

*Second Language Acquisition in Childhood***Johanne Paradis**

Second language (L2) acquisition in children has been seldom studied as a subfield with its own issues and questions separate from adult L2 acquisition on the one hand, or bilingualism and educational outcomes on the other. Consequently, we know little about second language acquisition (SLA) issues, such as individual differences, as they pertain to child as opposed to adult learners, and we know less about the developing oral language proficiency of L2 children than we know about their literacy development. Research on child L2 learners received a great deal of attention in the 1970s because SLA was emerging as a field of inquiry, and because educational programs such as French immersion in Canada and bilingual programs for Spanish-speaking children in the United States were being developed. There has been a recent resurgence of interest in this population of children in large measure due to clinical and special education researchers who seek to understand how to distinguish between language difference and language disorder in multilingual populations. This renewed interest in child L2 learners has come with a focus on oral language proficiency, because this is essential for assessment and intervention, as well as concern for issues that are more important to L2 learning by children rather than adults, such as the impact of languages spoken in the home on both first language (L1) and L2 development. This review discusses research on L2 children in terms of questions that are particularly relevant to child rather than adult SLA, and to oral language rather than literacy development: (1) Are child L2 acquisition patterns and rates similar to those for L1 acquisition? (2) How do child L2 learners compare with native speakers of the target language their own age? (3) What happens to the L1 development of minority children learning a L2 that is the majority language of the community?

The term “child bilingual” is often used synonymously with “child L2 learner,” but they do not necessarily denote the same population. Simultaneous bilingual children learn both their languages in the preschool years (see Genesee & Nicoladis, this volume), while L2 children have established one language before they begin learning the other,

and typically speak the L1 at home and the L2 at school. English L1 children who acquire French or Spanish as a L2 through immersion schooling are L1 majority L2 learners. By contrast, children who speak a minority language at home, such as Spanish, Chinese, or Arabic, and attend school in the majority language alongside English native speakers are L1 minority L2 learners. This chapter is concerned mainly with development of the L2 and L1 of minority children, but some research on L1 majority L2 children is discussed.

Initial Exposure to the Second Language

Tabors (1997) noted the following early stages in L2 development, based on observing minority children in an English preschool in the United States: (1) home-language use, (2) non-verbal period, (3) formulaic and telegraphic use, and (4) productive language use. Children initially use their native language in the L2 environment, but this stage is very brief because within a few days they realize that using their native language will not facilitate communication in the new context. By contrast, the subsequent non-verbal period can last a few weeks or extend to several months, and younger children seem to stay longer in this stage than older ones (Tabors, 1997; Winitz, Gillespie, & Starcev, 1995). During this stage, children produce few or no utterances in the L2, often make use of gestural communication, and may be silent for longer in a group rather than a one-on-one context.

L2 children's first utterances in English tend to be either formulaic or telegraphic, meaning that children rely heavily on memorized or unanalyzed phrases and use few grammatical morphemes. Tabors (1997) noted that the first utterances produced by the children in English were mainly single-words like object and color names, or counting sequences. Wong Fillmore (1979) lists several common formulas used repeatedly by the L2 children she observed in the early stages, for example *lookit, wait a minute, lemme see, or whaddya wanna do?* L2 children's transition from Tabors' stage (3) to the period of productive language is marked by their increasing use of novel concatenations of content and grammatical morphemes. Tabor's stage (4) resembles what L2 researchers traditionally call *interlanguage* (e.g., Selinker, Swain, & Dumas, 1975). Interlanguage describes L2 learner language that is reasonably fluent and is the product of an underlying productive linguistic system, but differs from the target language; it is a dynamic system balancing L1 transfer processes with target language developmental processes that gradually moves closer to the target language system.

Phonological Acquisition in the Second Language

Influence of the L1 is highly apparent in L2 phonology. According to Flege's Speech Learning Model, the starting point for L2 speech development is the L1 phonetic categories (Flege, 1999). For example, Spanish L1–English L2 children aged 4 to 7 years were

found to be more accurate in their production of phonemes that are shared between the two languages than of phonemes that are present only in the English L2 (Goldstein, 2004). This initial L1 influence can be life-long, even for child L2 learners. Retrospective developmental studies show that adults who began to acquire their L2 as early as 6 to 8 years of age can have a perceptible foreign accent (Flege, 1999; Flege & Fletcher, 1992). With respect to acoustic properties like voice onset time (VOT), Spanish L1–English L2 children can eventually develop two systems for marking the phonemic voicing distinction in their production of stop consonants, short-lag versus long-lag (English) and pre-voiced versus short-lag (Spanish); however, their perception of VOT-signaled contrasts may not display the language-specific and separate boundaries found in monolinguals for each language, and thus bilingual VOT perceptual systems may be intertwined (Watson, 1991).

