Linguistic Typology and Language Acquisition: The Accessibility Hierarchy and Relative Clauses

Jae Jung Song
(University of Otago)

Linguistic typology, together with language universals research, is not very widely invoked as a theoretical framework in which to raise questions about the language acquisition process and also to address some of the theoretical issues or problems emerging from language acquisition research. The objective of the present review article is to raise the profile of linguistic typology and language universals in the context of language acquisition research. By way of illustration, a critical review of the validity or role of the Accessibility Hierarchy (AH) in the L1/L2 acquisition of relative clauses is provided. Moreover, factors which may interfere with the predictions made by the AH or which may have a bearing upon the acquisition of relative clauses are identified and discussed.

Key words: linguistic typology, the Accessibility Hierarchy, L1/L2 acquisition of relative clauses

1. Introduction

The relationship between language universals and language acquisition was clearly identified very early on in the development of modern linguistic typology as was first enunciated by Jakobson in his 1941 monograph, *Kindersprache, Aphasie und Allgemeine Lautgesetze* (published again in 1968 in English under the title of *Child language, aphasia and phonological universals*). He assumed that the implicational universal of $p \supset q$ (if p, then q) can be dynamically interpreted with the effect that acquisition of phonological property q will precede acquisition of phonological property p, for instance.[1] Otherwise, the implicational universal of

---

1) For example, the presence of voiced aspirated stops implies the presence of voiceless aspirated stops, e.g. $b^h \supset p^h$.

$p\supset q$ will be violated, namely p & $-q$ (or not q). Hawkins (1987) makes an attempt to improve on Jakobson's nascent interpretation by arguing that all that can be predicted by the implicational universal of $p\supset q$ actually is that acquisition of property q will either precede, or occur simultaneously with, acquisition of property p because there are already numerous languages with both p and q as well as languages with q only. For instance, children may acquire p and q at the same time, "thereby mirroring the adult languages that have both [p and q]" (Hawkins, 1987, p. 458). Moreover, Hawkins (1987) demonstrates that the dynamic interpretation of $p\supset q$ applies not only to first language acquisition (FLA) but also to second language acquisition (SLA). Thus the implicational universal of $p\supset q$ can be understood to place a strong constraint on both the FLA and SLA processes to the effect that the progressions of (1a) and (1b) are permitted, whereas that of (1c) is not.

(1) a. $-p$ & $-q \rightarrow -p$ & $q \rightarrow p$ & q
     b. $-p$ & $-q \rightarrow p$ & q
     c. $-p$ & $-q \rightarrow {}^*p$ & $-q \rightarrow p$ & q

This leads him to formulate *the Principle of Universal Consistency in Acquisition* (PUCA): at each stage in their evolution first languages (L1) and second languages (L2) remain consistent with implicational universals derived from current synchronic evidence. Taking his cue again from Jakobson (1941), Hawkins (1987) also adds a quantitative dimension to the dynamic interpretation for the order of L1/L2 acquisition of the implicational universal of $p\supset q$ defined in (1). Given $p\supset q$, the quantity of successful production and comprehension instances in L1 or L2 of property q is predicted to be greater than, or equal to, the quantity for property p.

Unfortunately, linguistic typology and language universals, in the opinion of the present writer, have not been utilized in FLA and SLA research as much as they should have. This is echoed by the SLA researcher Rutherford (1984b, p. 138), who puts it, "[i]t is probably safe to say that the [L2] explanatory framework that is most often mentioned, though less often actually utilized, is that of 'language universal'". With the notable exception of Susan Gass and a few other researchers linguistic typology, together with language universals, is not widely invoked as a theoretical framework within which to raise questions about the language acquisition process and also to address some of the

theoretical issues in FLA and SLA research. This state of affairs, however, should not be understood to imply that linguistic typology has little to offer for these areas of linguistics (cf. Song, 2001). Rather, it may be due to the inadequate level of discussion that linguistic typology has received within the domain of FLA and SLA research.

