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Is Second Language Learning Like the First *

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A considerable array of evidence has been collected about the order and process of mother tongue acquisition. This study compares these findings to second language acquisition (learning of French by English speakers) in a natural milieu in which communication rather than form is the learner's focus of attention, and where the language is heard most of the day. The study showed that in many respects the development of comprehension of syntax and of morphological features follows the order in the mother tongue studies. Children of older ages learned much faster than younger children for the sample in the range of four through nine.

It has taken surprisingly long for scholars of language learning to envisage the relation between first and second language learning, and to view theories of the human language acquisition system as having a bearing on what they study (Cook, 1973; Corder, 1967; Selinker, 1972). For it has long been believed that there is a fundamental difference between the two, so deep it is pointless to develop a common theory. Why does this belief exist? Some reasons lie in the difference in purpose, method, and focus of the respective research traditions. For example:

1. Research on second language acquisition has generally been applied in purpose, and has until recently been light on basic and general theory; writing on child language, particularly in the Chomskyan tradition, has been more theoretical, and research has been less applied.
2. Child language research, for nearly a century, has used the case study as its primary method, with a focus on stages of development common to various cases. Second language learning studies normally are of large groups, with statistical pooling of information so that individual acquisition patterns are less visible.[1]
3. Research on child language has focused so heavily on learner strategies

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[1] There have of course been exceptions, such as the work of Evelyn Hatch's students (Huang, 1971), Ravem (1968), and Malmberg (1945, 1964).

that the input to the learner was, until recently,[2] almost completely ignored. Research on second language learning has paid primary attention to manipulation of the structure and presentation of teaching materials.

4. With some notable exceptions in which additional instructional milieux were added,[3] research on child language has been limited to the natural settings where language is learned, but not taught, as a by-product of communicative needs. Research on second language learning has almost entirely occurred in classrooms, where language is taught formally and where language structure rather than communicative intent is the focus of attention.

In addition to these differences in research style, there has been a theoretical rationale offered for treating first and second language learning as irreconcilably different; second language learning is, it is argued, built completely upon transfer from the first language, and therefore can tell us nothing more general about language learning (Bever, Weksel, 1965). Now it is certainly the case that the second language learner makes use of prior knowledge, skills, tactics, but it is also true that the first language learner does this. That is, any learning builds on what has happened before, and it remains a major question just how this occurs. A child learning a language at four, whether a first or second language, has knowledge of the world, knowledge of spatial and object relations, knowledge of causality, which a child of one does not have. A child hearing a sentence he has never heard before, at the age of four, can bring to it knowledge of sound groupings, recognition of familiar patterns, expectations about basic syntax-meaning configurations, which a child of one does not have—whether or not he is listening to a new sentence in his mother tongue or a second language. The fact that the second language builds on prior knowledge is not what differentiates it from first language learning.

It has been argued that language-learning is easy for children because the human being is biologically well-prepared to learn languages, a point Chomsky (1965), Lenneberg (1967), and McNeill (1971) have been most noted for making. In addition, it has been argued that there are critical periods for such learning, in order to account for the facts, especially adduced by Lenneberg (1967), of sharp age changes in language acquisition after traumatic aphasia, and for age changes in laterality related to language functions.

If the human brain is especially competent to deal with language learning, there is no reason to suppose this ability would confine itself to the first language. From the standpoint of research, the rejection of second language acquisition as a testing ground for the properties of the Language

[2] Findings by a group of students concerning input to English-speaking children (Pfuderer, Drach, and Kobashigawa, 1964).

[3] Cazden (1965), and numerous Russian studies.

Acquisition System[4] removes the possibility of studying those very conditions which may account for the repeated observation of age differences. Are the differences due to age? We can readily control age of second language acquisition, but are dependent on social or physical accidents, with attendant confounding circumstances, to study hearing-recovery cases or isolated children, learning a mother tongue late. Are the differences due to the changes in learning circumstances, amount of exposure, the need to communicate, the activity setting, simplicity and semantic obviousness of input, all of which may in natural uncontrolled conditions be greater for the younger language learner? There is certainly a much greater possibility of manipulation of circumstance for second than for first languages, for ethical reasons.

The research reported in this paper concerns an initial study asking two questions: Is second language learning like first language learning? Is there a change in learning rate or process with age? If it is the case that second language learning appears to draw on skills and processes similar to those available during first language learning, then the answer to the second question may be generalizable to first language acquisition. If the process is similar, then also we can manipulate the functional, social, and structural circumstances in which learning occurs and have a much broader knowledge of the learning system than is now available.

