A book. (Yan 1;11)
d. The ball? (Yan 2;3)
e. Two monkey. (Yan 3;0)
f. My cookie. (Yan 2;3)

Similar to Yann, Mathieu used both definite and indefinite determiners in French and English with a variety of nouns, as shown in (12a) to (12e). In contrast to Yann, Mathieu was beginning to use gender distinctions in French determiners, exemplified by (12d). Also, Mathieu was beginning to use number distinctions. In (12g), a determiner appears with a plural noun in English, and in (12i), a plural determiner in French appears. This is the only example of a plural determiner in French, so it may not have been productive. The examples in (12g) and (12h) show that Mathieu was beginning to use person distinctions in possessives in English by 2;11 (MLU = 1.96). In sum, both boys used DP's productively in both languages at First Syntax; however, more features seemed to be present in Mathieu's DP's by the final sample than in Yann's DP's during this period.

(12) a. *Un autre*? (Mat 2;1)
'Another one?'
b. *Un avion.* (Mat 2;11)
'An airplane.'
c. *Le bonhomme.* (Mat 2;3)
'The toy figurine.'
d. *La porte.* (Mat 2;1)
'The door.'
e. The balloon, Mama? (Mat 2;1)
f. A car. (Mat 2;1)
g. In my eyes. (Mat 2;11)
h. His turn. (Mat 2;11)
i. *Mes bobos* Juliette. (Mat 2;11)
'My booboos Juliette.'

Summary of the Results

In summary, our analyses reveal that the children produced mainly truncated clauses, PP's, XP's, VP's, NP's and DP's, in both languages at First Syntax. Only a minority of the children's utterances included verbs; many propositions were expressed without verbs. Thus, the children's grammars seemed to license truncated or small clauses as suggested by Radford (1988, 1990) and Rizzi (1994). In comparison and in contrast to Radford's claims, determiners appeared in both languages for both children from the beginning of the observation period. Importantly, we also found no interlanguage differences in the emergence of DP's or in their frequency of use.

While a predominance of truncated clauses and the emergence of determiners at the same time are shared characteristics of First Syntax in the children's English and French, the emergence of INFL differed. We found that for these two children, INFL emerged as early as MLU 1.50 in French, but only later in English, at the end of First Syntax. In addition, the frequency of IP clauses was greater overall in French than in English, even for Mathieu who received more English input. Also, DP and IP seemed to be independent of each other; a determiner could be omitted in a finite utterance, see (3k) for instance, and a nonfinite utterance could contain a determiner, as shown in (6b). Although, a systematic analysis might reveal some

relationship between the co-occurrence of certain INFL and DET features (cf. Hoekstra, Hyams & Becker, 1997).

Discussion

The data from Yann and Mathieu are not compatible with the maturation hypothesis as proposed in Radford (1990). Even though our data revealed that elements associated with functional categories were not always present and were not frequently used in the children's First Syntax, they nevertheless suggest that First Syntax cannot be characterized as a stage where functional items are universally absent. For example, determiners were used in both languages from an early stage, and so were finite verbs in French. Of particular interest, the present data indicate that there was differential appearance of INFL-related elements in each language. If the ability to project functional categories were controlled by neurological maturation, one would have expected them to emerge in both languages of these children at the same time.

These results also challenge the maturation hypotheses proposed by Rizzi (1993/1994, 1994) and Wexler (1994, 1996). Recall that Rizzi and Wexler claim that the period of optional truncated clause production or optional tense projection ends around 2;6 with the maturation of obligatory CP or TP projections. Between 2;5 and 2;10, Yann was producing IP's optionally in French, and nonfinite root clauses exclusively in English. At 2;11, Mathieu was producing nonfinite clauses optionally in English. Also, the children showed limited evidence of productive tense distinctions during the observation period, which Wexler (1994) argues is the sign that TP has entered the grammar. Therefore, there is no evidence in our data that a shift occurred in the children's grammatical development at 2;6. More importantly, we may ask whether the developmental curve shown by these children is compatible with the suggested maturational changes at any age. If there were a stage where tenseless or truncated clauses were truly optional, we might expect a

fairly random distribution, say 50/50, in the data. If the end of this stage is caused by the maturation of a grammatical principle, then we might expect to see the random distribution of truncated or tenseless clauses shift to a 90 percent of greater distribution of full clauses rather sharply. In contrast, our data show a gradual, incremental increase in the use of IP clauses after the third interval. Finally, the crosslinguistic differences in the emergence of IP are as problematic for these maturational accounts as they are for Radford's. Even though both Wexler's and Rizzi's accounts predict optional and not exclusive use of nonfinite clauses, they do not predict or explain why the degree of optionality would vary crosslinguistically. The crosslinguistic differences in our data suggest that the mechanism determining the appearance of optional nonfinite clauses and the change to obligatory finite clauses cannot be attributed to internal mechanisms alone, but must be determined at least in part by the specific language being acquired.

Because these data demonstrate the sensitivity of functional category acquisition to external factors like input, they are more compatible with a continuity account of developmental change. Let us discuss how the different continuity positions could account for our results. To the extent that a strong continuity account makes empirical claims, this position is not an adequate account of First Syntax because of the low frequency of IP clauses among other utterance types in both languages, and the absence of IP clauses in English throughout most of the observation period. However, recall that according to most views of strong continuity the absence of surface forms does not necessarily imply deficits in underlying representation. On this assumption, all clauses would be analyzed as IP's regardless of low frequencies overall and crosslinguistic differences in use patterns. Indeed, it could be argued that these data support strong continuity on the grounds that if a child has INFL in one language, he/she must have it, even covertly, in the other (see Hyams, 1992, 1994). However, such an analysis begs the question of what the feature

specifications would be for INFL in English. Would they be the specifications for French? In previous research, we found that bilingual children did not transfer grammatical properties like weak/strong features from one grammar to the other (Paradis & Genesee, 1996). If we were to assume that IP clauses are uniformly available in these children's English and French at First Syntax, we might adopt an underspecification account for INFL in English.

In contrast to a strong continuity account, a weak continuity analysis would consider the absence of INFL-associated items in the children's English to be reflective of their syntactic representation. Adopting an analysis parallel to Clahsen, Kursawe & Penke's (1996) weak continuity/minimal projection account, we could propose that First Syntax in these children's English consists of maximal VP clauses until the final interval for Mathieu where some clauses are IP's. The children's French First Syntax would consist of alternating VP and IP clauses until the final intervals where nearly 100% of the clauses have INFL. Nominal phrases would be analyzed as alternating between NP's and DP's for both children in both languages throughout the observation period. It is worth noting that whereas both strong and weak continuity are compatible with our finding of crosslinguistic differences in the use of INFL-associated items, the explicitly input-driven nature of the lexical learning hypothesis more directly predicts that such discrepancies might occur.

While the weak continuity/lexical learning hypothesis may predict this possibility, it does not predict the particular interlingual differences shown in our data. Therefore, regardless of whether a strong or weak continuity account is adopted, a principle aspect of our results still remains to be explained: Why does overt use of INFL emerge later in English? One explanation for the variable use of functional morphology could be constraints on phonological production. It has been suggested that children's tendency to omit weak syllables in production may

result in the variable appearance of functional elements because these tend to be unstressed (Demuth, 1994; Gerken, 1994; Gerken & McIntosh, 1993). On a phonological account, function morphemes can be considered present underlyingly, in the lexicon and syntax, but omitted in the course of production. If phonological constraints are the reason for the French-English differences observed, we would expect INFL-related function morphemes to be in unstressed positions primarily in English. However, subject clitics in French are unstressed, and both children were able to produce clitics in French at the same time as omitting the copula, modals, auxiliaries and inflectional morphology in English. Furthermore, because the children were equally capable of producing determiners, which are not stressed, in both languages, they did not demonstrate a general inability to produce unstressed syllables. Therefore, at a glance, the phonological hypothesis does not seem to provide a promising account of our data (see also Paradis & Genesee, 1996; Radford, 1994).

A more promising explanation for the observed crosslinguistic differences could be found in specific aspects of the morphosyntax of English and French. First, these French-English crosslinguistic differences seem to be robust because they have been documented in other bilingual children (Paradis & Genesee, 1996) and in monolinguals (Pierce, 1992). Second, the fact that INFL emerged earlier in Mathieu's French even though he was exposed to more English demonstrates that the *kind* of input and not the *quantity* is important. Finally, crosslinguistic research on other languages has shown that the prevalence of overt IP root clauses varies with the language being acquired (Clahsen, Penke & Parodi, 1993/94; Guasti, 1993/94; Philips, 1996; Platzack, 1990, 1992; Rohrbacher & Vainikka, 1995; Wexler, 1994, 1996, for example). In general, IP clauses emerge later in English and Swedish than in French, Italian, and German. Several hypotheses have appeared in the literature, typically noting the absence of rich inflectional

systems as a potential cause of the later emergence of INFL (Phillips, 1996; Pierce, 1992; Platzack, 1992; Radford, 1995, for example). Platzack (1992) points to the impoverished subject-verb agreement system in English and Swedish. He hypothesizes that subject-verb agreement could be the trigger for positing a functional category above VP, and that scant input delays the emergence of this initial functional projection in English and Swedish. Clahsen & Penke (1992) suggest that subject-verb agreement may be a crucial trigger for the emergence of AGRP and CP in German. Also, Phillips (1996) and Schütze & Wexler (1996) have proposed that the mapping between morphemes and grammatical features may have consequences for acquisition. Phillips (1996) suggests that fusional morphology may cause more difficulties in the coordination of syntax and the lexicon, and hence, may emerge later in child language. If the analysis of subject clitics in Canadian French as agreement markers is correct, then both these proposals would be supported. If clitics are becoming obligatory agreement affixes, Canadian French can be considered to have a rich subject-verb agreement system, which would trigger early emergence of INFL. Furthermore, subject clitics are marked only for agreement and not tense features, thus, it is likely they would appear earlier in acquisition than such fusional morphemes as the third person singular habitual present *-s* in English.

In sum, the present data argue for an explanation of the acquisition of functional categories that incorporates the interaction between universal predispositions and language-specific input factors. Our conclusions are based mainly on crosslinguistic differences in the emergence of INFL. Because the two languages resided within one individual, we believe this to be valuable evidence in favour of the position that external factors such as the properties of a particular language can play a determining role in the acquisition sequence. In general, this study illustrates

the relevance of bilingual child language in explicating the mechanisms of language acquisition in all children.

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Endnotes

[1.] Valian actually uses this term to designate the period between MLU 1.5 and 2.0.

[2.] One anonymous reviewer suggested that first and second person utterances be eliminated from the French corpus for comparison purposes with English because these forms are likely to bear overt inflection for finiteness while the English forms would be the verb root. Thus, the proportion of finite clauses in French could be inflated. We do not believe this to be a major biasing factor for the following reasons: English has two forms of the present tense, the habitual present and the present continuous. While it is true that the habitual present is only inflected for third person, the present continuous takes *be* as an auxiliary, each form of which is inflected, fusionally, for first, second and third person. If the children produced the auxiliary, the clause was counted as finite since we based our count on overt evidence for INFL, not on the number of inflections. Moreover, context indicated that the children in this study were attempting a continuous aspect meaning far more often than an habitual aspect meaning in their conversations because they tended to focus on the here and now, even for first and second person. Thus, the first and second person contexts in which an overtly marked finite verb could have appeared in English was much higher than this reviewer might think. In addition, as we discuss in 2.3.1, verbs which do not take the continuous aspect in English were isolated in an ambiguous category (see Table 2).