In addition to examining the role of the L1, researchers have also asked whether child L2 learners are faster to acquire L2 phonology than adult learners. Snow and Hoefnagel-Höhle (1977) studied the pronunciation of Dutch words by 47 English speakers aged 3 to 60 years learning Dutch as a L2 in the Netherlands. During the first 11 months of exposure to the L2, the children did not receive higher accuracy scores on pronunciation of individual target phonemes than the adults. Subsequent studies have shown that after 12 to 18 months of exposure to the target language, children's rate of phonological acquisition begins to outstrip adult learners because their foreign accent diminishes much more rapidly after that time (Flege, 2004; Winitz et al., 1995).

Adult Italian–English bilinguals were found to have lower pronunciation accuracy with vowels that are present in English but not in Italian, compared with vowels present in both languages, even though they had begun learning English as young children (Flege, 1999). Furthermore, Flege and Fletcher (1992) found that Chinese L1 adults had more perceptible foreign accents than Spanish L1 adults, even though both groups had been immersed in a majority English environment from 5 to 8 years of age.

Lexicon Acquisition in the Second Language

Building a lexicon is an important task for L1 minority children not only for achieving adequate oral proficiency in their L2, but also for performance in a majority L2 school since vocabulary knowledge is an important component in literacy development. Umbel, Pearson, Fernández, and Oller (1992) studied the vocabulary knowledge of 151 dual language children in first grade in Miami, some of whom had been introduced to English at school (L2), and some of whom had been exposed to both English and Spanish at home before school entry (bilingual). Umbel et al. (1992) found that the English L2 learners scored lower than the bilinguals on the English standardized tests, both groups scored the same on the Spanish standardized tests, and both groups scored higher in Spanish than in English. Neither the L2 learners nor the bilinguals scored at the mean for monolinguals in the English norming sample; whereas both groups scored close to the mean for the monolingual Spanish norming sample. This study indicates that vocabulary accumulation in the majority language for both L2 and bilingual learners is

a gradual process, but at the same time, exposure to English did not adversely affect the children's ability to maintain age appropriate vocabulary knowledge in their minority L1 into first grade. It is important to point out that using monolingual norms of vocabulary size to measure dual language children's development in both L1 and L2 might not sufficiently take into account context-dependent compositional differences between the monolingual and bilingual lexicons for a target language, and alternative methods of scoring tests and understanding lexical development for dual language children have been proposed (Patterson & Pearson, 2004; Peña & Kester, 2004).

As L2 children are accumulating vocabulary, the communicative demands on them in school and from native-speaker peers are often in advance of what they can produce. Harley (1992) presented English L1 children in French immersion, and French monolingual children, with cartoon story sequences to describe. The L2 children used a smaller number of different words overall than native speakers, and Harley noted three phenomena indicating that the L2 children were stretching their lexical resources in French. First, the L2 children often used non-specific verbs to describe specific actions; for example, in describing a picture of a man diving, an L2 child said *il va dans l'eau* "he goes into the water," while native-speaker age peers used the precise verb, *plonger* "to dive." Second, the L2 children were more likely to use sound symbolism, so another child described the diving picture as *il [pløβ] dans l'eau* "he [sound effect] in the water." Finally, some children would codeswitch to English to be more precise, for example one child said *il va, um, sauter, euh dive* "he goes, um, jump, uh, dive." The L2 children also used more non-specific nominals than native speakers, such as *une chose* "a thing" or the deictic pronoun *ça* "that." Interestingly, there are similarities between these early L2 lexical strategies and those employed in the context of L1 attrition discussed below.

L2 lexical learning differs from L1 in that the child is more cognitively mature when the process starts, and also has an existing lexicon in their L1 to draw upon for insight into conceptual-lexical mappings; therefore, it is possible that child L2 learners accumulate vocabulary faster than younger L1 learners for the same target language. Winitz et al. (1995) found that the Polish L1 child advanced four developmental years in vocabulary knowledge within one chronological year of exposure to English, as shown by age-equivalency scores on the Peabody Picture Vocabulary Test (PPVT). Following the same logic, PPVT age-equivalent scores and chronological ages were compared from 24 children participating in an ongoing longitudinal study of English L2 development in Edmonton, Canada (see Paradis, 2005, for details), to ascertain whether rate of vocabulary development is generally faster for L2 than L1 acquisition. At 9 (SD = 4.2) months of exposure to English (MOE), the mean chronological age of the children was 66.21 months (SD = 11.14), and the mean PPVT age-equivalency score was 44.33 months (SD = 20.16), nearly 22 months below chronological age. At 21 MOE (SD = 4), the mean chronological age was 75.9 months (SD = 9.97), with mean age equivalency on PPVT at 66.2 (SD = 18.76), nearly 10 months below chronological age. Thus, the children gained 12 months developmentally in vocabulary knowledge within 12 chronological months of exposure. Even though the overall rate of vocabulary accumulation for the group was similar to the rate for L1 acquisition, there were individual cases of remarkably rapid vocabulary acquisition. For example, two children's age-equivalency scores increased 40 months in the 12-month chronological interval. Also, the children's ages

were positively and significantly correlated with the PPVT raw scores at 9 MOE ($r = .498, p = .0287$) and 21 MOE ($r = .553, p = .0128$). In sum, precocious vocabulary development appears to be an individual rather than a group trait for child L2 learners, but older child L2 learners may be faster than younger L2 learners.