Method and subjects. The small study to be reported here was conducted in Geneva, Switzerland, and involved the testing of all English-speaking children in that area between the ages of 4 and 9 who were in school where French was the instructional medium, and who had not been exposed to French for more than nine months. There were thirty-one children in the study, with heavier age concentrations at the younger ages. The subjects are in no sense a random sample of second language learners; the social circumstances were such that English speakers in Geneva are unusually well-educated, and those who chose to send their children to French rather than bilingual or English schools tend to be almost entirely professionals. The diminution in numbers available at 8 and 9 probably is related to the preference for English schools as curricular complexity increases, since some people were on one-year visits.

Comprehension tests. Most of the tests employed involved the comprehension of syntax and morphology, rather than production, in order to avoid shyness, perfectionism, and other factors which might mask knowledge of the second language by performance inhibition. The most elaborate comprehension tests were of 24 sentences with passives, actives, reversed

[4] In Ervin-Tripp (1973b) we have argued that a Language Acquisition System (LAS) is composed of component processors whose properties were discussed generally there. Some of these may be highly limited and specific to language acquisition, as proposed by Chomsky in his discussion of an hypothesis-testing Language Acquisition Device (1965). It has been shown convincingly by Braine (1971) that an hypothesis-testing device requires corrective feedback which does not exist in natural conditions. Levelt (1973) cites studies showing that learning must involve interaction, or at least have very special text properties, for even quite weak grammars to be learned.

anomalous passives (e.g., the boy was eaten by the carrot), indirect objects, and telegraphic sentences (box open boy), in which the children acted out the situation with dolls or animals. These were given in both English and French, since the younger children had not mastered these sentence types in their mother tongue. Mastery of French pronouns for number and gender (for animate referents only) was assessed through two tests: a story in which sentences about dolls were interspersed with sentences using anaphoric pronominal reference (e.g., *il la lave*), and a picture-comprehension test using demonstrative and adjectival cues (*ces petites amies, ce petit camarade, cette petite camarade, ces petits amis*).

Imitation was employed with the children of five to nine. The sentences had two purposes. One was the inclusion of phonological features, with contrasted pairs where possible in a given sentence. The other was testing the relative accuracy of pronominal imitation as a function of initial, medial, or final location in a sentence, or of phonological features, e.g.,

Lui il a répondu: "Cachez-la."
Il lui a répondu: "Cachez-la."
Il a répondu: "Cachez-la-lui."
Papa t'apportait le train.
Papa m'apportait le train.
Papa supportait le train.
Papa y apportait le train.

Translations were elicited for key structures such as simple sentences, interrogation, and various kinds of indirect and direct objects.

Case material. Diary records and taped natural conversation of a five year old and a six and a half year old child added details to the knowledge obtained from tests, with a production emphasis. In addition, in the discussion below we shall refer to studies of case development by students of Evelyn Hatch, who have studied natural acquisition of English by children.

Social milieu. The logic of the study required that the acquisition of French be in situations like those in which children acquire their mother tongue. Since the study was done during the school year, we were limited to children who were exposed to French in school. There were basically three sources from which they acquired French: peers, school, and home. All learned from peer interaction in the school and often outside of school. All learned in the classroom. The majority of them were in classes where each was the only anglophone, and where the teacher knew little or no English. Many of the children also learned French at home, since their parents, and often an *au pair* girl spoke to them. In some families, sibling interaction began to occur in French in the course of the year. We have no control ever the amount of home exposure. In addition, television and assorted interaction in shops provided miscellaneous exposure. It was clear that in terms of hours, the school training was important. The children spent between 22 and 26 hours a week in class; nursery schools were on half-days.

The children heard only French in school. There is more time given to memorizing songs and poetry than here, and playground activities tend to be highly structured, with language involved in instuctions and teacher control of activities. The classroom interaction is formal and teacher-centered.

We do not know how much of the classroom instruction was specifically focused on language. At the age of six, primers were used which are in some ways optimal initiation into second language. The impact of schooling was evident in the spelling pronunciations which sometimes appeared in the imitation tests—such as "grenouille" pronounced with a final /l/ instead of a semi-vowel. Presumably the content of the curriculum dealing directly with French structure varied with the grade level. A good deal of formal instruction in French schools perforce deals with gender and with conjugation, since the cues for some of the contrasts are different in the written and oral forms of the language.