Connecting Text - Study 2 to Study 3

Both Study 1 and Study 2 examined the emergence of functional categories in French-English bilingual two year olds with respect to whether their patterns supported a maturation or a continuity perspective on the acquisition process. The results of both studies were most compatible with a continuity position. The principle evidence for the continuity view in both studies was the presence of consistent crosslinguistic differences in the emergence of INFL.

Study 3 further investigates the continuity debate in a different acquisitional context. In Study 3, functional category acquisition was examined in successive rather than simultaneous bilinguals, that is, English-speaking L2 learners of French. The continuity debate has been extended in the literature to L2 acquisition, but the various views range between strong and weak continuity with the exclusion of the maturation perspective. This is because even child L2 learners are beyond the age of the proposed maturational changes. By examining how adequately continuity describes acquisition in another context, it can be determined whether there are parallels between the L1 and L2 acquisition of functional categories.

In Studies 1 and 2, crosslinguistic differences in the emergence of one functional category, INFL, were examined. Recall that the continuity perspective also predicts the possible gradual emergence of functional categories within one language. Accordingly, sequences in the acquisition of separate functional categories in L2 French were investigated in Study 3. More specifically, Study 3 addresses whether tense and agreement, two categories (or features) within INFL, emerge simultaneously or in sequence. Thus, Study 3 complements Studies 1 and 2 in looking at another source of evidence for a continuity account of functional category acquisition. In addition, prior studies of L2 acquisition have not looked specifically at a possible sequence between tense and agreement (except see Eubank, 1996). Because Study 3 looks in particular at stages in acquisition, the observation interval

is longer, three years instead of one year. During this period, two stages in functional category development were identified in the L2 learners' grammars.

There are other methodological differences between Study 3 and Studies 1 and 2. In Study 3, a larger sample size was used in order to ascertain how robust trends are across learners. Also, because the children in Study 3 were older, they were given a structured questionnaire each year instead of being taped in free play situations. The use of the same interview for each child facilitated between-subject comparisons for the use of specific functional categories. Finally, Study 3 included a control group of monolingual French-speaking children. In Study 1, comparisons were made between the bilingual children and extant reports in the monolingual literature, but these were often limited because of differences in design between studies. In Study 3, more direct comparisons could be made because the control group received the same interview.

Study 3

The emergence of tense and agreement in child L2 French

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Under Review for *Second Language Research*

Abstract

The present study examined the acquisition of tense and agreement by L2 learners of French. We looked at whether the features <tns> and <agr> and the categories AGRP and TP emerged simultaneously or in sequence in the learners' grammars. We conducted interviews with English-speaking children acquiring French as a second language and with grade-matched native speaker controls once a year for three years. The data were analysed for the productive use of morphosyntax encoding tense and agreement. Results revealed that items encoding agreement emerged before items encoding tense, suggesting that the abstract grammatical structures associated with these morphosyntax items emerge in sequence. The findings are interpreted with respect to three prevailing views on the acquisition of functional phrase structure in L2 acquisition: the Lexical Transfer/Minimal Trees hypothesis (Vainikka and Young- Scholten, 1994, 1996a, 1996b), the Weak Transfer/Valueless Features hypothesis (Eubank, 1993/94, 1994, 1996) and the Full Transfer/Full Access hypothesis (Schwartz and Sprouse, 1994, 1996). Possible reasons for the existence of this acquisition sequence in French are also discussed.

The emergence of tense and agreement in child L2 French

The emergence of functional categories has been the subject of much recent research on second language acquisition. In particular, researchers have been concerned with the status of the functional projections IP and CP in early L2 grammars (Bhatt and Hancin-Bhatt, 1996; Beck, 1996; Eubank, 1993/94, 1994, 1996; Gavruseva and Lardiere, 1996; Grondin and White, 1996; Lakshmanan, 1993/94; Lakshmanan and Selinker, 1994; Prévost, 1997; Schwartz and Sprouse, 1994, 1996; Vainikka and Young-Scholten, 1994, 1996a, 1996b, for example). In spite of the attention functional categories have received in general, most L2 researchers looking specifically at IP have not systematically separated the IP features tense and agreement in their analyses (Gavruseva and Lardiere, 1996; Grondin and White, 1996; Lakshmanan, 1993/94; Prévost, 1996). Furthermore, those who differentiate between agreement and tense have focused mainly on agreement alone (Vainikka and Young-Scholten, 1994, 1996a, 1996b; except see Eubank, 1993/94; 1994, 1996). Separate treatment of IP features is not essential for addressing the question of whether functional projections are present or absent overall in early grammars, which is a principle concern of much of this prior work. However, examining each feature separately is essential to the related question of whether functional categories emerge in sequence or simultaneously in learners' interlanguage. There are several reasons for investigating an acquisition sequence between agreement and tense. First, agreement and tense can be considered syntactically distinct, which makes a sequence possible. Under the split-INFL hypothesis and minimalist syntax (Chomsky, 1992; Pollock, 1989), the features <agr> and <tns> are checked off in separate projections headed by AGR and T which replace the undifferentiated IP. Second, it has been found in studies of first language learners that agreement and tense may not follow the same acquisitional

timetable (Malamud-Makowski, 1994; Meisel, 1994; Radford, 1994; Wexler, 1994). Finally, the question of acquisition sequences has been central to the theoretical debate on how functional categories emerge in L2 grammars.

Three perspectives on the L2 initial state grammar and the development of functional phrase structure have appeared in the literature: the Lexical Transfer/Minimal Trees account (Vainikka and Young-Scholten, 1994, 1996a), the Valueless Features/Weak Transfer account (Eubank, 1993/94, 1994, 1996) and the Full Access/Full Transfer account (Schwartz and Sprouse, 1994, 1996). Each perspective makes different claims about the presence of transferred L1 functional phrase structure in the L2 initial state. Vainikka and Young-Scholten (1994, 1996a, 1996b) argue that only lexical categories and head directionality are transferred from the L1 to the L2 and that the L2 initial state consists of a lexical grammar with VP as the maximal projection in clauses. In their account, functional projections develop gradually in learners' interlanguage. They identify three early stages: (1) a VP-only grammar; (2) a grammar with an underspecified functional projection (FP) above VP, and (3) a grammar with AGRP above VP. At stage three, learners have acquired verb movement and agreement morphology, but not necessarily tense distinctions. Thus, a possible extension of the Minimal Trees account would predict TP to be the next functional projection added to the grammar.

The Valueless Features account of Eubank (1993/94, 1994, 1996) is similar to the Minimal Trees account in that only limited transfer from the L1 is posited, and that the L2 initial state does not include all the properties of a final state grammar. Eubank proposes that both lexical and functional categories transfer from the L1 into the L2, but that the parameter values associated with the functional categories do not transfer. Specifically, he claims that parameter-defining feature values, such as the strength value of <agr> which determines the presence of overt verb movement, do not transfer. He also assumes that <tns> is initially 'inert', meaning

unspecified or valueless. He identifies two early stages. At the first stage, learners have no verb movement in their grammars, and no overt morphological manifestations of functional projections. Thus, the Valueless Features initial stage is comparable to that of the Minimal Trees account. At stage two, learners begin to acquire the target language value for the verb movement parameter, but verb movement is initially optional. Tense is not fully specified at this stage. Akin to Wexler's account of L1 acquisition, Eubank proposes that the unspecified value of <tns> explains the optionality of verb movement at stage two (Wexler, 1994). As with the Minimal Trees account, we could extend the Valueless Features account by positing a third stage where <tns> is specified, and verb movement ceases to be optional.

One important commonality shared by these two accounts is the assumption that the status of abstract properties like functional features and heads in a learners' grammar is related to the acquisition of lexical material. In other words, evidence for the presence of AGRP/<agr> and TP/<tns> in the grammar can be inferred from the presence of the morphological items associated with them in learners' interlanguage. Vainikka and Young-Scholten (1994, 1996a, 1996b) adopt the lexical learning hypothesis from L1 acquisition (Clahsen, Eisenbeiss and Vainikka, 1994, for example) to explain the contingency between items in the lexicon and abstract syntactic structure. On this hypothesis, the syntactic structures in a learners' grammar are built up through the interaction of UG principles with the learners' lexical knowledge. It is assumed that as few positions in the grammar as possible are posited to accommodate the learner's lexicon at any given stage. Thus, syntactic structure is projected from the lexical material acquired, and not imposed top-down like a template. For example, if no determiners have been acquired in the lexicon at stage n, the head DET will not be projected in clauses at stage n.

In a similar vein, Eubank (1996) distinguishes between dynamic and static views of syntactic structure, which hold for both final state and interlanguage grammars (see also Grimshaw, 1994). On the dynamic perspective, the structure projected in a clause is determined by what is lexically licensed. Functional projections must be licensed by the presence of semantic or phonetic content. On this view, the underlying syntactic structure will vary from clause to clause depending on the lexical material present. Clauses without overt lexical material licensing a functional head could be analysed as not having that head projected. In contrast, on the static view, the syntax supplies the same representation to every utterance, like a top-down template. Eubank adopts the dynamic perspective.

In contrast to Minimal Trees and Valueless Features, the Full Access perspective includes a full competence account of the L2 initial state and assumes no direct relationship between the use of overt morphology and the presence of abstract grammatical properties. Schwartz and Sprouse (1994, 1996) claim that the L2 initial state consists of the full L1 grammar, including lexical and functional categories and feature specifications relating to parametric values. As learners assimilate more of the L2 data, they revise the L2 grammar accordingly in such a way that each stage of their interlanguage corresponds to a possible final state grammar, even if it is not the target language grammar. Thus, contrary to the Minimal Trees and Valueless Features accounts, Full Access does not permit an intermediate truncated grammar, even at the early stages of L2 acquisition. A second key aspect of the Full Access perspective is that use of overt morphology is not considered relevant evidence for the presence or absence of abstract structures in the underlying grammar. In other words, the absence of determiners in the lexicon would not indicate the absence of DET in the grammar. Schwartz and Sprouse (1996)'s rationale for their position is based mainly on the difficulty of accounting for how truncated clauses would be interpreted at Logical Form.

With respect to the acquisition of agreement and tense, the Full Access account would predict that the initial state of the L2 grammar would include fully specified <agr> and <tns> features, as well as the functional heads, AGR and T, because these have been transferred from L1. Also, the absence of overt agreement and tense morphology would not constitute evidence of any deficits in underlying structure. In fact, it might be argued that a sequence in the emergence of morphology marking agreement and tense would not be expected on this view. The reasons for this expectation are as follows. Optional use or any other lack of mastery of morphological inflections could not be related to the systematic aspect of language, i.e. grammar, on the Full Access account. Therefore, absence of mastery must be attributed to extra-grammatical factors, such as, frequency of exposure, individual memory limitations and attentional differences. Because these factors would be subject to a high degree of variation between individual learners, it is doubtful whether one could expect such factors to yield a consistent sequence in the emergence of such morphology across L2 learners.

A priori, we have both empirical and conceptual reservations about the Full Access account. First, in spite of their claims of full transfer from L1, Schwartz and Sprouse (1994) failed to find a full transfer stage in the L2 German of the Turkish subject they studied. This learner had non-final finite verb placement from the earliest interviews in which he used utterances with verbs in German. In Turkish, finite verbs are in final position. In addition, other researchers report evidence of correct L2 parameter settings in the L2 initial state, where transfer from the L1 settings would have been expected on the Full Access account (Eubank, 1993/94; Grondin and White, 1996; Lakshmanan and Selinker, 1994; White, 1996). More importantly, we believe the Full Access account to be of limited explanatory value because the assumption that overt morphology is irrelevant to postulations about underlying structure renders this account difficult to falsify. By

eliminating an observable source of evidence about L2 learners' grammatical competence, their account becomes compatible with a broad range of empirical findings, and thus, its ability to explain those findings is diminished. We return to the Full Access account in light of our empirical findings in the Discussion.