This paper will thus make an attempt to raise the profile of linguistic typology in the context of FLA/SLA research by providing a critical review of the application of linguistic typology and language universals. Needless to say, such a review will demand more than an article, if not a book. What will instead be done here, in the interests of space, is to concentrate on one particular grammatical phenomenon which has been reasonably thoroughly investigated in linguistic typology and which has also attracted—and will continue to attract—attention from FLA/SLA researchers and, then, to expatiate upon what insight, if any, such an investigation has provided into both the L1 and L2 acquisition processes. The grammatical phenomenon selected for this particular purpose is accessibility to relativization, investigated by Keenan and Comrie (1977).

The paper is divided into two main sections, one on FLA and the other on SLA. The rationale for this division comes from evidence that suggests that, affinities between them notwithstanding, e.g. similar, but not necessarily identical, developmental sequences in L1 and L2, there are differences between the L1 and L2 acquisition processes. L2 learners already possess (i) a mature semantic, pragmatic and syntactic system; (ii) a great deal of world knowledge; (iii) the option of using some or all of their L1 system as a starting point for building the L2 grammar and (iv) the ability to produce sentences using the few L2 words and the L1 grammar as a skeleton for those L2 words (Smith, 1994; also see Bley-Vroman, 1989 for detailed discussion). Thus in SLA, unlike in FLA, "[w]e cannot speak of conceptual [or cognitive] development or conversational immaturity delaying the onset of acquisition and we cannot speak of one-word or two-word stages in the language of more mature learners" (Smith, 1994, p. 46). More importantly, children may undergo different maturational stages during L1 acquisition. But presumably L2 learners—at least adolescents and adults—do not have to go through such maturational stages of language acquisition (e.g. Gass & Ard, 1980; Felix, 1984 *inter alia*). Cognitive and perceptual development may thus affect young children's (or L1 acquirers') linguistic development. So much so that Cook (1985, p. 11) goes so far as to characterize SLA as "acquisition minus maturation".

Thus "it is conceivable that some properties of first language acquisition might reflect properties of maturational stages that are subsequently lost, i.e. do not form part of the adult human language potential" (Comrie, 1989, p. 230).

2. The Accessibility Hierarchy

The primary objective of Keenan and Comrie's (1977) cross-linguistic study is to examine formal constraints on relativization. They focus on the grammatical relation of the head noun in the relative clause. Based on a sample of about fifty languages Keenan and Comrie (1977) discover that, although they vary with respect to which grammatical relations can or cannot be relativized on, languages may not do so randomly. For instance, there are no languages in their sample that cannot relativize on subject although there are languages which can relativize only on subject. In other words, all languages must have at least one relativization strategy whereby subjects are relativized on. This relativization strategy is referred to by Keenan and Comrie (1977, p. 68) as the "primary strategy". There is also a very strong tendency for relativization strategies to apply to a continuous segment of a hierarchy of grammatical relations or the Accessibility Hierarchy (AH hereafter), defined in (2).

(2) SBJ > DO > IO > OBL > GEN > OCOMP
     N.B.: ">" = "is more accessible to relativization than"; SBJ =
     subject, DO = direct object; IO = indirect object; OBL = oblique;
     GEN = genitive; and OCOMP = object of comparison

The primary strategy, which must by definition apply to subject relation, may also continue to apply down to 'lower' relations on the AH, and at the point where it ceases to apply, other relativization strategies may or may not take over and apply to a continuous segment of the AH. Relativization strategies including the primary strategy may 'switch off' at any point on the AH but they should in principle not 'skip' on the AH. English is one of the rare languages which can relativize on all the grammatical relations on the AH. This language thus serves as a good example by which the AH can be illustrated with respect to relativization. Consider:

(3) the girl who swam the Straits of Dover [*SBJ*]

(4) the girl whom the boy loved with all his heart [*DO*]