Lexical processing, which consists of the ability to recognize, access, and produce words in the target language in a time dependent way, is a skill that continues to develop gradually in monolingual children until adolescence, and so it could be expected to also develop gradually in a child's L2, in tandem with vocabulary growth (Kohnert, 2004). Kohnert and colleagues studied picture-naming and picture-word verification in 100 Spanish L1 children and adolescents aged 5 to 16 in California (Kohnert & Bates, 2002; Kohnert, Bates, & Hernandez, 1999). The participants' accuracy with picture-naming and picture verification in their English L2 was superior in comprehension than production, and both continued to increase until the 14 to 16 age range, when accuracy reached 90% or greater. Response times in both tasks continually decreased until ages 14 to 16. Similar protracted development for lexical processing was also found for German L1–Swedish L2 children (Mägiste, 1992). Therefore, children's L2 lexical processing develops very gradually throughout elementary school and is consistent with known patterns for monolinguals (Kohnert, 2004).

Morphosyntactic Acquisition in the Second Language

Foundational studies on L2 morphosyntactic development examined children's errors with grammatical morphemes and syntactic structures, mainly for the purpose of determining whether interlanguage errors were developmental or transfer-based in this domain of acquisition, and whether the developmental sequence for grammatical morphemes mirrored L1 acquisition (Dulay & Burt, 1973, 1974). Dulay and Burt (1973) found that 85% of the errors in spoken English by 145 Spanish L1–English L2 children were developmental in origin, in other words, not traceable to Spanish, and were mainly errors with grammatical morphemes. Transfer from Spanish was expected for a variety of structures, for example, use of *have* in *he has hunger* instead of *he is hungry*, or use of noun–adjective word order, *the man skinny* instead of *the skinny man*. In their follow-up study with both Spanish and Chinese L1 children, they found again that the major source of difficulty for both L1 groups was developmental errors with grammatical morphology, demonstrating that the learner's L1 was not the principal source of the errors in their interlanguage (Dulay & Burt, 1974). In addition, Dulay and Burt (1973, 1974) and Dulay, Burt, and Krashen (1982) show that order sequence of morpheme acquisition is similar to that found in L1 English: for example, early-acquired morphemes in English L2 are progressive [-ing] and plural [-s]; late-acquired morphemes are past tense [-ed] and third person singular [-s]. More recent research confirms the special difficulty of grammatical morphemes in child English L2 acquisition, and the dominance of developmental, mainly omission, errors in children's interlanguage (Ionin & Wexler, 2002; Jia, 2003; Paradis, 2005; Paradis, Rice, Crago, & Richman, 2004). Here are some examples of omission and commission errors in child L2 English: *we playing*

hide and seek; he want some ice cream; how you say that?; I didn't sawed, and there's are not maths in my school (Genesee, Paradis, & Crago, 2004, pp. 124–125).

Building on the notion of early-versus late-acquired morphemes, recent research shows that omission of tense/agreement (finiteness) markers in particular is a significant characteristic of child L2 interlanguage, whether the L2 is French, German, or English, regardless of the L1 background, and for both L1 majority and minority children (Grondin & White, 1996; Haznedar, 2001; Ionin & Wexler, 2002; Lakshmanan, 1994; Paradis, 2005; Paradis & Crago, 2000, 2004; Paradis, Le Corre, & Genesee, 1998; Prévost & White, 2000). More specifically, finite verb morphology in English and French is acquired later by child L2 learners than non-finiteness-related morphology, and this directly parallels L1 acquisition patterns for early- versus late-acquired morphemes (Paradis, 2005; Paradis & Crago, 2000, 2004). One exception is that the verb *BE* emerges relatively early for a finiteness-marking morpheme (Haznedar, 2001; Ionin & Wexler, 2002; Paradis et al., 2004).

Concerning other L1–L2 acquisition comparisons, researchers have found parallels in how grammatical aspect is acquired by child L1 and L2 learners of English and French (Gavruseva, 2002; Harley, 1992), and how object pronouns are acquired in child L1 and L2 French (Paradis, 2004). Child L2 learners have also been found to make similar errors in morphosyntax as monolingual children the same age with language impairment, with either English or French as the target language (Paradis, 2004, 2005; Paradis & Crago, 2000, 2004). Such an overlap between a clinical and typically developing population has practical consequences for differential diagnosis in multilingual contexts, as well as posing challenges for theories of language impairment aimed at identifying linguistic characteristics that circumscribe the clinical population among same-aged children.