A few children had a little supplementary FSL instruction in their schools, but as far as we could learn the focus was on vocabulary, not on the syntactic features of this study.

RESULTS

Similarity to child language

1. Learning by children occurs first for the material which is predictable, and for which the meaning is apparent. We did not have diachronic comprehension tests, so our evidence on this point comes from the diary material. Some of the children said nothing for many months, so we do not know what they were learning. My own children began speaking six and eight weeks after immersion in the school setting. Their earliest utterances included greetings: "au revoir," "salut," "bonjour, Madame;" operational terms dealing with interaction: "regarde," "tiens," "allez-y," and claims related to the self: "moi bébé," "moi sanglier."[5]

Evelyn Hatch mentioned that a Chinese five year old learning English after two weeks of exposure imitated "get out of here" with full comprehension, as indicated by a correct translation. Three months later this phrase survived in expansion sets like "Let's go. Get out of here. Let's get out of here."

In the Geneva study, the first phrase memorized by the two children in the case study was "Peut-je jouer avec Corinne?" They knew its meaning.

[5] These sentences and phrases are parallel to those observed by others. Benjamin Chen, keeping a record of his two-year-old son's first utterances in English as a second language for a term paper found "Thank you," "you are welcome," "Ya," "Good night," "Pleasant dreams," "no," Good-bye," "Bad boy," "Like that," "Wait here," "It's mine," "Like you," "Stand up," "Sit here," and "want that," in that order. He pointed out that the child did not map the meanings onto already known Hebrew forms such as the equivalent of "Good night." Instead, he overgeneralized: Whenever his father kissed him, even in the morning, he said "Good night, pleasant dreams." As Chen points out the first forms are not nouns but functionally significant reflections of interactive milieux.

TABLE 1
FRENCH
First Spontaneous Speech Samples of Two Anglophones at Home

Weeks in Geneva		
	6.7 year old child	
6	moi sanglier	(me boar) [claiming animal from comic book]
	au-revoir	(goodbye)
	je-ne-comprends	(I don't understand)
	à moi, lait, moi	(mine, milk, me) [gestures he wants milk]
	allez-y	(hurry up, get going)
	tour de vélo	(bike trip) [wants to go biking]
	assieds-toi	(sit down)
	asseyez-vous	(sit down)
8	Nicholas dit non.	(Nicolas says no)
	Nicolas dit pourquoi.	(Nicolas says why)
	pousse-moi	(push me)
	ferme la porte	(close the door)
	toi nez rouge	(you nose red)
	petit couteau	(little knife)
	ça Nicolas vélo	(that Nicolas bike)
	5 year old child	
8	regarde [lə'gaʁd]	(look)
9	regarde, escargots	(look, snails) [saw snails for dinner]
	moi bébé	(me baby) [playing she is baby]
	moi poupee	(me doll)
	moi princesse	
	Therèse, tiens	(Therese, take)
11	regarde, Anna	(look at Anna)
	le crayon bleu, c'est là-bas	(the blue pencil, it's over there)
16	pas moi, toi, moi là.	(not me, you, me there) [directing play locations]
	ça moi, ça Alexandre.	(that me, that Alexander.) [possessions]
	moi, c'est grand.	(me, it's big) [= mine's big]
	ça va, ça va pas, Eric?	(that's okay, that's not okay, Eric?)
	pas lait là, pas lait, milk.	(not milk there)

It referred to a child in a hotel they occupied for two weeks. This phrase, without overt practice, was recalled two months later. As in the Huang example, the size of the unit stored is impressive, since at the time it must have been stored as a lexical simplex.

Second language learners, like children, remember best the items they can interpret.

2. Meaning recurrences provide basic categorization devices for mapping of forms. Two examples can be seen in the texts on Table 1. When the child said "moi sanglier," with the meaning of "my boar" (boars being major figures in a favorite French comic strip), he was corrected: "mon sanglier." He resisted complicating the system by having inflected pronouns, and persisted for some time in using "moi" as the form both for "my" and "me." The resistance to correction when the system would be complicated is fa-

miliar in child language studies. In this case it cannot be attributed to mother tongue interference.

The child reported that a new word learned at school was "Assieds-toi" (sit down), pronounced as a single word [asi'ɛtə]. The next day he reported that this was a mistake, he had heard wrong, the word was "asseyez-vous." The situations appeared identical to him, requiring a single form.