The present study examined the emergence of agreement and tense in childhood learners of French as a second language. We adopt the dynamic perspective on syntactic structure; therefore, we consider the use of inflectional morphology to constitute evidence for the presence and specification of the features <agr> and <tns> and the functional heads AGR and T in learners' grammars. To clarify the details of our analyses, it is necessary to discuss some aspects of French morphosyntax.

Some aspects of French morphosyntax

Verb movement. One central aspect of French grammar that English-speaking L2 learners must acquire is a different setting for the verb movement parameter. In French, thematic verbs with tense and agreement inflections, as well as modals and auxiliaries, move out of the VP in the syntax to check their features of <tns> and <agr> in the functional heads AGR and T. This contrasts with English, where thematic verb movement 'procrastinates' until Logical Form. The difference between the two languages is captured by the distinction between a strong and weak <agr> feature. Languages which have rich subject-verb agreement are typically analysed as having a strong value for <agr> and overt verb movement. Languages with impoverished subject-verb agreement systems have a weak value for <agr> and covert verb movement.

The presence of overt movement in French is evident on the surface in clauses with a negative marker. When a negative marker is present, the verb moves around NEGP to land in AGR. Thus, in such clauses, verb movement is attested by a verb-NEG surface word order, as shown by the sentence (1a), where *pas* 'NEG'

follows the thematic verb *voit* 'see'. In English, the negative marker appears before the thematic verb on the surface, as in (1b), because there is no overt movement of these verbs in the syntax.

(1) a. *Le lion voit pas l'éléphant*
'The lion does not see the elephant'
b. The lion does not see the elephant.

The status of clitics. French has pronominal clitics which attach to a verbal host, whereas, English pronouns behave syntactically like DP's (Kayne, 1975). A list of the subject clitics used in Quebec French is given in (2). Note that the *s* on *ils* and *elles* is silent, rendering these forms phonologically identical to their singular counterparts. Unlike standard French, first person plural is typically encoded with the clitic *on* in Quebec French.

(2) a. *je* (1st pers. sing.)
b. *tu* (2nd pers. sing.)
c. *il* (3rd pers. sing. masc.)
d. *elle* (3rd pers. sing. fem.)
e. *on* (1st pers. pl.)
f. *vous* (2nd pers. pl.)
g. *ils* (3rd pers. pl. masc.)
h. *elles* (3rd pers. pl. fem.)

There is no consensus among researchers concerning the theoretical status of clitics. Some adopt a syntactic analysis of clitics (for example, Kayne, 1991; Sportiche, 1992). In contrast, researchers looking specifically at Quebec French tend to argue that subject clitics in this dialect are agreement morphology (Auger, 1995; Cummins and Roberge 1993, for example). Evidence for this position includes the semi-obligatory nature of subject doubling, clitic repetition in coordinated structures, and morphophonemic alternations between clitics and verbs. In subject doubling constructions, a lexical subject or a strong pronoun and a coreferential clitic can appear together, as presented in (3). Kaiser (1994) notes that

the absence of a pause between the lexical subject and the clitic indicates that these constructions are not left dislocations, but instead the lexical item occupies an argument position. Auger (1995) suggests that the presence of the subject clitic is becoming obligatory in colloquial Quebec French, as speakers tend to use clitics with lexical subjects 70-75% of the time.

(3) a. *Annie elle fume.*
Annie 3rd sing fem-smokes
'Annie smokes.'
b. *Moi j'aimes la bouffe mexicaine.*
me 1st sing-like the food Mexican
'I like Mexican food.'

In addition to subject doubling, speakers of Quebec French strongly prefer to repeat clitics in coordinated structures, while speakers of standard French can omit the second clitic (Auger, 1995). This contrast is illustrated in (4). Note that it seems preferable in English to not repeat the pronoun.

(4) a. *Je mange du pain et bois du vin.* Standard French
1st sing-eat some bread and drink some wine
'I am eating bread and drinking wine.'
b. *Je mange du pain et je bois du vin.* Quebec French
1st sing-eat some bread and 1st sing-drink some wine
'I am eating bread and drinking wine.'

Finally, Auger (1995) notes individual cases of morphophonemic alternations between a clitic subject and verb, for example, *Je suis* 'I am' has become *Chus* in colloquial speech. Such alternations would not be expected if clitics were not morphological elements. These cases cannot be attributed to fast speech processes because they do not apply 'across the board' to any clitic+verb combination.

We adopt the agreement morphology analysis of subject clitics for Quebec French. As prefixes, subject clitics do not occupy argument positions in the syntax, and are attached to the verb before the syntax, in line with the assumptions of minimalist syntax (Chomsky, 1992). In the syntax, the clitic+verb raises to AGRP to check <agr> features.

Verb paradigms. Quebec French has both simple and composite verb tenses. Verb paradigms for the present tense first, second and third conjugations are presented in (5), adapted from Grondin and White (1996). Silent suffixes are enclosed in parentheses. Subject clitics are written as separate words, following French orthographic conventions. For most persons in the paradigm, the present tense consists of the verb stem only. It is only the third person plural suffixes for the second and third conjugations, and the second person plural suffixes for all conjugations which are phonologically distinct. The third person plural is also phonologically distinct in irregular verbs such as, *aller* 'to go', *avoir* 'to have' and *être* 'to be'.

(5)

a. first	b. second	c. third
donner 'to give'	*finir* 'to finish'	*prendre* 'to take'
je donne	*je fini* (*-s*)	*je prend* (*-s*)
tu donne (*-s*)	*tu fini* (*-s*)	*tu prend* (*-s*)
il, elle donne	*il, elle fini* (*-t*)	*il, elle prend*
on donne	*on fini* (*-t*)	*on prend*
vous donne-z	*vous fini-ssez*	*vous prenn-ez*
ils, elles donne (*-nt*)	*ils, elles fini-ssent*	*ils, elles prenn-ent*

The composite past tense is formed with either *être* 'to be' or *avoir* 'to have' in the present tense as an auxiliary and the past participle of the verb. The composite future tense is formed with the present tense of the verb *aller* 'to go' as an auxiliary and the infinitive of the verb. The past tense and future tense paradigms for *donner* 'to give' are shown in (6).

(6)

a. past	b. future
donner 'to give'	*donner* 'to give'
j'ai donn-é	*je vais donn-er*
tu as donn-é	*tu vas donn-er*
il, elle a donn-é	*il, elle va donn-er*
on a donn-é	*on va donn-er*
vous avez donn-é	*vous allez donn-er*
ils, elles ont donn-é	*ils, elles vont donn-er*

French also includes an imperfect past tense, which was used by the children in our study in addition to the other tenses mentioned above. The imperfect past is a

simple verb tense, and a sample paradigm for the verb *finir* 'to finish' is presented in (7). Aside from the second person plural, the imperfect suffixes are pronounced the same, as [ɛ].

(7) a. *finir*
je finiss-ais
tu finiss-ais
il, elle finiss-ait
on finiss-ait
vous finiss-iez
ils, elles finiss-aient

Thus, contrary to what the orthography indicates, Quebec French does not have rich agreement in the form of verbal suffixes. If verbal suffixes were considered the only form of agreement, Quebec French would be classified as having marginally strong agreement according to the definition proposed by Eubank (1993/94): 'overt agreement affixes that isolate different persons of the same number have the value [strong] AGR' (p.204). However, if subject clitics are considered to be agreement morphology, Quebec French is certainly a rich agreement/strong<agr> language. Since French does have overt verb movement, and must be considered a strong <agr> language, this lends support to the hypothesis that subject clitics are agreement prefixes.

Relating morphosyntax to features and functional projections

In this section we specify how verb movement and verbal morphology relate to abstract grammatical elements such as features and functional heads.

Note that Quebec French has both fusional and non-fusional morphology. Subject clitics can be considered non-fusional because they mark nominal features like person, number and gender only and do not encode verbal features like past tense. The other forms of overt morphology we examined are fusional. For example, third person plural suffixes in the present tense encode both present tense, person and number. The composite past and future tenses encode both nominal and

verbal features because they include an auxiliary with overt person and number encoding.

The list presented in (8) shows which features and feature values can be associated with some of the verbal morphology we have discussed. Because subject clitics only encode agreement, they have a specification for <agr> but no <tns> specification, as shown in (8a). The composite past and third person plural suffixes have specifications for <agr> and <tns>, shown in (8b) and (8c). Three specification combinations are listed in (8d) for the verb stem. In a mature grammar, it could be assumed that this form has a null morpheme marking present tense and strong <agr>. However, in an interlanguage grammar which may lack some overt morphology specified for tense and agreement, it is ambiguous whether learners have acquired the properties of this null morpheme. We adopt the following conservative interpretation of the status of the verb stem in L2 learners' grammars. In an interlanguage French grammar which includes no movement and no overt tense and agreement morphology, we assume the verb stem to be unspecified for features. In a grammar that includes verb movement and subject clitics, it is possible to conclude that the verb stem has been specified for strong <agr>, since AGRP acts as a landing site to check these features. But, if tense alternations are absent from a grammar with overt manifestations of <agr>, the verb stem cannot be considered to have a <tns> specification at this stage. Other researchers have required the presence of tense alternations to motivate <tns> or TP in L1 acquisition (Malamud-Makowski, 1994; Meisel, 1994; Wexler, 1994). In brief, we consider the verb stem to be associated with three possible specification combinations, depending on the state of the interlanguage: (1) no specifications for <agr> or <tns>; (2) specification for <agr> only; (3) specifications for both.

(8) a. Subject clitics (*je, tu, il...*) = <+agr <+strong>>, < Ø tns>
b. Passé composé (*ai donn-é*) = <+agr <+strong>>, <+tns < +past>>
c. Third plural (*prenn-ent*) = <+agr <+strong>>, <+tns < +pres>>
d. Verb stem (*donne*) = < Ø agr>, < Ø tns>
(*donne*+ Ø) = <+agr <+strong>>, < Ø tns>
(*donne*+Ø) = <+agr <+strong>>, <+tns<+pres>>

Lastly, let us consider the relationship between verb movement, tense and agreement morphology and the presence of AGRP and TP in the grammar. Recall that on a dynamic analysis of syntax, the use of lexical material indicates the presence of certain functional heads in a clause. The use of tense and agreement morphology signals the presence of AGRP and TP in a clause because the features <agr> and <tns> must be checked. Evidence of verb movement in a clause would indicate the presence of at least one functional head to act as a landing site, but not necessarily both. For example, in an utterance showing evidence of verb movement and overt agreement, but missing obligatory tense marking, AGRP would be the only functional projection motivated by the morphosyntax. Therefore, we consider AGRP and TP to be part of a learner's grammar if there is evidence they are projected in some clauses. However, even if they are part of a learner's grammar in general, they may not be present in all clauses.