Differences between L1 and child L2 acquisition have also been found. L2 children display a larger proportion of commission errors than younger L1 learners, and the phenomenon of *BE*-overgeneration appears to be unique to child L2 (Ionin & Wexler, 2002; Paradis et al., 2004). *BE*-overgeneration consists of using this morpheme in contexts not permitted in adult English, possibly as a general-all-purpose finiteness marker, for example *I'm sit down on my spot* or *you're win*, and has been documented in children with various L1 backgrounds. Another difference between L1 and L2 concerns the appearance of subjects. Null subjects appear widely in the speech of young children cross-linguistically, even when the target language does not permit null subjects, like English. However, in the L2 acquisition of English, null subjects are infrequent or non-existent, even when the children's L1 permits null subjects (Haznedar, 2001; Ionin & Wexler, 2002; Lakshmanan, 1994). Perhaps the cognitive immaturity of very young learners is the source of the null subjects stage in L1 acquisition.

As with lexical acquisition, researchers have asked whether morphosyntactic acquisition is faster for the more cognitively mature L2 children than for younger L1 learners. Jia (2003) found that it took an average of 20 months of exposure (range 7–33) for nine Mandarin L1 children to master the use of plural [-s] in their English L2 (mastery = 80% use or greater). Assuming 12 months to be the onset of language production, Jia (2003) reckoned the L1 average for mastery of plural [-s] is 17 to 21 months after production begins, making it similar to the L2 average, although the range might be broader

for L2 children. The Edmonton ESL study supports Jia's (2003) findings with a larger sample, and with children from various L1 backgrounds. At 21 MOE (SD = 4), the children used plural [-s] 79.85% (SD = 15.05) correct in obligatory context, similar to L1 acquisition. Regarding a more global measure of morphosyntactic development, the Edmonton ESL children had an average mean length of utterance (MLU) of 4.66 (SD = .89) at 21 MOE. Assuming production to begin at 12 months, the majority of English L1 children reach this milestone after 29 months of production (Miller & Chapman, 1981), while these L2 children reached it 8 months earlier. In fact, 5/24 ESL children had an MLU of 4.5 or higher at 9 MOE. Perhaps already having a language established and being more cognitively mature accelerates development of utterance length in L2 acquisition.

While Dulay et al. (1982) argued that L1 transfer does not play a dominant role in L2 acquisition of morphosyntax, L1 influence can determine some interlanguage patterns. Paradis (2004) found that error patterns with object pronouns in child L2 French reflected possible transfer from English. Harley (1989) compared the use of verbs and prepositions in sixth grade by monolingual French native speakers and English L1 children in French immersion. The French L2 learners differed systematically from the monolingual French children in ways that reflected properties of English. For example, to describe the rescue of a cat from a tree, native speakers would often choose a verb with directionality encoded into it, *elle descendit le chat* "she brought the cat down," where the L2 learners often chose to use a prepositional phrase in their expression of this event, *il le pris dans ses bras* "he took him in his arms" (Harley, 1989, p. 14; see also Harley, 1992).

Child Second Language Learners Compared with Monolingual Age Peers

A substantial body of research indicates that it takes 5 to 7 years in English school for L2 children to have academic verbal skills on par with native speakers (Cummins, 2000), but there has been less research focused on the time it takes to master oral language. Hakuta, Goto Butler, and Witt (2000) examined standardized measures of English oral proficiency for 1,872 L1 minority children in San Francisco, and concluded that it took approximately 5 years of schooling in English for children to score in the native-speaker range. Looking at vocabulary in particular, Cobo-Lewis, Pearson, Eilers, and Umbel (2002) and Eilers, Pearson, and Cobo-Lewis (2006) report that Spanish-at-home/English-at-school children in Miami scored below monolingual English children on standardized tests for productive and receptive vocabulary throughout elementary school, although the gap narrowed by fifth grade. Scoring within the monolingual range occurred more often for receptive than productive vocabulary.

How long it takes for L2 children to perform within the normal range for native speakers may differ depending on the aspect of language being examined on the standardized measure. In the Edmonton ESL study, after 21 MOE (SD = 4), 40% of the children performed within the normal range of monolinguals for grammatical

morpheme production, 65% for receptive vocabulary, and 90% for story grammar in a narrative. One reason why these L2 children achieved monolingual norms so rapidly for story grammar could be because the conceptual underpinnings of storytelling abilities could easily transfer from their native language.