Most of the 31 children regularly treated "le" (masculine article) and "la" (feminine article) as synonyms, perhaps because they appeared to have identical meanings. In the imitation test, though they never confused [a] and [ɛ̈] otherwise, they regularly failed to differentiate these articles and pronouns. In songs they confused them. In the pronoun comprehension test, differentiation of gender for direct object pronouns "le" and "la" was quite late. In texts, the existence of arbitrary gender created ambiguous cues for marking the meaning of the forms. In the case of number, this ambiguity did not exist, so number contrasts for articles and pronouns were correctly imitated and understood much earlier, while gender still was random.

E. Hernández studied a Chicano child who in learning English rejected double vocabulary, noting that "it's not wolf, but *lobo*!" in a bilingual environment. *The basic preference of the child at first is for a principle of one meaning-one form, and he rejects two forms for what appears to be an identical meaning or referential situation.*

3. *The first features of sentences to be used in comprehension rules are those which survive in short term memory best.* We have argued elsewhere (Ervin-Tripp, 1973a, b) that it is plausible to extend findings from word list studies to the learning of initially unfamiliar sentences. In these studies first and last position survive best in memory. In the Geneva study, medial pronouns were far less often imitated than initial or final pronouns. The order of items is relatively easy to recall, and appears to be very strong in imitation examples, from the beginning.

Young children also learn the relation of order to meaning relatively early. In permuting languages like Finnish, they learn the relative hierarchy of frequency of subject-verb-object order and other permutations. In fixed order languages, they learn simple order strategies at an early age, such as English possessor + possessed, quantifier + quantified, attribute + head. Paul Huang's studies of a Chinese child learning English showed sentences much like native speaker English: "This kite," "Two cat," "No candy," "No more truck." Although in both Norwegian and French the negator follows the main verb, Ravem (1968), studying a Norwegian child learning English, and Kesselman studying French children (personal communication) found that in English they placed the negator before the verb.

The most thoroughly studied of these order strategies is the so-called NVN or SVO strategy, which in its basic form identifies the first noun as an agent, and the second as direct object of a transitive action (Bever, 1970, 1971). Developmentally, this begins with a rule that the noun just before the verb is the agent (sometimes with semantic restrictions that it be animate

or a vehicle). Later the order of nouns alone signals the meaning (Sinclair-de Zwart, 1973).

In my research, half of the four and five year olds interpreted the first noun in an English NVN sequence, even a passive, as the agent. Thus in "The bear is pushed by the giraffe" it is the bear who pushes. This strategy remains later for word sequences which are telegraphic, such as "box open boy." Sinclair-de Zwart (1973) found that 37% of the seven year old francophones try to make the box open the boy when they hear "boite ouvrir garçon." The general principle of this rule also causes errors of comprehension for indirect objects in English. In response to "The bear gave the giraffe the monkey" many children, even at later ages, move the giraffe to the monkey.

After five the children begin to interpret the morphological information in passives well enough to by-pass this rule, but they may not do so if semantic plausibility counteracts. For example, if the first noun is animate and the second both inanimate and a common object of the verb, an active interpretation is almost inevitable, as in a sentence like "the boy was eaten by the carrot." The same children who stumbled over this sentence might correctly interpret "the boy was pushed by the dog."

We might expect, on the transfer hypothesis, that English-speaking children learning French would simply interpret the sentences as if they were English. But they don't. In the early stages of learning French, regardless of age, the children reverted to the unmodified SVO strategy and systematically misunderstood passives. The older children, who in English correctly understood anomalous passives, regressed on the French version.

In French, the indirect object sentences are easy since they are marked by a preposition, but if we used the English order, the children often ignored the prepositions and interpreted the noun following the verb as the patient, regardless of its form. Thus they continued to use an SVO strategy in spite of the cue from the preposition.

By chance, we encountered two American children who were losing English after nine months living with their Swiss mother and grandparents in Geneva. Their family language had been English until then, but their father was absent in the Air Force. They were extremely reluctant to respond to English speech, and when they did, used comprehension patterns similar to those of the other children after three months exposure to French. That is to say, they interpreted English passives, but not French passives, as if they were active. They had regressed to a simpler sentence processing heuristic in which the cue from the function words and suffixes was inoperative, and the primary pattern, NVN = SVO, reappeared. Other studies of language loss may show patterned deterioration of syntax, too.[6] We would

[6] In a study of language loss of Israeli-speaking children in the United States, Shaltiel (personal communication) noted that the irregular forms were particularly vulnerable, as if the over-regularization stage of child language may recur. In two years, during which Hebrew was the home language, the six year old lost the ability even to say "I want to go home" which has two irregular forms.

expect that the general syntactic rules which are qualified by special rules would take over and the special rules would be the first to be lost; also that over-generalizations would take over, in morphology.