Method

Subjects

Fifteen English-speaking children who were L2 learners of French, and five native French-speaking children from the greater Montreal area of Canada participated in the study. The English-speaking children had been attending French-medium schools from kindergarten. Because these were not immersion schools and because the children were not all in the same school, the majority of their classroom peers were native speakers. Also, because these were French-medium schools, the children were not being explicitly taught French as a second language. We began interviewing the children at the end of grade one, after they

had had at least two years of daily exposure to French. The control group consisted of monolingual French-speakers who were grade-matched with the anglophone children. A control group was included for establishing mastery of an item of morphosyntax. No difference between the rates of use of the L2 group and the native speaker group for a certain item was used as an indication that the item had been mastered by the L2 learners.

Materials and procedure

The children were interviewed individually once a year for three years, from grade one until grade three by a native speaker of Quebec French. We used the same structured interview each year which was similar to that used by Harley (1992). The interview included questions designed to elicit the use of the present, past and future tenses. Interview questions covered topics about the child's own routine, family, and school experiences. Children were also asked to describe events depicted in cartoon sequences without captions. The interviews lasted about thirty minutes each and were recorded on audiotape.

We would like to comment briefly on our choice of method. Grondin and White (1996) have suggested that production-based data is likely to underestimate an L2 learner's underlying competence and thus may be a less accurate assessment of competence than a receptive task. However, we concur with Schwartz and Sprouse (1994) that there are benefits in using naturalistic production data instead of a controlled receptive task. The principle benefit is that subjects are engaged in a task whose focus is communication rather than structure and consequently subjects are less likely to be consciously reflecting on grammatical knowledge. In a receptive task such as making grammaticality judgments, a subject's metalinguistic and explicit knowledge might interfere with the on-line processing desired in the procedure[1]. Moreover, as Schwartz and Sprouse (1994) point out, longitudinal production data can reveal systematic change in syntactic patterns over time, which

are presumably subsumed by changes in underlying grammatical competence. In sum, we believe naturalistic production data to be an informative method of estimating L2 learners' competence, although converging evidence from comprehension and production is desirable in the long run.

Transcription and coding

The recorded interviews were transcribed using the CHAT transcription system (MacWhinney, 1991). We developed our own codes for morphosyntax based on the CHAT coding system. We coded the transcripts for the use of the following items in obligatory context: the finite verb stem, the placement of the negative with respect to the verb, subject clitics, present tense third person plural morphology, past and future tense morphology. Obligatory context was determined by discourse requirement; for example, a question asked about past events should be answered using the past tense verb form. Or, it was determined by the structure of the sentence itself; for example, a nonimperative finite verb without a lexical subject must have a clitic subject. We also verified the obligatory discourse requirement by examining whether the French native speakers used the form in the relevant context. We coded both regular and irregular verb forms for third person plural morphology. In addition, we included future tense even though the traditional tense feature breakdown is between past and present. It was included because our criterion for evidence of TP/ <tns> in the grammar is the presence of overt tense alternations, and we did not want this criterion to be limited to present-past alternations only.

Following Grondin and White (1996), we disregarded minor inaccuracies in form when coding. For example, if a child used the wrong participle form in an otherwise correct past tense sequence, it was coded as past tense. The only exceptions were utterances where children used the verb stem with a first person singular clitic and an auxiliary for the past, for example *j'ai joue* 'I play(ed)'.

Because of the phonological similarity between *je* 'I' and *j'ai* 'I have', it was difficult to determine whether the child was uttering a present tense or past tense statement. There were very few examples of this kind, and they were excluded from our analyses.

Analyses

We performed three principle analyses on the data: (1) use of morphosyntax items over the three years for the two groups; (2) the status of clitics in the L2 grammars, and (3) individual acquisition sequences among the L2 learners.

We first calculated proportions of use for each item of morphosyntax in obligatory context for each child at each year. Proportions and ratios are given in the Appendices. We averaged the scores for finite verb stems and negative placement to make one verb movement (strong <agr>) score per child. Subsequently, we analysed the data for differences in use of morphosyntax between the language groups, L2 and native, at each year to see to what extent the L2 learners were approaching native speaker performance. We also examined the use of morphosyntax within the L2 learners' group at each year to see if items were being used at different rates.

Second, we examined the L2 learner's use of subject clitics in more detail, in order to determine whether they had misanalysed these pronominals as pronouns instead of clitics. We undertook this analysis because use in obligatory context is not sufficient to determine if the items had been correctly classified as clitics, or more specifically, as agreement morphology.

Finally, in addition to the group analyses, we examined the acquisition sequence of tense and agreement items for each individual. In order to facilitate between-subject comparisons, it was necessary to establish a criterion according to which an item of morphosyntax could be considered 'emerged' or 'acquired'. By emerged or acquired, we mean it was being used productively and not that it had been

mastered. There are at least three cut off points used in the literature for determining emergence. Grondin and White (1996) consider first use as an indication of emergence. In contrast, Vainikka and Young-Scholten (1994) used a 60% use in obligatory context as their criterion for whether an item had been acquired. Finally, there is the 90% criterion which has traditionally been used in psycholinguistic research. We wanted to use a criterion considerably lower than Vainikka and Young-Scholten's 60% because such a stringent criterion could bias results in favour of a sequence. However, we did not want to rely simply on first use because items may be memorized rather than fully productive in the beginning. Consequently, we used 30% use in obligatory context for our emergence/acquisition criterion. We recognize that this criterion is arbitrary and only serves to facilitate our analysis of individual sequences.

Results

Use of verb movement, agreement and tense

Three mixed two-way (language group X morphosyntactic item) ANOVA's were performed on the use-in-obligatory-context scores for each year. Categories within morphosyntactic items were: verb movement, subject clitics, third person plural, past and future tense. A significant interaction between language group and morphosyntactic item was obtained for each year (year one, $F(4, 72) = 10.923$, $p < .0001$; year two, $F(4, 72) = 11.335$, $p < .0001$; year three, $F(4, 72) = 9.224$, $p < .0001$).

Post-hoc pairwise comparisons using the studentized range statistic (Tukey hsd test) were performed on the cell means. The results of the means comparisons for the between group factor, language, are given in Table 1. These tests reveal that there was no difference between the French L2 learners' and French native speakers' use of verb movement and subject clitics across the three years. However, at year one, the L2 learners used third person plural, past tense and

future tense significantly less than the native speakers. At year two and year three, the L2 learners' use of the past tense was no longer different from the native speakers', but their use of third person plural and future tense remained significantly below that of the native speakers.

Table 1. *Post-hoc pairwise comparisons between L2 learners' and native speakers' average percentage use of morphosyntax items for each year*

Morphosyntax Item	L2 French	Native French	Q
Year One			
Verb Movement	.947	.984	.427
Subject Clitics	.859	.972	1.305
Third Person Plural	.138	.846	9.63**
Past Tense	.327	.872	6.29**
Future Tense	.255	.718	5.35*
Year Two			
Verb Movement	.929	.992	.708
Subject Clitics	.943	.986	.483
Third Person Plural	.197	.934	8.28**
Past Tense	.669	.924	2.87
Future Tense	.347	.882	6.01**
Year Three			
Verb Movement	.959	.992	.381
Subject Clitics	.943	.982	.462
Third Person Plural	.375	1.00	7.22**
Past Tense	.706	.948	2.79
Future Tense	.424	.898	5.47**

Note. * $p < .05$, ** $p < .01$.

Results for means comparisons within the L2 language group are given in Table 2. At year one, there was no difference between the use of verb movement and subject clitics, but both of these items were used significantly more than the other

three items. There were no significant differences between the use of third person plural, past or future tense. At year two, the results remained the same except that the past tense was used significantly more than third person plural and the future tense. There were no significant changes between year two and year three.

To save space, results of the pairwise comparisons within the native speaker group are not given. There were no significant differences between the use of items at any of the three years for this group.

Table 2. *Post-hoc pairwise comparisons of average percentage use of morphosyntax items for the L2 learners for each year*

	Year One		Year Two		Year Three	
Items	Means	Q	Means	Q	Means	Q
VM-SC	.947-.859	.326	.929-.943	.311	.959-.943	.372
VM-3PL	.947-.138	18.8**	.929-.197	16.27**	.959-.375	13.58**
VM-PAS	.947-.327	14.42**	.929-.669	5.78**	.959-.706	5.88**
VM-FUT	.947-.255	16.09**	.929-.347	12.93**	.959-.424	12.44**
SC-3PL	.859-.138	16.71**	.943-.197	16.58**	.943-.375	13.21**
SC-PAST	.859-.327	12.37**	.943-.669	6.09**	.943-.706	5.51**
SC-FUT	.859-.255	14.05**	.943-.347	13.24**	.943-.424	12.07**
3PL-PAS	.138-.327	4.40	.197-.669	10.49**	.375-.706	7.70**
3PL-FUT	.138-.255	2.72	.197-.347	3.33	.375-.424	1.14
PAS-FUT	.327-.255	1.674	.669-.347	7.16**	.706-.424	6.56**

Note. VM = Verb Movement, SC = Subject Clitics, 3PL = Third person Plural, PAS = Past Tense, FUT = Future Tense.

* $p < .05$, ** $p < .01$.

To summarize, these analyses reveal that the L2 learners differed from native speakers in the use of third plural, past and future tenses, all associated with TP/<tns>, but did not differ from them in the use of verb movement and subject clitics, both associated with AGRP/<agr>. Furthermore, at the outset, the L2 learners' use of verb movement and subject clitics was significantly greater than their use of the other items.

The status of clitics in the L2 grammars

We performed three tests of 'clitichood' on both the French L2 and native French children's clitic constructions. Our three tests were: (1) clitic-finiteness contingency; (2) repetition of clitics in coordinated constructions, and (3) use of subject doubling.

First, we looked for a contingency between finite verbs and clitics. Because a nonfinite main verb has not moved out of the VP, it cannot host a <+agr> marker. However, a DP pronoun could appear with a nonfinite verb. Consequently, a contingency between finite verbs and clitics attests that clitics are not subject pronouns (see Paradis and Genesee, 1996; Pierce, 1992). For year one, two and three, the L2 learners restricted their use of clitics to finite verbs 96% (range = 89% - 100%), 98% (range = 95% - 100%) and 98% (range = 98% -100%) of the time, respectively. The native French-speaking children used so few nonfinite main verbs that this contingency was not calculated for them. The use of nonfinite main verbs among the L2 learners was more frequent, but in general quite low.

Recall that in coordinated structures with two finite verbs, it is required (or at least highly preferred) for the clitic to be repeated with the second verb. In contrast, in English, the repetition of a pronoun is optional, and arguably, it is preferable to omit it (see examples in (4) above). We calculated the number of coordinated structures with the clitic repeated out of the number of coordinated structures used by the children in both language groups. At year one, three L2 learners did not

have any coordinated structures. Of those that did, 96% (range = 75% - 100%) of their coordinated structures had repeated clitics. At year two, only one L2 learner did not produce any coordinated structures. Of the remaining fourteen children, 92% (range = 75% - 100%) repeated the clitic in the sentence. At year three, all the children produced coordinated structures, and of those structures, 90% (range = 70% - 100%) had repeated clitics. These results are comparable to the native French-speaking children. At year one, 97% (range = 83% - 100%) of the French-speaking children's coordinated structures had repeated clitics, at year two, 100% (no range) and at year three, 94% (range = 80% - 100%). Thus, it appears that the L2 learners had grasped this property of clitics.