Unlike comparisons based on standardized tests, direct comparisons between L2 learners and native speakers can provide more specific information about qualitative differences in linguistic competence between these groups. Flege (2004) compared foreign accent ratings for Korean and Japanese L1–English L2 children and age-matched English native speakers and found differences between the groups even after 5 years' exposure to the English L2. These findings suggest that L2 phonological development takes a long time to reach native-speaker levels, and as mentioned above, some differences between the speech of monolinguals and early-onset bilinguals may be life-long. Gathercole (2002a, 2002b) elicited grammaticality judgments for English morphosyntactic structures that differ with Spanish in Spanish-at-home/English-at-school children and monolingual English children in Miami. At second grade, the L2 children made fewer correct judgments of acceptable/non-acceptable structures in English than the monolinguals; however, differences between the groups narrowed considerably by fifth grade. Gathercole raises the important issue of whether bilingual children ever develop identical competencies to monolinguals (difference), or whether they are simply slower to develop these competencies because of the reduced amount of input in each language (delay). Kohnert and Windsor (2004) also present research addressing the “difference or delay?” question. They examined word recognition and picture-naming in Spanish L1–English L2 learners and English native speakers aged 8 to 13. The L2 learners performed similarly to the native speakers in both accuracy and response time for word recognition; in contrast, the English native speakers outperformed the English L2 group for picture-naming accuracy and response time. It is possible that the L2 children will catch up with the monolinguals in production abilities, but on the other hand, longer latencies might be typical of lexical production in all bilinguals. In sum, all these studies point to the possibility that bilinguals are not just two-monolinguals-in-one; the dual language experience of L2 children may cause their pronunciation, grammatical competence, and processing abilities to possess some different characteristics (but see Gathercole, 2002b).

Sources of Individual Differences in Child Second Language Acquisition

There are striking individual differences in rates of child L2 acquisition, even for children with similar amounts of classroom exposure to the L2 and similar instructional programs (Paradis, 2005; Wong Fillmore, 1983). Individual differences have a more prominent focus in L2 than L1 acquisition research, possibly because young L2 learners have more potential sources of individual differences in acquisition than L1 learners. For example, child L2 learners have more variation in their target language input than L1 learners because the input amount is divided between two languages (and often between two

contexts), they come in contact with the target language at various ages instead of uniformly at birth, and they already have another developing language when L2 learning begins. Research aimed at determining the sources of individual differences in L2 acquisition rates and ultimate attainment has looked at various factors ranging from internal psychological and cognitive characteristics to external variables like social context of target language input.

Motivation

Motivation is a set of attitudes, affective variables, and beliefs toward the target cultural group and learning the target language that consistently predict differences in achievement across numerous studies of L2 learners (Dörnyei & Skehan, 2003; Gardner, 1980; Skehan, 1991). It is easy to understand why internal attitudes and beliefs would exert an effect on the outcomes of adult learners who have chosen to acquire a L2. However, it is possible that attitudinal variables are less likely to predict outcomes in younger children because they may not have a developed view of intergroup and cultural differences (Genesee & Hamayan, 1980). Furthermore, motivation is even less of a concern for L1 minority children who, generally speaking, demonstrate a strong desire to assimilate to the new language and culture. On the other hand, Wong Fillmore (1979) argues that motivation to integrate with the host society may explain some individual differences in L2 development among L1 minority children who are in communities where the L1 is spoken outside their homes.

Aptitude

Language aptitude consists of several analytic and working memory abilities pertinent to acquiring language structures and individual words, as measured by tests like the Modern Languages Aptitude Test (Carroll & Sapon, 1959), and is related to, but not the same as, verbal and non-verbal intelligence (Dörnyei & Skehan, 2003; Sawyer & Ranta, 2001). Language aptitude is considered to be a relatively stable and inherent characteristic, predictive of both L1 and L2 development (Skehan, 1991). Language aptitude is one of the most reliable factors explaining individual differences in L2 success among adolescent and adult learners, along with motivation (Dörnyei & Skehan, 2003; Gardner, 1980; Skehan, 1991). Ranta (2002) examined language analytic aptitude and L2 attainment in French-speaking sixth grade children from the French-majority province of Québec in Canada who were enrolled in an intensive English immersion program. Results showed that high and low language aptitude was associated with high and low L2 attainment in the 5-month program. Harley and Hart (1997) studied language aptitude and L2 proficiency in two groups of adolescent English L1 French immersion students in Canada: those who began learning the L2 in seventh grade (late immersion) and those who began learning the L2 in first grade (early immersion). They found that memory-based aptitude skills better predicted L2 proficiency in the early-immersion group whereas language analytic aptitude skills better predicted L2 proficiency in the

late-immersion group. Harley and Hart (1997) suggest that the memory component of language aptitude may be more relevant to L2 acquisition in young children. By contrast, Genesee and Hamayan (1980) found that a general analytical skill, non-verbal reasoning, predicted success in verbal academic skills, vocabulary, and listening comprehension in French by English L1 children in first grade immersion.