Translations were our only systematic data on sentence production, other than the diary and taped material, which only exists for a few children. At first glance, many of the translations (Table 2) look as if they were word-for-word. We would expect to find such translations if the general production pattern for the children was mapped onto English syntax rather than onto

TABLE 2
Examples of English to French Translations

Stimulus	5 year old Geneva since birth English only at home	5½ year old Geneva 9 months E, F at home	7 year old Geneva 9 months E, F at home
I see her.	Je vois elle.	Moi je vois elle.	Je elle vois.
She sees them.	Elle voit eux.	Elle regarde eux.	Elle les voit*
Why does she eat them?	Pourquoi elle mange le?	Pourquoi il mange ça?	Pourquoi elle les mange?†
He gave her the carrots.	Il a donné une carotte.	Il a donné les carottes.	Il a donné à elle les carottes.†
Who is she waiting for?	Où est-elle attend pour?	Qui elle attend pour?	Elle attend pour qui?
She's waiting for them.	Elle attend pour eux.	Il attend pour eux.	Elle les attend.*
What pushed the door?	Quoi poussait la porte?	Quoi il poussait la porte?	Qu'est-ce qui a poussé la porte?*
What fell down?	Quoi-t-il a tombé?	Quoi il a tombé?	Qu'est-ce qui a tombé?
Why is he pushing her?	Pourquoi il pousse elle?	Pourquoi il pousse elle?	Pourquoi il elle pousse?
Where is the dog going?	Où est le chien, il va?	Où le chien il va?	Où va le chien?*
Where is he going?	Où est-ce il va?	Où lui il va?	Où ils'en va.† Il s'en va où?†

* Correct. † Colloquial, possible in native speaker's usage.

a newly developing French syntax, or if the child solved the particular challenge of the task by a word-for-word mapping onto the surface of the sentence. But these appeared to be the strategies used in only a small residual of sentences. The basic patterns seemed rather to be as follows:

a. In declarative sentences, use SVO order. Very few children had progressed to a separate rule for pronominal objects. The result of this rule was sentences like:
   "I see her" Je vois elle
b. In question word sentences, give the question word, then the nuclear order, either SVO or SVL. (Older children displaced the question word to preserve nuclear order.)

"What can she see?"
Quoi elle peut voir. (What can she see.)
Elle peut voir quoi. (She can see what.)
"Why is she there?"
Pourquoi elle est là. (Why she is there.)
A word-for-word translation would lead to inversion of these sentences, but inversion was rare. It is not surprising that *Dato* (1970) found inversion errors to be rare in anglophones learning Spanish.

c. Word-for-word translations were a small residual and were most frequent in the youngest children. These were to some extent lexical, as in:
"Who is he waiting for?"
Qui elle attend pour? (Who she waits for.)

A particularly interesting example is the sentence "Where is the dog going?" which produced some of the most amusing translations. The older children had, in many cases, learned the French inversions or an acceptable apposition:

Où va le chien? (Where goes the dog?)
Où il va, le chien? (Where he goes, the dog?)

Or they employed the second rule, with results like this:

Où le chien il va. (Where the dog, he goes.)
Le chien va où. (The dog goes where?)

The smallest children had more trouble, and revealed segmentation errors arising from the very high frequency, familiar question "Où est le chien?" which was one of their first question structures. Its alternative form is "Où il est, le chien?" The result of the alternation is that "Où-est" = "Où-il-est" and they are in free variation for the little speakers. My two year old, months after our departure, still alternated "Où-il-est Daddy" and "Où-est Daddy." The translations employed these forms, which of course are inappropriate for a main verb sentence.

Où-il-est	le chien	aller.
Où-il-est	le chien	il-va.
Où-est	le chien	va.

"Where did the dog go" also elicited the same forms, so we cannot account for them entirely as word-for-word translations. They may also reflect the question-forming rule Q-S-V, but with a different segmentation for the components, just as we find in early child English free variation of "there's," "there's a" and "there" in sentence-initial position (Ervin-Tripp, in press).

In sum, we found many similarities between the sentence forms produced and understood by children learning their mother tongue and children learning a second language. In the most carefully studied example, the SVO strategy, it appeared that this clause-analysis heuristic is either relearned

again in the early stages of the acquisition of French, or that the detailed sub-rules which govern indirect objects and passives are ignored in early comprehension of French, just as they seem to be lost as mastery of English disappears. Obviously, the best test of these alternatives would be the study of a language in which the rules of simple clause analysis are quite different in mother tongue and second language.