For the third test, a contrast between L2 learners and native French speakers was observed. We calculated the number of utterances where a lexical subject appeared with a clitic subject out of the number of utterances with lexical subjects. In other words, we calculated how often the children chose to do subject doubling when it was structurally possible. As mentioned above, subject doubling is not required, although, according to Auger (1995) it is becoming the preferred form in colloquial Quebec French. Also, the presence of any subject doubling, regardless of rate, is an indication that children were treating clitics as clitics and not as pronouns. At year one, 22% (range = 0% - 41%) of the L2 learners' eligible utterances contained subject doubling. Three children never subject doubled. At year two, the average dropped to 16% (range = 0% - 42%), with two children having no subject doubled examples. At the third year, 15% (range = 0% - 47%) of the children's eligible utterances contained doubled subjects, with five children having no examples of these constructions. Rates of subject doubling were much higher among the French-speaking children. All the children had subject doubled constructions each year. The first year, 59% (range = 25% - 92%) of their eligible utterances contained doubled subjects. At year two the average was 65% (range = 44% -

76%), and at year three it was 76% (range = 67% - 89%). Note that in the final year, the average was close to what Auger (1995) found for adult usage. We can conclude from the L2 learners' use of subject doubling that clitics were not misanalysed as DP pronouns in their grammars. However, the discrepancy in frequency of use between the L2 learners and native francophones is noteworthy.

To summarize, these three tests suggest that subject pronominals had the status of clitics (agreement morphology) in the L2 learners' grammars.

Acquisition sequences

In addition to examining group means for the use of morphosyntax, we looked at the acquisition sequence of the morphosyntax items for each of the L2 learners. Sizable standard deviations in the use of third plural, past and future tense (see Appendices) indicate that the rate of acquisition varied among the children and motivates an analysis of individual patterns. Our analysis is based on comparisons of individuals' productive versus nonproductive use of the morphosyntax items identified above. Recall that the criterion for productive use was set at 30%.

The productive use values are presented for years one, two and three in Tables 3, 4 and 5, respectively. A a [+] value indicates a use level at or greater than 30%, and a [-] value indicates a use level below 30%. In addition to the [+/-] values given for productive use, we assigned a value of zero to those cases where less than two tokens of an obligatory context occurred. If less than two tokens occurred, it was judged to be an insufficient number to conclude that the item was being used productively or not. For example, a ratio of 1/2 would yield a proportion of .50, which may not be reliable. Thus, for scores of 0/0, 0/1, 0/2 and 1/2, a zero value was given. There were no 2/2 scores. There was no variation in the values assigned to the French-speaking controls, and therefore, they are not given in order to save space. Each francophone child received a positive value for each item every year.

Table 3. *Evidence of verb movement, subject clitics, third person plural suffixes, past and future tenses at year one*

Children	Verb movement	Subject Clitics	Third person plural	Past	Future
Amanda	+	+	0	-	0
Chad	+	+	-	-	-
Charlene	+	+	0	0	-
Gary	+	+	-	-	0
Jason A.	+	+	0	-	-
Jason B.	+	+	-	-	-
Bradley	+	+	0	-	-
Jennifer	+	+	-	-	-
Kerin	+	+	-	-	+
Lindsay	+	+	-	+	-
Sandra	+	+	0	-	+
Marylin	+	+	0	+	+
Jeffrey	+	+	0	+	+
Jon	+	+	+	+	-
David	+	+	+	+	+

Note. A positive value means that the item was used at least 30% correctly in obligatory context. A negative value means the item was used less than 30% correctly in obligatory context. A value of zero indicates that insufficient tokens (2 or less) for that item occurred in the interview.

Table 4. *Evidence of verb movement, subject clitics, third person plural suffixes, past and future tenses at year two.*

Children	Verb movement	Subject Clitics	Third person plural	Past	Future
Amanda	+	+	-	+	-
Chad	+	+	-	+	-
Charlene	+	+	-	+	-
Gary	+	+	-	+	+
Jason A.	+	+	+	+	+
Jason B.	+	+	-	+	-
Bradley	+	+	-	+	+
Jennifer	+	+	-	+	+
Kerin	+	+	-	+	+
Lindsay	+	+	-	+	+
Sandra	+	+	-	+	-
Marylin	+	+	-	+	+
Jeffrey	+	+	+	+	+
Jon	+	+	+	+	-
David	+	+	+	+	+

Note. A positive value means that the item was used at least 30% correctly in obligatory context. A negative value means the item was used less than 30% correctly in obligatory context. A value of zero indicates that insufficient tokens (2 or less) for that item occurred in the interview.

Table 5. *Evidence of verb movement, subject clitics, third person plural suffixes, past and future tenses at year three.*

Children	Verb movement[a]	Subject Clitics	Third person plural	Past	Future
Amanda	+	+	-	+	+
Chad	+	+	+	+	+
Charlene	+	+	-	+	+
Gary	+	+	+	+	-
Jason A.	+	+	+	+	-
Jason B.	+	+	+	+	-
Bradley	+	+	-	+	+
Jennifer	+	+	+	+	+
Kerin	+	+	-	+	-
Lindsay	+	+	+	+	+
Sandra	+	+	-	+	+
Marylin	+	+	+	+	+
Jeffrey	+	+	-	-	-
Jon	+	+	-	+	+
David	+	+	+	+	+

Note. A positive value means that the item was used at least 30% correctly in obligatory context. A negative value means the item was used less than 30% correctly in obligatory context. A value of zero indicates that insufficient tokens (2 or less) for that item occurred in the interview.

Notice that at year one (Table 3) all the children used verb movement and subject clitics productively, but only 47% (7/15) used past and future tense productively. Only two children received a positive value for third person plural. At year two, all the children were using the past tense productively and 60% (9/15) were using the future tense productively, but only four children received a positive value for third person plural. At year three, 47% (7/15) were using the third person plural productively.

The vast majority of scores changed from negative to positive values from year one to year three, but there were a few reversals. For instance, Jeffery received negative values for third person plural, past and future tense at year three, although he had received positive values at year two for these items. These reversals could be an artifact of our 30% cut off point, because Jeffery's use proportions for these three items were .28, .28 and .28. A similar explanation most likely underlies Jason A.'s reversal for future tense at year three, where his proportion was .25. Out of all the values for the three years, only 4% were reversals.

To examine the sequence of acquisition in individual grammars, we compared the order in which items emerged in the children's interlanguage regardless of year. First, we examined the relative order of agreement and tense. We considered at least one form of agreement or one tense distinction sufficient evidence for the presence of the grammatical feature. We calculated how many children acquired productive use of agreement before tense, tense before agreement, or had both present at year one. The results of this calculation are in Table 6. All the children who showed a sequence used agreement before tense. For the children who had two or all of these items at year one, a sequence could not be determined.

Table 6. *Distribution of acquisition sequence for agreement and tense*

	Sequences		
	Agree before Tense	Tense before Agree	Agree and Tense[a]
Number of Children	8	0	7

[a] Present at the same time in year one

Table 7. *Distribution of acquisition sequence for third person plural and tense*

	Sequences		
	3rd Pl before Tense	Tense before 3rd Pl	3rd Pl and Tense[a]
Number of Children	0	12	3

[a] Present at the same time in year one or year two

Table 8. *Distribution of acquisition sequence for past and future tense*

	Sequences		
	Past before Future	Future before Past	Past and Future[a]
Number of Children	6	2[b]	7

[a] Present at the same time in year one or year two
[b] One child's score reversed in year two; The other's reversed in year three

In addition to comparing the sequence of the major categories, we compared the sequence of third person plural morphology, past tense, and future tense. First, we compared the acquisition order of the third person plural morphology and tense distinctions. Table 7 reveals that the children who showed a sequence acquired the

use of tense distinctions before they acquired the use of third person plural morphology. Second, we calculated how many children acquired the past before the future tense, the future before the past, or acquired both in the same year. The results in Table 8 reveal that of those children who showed a sequence, the majority acquired the past before the future tense.

Discussion

Both our group analyses and our analyses of individual sequences revealed that those items of morphosyntax associated exclusively with agreement (verb movement and clitics) were used productively and were mastered earlier than items associated primarily or in part with tense (third person plural, past and future tense). The individual children who did not show such a sequence during the study are not necessarily counter-examples to this generalization for the following reasons. For those who had evidence of both tense and agreement at year one, an acquisition sequence could have occurred before the study began, as individual rates of acquisition varied. For those who had evidence of both simultaneously at year two, an acquisition sequence could have occurred between interview sessions because the observation interval was a year. Finally, among the children who did show a sequence, not one child showed the opposite sequence.

These results suggest that two stages are observable in the L2 learners' interlanguage grammars. On the basis of the individual sequence analysis, it appears that some children were at the second stage even at the outset of the study, but 8/15 passed through both stages. We refer to the first stage as 'stage n' and not 'stage one' because our subjects were not at the initial stage of L2 acquisition when the study began. Stage n grammars have the following characteristics. The feature <agr> has been specified as strong, and is associated with subject clitics and the verb stem. The use of agreement morphology is obligatory rather than optional because mean use levels are above 90% and are not different from those of native

speakers. Thus, AGRP is projected in virtually all clauses. There is no evidence that the verb stem has been specified for <tns> at this stage because it does not alternate with the productive use of other morphological forms marked for tense, such as third person plural suffixes and the past and future tenses. Since <tns> is not specified at stage n, a TP projection in clauses is not supported by overt evidence, and it is possible that AGRP is the only landing site for verb movement.

At stage n+1, <tns> is specified for some relevant morphemes in the lexicon, and TP is present in the grammar, but the appearance of TP in clauses is optional. The optionality of tense is indicated by the following. First, not all morphology marking tense emerges simultaneously. For example, the use of past tense morphology precedes the use of third plural and future tense in most individual cases and for the L2 group as a whole. Second, although the L2 learners used the past tense at a rate statistically indistinguishable from native speakers at year two, individual rates of use varied considerably for the past tense, future tense and third person plural (see Appendices). This stands in sharp contrast to the uniformly high and stable individual use levels for agreement markers.

At first glance, our findings seem compatible with either the Minimal Trees account or the Valueless Features account in that we have found evidence for the sequential acquisition of tense and agreement. However, upon examining how stages are interpreted in each account, it appears our findings are more consistent with the Valueless Features account. On the Minimal Trees perspective, strict stages are proposed for the acquisition of functional categories. That is, functional heads are either totally absent from or present in the grammar at certain stages. For this reason, our stage n+1 where TP is optionally projected does not conform to the Minimal Trees account. In contrast, the dynamic view of syntactic structures in the Valueless Features account is compatible with stage n+1. The optionality of tense at stage n+1 can be explained as follows: TP is present in the grammar as a whole

but is not projected in clauses where <+tns> morphology does not appear. Morphology specified for <+tns> would not appear either because it has not been acquired yet (for e.g., third person plural) or because it has not been accessed in production (for e.g., absence of past tense morphology after productive use has been established). In the latter case, we assume that gradual accuracy in the use of newly acquired lexical material is an expected outcome of language learning because processing routines take time to perfect. One important difference between our account and Eubank (1993/94, 1994, 1996) is that he identifies a stage where <tns> is unspecified and verb movement (strong <+agr>) is optional. In our data, strong <+agr> can be obligatory before <tns> is specified. It is possible that we have observed a later and somewhat overlapping stage in acquisition than the one Eubank investigated.