Personality characteristics

Personality characteristics such as outgoingness or assertiveness are predicted to lead to success in L2 learning because an individual who possesses such characteristics is expected to experience more frequent and high quality interactions with native speakers of the target language. Research investigating the relationship between personality variables and L2 outcomes has shown mixed results (Dörnyei & Skehan, 2003; Sawyer & Ranta, 2001; Strong, 1983); however, Strong (1983) argues that studies that measured natural communicative language are those that consistently found a relationship between personality variables and L2 outcomes. Two studies looking at L1 minority children in particular suggest social–personality variables play some role in determining individual differences (Strong, 1983; Wong Fillmore, 1983). Wong Fillmore (1983) reported that the most successful L2 learners in her study of 48 children had one of two personality types. One type of successful learner was highly social and outgoing and sought out opportunities to speak English through peer interaction. The other type of successful learner was shy and not sociable, but seemed to otherwise compensate by demonstrating strong cognitive abilities and attentiveness to the teacher in the classroom. Strong (1983) found that personality variables associated with amount of social contact with native speakers, namely talkativeness, responsiveness, and gregariousness, were significantly correlated with higher achievement in English grammar, vocabulary, and pronunciation gathered through natural child–child interactions in kindergarten.

First language typology

Typological similarities and differences between the L1 and L2 could affect rate of development and ultimate attainment in the L2. As mentioned earlier, adult Italian–English bilinguals were found to have lower pronunciation accuracy with vowels that are present in English but not in Italian, compared with vowels present in both languages, even though they had begun learning English as young children (Flege, 1999). Furthermore, Flege and Fletcher (1992) found that Chinese L1 adults had more perceptible foreign accents than Spanish L1 adults, even though both groups had been immersed in a majority English environment from 5 to 8 years of age. In the lexical domain, overlap between L1 and L2 in vocabulary may have a facilitating effect because school-age children can make effective use of cognates in their acquisition of L2 vocabulary (Patterson & Pearson, 2004). Whether typological distance between L1 and L2 causes variation in morphosyntactic acquisition is more controversial. Dulay and Burt (1974) found that Chinese L1 learners of English had somewhat lower accuracy scores with grammatical morphemes than the Spanish L1 learners of English. By contrast, Paradis (2005) found

that at 9 MOE (SD = 4.2), Chinese L1 children, whose native language has few inflections and no grammatical tense, produced tense morphemes in English with the same accuracy as children with more richly inflected native languages. Turning to ultimate attainment, Bialystok and Miller (1999) found that when exposure to English began before 8 years of age, adult Chinese L1 and Spanish L1 speakers of English performed virtually the same on their grammaticality judgment task as English native speakers. However, McDonald (2000) compared the grammaticality judgment performance of Spanish L1 and Vietnamese L1 adults whose exposure to English began around 5 years of age. The Spanish L1 bilinguals performed like English native speakers in terms of accuracy and response times, but the Vietnamese L1 bilinguals had lower accuracy and slower response times.

Age of acquisition

The existence of age effects in L2 acquisition is not controversial. It is exceptional for a late onset L2 learner to appear indistinguishable from native speakers even in informal conversation, let alone in a more sensitive experimental context. The question being continually debated is what the source of these effects is; more specifically, whether it is a biological critical period that ends around puberty. Age of acquisition may not seem relevant in the context of child L2 acquisition; however, much research indicates that in contrast to the assumption of a critical period at puberty, individual differences in ultimate attainment emerge depending on what age in the pre-puberty years L2 learning begins. Jia (2003) reported differences in the acquisition of plural [-s] in English by Mandarin L1 children based on their age of first exposure to English. Several studies employing a retrospective developmental design have also found gradient age effects within the pre-puberty period on English language attainment in both phonology and morphosyntax (Bialystok & Miller, 1999; Flege, 1999; McDonald, 2000; Weber-Fox & Neville, 1999, 2001). Gradient age effects within the pre-puberty period are not apparent for all aspects of language, however. Weber-Fox and Neville (1999, 2001) found no differences in event-related potential (ERP) measurements for open class word processing or in performance on grammaticality judgments of semantic (lexical choice) violations for Chinese L1 adult speakers of English whose first exposure to English ranged between 1 and 16 years of age. By contrast, these researchers found differences both in ERP measurements of closed class word processing and in grammaticality judgments of syntactic violations between adult Chinese L1 speakers who were first exposed to English before age 7, and those first exposed to English between 7 and 10 years of age. Bialystok and Miller (1999) and Jia (2003) argue that the existence of gradient age effects within the pre-puberty period on L2 attainment is evidence against the notion of a biological critical period.