Most of the evidence showing mother-tongue interference in the learning of syntax has had two peculiarities: It has come from learning conditions in which the second language was not the language of the learner's larger social milieu so that the learning contexts were aberrant both in function and frequency of structures. Further, both the learning and the testing often occurred in situations where the milieu and the addresses were not overwhelmingly connected with the second language. Yet we know that learners are extremely sensitive to such nuances.

If it is the case that second language learners recapitulate mother tongue acquisition, why do we have the impression that the second language learner is severely handicapped by first language interference?

Let me speculate a little on this question. We do not at the moment have good models of speech production, even for monolinguals, so we have very little knowledge of how interference occurs. In the free speech observed by Evelyn Hatch's students, and in my own tape recordings, there is only partial evidence of word-for-word translations. Most of the first sentences are either learned as units or generated from very simple order rules, such as those we find in early child language. The older learner, as Hatch has persuasively shown, has a very good capacity to repeat long sequences, compared to two-year olds, so more idiomatic material could occur of deceptively long sequences.

I would suppose that if we push a child to generate sentences about semantically difficult material or concepts unfamiliar in the new culture, he may use somewhat different production patterns. Some years back, there was an argument over whether speech was degenerate and full of errors and false starts; the evidence from conferences suggested that it was, the evidence from family speech to small children that it was not (Bever, Fodor and Weksel, 1965; Pfuderer, Drach and Kobashigawa, 1969). I am suggesting that the simpler the semantic task, and the simpler the relation between meaning and form (e.g., description vs. inference), the less the likelihood the speaker will have recourse to other-tongue formations.[7] This notion

[7] There is some evidence that in formulating simple order rules, children sometimes draw on mother-tongue formulations if (a) there is some second language support for the rule, i.e. partial overlap or (b) the mother-tongue rule is much simpler. An example appears in Ravem's (1968) data. The children employed the English order rule for negation, because it was simpler than the Norwegian and did not differentiate between modal and main-verb sentences, but always puts the negator before the main element in the verb phrase. But the children retained the Norwegian question-inversion rule, for main verbs at first. The implication, which needs testing through studies of comprehension, is that verb-first sentences are highly marked and the salience of the verb

might lead us to predict the kinds of speech situation which should produce most and least interference. It may also be the case that we normally make greater semantic demands in testing older learners, and that they may, in free speech, make attempts at more complex communication than younger children do, leading to more apparent interference.

Age and rate of learning

It is a common belief that the older the learner is, the more burdened he or she may be with overlearned habits. My reasoning supports a different prediction, on the following grounds:

1. Oral languages are alike more than they are different. The older learner has already discovered some basic principles of phonology. If he has learned to read a syllabic or morphophonemic written language he has acquired a fairly abstract knowledge of oral language phonology.
2. Languages tend to have similar semantic content. By and large the major changes we find in acquisition of the mother tongue with age are related to semantic development. The older child has a fuller semantic system, so he merely needs to discover a new symbolic representation. There will of course be errors in the cases where the semantic properties differ, but these are minor compared to the burdens of a child learner at a similar stage of syntax.
3. The older child has more efficient memory heuristics, related to his greater knowledge. Because he can learn both strings and single items faster, he may map new vocabulary into storage too quickly, before he has enough text to discover the semantic and structural distribution, in those cases where there is a slight difference.
4. The older learner is smarter. The child's capacity to solve problems, to make sub-rules, to carry in mind several principles increases with age. We would expect rule learning to be faster with age in both phonology and syntax.

Another way to think about age is to examine the principle that we learn our mother-tongue throughout life, but that different components of our Language Acquisition System are most activated at various ages. For most people, the prime activation of phonology learning is in the first five years,

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was important to major interrogation-forming rules in Norwegian and were carried over into English.

Shira Milgrom, studying Israeli acquisition of English in a term paper, found that children, but not adults, went through a stage which evidently was influenced by Hebrew. In Hebrew, there is a Y/N interrogation morpheme that is sentence-initial. Children created a syntactic class of preposed auxiliaries, rather on the model of tag questions, as in:

Is I am going to be a rich man?
Is it he is singing a song?
Is she is crying?
Do I'm am going to be a fortune teller?
Do you can tell me what is the time?

and then again at six in relation to reading, where different segmentation is required than in speech. Only if we travel in different dialect areas or learn to understand quite different phonological registers do we tamper much with phonology in later years.