(5) the girl to whom the boy gave a rose [*IO*]

(6) the girl with whom the boy danced [*OBL*]

(7) the girl whose car the lady bought for her son [*GEN*]

(8) the girl who the boy is taller than [*OCOMP*]

The majority of the languages of the world, however, are not so generous as English in their relativizing possibilities. In fact, the very nature of the AH is grounded on the observation that there are more languages which can—whether by primary or non-primary relativization strategies—relativize on subject than languages which can also relativize on direct object, on direct object than also on indirect object, on indirect object than also on oblique, and so forth (cf. Tarallo & Myhill, 1983, who investigate the role in L2 relativization of linear proximity between the head noun and the relativized position; see section 4 for further discussion).

One important point follows from the preceding discussion. If a grammatical relation on the AH can be relativized on, all 'higher' grammatical relations also must be relativized on. For example, if genitive NPs are relativized on in language X, then a prediction can be made to the effect that subject, direct object, indirect object and oblique NPs also will be relativized on; if oblique NPs are relativized on in language Y, then a prediction can be made to the effect that subject, direct object and indirect object NPs also will be relativized on; and so forth. When applied to L1/L2 acquisition data, what this means is that, in accordance with Hawkins's (1987) interpretation of implicational universals, L1 acquirers or L2 learners will correctly produce or comprehend direct object relativization more often than, or at least as often as, indirect object relativization, and indirect object relativization more often than, or at least as often as, oblique relativization, and so forth. This is precisely the kind of prediction that has been tested in a number of FLA/SLA studies of the AH.

Finally, reference must be made to Fox's (1987) study, which demonstrates that in English natural discourse intransitive subject and direct object are treated preferentially in relativization as opposed to transitive

subject. The reason for this is that, unlike intransitive subject and direct object, transitive subject tends to carry given or old information, thereby functioning as an excellent anchor to the preceding discourse. This difference in their discourse roles is claimed to give rise ultimately to the predominance in natural discourse of the relativized NP being in intransitive subject or direct object function, as opposed to transitive subject function, in the relative clause. Fox's (1987) findings call into question subject relation as a single grammatical category on the AH, and consequently also FLA/SLA claims made in relation to this position on the AH, as will be discussed briefly in the following two sections. In the interests of space, however, implications for the AH of Fox's (1987) study will not be discussed further, except for emphasizing two important points: (i) Fox's (1987) claim for the discourse prominence of intransitive subject and direct object in English relative clauses must be tested on the basis of in-depth analysis of discourse data from a wide range of languages; and (ii) it remains to be seen whether Fox's (1987) discourse prominence is equivalent to the special cognitive status that Keenan and Comrie (1977) attribute to subject relation: subject is cognitively or psychologically the easiest position on the AH to relativize on.

3. Accessibility to Relativization in FLA

Children's acquisition of relative clauses has been examined largely by testing their comprehension. Children were asked to 'act out' sentences with relative clauses by manually manipulating small toy animals (Sheldon, 1974; Harada, Uyeno, Hayashibe, & Yamada, 1976; de Villiers, Tager Flusberg, Hakuta, & Cohen, 1979; Tavakolian, 1981; Hakuta, 1981; Goodluck & Tavakolian, 1982; Clancy, Lee & Zoh, 1986). Languages that have been looked at in these studies are mainly English, Japanese and Korean. What strikes one as most remarkable about these comprehension tests is that they have produced most inconsistent or at best inconclusive evidence insofar as accessibility to relativization is concerned. For instance, Harada *et al.'s* (1976) study of six-year-old Japanese children indicates that sentences with subject relativization were interpreted correctly about 80 per cent of the time, whereas those with object relativization were understood correctly only about 60 per cent of the time. Hakuta (1981), on the other hand, comes to the opposite conclusion