Socio-economic status

The socio-economic status (SES) of a child's family, as measured by parental level of education or family income, has been widely studied as a predictor of individual

differences in L1 acquisition. Family SES is rarely considered as a source of individual variation in adult SLA, but it has been considered in some child SLA research, and it seems to make a difference. The Miami studies reported above on vocabulary and grammatical acquisition found that low SES children performed worse than high SES children on the oral language measures from second grade to fifth grade (Cobo-Lewis et al., 2002; Eilers et al., 2006; Gathercole, 2002a, 2002b). Hakuta et al. (2000) examined the impact of SES in their data on oral English proficiency in San Francisco area minority children. They examined the level of school poverty as measured by percentage enrollment in school free lunch programs and found that children at schools with 70% enrollment lagged behind children in the other schools at achieving native-speaker levels of proficiency.

Quality and context of second language input

Researchers have looked beyond broad measures of amount of input, such as age of arrival in the English majority society or years spent in an English classroom, and explored other facets of the L2 input to see if they impact on children's rate of L2 acquisition. Jia (2003) and Jia and Aaronson (2003) measured richness of the English L2 environment outside the classroom for Chinese L1 children using a composite score based on information about hours of English TV watched weekly, number of English books read, number of English native-speaker friends, and the percentage of time they spoke English at home. Jia (2003) found that faster acquisition of the plural [-s] in English was associated with increasing richness of the L2 environment over time. However, the richness of the L2 environment may have non-straightforward effects on children's L2 acquisition when it occurs at the expense of rich input in the L1 at home. In the Edmonton ESL study, information on amount of English spoken in the home was calculated as a percent mean across the percent each household member reported using English versus the native language. This is a different home language measure from the one used by Jia (2003) and Jia and Aaronson (2003), which focused on the child's use and preference only. When MOE in the classroom was held constant at two academic years (20 months), English home language use varied considerably among the children's families, 23% to 80% (mean = 47%), and was significantly and negatively correlated with children's raw scores on the PPVT ($rho = -.501$, $z = -2.242$, $p = .0250$), and significantly and negatively correlated with years of parental education ($rho = -.568$, $z = -2.538$, $p = .0111$). This finding is not surprising when one considers the quality of the L2 input children might be getting from their non-native-speaker parents. Children need exposure to rich and diverse vocabulary in order to build their English lexicons, and their parents may not be able to provide this when speaking their L2. In addition, this finding suggests that the rich vocabulary parents provide when they use their native language could have a positive impact on L2 lexical growth through a positive impact on L1 lexical growth (see Cummins' (2000) discussion of the interdependence hypothesis).

The L2 classroom is a primary source of input, and children may make differential use of this input depending on how they interact in the classroom context. Wong Fillmore (1983) argued that teacher-centered versus group-oriented classrooms yield differ-

ent sources of input that suit different learner needs. Outgoing learners can gain a great deal from group-oriented classrooms because more peer interaction means more L2 input. By contrast, teacher-centered classrooms may provide a consistent source of input for shy, less sociable learners. Genesee and Hamayan (1980) found that one of the strongest predictors of success in French language learning by first grade immersion students was how actively individuals participated in class, practiced French in class, and used French in the halls and at recess, as measured by teacher questionnaires.

Language Shift and First Language Loss

While acquiring their L2, minority children's dominant, or most proficient/preferred, language typically shifts from the L1 to the L2. Language shift can result in maintenance of the L1, albeit as the less dominant language, but it can also result in gradual L1 loss, a process often described as L1 attrition. A shift in dominance or loss of L1 proficiency does not occur for L1 majority children acquiring a minority L2 at school, which underscores the importance of sociolinguistic context on dual language learning outcomes in children (Genesee et al., 2004).

Research on dominant language shift indicates that this can occur gradually and need not be accompanied by precipitous loss of the L1, particularly if children reside in communities where their L1 is spoken outside the home. Kohnert and colleagues found that Spanish L1–English L2 children's lexical processing skills were superior in Spanish until they had approximately 7 to 10 years' experience with English in school in California, at which point abilities in both languages were fairly balanced, followed by the emerging superiority of the English skills (Kohnert & Bates, 2002; Kohnert et al., 1999). In addition, Pease-Alvarez, Hakuta, and Bayley (1996) found that lexical knowledge and grammatical abilities in Spanish L1 children aged 8 to 10 attending English schools in California still met age expectations for Spanish monolinguals. However, the dominant language shift may occur faster in younger L2 children. In Mägiste's (1992) study of lexical processing in German L1–Swedish L2 children, it was found that the switch to the L2 as the superior language in lexical processing occurred after 4 years' residence for the young children but after 6 years for the adolescents. Jia and Aaronson (2003) also found that the switch in preference from the L1 to the L2, as measured through questionnaires, occurred more rapidly for the Mandarin L1 children who were younger than 9 years old when they arrived.