For most people the prime period for the learning of syntax may be from two to ten or so, and only recondite aspects of register are of issue later. For all of us, vocabulary learning goes on throughout life, unless we lead very isolated and humdrum lives. Even in village cultures, the social nuances of certain vocabulary continue to be elaborated throughout life.

Thus adults learning a second language tend to pay most attention to vocabulary, but I would suppose that children well into their teens may still be good learners of syntax (Asher and Garcia, 1969). I have assumed that for phonology, the optimal learning stage might be around seven or eight, after the learning of reading. In these predictions, the assumption is that learning strategies can fall into relative disuse. There is, of course, another set of predictions, based on biology, which would be generated by lateralization and aphasia research (Bever, 1971). However, testing such generalizations would require a later time range than this study included.

Phonology. For most features of segmental phonology, the children above seven learned faster than the younger children. The samples are fairly small in the higher age ranges, however. This finding is consistent with the experiment of Olson and and Samuels (1973).

The most interesting finding is accidental. My six and a half year old son, who could read English and was learning to read French, playfully pronounced an American name with a French accent a month after our arrival. Of course I rapidly tested both the children on this skill and developed a test for the other children in the study, but at a much later stage. The evidence on Table 3 will show you responses of two children who had been in a French milieu only a month. The younger child could not read, and had much simpler rules. However, it is very clear that the children had

TABLE 3
Phonological Translations After Five Weeks

English Stimulus	5 year old	6½ year old
knife [naɪf]	[naɪ]	[nif]
ride [raɪd]	[raɪt]	[ʁad]
fan [fæn]	[fæn]	[fã]
fast [fæst]	[fæs]	[fɑst] "British"
bent [bɛnt]	[bɛ·]	[bant]
cones [konz]	[kõ]	[kõz]
bones [bonz]	[bõ]	[bõz]
finger ['fɪŋgɾ]	[fɪŋ]	[fɪŋ'gøʁ]
winter ['wɪntɾ]	[wɪn]	[wɪn'tiʁ]
ladder ['lædɾ]	[læt]	[lə'tir]
hungry ['həŋgri]	[həŋg]	[həŋ'gʁi]
birthday ['brθdeɪ]	[brθ]	['bɨθdeɪ]
umbrella [əm'brelə]	[bʁɛl]	[pɑʁa'plyi]

mapped the two phonological systems onto each other and had discovered some general principles.

The younger child reduced all words to a single syllable, and deleted most final consonants. She converted nasal segments to nasalized vowels, and partially replaced apical or retroflex with uvular R. Her older brother had more complex rules, including more complete R replacement, a shift of stress to second syllables, vowel changes to the French vowel values—even including a rounded front vowel, and of course nasalization.

The dramatic evidence from this example and the other cases is that children can make such correspondences well before they comprehend much. Eduardo Hernandez-Chavez and others have told me that anglophone children spontaneously "speak Spanish" by adopting Spanish phonological features, with either English words or nonsense. Ronjat (1913) in his elegant description of his child's Franco-German bilingualism from birth, reported that the child tried words out in both systems before settling on the right one, as though he stored them abstractly and had corresponding production rules. So there is apparently a phonological mapping, much like lexical mapping, onto an existent analysis. The children did, however, have a strong sense of the appropriate system in speech and did not recognize, or corrected, proper French names if they were anglicized.

Morphology. The older children learned number and gender more rapidly than the younger children. The youngest learner was a very bright six year old. Both number and gender exist in English and are usually semantically mastered by the ages in this study. The assumption made here is that French gender for inanimate nouns creates "noise" in acquisition, and retards the discovery of systematic correspondences between form and meaning. Number was correct before gender.

In an analysis of the acquisition of English plurals in two Malayan children, Arfah Aziz has shown in a term paper that an eight year old uniformly learned to use suffixes (although with some phonological problems) when the four year old had not. The four year old more often added numerals, which is the most general of the Malay pluralizing devices which could be extended to English. These findings confirm the age difference in rate of acquisition, and suggest that the child might (as in the Israeli example) at first overgeneralize patterns which look common to the two languages.

Syntax. Syntax was learned faster by the older children. On virtually all the tests the nine year olds were always correct in French, including a child in Geneva for only six months. Age gave enough of an advantage to overcome even a relatively short exposure.