While our findings are consonant with the Minimal Trees and Valueless Features perspectives, they pose some challenges for the Full Access account. Recall that on the Full Access account, <agr>, <tns> , AGRP and TP are specified and present in the initial state of L2 acquisition as the result of transfer from L1. Learners' need only fill in these preexisting categories with L2 lexical material and make adjustments in specifications accordingly. As mentioned in the Introduction, this account most likely predicts that lexical material associated with <agr> and <tns> would not be acquired in any sequence. Rather, it would be expected for use to increase from 0% to 90% roughly in parallel. Clearly, this is not consistent with our findings. Our group analyses showed that tense and agreement did not emerge in parallel. Furthermore, some children had 75% or greater use rates for subject clitics and verb movement at the same time as 30% or lesser use rates for third plural, past and future tense (see Appendix A for examples). Moreover, it is doubtful that this sequence reflects the influence of extra-grammatical factors, which are the only factors that could be used to explain such findings on the Full

Access account. For instance, could the sequence we observed reflect nothing more than timing and frequency of the input? Such an explanation is unlikely because the L2 learners in this study attended four different French schools and were exposed to natural not pedagogical French input from teachers and peers. Therefore, no systematic and controlled sequence in each child's input would have occurred. With respect to frequency, it is difficult to accept that structures like the past tense were so rare in natural conversation that a significant and consistent delay in acquisition was caused.

It could also be proposed on the Full Access account that at the stages where overt morphological marking was missing, learners were using covert marking with the appropriate feature specifications. In other words, these L2 learners would have passed through a stage where they had incorrectly assumed French marked all tense forms with null morphemes. While this hypothesis permits an analysis of the underlying grammar as 'complete', it has certain shortcomings. First, it would be difficult on this account to explain why learners would posit null morphemes for tense and not for agreement. Second, it would be difficult to explain how learners could shift from null marking to marking tense obligatorily with overt morphology. Positive evidence would presumably indicate to them that overt marking was an option, but without indirect negative evidence, how would they assume it was obligatory? (see also Eubank, 1994).

Why would agreement emerge before tense?

We are contending that the systematic sequence in the emergence of morphosyntax associated with tense and agreement must reflect changes in learners' underlying competence. That is, the functional category AGR and specifications for the feature <agr> emerge earlier than T and <tns> in interlanguage grammars of French. The next logical step is to ask what mechanisms might explain this

particular sequence in grammatical acquisition. Let us briefly consider two possible explanations.

The traditional distinction between fusional and non-fusional morphology might be linked to the earlier emergence of verb movement and subject clitics. Fusional morphemes are specified for both tense and agreement features, while non-fusional morphemes are specified for only one of these features. Recall from the list given in (8) that subject clitics are only specified for <agr>, while the other morphemes are specified for <agr> and <tns>. It is possible that multiply-specified morphemes are acquired later that singly- specified morphemes. Thus, clitics are acquired before past tense morphology which results in the emergence of agreement before tense in the grammar. However, there is one problem with this account: the verb stem. We have assumed that it is doubly marked in a final state grammar, yet this form emerges early along with subject clitics and participates in verb movement. Perhaps the verb stem is initially considered to be singly marked by learners for strong <agr> only with no other nominal or verbal features.

There is some support for a fusional morphology account from first language acquisition. For example, it has been found that children acquiring first languages with fusional morphology acquire inflections later than children acquiring nonfusional or agglutinative languages (Slobin, 1982). Also, this proposal is consistent with Malamud-Makowski (1994)'s analysis of L1 English. She reports that children used the *-ed* past tense marker before they used the *-s* third person singular present tense marker. Consequently, she argues that tense distinctions emerge before agreement distinctions in L1 English. The late emergence of present tense *-s* has also been documented in morpheme order studies of L2 learners (Dulay & Burt, 1974, for example). This sequence could be explained by the non-fusional status of *-ed*, which encodes past tense without any overt agreement

properties, and the fusional status of *-s*, which encodes present tense and third person singular agreement (Schütze and Wexler, 1996).

There is a functional/pragmatic reason which may also explain the primacy of agreement in French interlanguage. Malamud-Makowski (1994) suggests that agreement may emerge later in languages like English because of the absence of a rich agreement paradigm. In English, agreement is encoded sparsely, and because English is a fixed word order language with no pro-drop, subject-verb agreement is not essential to conveying meaning. The absence of rich agreement in the input, together with the absence of a communicative need for overt agreement might explain why AGRP appears later than TP in English. If our analysis of subject clitics is correct, then French is a pro-drop language with rich agreement. Thus, learners of French have rich input in the form of subject clitics and overt verb movement, and the communicative need to acquire agreement morphology. Hence, AGRP appears early in French interlanguage grammar.

We found not only that subject clitics were acquired before the doubly-marked morphology, but that there was a sequence within the doubly marked forms, namely that past tense emerged before future and third plural. We have no explanation for the future tense results, but we can consider two possible explanations for why third person plural lagged behind other manifestations of <agr> and <tns>. One reason could be that third person plural marking is only semi-systematic and might be less frequent than other morphological marking in the input. For instance, it does not occur on first conjugation verbs, which comprise the bulk of French verbs (Pierce, 1992). However, irregular verbs like *aller* 'to go', *être* 'to be', *avoir* 'to have' and *faire* 'to do/make' are all high frequency verbs, as are some third conjugation verbs like *prendre* 'to take' (Harley, 1989), and these all mark third person plural overtly. Therefore, it seems unlikely that frequency alone can explain the lag behind past tense marking. A second, complementary

reason for the late emergence of third plural is that person agreement can be considered a more important grammatical relation than number marking, especially for pro-drop languages (Meisel, 1994). Third person plural can be considered as primarily marking number. According to this explanation, singular-plural distinctions in the present tense should be acquired later than the person distinctions marked by subject clitics. In fact, researchers have found that person agreement (clitics) appears before number agreement (suffixes) in child L1 French (Meisel, 1994; Clark, 1985) and child L2 French (Grondin and White, 1996).

These explanations for grammatical acquisition sequences are tentative and further examination of a variety of languages with different morphosyntactic realizations of tense and agreement would be required to substantiate them. Because many others have also argued for sequential emergence of functional categories (Bhatt and Hancin-Bhatt, 1996; Eubank, 1993/94, 1994, 1996; Vainikka and Young-Scholten, 1994, 1996a, 1996b), investigating the mechanisms underlying these sequences merits our future consideration.

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Endnotes

1. This limitation of grammaticality judgement tasks might not be present in all receptive tasks. For example, the sentence-matching technique (Eubank, 1993) is designed to uncover covert processing of syntactic structures. Although, the task still requires some focus on structure as it is not communicative.

Appendix A

Percentage use of verb movement, subject clitics, third person plural suffixes, past and future tenses in obligatory context at year one.

Children	Verb movement[a]	Subject Clitics	Third person plural	Past	Future
Amanda	.88	.77 (14/18)	.00 (0/1)	.00 (0/12)	.50 (1/2)
Chad	.95	.95 (64/67)	.00 (0/3)	.00 (0/11)	.10 (1/10)
Charlene	.93	.50 (11/22)	.00 (0/1)	.50 (1/2)	.00 (0/3)
Gary	.95	.77 (23/30)	.00 (0/3)	.11 (1/9)	.00 (0/2)
Jason A.	.90	.84 (26/31)	.00 (0/0)	.18 (2/11)	.10 (1/10)
Jason B.	.90	.91 (32/35)	.20 (1/5)	.25 (2/8)	.00 (0/6)
Bradley	.98	.90 (54/60)	.00 (0/2)	.25 (3/12)	.00 (0/7)
Jennifer	.97	.83 (79/96)	.25 (3/12)	.23 (5/22)	.12 (1/8)
Kerin	.98	.99 (82/83)	.27 (3/11)	.27 (3/11)	.33 (5/15)
Lindsay	.97	.97 (61/63)	.00 (0/3)	.42 (13/31)	.08 (1/13)
Sandra	.94	.91 (52/57)	.00 (0/2)	.17 (1/6)	.60 (6/10)
Marylin	.98	.88 (36/41)	.00 (0/0)	1.00 (7/7)	.67 (2/3)
Jeffrey	.95	.83 (43/52)	.50 (1/2)	.60 (9/15)	.60 (9/15)
Jon	.96	.93 (57/61)	.45 (5/11)	.43 (3/7)	.11 (1/9)
David	.97	.91 (62/68)	.40 (4/10)	.50 (9/18)	.62 (5/8)
Means	.947	.859	.138	.327	.255
Ranges	.88-.98	.50-.99	.00-.50	.00-1.00	.00-.67
SD's	.032	.119	.189	.259	.266

[a] Ratios not given because these percentages are averages of the percentages of finite verb use and correct negative placement.

Appendix B

Percentage use of verb movement, subject clitics, third person plural suffixes, past and future tenses in obligatory context at year two.

Children	Verb movement[a]	Subject Clitics	Third person plural	Past	Future
Amanda	.97	.91 (64/70)	.00 (0/9)	.76 (13/17)	.18 (2/11)
Chad	.97	.92 (95/1030	.00 (0/10)	.48 (11/23)	.00 (0/6)
Charlene	.98	.83 (49/59)	.00 (0/4)	.45 (5/11)	.14 (1/7)
Gary	.95	.97 (91/94)	.00 (0/6)	.65 (15/23)	.33 (6/14)
Jason A.	.99	1.00 (80/80)	.54 (7/13)	.50 (13/26)	.30 (3/10)
Jason B.	.93	.97 (61/63)	.25 (1/4)	.69 (11/16)	.00 (0/9)
Bradley	,97	.86 (70/81)	.00 (0/4)	.83 (15/18)	.86 (6/7)
Jennifer	.96	.96 (95/99)	.17 (1/6)	.91 (20/22)	.30 (3/10)
Kerin	.95	.99(111/112)	.20 (1/5)	.80 (16/20)	.50 (7/14)
Lindsay	.74	.98(105/107)	.00 (0/9)	.89 (24/27)	.86 (12/14)
Sandra	.83	.96 (91/95)	.00 (0/7)	.38 (8/21)	.00 (0/10)
Marylin	.98	.96 (74/77)	.00 (0/5)	.95 (19/20)	.62 (8/13)
Jeffrey	.88	.98 (84/86)	.50 (3/6)	.64 (16/25)	.38 (5/13)
Jon	.87	.96 (85/89)	.43 (3/7)	.37 (10/27)	.18 (2/11)
David	.96	.90 (70/78)	.86 (6/7)	.73 (16/22)	.56 (5/9)
Means	.929	.943	.197	.669	.347
Ranges	.74-.99	.83-1.00	.00-.86	.37-.95	.00-.86
SD's	.70	.049	.270	.194	.285

[a] Ratios not given because these percentages are averages of the percentages of finite verb use and correct negative placement.

Appendix C

Percentage use of verb movement, subject clitics, third person plural suffixes, past and future tenses in obligatory context at year three.

Children	Verb movement[a]	Subject Clitics	Third person plural	Past	Future
Amanda	.97	1.00 (72/72)	.00 (0/12)	.95 (19/20)	.40 (2/5)
Chad	.96	.96(101/105)	.71 (5/7)	.54 (12/22)	.31 (4/13)
Charlene	.94	.95(42/44)	.28 (2/7)	.83 (5/6)	.33 (2/6)
Gary	.96	.96(93/97)	.33 (2/6)	.88 (15/17)	.14 (1/7)
Jason A.	.94	.92(68/74)	.42 (5/7)	.68 (13/19)	.25 (2/8)
Jason B.	.93	.91(49/54)	.71 (5/7)	.40 (6/15)	.14 (1/7)
Bradley	.93	.95(77/81)	.00 (0/10)	.90 (18/20)	.67 (4/6)
Jennifer	.96	.95(93/98)	.50 (2/4)	.74 (14/19)	.60 (3/5)
Kerin	.98	.93(126/136)	.27 (3/11)	.77 (24/31)	.10 (1/10)
Lindsay	1.00	.98(164/167)	.62 (8/13)	.95 (53/56)	.69 (9/13)
Sandra	.94	.89 (57/64)	.00 (0/7)	.57 (8/14)	.82 (9/11)
Marylin	.98	.96 (75/78)	.40 (2/5)	.83 (10/12)	.43 (3/7)
Jeffrey	.94	.87 (52/60)	.28 (2/7)	.28 (2/7)	.28 (2/7)
Jon	.96	.94 (77/82)	.11 (1/9)	.33 (5/15)	.40 (2/5)
David	.99	.98 (62/63)	1.00 (6/6)	.94 (17/18)	.80 (4/5)
Means	.959	.943	.375	.706	.424
Ranges	.93-1.00	.87-1.00	.00-1.00	.28-.95	.10-.82
SD's	.022	.035	.295	.230	.239

[a] Ratios not given because these percentages are averages of the percentages of finite verb use and correct negative placement.