in his experiments, in which children aged 5;3-6;2 were tested: at least in left-embedded (or left-branching) relative clauses object relativization was better understood than subject relativization.[2] English data for the relevance of accessibility to relativization prove to be no less different or, as a matter of fact, "disappointingly inconsistent" (Clancy *et al.,* 1986, p. 250). Both de Villiers *et al.* (1979) and Tavakolian (1981) report that in their respective studies children understood subject relativization far more often than object relativization but Sheldon's (1974) data motivate her to put forth the parallel function hypothesis, whereby it is predicted that children will find it easier to interpret sentences in which the relativized NP has the same grammatical relation in both the main and relative clauses (e.g., object relativization as in *The dog stands on the horse that the giraffe jumps over*) than sentences in which the relativized NP has different grammatical relations in the main and relative clauses (e.g. subject relativization as in *The pig bumps into the horse that jumps over the giraffe*).

Clancy *et al.* (1986) present a careful evaluation of most of the studies referred to above. They come to the conclusion that Japanese data provide support only for the anti-interruption hypothesis (Slobin, 1973, p. 354), which predicts that "the greater the separation between related parts of a sentence, the greater the tendency that the sentence will not be adequately processed (in imitation, comprehension, or production)". This is, then, taken to explain, among other things, Japanese children's consistent failure to interpret centre-embedded relative clauses as opposed to left-embedded ones, and also their strong tendency to interpret sentences with centre-embedded relative clauses by using the canonical sentence schema, i.e., SOV. However, Clancy *et al.* (1986) find no evidence for the relevance of Keenan and Comrie's (1977) AH to Japanese children's comprehension of relative clauses as, in fact, indirectly manifested by Harada *et al.*'s and Hakuta's contradictory data.

Clancy *et al.* (1986) also come to a similar conclusion about data from English. Not just one strategy but multiple strategies are found to be at work in English-speaking children's comprehension of relative clauses. For

---

2) In Hakuta's (1981) study, Japanese children almost never processed centre-embedded relative clauses correctly. Thus it was not possible to test accessibility to relativization. Clancy *et al.* (1986) put forth a possible explanation for this by pointing out that the embedded verb in Japanese relative clauses bears morphological marking indistinct from that which appears on the main verb.

instance, there is evidence in support of sentences with relative clauses being processed in terms of schemas already developed for conjoined sentences (as most clearly demonstrated by Tavakolian's 1981 study): the superior performance on sentences with the relativized NP with subject relation in both the main and relative clauses (e.g., *The sheep that jumps over the rabbit stands on the lion*) and the poor performance on sentences with the relativized NP with object relation in the main clause and subject relation in the relative clause (e.g., *The duck stands on the lion that bumps into the pig*)—these sentences will thus be interpreted under the conjoined clause strategy as *The sheep jumps over the rabbit and stands on the lion* and *The duck stands on the lion and bumps into the pig*, respectively. This tendency to rely on the conjoined clause strategy is, incidentally, taken by Clancy *et al.* (1986) to provide partial support for Sheldon's (1974) parallel function hypothesis—albeit not in the strictest sense—because the initial NP is taken to be the subject of both the main and embedded verbs. There is also evidence which points to the importance of the canonical sentence schema strategy (Slobin & Bever, 1982). Main clauses were better understood than right-embedded (or right-branching) relative clauses but the final NVN segment of sentences with the relativized NP having subject relation in both the main and relative clauses i.e.—$N_S[VN]_SVN$—was misinterpreted as an SVO unit. Nevertheless, as demonstrated, for instance, by de Villiers *et al.* (1979) and Tavakolian (1981), subject relativization certainly was understood far more often than object relativization (but cf. Sheldon, 1974). This may perhaps be taken to be in support of the AH. Clancy *et al.* (1986), however, put this down to the canonical word order of SVO in English because subject relativization creates a canonical SVO sequence as in ***The sheep*** [S] ***that jumps over*** [V] ***the rabbit*** [O] *stands on the lion*, whereas object relativization gives rise to a non-canonical or unfamiliar OSV sequence as in ***The lion*** [O] ***that the horse*** [S] ***kisses*** [V] *knocks down the duck*. They (1986, p. 256) conclude, therefore, that what little evidence in support of the AH there may be "probably reflects the conformity of subject relativization in English to the canonical SVO word order, rather than demonstrating a direct relevance of the [AH] *per se* to sentence processing".