The most complex syntactic tasks were relative clauses, with the purpose of finding changes at later ages, when internal clause structure might be stabilized. The measure of comprehension was acting out of two actions in the two clauses. In each of 12 sentences there were three nouns and two verbs. Table 4 shows the sentence types, and relative success at various ages. In the first three of the sentences the order was NVNVN or NVNNV. In

TABLE 4
Relative Clause Comprehension*
(Percent with correct patients and agents)

Age	English		French	
	4–6	7–9	4–6	7–9
	%	%	%	%
SS	78	79	38	55
OS	24	68	35	60
OO	38	92	52	72
SO	15	57	27	64
N	19	12	19	12

SS The dog who pushed the cat carried the bear.
OS The dog pushed the cat who carried the bear.
OO The dog pushed the cat that the bear carried.
SO The dog that the cat pushed carried the bear.

* There were three sentences of each type in French, two in English.

these sentences, the children could draw on their NVN = SVO strategy to interpret agent and patient in the clauses. In the last, which proved much harder, they could not, since the order was NNVVN.

In the first three sentences, the children easily interpreted the first NVN sequence, but had trouble finding the missing noun complement in the second clause. The younger subjects tended often to keep the same agent for both actions. This solution leads to success for sentence SS but error on sentence OS, which were treated indiscriminately by children 4 through 6, in English.

A second common solution, found at all ages, was to interpret NV sequences as agent-action. This solution produced errors on SS but success on OS and OO. A third strategy appeared on the OO sentence, where the problem was to find a patient. Many subjects went back to the first noun of the sentence for that patient—possibly a random guess. The English findings are similar to those of Amy Sheldon (1972).

I have mentioned earlier that children had available to them in French an SVO clause interpretation strategy, so they had no problems with the first clauses of these sentences (at least the first three). The surprising finding was that they generally used solution strategies in French for the second clause like those in English. Age, rather than language, seemed to dictate their solutions. In both languages, for each sentence type, the older children were more successful and more likely to take into account the location of the relative pronoun.

Only for the most recent learners, who knew little French, was there a distinct advantage in interpreting the English sentences. This was true of the passives, too, but in the case of the passives, the new learners used a simplifying, earlier strategy still available to them. In the relative clauses, there is no evidence of such return to a simpler, earlier strategy.

For the younger newcomers, there was a reduced tendency in French to use the first noun in the sentence to complement the second verb. The result was that in French they had fewer errors on the second and third sentence

in French than in English and more on the first sentence. Perhaps their short term memory was briefer in French so the first noun was less salient.

In brief, learners of transitive clauses in French appeared to recapitulate the stages of acquisition the first language learners traverse. But in interpretation of relative clauses they do not. Perhaps the interpretation of relative clauses is less a function of surface structure heuristics and more related to the stage of cognitive maturity than is comprehension of simple sentences.

The first question of this paper was whether the process of second language acquisition looks like the first. We found that the functions of early sentences, and their form, their semantic redundancy, their reliance on ease of short term memory, their overgeneralization of lexical forms, their use of simple order strategies all were similar to processes we have seen in first language acquisition. In broad outlines, then, the conclusion is tenable that first and second language learning is similar in natural situations. However, if children come to the task with some knowledge already available, there may be very accelerated progress in some respects, so that the rate of development will not look the same for all details. In every respect, we found that in the age range of four through nine the older children had an advantage and learned faster.

The first hypothesis we might have is that in all second language learning we will find the same processes: overgeneralization, production simplification, loss of sentence-medial items, and so on. More detailed studies will be needed to find which aspects of acquisition change with age when learning contexts are identical, and which are sensitive to structural dissimilarities between L_1 and L_2, or differences in social milieu.

The most difficult problem in generalizing the results of this study is the high degree of syntactic similarity between French and English. For the syntactic patterns studied in the simple and complex sentences the languages are word-for-word translations of each other. Therefore, in this particular study, we cannot fully differentiate the two interpretations, which I have used interchangeably: (a) The children in learning a second language recapitulate learning, and go faster through essentially the same stages, as a child learning French as a mother tongue, (b) because they lack knowledge about, for example, the morphemes identifying passives in French, they "regress" to a processing strategy still available to them for use under certain conditions in English. Only studies of structurally dissimilar languages can disambiguate these interpretations. But we can reject, at least, the hypothesis that children's interpretations of second-language sentences are directly processed through a translater. For interpretation tasks and translations both, direct word-for-word translations did not account for the evidence as well as did learner strategies quite like those mother-tongue learners employ.

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