General Discussion

The three preceding studies were undertaken to address two general questions about simultaneous and early successive bilingual acquisition, repeated here from the General Introduction: (1) Can bilingual child language development be considered as 'two monolinguals in one', and (2) Can bilingual child language contribute uniquely to our understanding of the acquisition process in all children? Let us evaluate how the results of this research have contributed to our further understanding of these issues, and discuss some limitations and residual issues which could be addressed in future work. In Section 1, I will discuss the findings which are relevant to the first question, and in Section 2, the second question is addressed.

1. Autonomy or Interdependence

The principal focus of Study 1 was to investigate the degree of autonomy or interdependence between the developing grammars of bilingual two year olds. Interdependence was defined as being '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 monolinguals' (p.27). Transfer between the grammars, as well as possible acceleration or delay in the acquisition of syntactic structures, were examined as possible points of contact. It was found that for the properties of INFL investigated, finiteness, clitics and head movement, the children's developing grammars were autonomous. In particular, no evidence of transfer was detected. The examination of delay or acceleration was necessarily tentative due to the small sample size of both the bilingual and monolingual groups.

Although the principal focus of Study 2 was the issue of continuity in the acquisition of functional categories, the results of this study corroborated those of Study 1. The patterns of INFL acquisition in French and English for the children in

Study 2 were parallel to those of the children in Study 1, although at a somewhat earlier stage in acquisition. The absence of transfer between the grammars of simultaneous bilinguals stands in contrast to findings for successive bilinguals, even when the L2 is acquired early in childhood (see Ellis, 1986, for a review). In sum, on the basis of Studies 1 and 2, simultaneous French-English bilinguals can be considered as 'two monolinguals in one' with respect to the acquisition of INFL.

It is worth asking whether autonomous development also occurs for other language pairs and in different acquisitional contexts. For example, the bilingual acquisition of language pairs which are typologically similar might show more interdependence than language pairs which are not, presumably because the greater the similarity between the languages, the more challenging it would be for the child to keep the input separate. Furthermore, the sociolinguistic context could influence autonomy in development. In the context of Montreal, where Studies 1 to 3 took place, both English and French are widely spoken and valued. However, in contexts where one language in the pair is not supported by use in the larger community, for example, a minority language in an immigrant situation, transfer from the majority to the minority language in acquisition might be more likely. We could speculate that this would occur because input in the language of the general community would be more prevalent outside the home, and perhaps even a young child could have some awareness of the higher status of the majority language.

Subsequent to the publication of Study 1, other researchers have examined autonomy in the syntactic acquisition of bilingual children learning other language pairs in other contexts (Döpke, 1997; Mishina, 1997). Mishina (1997) investigated aspects of the syntactic acquisition of two English -Japanese bilingual children aged 2;8 to 3;2 and 2;4 to 2;10, who were residing in California. She examined potential acceleration/delay and transfer in the acquisition of the past tense inflection and negative placement, respectively. Past tense inflection emerges earlier in Japanese

child language than in English child language, and in adult Japanese, the negator appears post-verbally, whereas, in adult English it appears before the main verb. Mishina found that there was a discrepancy between the bilingual children's Japanese and English in the emergence of the past tense inflection where the timing was parallel to monolingual acquisition. She also found no evidence of transfer with respect to negative placement. Since Japanese and English are more typologically distinct than English and French, it could have been predicted that interdependence would be unlikely to occur. However, the children in this study were being raised in a largely English-speaking community, and yet English influence on the children's Japanese syntax was not observed.

In contrast, Döpke (1997) argues that some interdependence can be observed in the language development of four German-English bilinguals who were studied from two years of age onward and were residing in Australia. Döpke examined the children's acquisition of mid-sentence negators and modal particles. The underlying syntax of these structures differs between English and German, as analysed in Principles and Parameters theory, but some surface level similarities in word order do occur. Döpke found that, overall, the children used the appropriate target language structures in German and English, but that for three of the four children, some use of what appear to be crosslanguage structures persisted for a few months. These structures consisted mainly of negative clauses in German that followed English word order. It is doubtful whether these findings truly indicate that the children's English and German were developing interdependently. The crosslanguage structures occurred at a very low frequency, which begs the question of whether they were syntactic code-mixes rather than evidence of the systemic influence of English on German. However, if we accept that these children's acquisition patterns were more interdependent than those of the French-English children in Studies 1 and 2, we could speculate on why interdependence would

occur in their case. First, the surface word order similarities that occur in the structures Döpke examined may have led the children astray temporarily. Also, the children were acquiring German in a non-bilingual community where English was the majority language. This may have had an impact on the direction of the transfer, which was from English to German. But, because language status did not appear to influence acquisition in Mishina (1997), this explanation may not be valid. In sum, Döpke's (1997) study highlights the need to further investigate the issue of autonomy in diverse populations of bilingual children.

It is equally important to investigate autonomy in the acquisition of other components of language aside from syntax, for example the lexicon or phonology. Interdependent development might be more likely to occur in these other components. Concerning the lexicon, one might predict that semantically-based links between the lexicons of bilingual children would be established early on, since some researchers have found evidence for such links in adult bilinguals when performing lexical access tasks (De Groot, 1993, for example). With respect to phonology, the appearance of interlinguistic interference in production might occur because, unlike syntax, this system interfaces with the articulation and perceptual systems. It is conceivable that the task of establishing and implementing two separate articulatory routines may be overwhelming for an infant bilingual, who may rely on a hybrid system initially. Indeed, in contrast to syntactic acquisition, the majority of researchers examining differentiation in bilingual children's phonological production have argued for a fused early system (Celce-Murcia, 1978; Duechar & Clark, 1988; Schnitzer & Krashinski, 1994; Leopold, 1949; Vogel, 1975; except see Ingram, 1981/2; Paradis, 1996). Paradis, Fonte, Petitclerc & Genesee (in preparation) are currently investigating the issue of autonomy in phonological production in French-English bilingual two year olds.

Another relevant issue to address is whether interdependent development is more likely to occur at the earlier stages of acquisition, before two years of age. Research focused on differentiation have given relatively less attention to the period of acquisition from birth to two years. One reason for this lacuna is that prior to the production of multiword utterances it is difficult to assess the degree of separation between bilingual children's linguistic competence. Researchers examining bilingual children under two years of age have looked at the presence of translation equivalents in the lexicon (Nicoladis & Genesee, 1996; Pearson, Fernandez & Oller, 1995; Quay, 1995) and interlocutor sensitivity in language use (Nicoladis & Genesee, 1996). Translation equivalents were found to be present in the lexicons of all the bilingual children studied, and their proportion was found to grow over time (*contra* Volterra & Taeschner, 1978). This may indicate the early establishment and maintenance of two separate systems; however, as Pearson, Fernandez & Oller (1995) argue, translation equivalents only constitute evidence of two systems on the assumption that within-language synonyms are avoided by young children. The use of evidence from interlocutor sensitivity or pragmatic differentiation is an indirect route to assessing autonomy of representations in competence. However, as pointed out in Study 1, the presence of pragmatic differentiation is difficult to reconcile with a fused underlying system while the reverse is not necessarily true. Nicoladis & Genesee (1996) found that under two years of age, bilingual children did not show reliable evidence for pragmatic differentiation, and the emergence of pragmatic differentiation varied with age, from 1;9 to 2;4. Thus, further research is necessary to determine when differentiation occurs and how autonomous the developing languages of bilingual children are under two year of age. One method for addressing this issue which has not yet been attempted is assessment of bilingual children's receptive capacities. Research in this domain might be very promising since studies of monolingual children have

shown that they begin to acquire components of language-specific syntax in comprehension before they use multiword utterances in production (Hirsh-Pasek & Golinkoff, 1996).

Before ending this section, I would like to discuss one major limitation of Study 1, which is shared by virtually all studies of young simultaneous bilinguals. With the exception of studies conducted by Pearson and colleagues (Pearson Fernandez & Oller, 1993, 1995; Pearson, Fernandez, Ledeweg & Oller, 1994, for example), research on bilingual children has consisted mainly of case studies and small groups. Small sample sizes are often the result of simultaneous bilinguals being a special population in some areas, and is thus beyond the control of many researchers. However, the lack of studies on larger groups of bilingual children acquiring the same language pair limits the conclusions we can make from the extant research. We are able to speak of what bilingual children *can* do, and rarely of what they *typically* do. The need for normative data on bilingual language acquisition would be useful not only for theoretical but also for applied purposes. Presently, speech pathologists, early childhood educators and parents have little information to guide them in assessing what is typical in bilingual children's development. In particular, the issue of whether bilingual children as a group are delayed in some aspects of their linguistic development would be important to pursue in future research.

2. Continuity in the acquisition of functional categories

In Studies 1, 2 and 3, the acquisition of functional categories in the grammars of simultaneous bilinguals and child L2 learners was examined. The category INFL was the main focus of these studies, but DET was also looked at in Study 2. Let us summarize the empirical findings with respect to this process across the three Studies. First, the emergence of functional categories and features is gradual and sequential in a language. The term 'gradual' refers to the steady increase over time

in use of word order contingencies and functional morphemes associated with functional categories. Sequential emergence refers to the fact that the use of morphemes and operations associated with certain categories can systematically appear before others within one language or between languages. Finally, in addition to gradual and sequential emergence, Studies 1 and 2 demonstrated that the timetables for emergence of functional categories are language specific rather than universal.

In more detail, the findings for sequential acquisition within a language were as follows: DET emerges before INFL in the bilingual first language acquisition of English (Study 2); agreement emerges before tense in the child L2 acquisition of French (Study 3); definiteness within DET emerges before number in the bilingual first language acquisition of French and English (Study 2), and person agreement emerges before number agreement in child L2 French (Study 3). With respect to language specific effects, Studies 1 and 2 showed that INFL emerges earlier in the bilingual first language acquisition of French than in English, and that INFL emerges after DET in English but not in French. Also, the agreement before tense findings for L2 French may not be universal, as it has been reported elsewhere that the opposite sequence may obtain in the acquisition of English (Malamud-Makowski, 1994).

It can be argued that both the gradual, sequential patterns and the presence of language-specific effects support a continuity account, as discussed in the General Introduction, for both the L1 and L2 acquisitional contexts. First, the behavioural changes over time appeared to be quantitative rather than qualitative since the emergence of functional structure in the learners' grammars did not occur in separate, distinct stages. Even though all clauses were truncated (VP's with no INFL) in early English, the transition from this period to one where IP clauses appeared was smooth, not abrupt, because the use levels of items signaling the

presence of INFL followed an incremental curve from 0% to 90% usage. Second, the sensitivity of the acquisition process to specific language input argues against a discontinuity account which would attribute changes in behaviour to a reorganization of internal mechanisms, rather than to the influence of external factors.