Even when the L1 is maintained, the variety used by minority children may become distinct from that of monolinguals. Anderson (2004) reviews several studies reporting on lexical/semantic and morphosyntactic characteristics of Spanish L1 children acquiring English in the United States. The lexical characteristics are mainly compensatory strategies used when the child does not know the precise word in Spanish, for example general-all-purpose demonstrative pronouns like *esto* "this one." Some grammatical changes appear to be the result of transfer from the English L2, such as rigid Subject–Verb–Object word order, while others appear to consist of simplification of paradigms, such as the use of the third person singular as a default verb form. Anderson also notes

lexical borrowing and code-mixing into English as a vocabulary gap-filling strategy (see Genesee & Nicoladis, this volume). While these characteristics are typically accepted as examples of L1 attrition, it is not always possible to tease apart something that was learned in the L1 and then lost (attrition) versus something that was never completely learned in the first place (incomplete acquisition) due to a change in quality or quantity of L1 input (Anderson, 2004; Montrul, 2002).

Why do some minority children lose their L1, and others undergo a more gradual shift to become L2-dominant bilinguals? Wong Fillmore (1991) pointed to early onset of English acquisition as a major factor contributing to L1 attrition. Results of this large-scale survey showed that 73% of the children who attended English-only or bilingual preschool used some English in the home, while this was true for only 48% of the children in Spanish-only preschool programs. Parents of the children in the English-only preschool programs were six to eight times more likely to describe their children's abilities in the native language as deficient or non-existent. By contrast, Winsler, Díaz, Espinosa, and Rodríguez (1999) found that early onset of English L2 acquisition did not adversely affect native language maintenance in Spanish L1 children because the English preschool group in this study did not perform worse in Spanish in kindergarten than the at-home group. One reason for these discrepant findings could be that Wong Fillmore's (1991) sample of children included some who had little community support for their L1, while Winsler et al. (1999), as well as the studies by Kohnert and Hakuta and colleagues discussed above, examined children from communities where Spanish was widely spoken (see also Anderson, 2004). Furthermore, Jia and Aaronson (2003) discuss the dynamic interrelationship between age of L2 onset and other factors, such as positive attitudes toward the L2 and host culture, the social network in the L2, and L1 proficiency, as predictive of L1 maintenance. In a nutshell, the earlier the age of arrival, the more likely a child is to have positive attitudes toward the host culture and language, which in turn increases the likelihood of a larger social network of L2 speakers. This increased experience with and attraction toward the L2 underlies the shift in preference from L1 to L2, and, potentially, loss or stagnation of L1 proficiency. Diminished proficiency in the L1 then becomes another factor pushing the minority child toward the host culture and language. Finally, Hakuta and colleagues found that immigration depth of family (i.e., generations born in the United States) and personal commitment to Spanish were inter-related and predictive of the amount of Spanish spoken in the home, which was in turn predictive of L1 maintenance in the children (Hakuta & D'Andrea, 1992; Hakuta & Pease-Alvarez, 1994; Pease-Alvarez et al., 1996). Eilers et al. (2006) found that immigration depth interacted with SES in predicting Spanish language maintenance in Miami, where low SES families with parents born in the United States were less likely to maintain Spanish as the home language.

Summary

Let us return to the three questions posed at the outset and consider some possible answers. (1) Are child L2 acquisition patterns and rates similar to those for L1

acquisition? Patterns and rates are highly similar overall between L1 and L2; for example, difficult and late-acquired morphosyntax is the same for L1 and L2, and rates of vocabulary accumulation in L1 and L2 appear to be the same for children as a group. Some notable exceptions include patterns potentially caused by L1 transfer, which is prominent in phonological development, and the absence of L1 patterns like subject omission and short MLUs, possibly due to the greater cognitive maturity of L2 learners. In addition, individual variation in patterns and rates is possibly more pronounced for child L2 acquisition because there are more sources of variation than in L1 acquisition. (2) How do child L2 learners compare with native speakers of the target language their own age? It is commonly believed that child L2 learners, unlike adults, acquire a L2 quickly and with uniform native-speaker ultimate attainment; however, research does not substantiate these beliefs. In particular, the cognitive maturity of these learners does not seem to confer advantages as a group in rate of development, with the exception of MLU, and obtaining oral language proficiency in the L2 on par with native speakers can take most of the elementary school years. It is also important to consider that some discrepancies in performance between native speakers and L2 children might be due to the different, that is, bilingual, nature of their language competence, rather than being a mark of inferiority with respect to monolinguals. (3) What happens to the L1 development of minority children learning a L2 that is the majority language of the community? L1 minority children experience a shift in dominant language from L1 to L2, whose rapidity and effect on long-term proficiency in L1 is determined by a combination of social and psychological factors, chief among which is community support for the L1.

Understanding child SLA is crucial to developing a complete understanding of children's language development in the school years because dual language children are the majority globally (Tucker, 1998), and thus their experiences and outcomes are neither marginal nor abnormal. It is hoped that in the future child SLA will be examined with less emphasis on deviation from the monolingual situation, and with greater acceptance of bilingualism as a healthy and advantageous developmental path.

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