The particular discontinuity view considered in Studies 1 and 2 was the maturation perspective. The maturational accounts examined were not supported by the findings in either Study (Radford, 1988, 1990, 1992; Wexler, 1994, 1996; Rizzi, 1994). Radford proposes two stages in acquisition, one where no functional categories appear, followed by a stage where all functional categories are projected. Wexler's and Rizzi's accounts predict two stages as well, one where the generation of tenseless or truncated clauses is generally optional, followed by a stage where full clauses are obligatory. None of these two stage proposals were supported by the longitudinal data from the bilingual acquisition of French and English, and moreover, any maturational proposal would be difficult to reconcile with the finding that robust interlingual differences in acquisition patterns could occur within one individual. In addition, the parallels between L2 acquisition and bilingual first language acquisition for gradual and sequential emergence is further evidence against neurological maturation underlying the patterns of functional category acquisition. After all, the children in Study 3 were beyond the age at which neurological changes could have driven the acquisition process.

The evidence from Studies 1 to 3 not only favours continuity over discontinuity, one could also argue that it favours a weak over a very strong version of continuity with respect to functional category acquisition. Recall that on most strong continuity views, no changes in the functional layer of underlying competence occur in the acquisition process. Systematic similarities in sequential acquisition patterns between learners of the same language (Study 3), and

systematic differences in the acquisition timetable between learners of different languages (Study 1 and Study 2) make it difficult to maintain that particular language grammars remain constant throughout the acquisition process for all languages in all contexts. Unless these patterns can be attributed to other factors, such as phonological or processing constraints, the data from all three Studies are more compatible with a weaker version of continuity where the observed systematic patterns can be accounted for by the structure of the underlying grammatical representation of the particular language being acquired.

In addition to a continuity perspective, I also have assumed a dynamic or minimal projection approach to the generation of syntactic structures, as discussed in Studies 2 and 3. Recall that on this perspective, functional heads are projected in a clause only if the relevant lexical material has been accessed or movement operations have applied. Thus, on this approach, a learner can have a full competence grammar without having 100% full competence clauses. Putting a weak continuity and minimal projection approach together, let us discuss characterizations of learners' syntactic competence at the different acquisitional stages observed across the three Studies for English and French. I am using the term 'stage' as a convenient label to refer to periods where certain linguistic behaviours occur together. As the data have shown, these stages are not discontinuous; rather, the transition from one to the next is gradual.

English First Syntax appears to have a stage where INFL has not yet been instantiated in the particular language grammar. Yann's English was at this stage throughout Study 2, Mathieu's was at this stage until the final interval for Study 2, and Olivier was at this stage at the first interval in Study 1. Because no lexical material or operations signaling INFL appeared in the children's speech at this stage, all clauses would be truncated at VP, following a minimal projection account. These truncated clauses at English First Syntax may contain DP's, since Study 2

showed that determiners were used at this stage. However, the first DP projections were only partially-specified in both Yann and Mathieu's English. For example, manifestations of the feature definiteness appeared initially, but not of number. Subsequent to First Syntax, INFL-associated items appeared in the children's speech. William and Gene were at this second stage in English throughout Study 1, and Olivier was at this stage for intervals 2 and 3 in Study 1. Mathieu's English was at this stage at the final interval of Study 2. Thus at this second stage, we can conclude that IP clauses have emerged in the grammar; however, IP clauses are not used obligatorily, defined as greater than 90% of the time. In other words, INFL can be considered part of competence, but VP and IP clauses alternate in production, again following minimal projection assumptions. Also at this second stage in English, DP's could be specified for number distinctions, as evidenced by Mathieu's corpus. None of the children in either Study 1 or 2 entered a subsequent stage in English during the observation period. These two stages in the acquisition of English are summarized in Table 1.

In contrast to English, INFL - associated operations and items were produced in French First Syntax, although not in all obligatory contexts. Both Mathieu and Yann's French was at this stage at the beginning of Study 2 until the penultimate interval. William's French was at this stage throughout Study 1, and Gene and Olivier's French was at this stage for the first interval of Study 1. In parallel with the second stage in English, we can characterize French First Syntax as including an INFL projection in grammatical competence with VP and IP clauses alternating in production. Similar to First Syntax in English, First Syntax in French includes a DP projection, which is initially partially specified for definiteness only, shown in Yann and Mathieu's corpora. At the second stage in French syntactic development, children used IP clauses obligatorily, or greater than 90% of the time. Olivier and Gene reached this stage by interval 2 in Study 1. Mathieu reached this stage by the

final interval in Study 2, and Yann almost reached this stage by the final interval in Study 2. Also at the second stage in French, DP's could be specified for number, as shown in Mathieu's data.

While Studies 1 and 2 provide no further information about stages in English acquisition, Study 3 provides such information for French. The learners in Study 3 demonstrated two stages in the L2 acquisition of French. At the earliest stage observed, INFL appeared to have been instantiated as part of their French grammars, projected obligatorily, but it was specified for agreement only. We can speculate that this stage corresponds to the second stage in the L1 studies as the bilingual children showed marginal use of tense distinctions in their French. At the second stage observed in Study 3, learners used IP clauses obligatorily, with an INFL fully specified for tense. A combined summary of these stages in the acquisition of French is given in Table 1.

Table 1. *Stages in the acquisition of IP and DP in English and French*

	Stage 1	Stage 2	Stage 3
English	VP	IP/VP	--
	DP/NP (DET<def>)	DP/NP (DET<def,num>)	
French	IP/VP	IP (INFL<agr>)	IP (INFL<agr,tns>)
	DP/NP (DET<def>)	DP/NP (DET<def,num>)	

Although a weak continuity/minimal projection account can provide an adequate description of these observed stages in grammatical acquisition, it does not provide an explanation of why gradualness or optionality occurs. In other words, it does not tell us why a learner's grammar would include the functional category INFL,

but not project it in all clauses, and gradually project it in all clauses over time. The lexical learning hypothesis, a component of the weak continuity view, attempts to explain how functional categories can be absent from or underspecified in a grammar. Recall that on this hypothesis, functional categories are instantiated in the grammar when the relevant lexical material has been acquired in the lexicon. Thus, if no determiners have been acquired, the grammar does not include DET, and if a subset of determiners has been acquired, then the grammar includes a DET specified for a subset of the target features. The minimal projection approach accounts for how variable appearance can be licit in formal terms. For example, if a determiner has not been accessed, then no DET appears in the sentence representation. Grimshaw (1994) claims that the minimal projection principle operates equally in adult and child systems, and thus is a constant principle of UG. But, adults do not use VP clauses like *Truck go there*, and the adult system is not undergoing change towards the elimination of such utterances in output. Therefore, neither lexical learning nor minimal projection explains *why* lexical material would not be accessed when it has been acquired, and *why* accuracy in access increases gradually over time. There is something particular to the developmental or language learning process that interacts with lexical learning and minimal projection to produce such utterances, and causes them to diminish over time.

Wexler's (1994, 1996) optional tense hypothesis and Rizzi's (1994) truncated clause hypothesis both attempt to provide an explanation of the optionality phenomenon. I have argued that the overall predictions and maturation assumptions of these two accounts are not compatible with the acquisition process as shown by the bilingual children. I would also like to suggest that these accounts may not offer adequate explanations of the optional projection of functional categories. The main reason is that these accounts are based on abstract competence, which does not typically explain incremental changes in patterns of use

over time. For example, if we accept that a learner's competence is structured in such a way that the feature tense is optional, this does not explain why the learner gradually accesses the lexical material encoding tense over time until full accuracy has been achieved. The difficulty in mapping a theory of a stable grammar onto certain phenomena displayed by developing grammars is evidenced by the *deus ex machina* flavour of accounts based on the maturation of specific UG principles. Furthermore, variable use of newly acquired lexical material and operations may be a hallmark of many aspects of language acquisition; therefore, local explanations for each phenomenon based on specific grammatical principles, like optional tense, might miss the forest for the trees.

These problems suggest looking for reasons outside of competence to explain gradualness/optionality. In the discussion of Study 3, it was mentioned that gradual accuracy in the use of newly acquired lexical material, like tense marking, could occur because processing routines take time to perfect. Thus, optionality was attributed to the developing system of language production, rather than the developing system of competence. Similarly, Philips (1996) proposes that variable use of functional morphology could be caused by problems in the interface between the lexicon and computational system (grammar) which would become resolved as language development progresses. It is beyond the scope of this dissertation to fully explore this issue, but I would like to suggest that optionality phenomena are most likely best accounted for by appealing to principles of processing and learning, and by examining the production system rather than abstract competence. One may ask whether such a view is compatible with a Principles and Parameters framework, where the properties of functional categories are considered to be triggered rather than learned. I believe that these views are compatible on the understanding that there is a distinction between abstract knowledge on the one hand, implementation of that knowledge on the other, and that possible differences

in the acquisition time of these two forms of knowledge could occur (cf. Carroll, 1989). Finally, not only would a processing account be a more fruitful explanation of gradualness/optionality with respect to functional categories, it has the advantage of being generalizable to other gradualness/optionality phenomena in language acquisition.

In addition to gradualness/optionality, there is another issue that a weak continuity/minimal projection account does not address: What causes the language-specific effects in the emergence of functional categories? Although I have argued that a lexical learning perspective predicts that crosslinguistic differences in emergence could occur, it does not explain how and why specific differences occur. Studies 1 to 3 suggest that language input plays a role in determining the acquisitional timetable, but what aspects of French and English are driving this process needs to be addressed. In each study, some tentative suggestions were put forth to explain the French-English discrepancy regarding INFL. In Study 1, Pierce's (1992) markedness hypothesis was discussed. Pierce proposed that because the English verb movement parameter had a more marked setting (affix-lowering) the emergence of INFL and its properties tended to be delayed in the acquisition of English. This hypothesis leaves open the question of what aspect of the English input triggers this knowledge of the marked setting in the learner. In Study 2, it was suggested that agreement paradigms in the input could be the trigger for projecting a functional category above VP. Thus, if the language possesses a rich subject-verb agreement system, like French, a greater quantity of input and/or more complex input for triggering an INFL projection is provided, and INFL is projected sooner. Finally, in Study 3, the specific acquisition order of agreement and tense features within INFL was considered. The feature values of morphological encodings in French was examined and it was suggested that encodings marked for more than one feature (fusional) may emerge later than those

marked for one (nonfusional). These suggestions represent an initial exploration into this issue and much future research is needed to fully address the question of how specific language input influences the acquisition of functional categories. More detailed crosslinguistic comparisons of acquisitional sequences and the structure of the input must be carried out. We also need a greater understanding of how children attend to and process the functional component of the ambient language input.

To summarize, Studies 1 to 3 support an account of functional category acquisition that involves a combination of external factors, like the morphosyntactic structure of the linguistic input, and internal factors such as UG-guided instantiation of specific language competence. Two worthwhile directions for future research include investigating the mechanisms underlying optionality in production of functional items and the impact of different kinds of linguistic input on the acquisitional timetable.

In conclusion, Studies 1 to 3 not only contribute to our understanding of the theoretical questions (1) and (2) as stated above, but the findings are also useful in applied domains. In particular, the similarities between bilingual and monolingual children with respect to syntactic acquisition could provide insights to clinicians and early childhood educators in their assessment of language development in bilinguals.

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