Clancy *et al.* (1986) also carry out their own experiment in order to test Korean children's (aged 6;3 to 7;3 years) comprehension of relative clauses. Very much as they have done with the others' studies, they also

interpret their own findings to indicate that there is no single processing strategy that can wholly account for Korean children's comprehension of sentences with relative clauses. Rather, anti-interruption, canonical sentence schema, parallel function and even intonation each have a role to play in Korean children's comprehension of sentences with relative clauses, although some factors are more significant than others. For example, in SOV order Korean children performed far better on sentences with subject head nouns than on sentences with direct object head nouns, whereas in OSV order they performed far better on sentences with direct object head nouns than on sentences with subject head nouns —Korean allows both SOV and OSV although the former is taken to be basic. Because in Korean relative clauses must precede head nouns, in SOV sentences with subject head nouns contain left-embedded relative clauses, and sentences with object head nouns centre-embedded relative clauses. The situation is reversed in OSV sentences with relative clauses, however. This provides a clear piece of evidence in support of Korean children's preference of left-embedded relative clauses to centre-embedded ones. This in turn provides support for the anti-interruption hypothesis, with centre-embedding giving rise to separation of related parts of the main clause (Slobin, 1973). With regard to the AH, however, Clancy *et al.* (1986, p. 244) point to those cases where object relativization—i.e. with left-embedded relative clauses—is better understood than subject relativization—i.e. with centre-embedded relative clauses—as "partially contradict[ing] predictions of the [AH]" (but cf. Comrie, 1984; Hawkins, 1987).

In view of the foregoing discussion one may jump to the conclusion that the AH may shed little light on the way children actually interpret sentences with relative clauses. After all, a number of other processing strategies such as anti-interruption, canonical sentence schema, parallel function, etc. have been found to play a more or less important role in children's performance. It will be injudicious to dismiss the AH out of hand, however. There are at least four reasons for being cautious.

First, the AH involves many grammatical relations other than subject and direct object relation—i.e. indirect object, oblique, genitive and object of comparison. None of the studies referred to above, however, have actually tested children's comprehension of sentences with the relativized NP having grammatical relations other than subject or direct object in the relative clause.[3] Thus it remains to be seen whether or not the AH still has any bearing on children's acquisition of relativization on the lower

grammatical relations.

Second, relative clauses are generally regarded as a very difficult construction for children to produce, comprehend and imitate (Tavakolian, 1981). Bloom, Lahey, Hood, Lifter and Fiess (1980, p. 250) also find in their study of children aged 2-3 that "[r]elativization ... was the last structure to appear [and] was always infrequent". It must be noted, however, that this may be more true of some languages than of others. Slobin (1982), for instance, reports that Turkish children (up to age 4;8) all failed to act out sentences with relative clauses but that Yugoslav children at the age of two produced relative clauses with much ease. He argues that this striking difference in time of acquisition of relative clauses between these two groups of children is due directly to the difference in linguistic complexity between Turkish and Serbo-Croatian relative clauses. What this suggests strongly is that there may be language-particular variables that may interfere with the relevance of the AH to children's mastery of relativization in their input language.

Third, there is evidence that in English natural discourse intransitive subject and direct object are treated preferentially in relativization as opposed to transitive subject (Fox, 1987). This is all the more pertinent to the present discussion because sufficient evidence has been accumulated to conclude that adults' linguistic input to children has a direct impact on what they acquire and also on how they acquire what they acquire. For example, Mills (1986) explains that German children's early and frequent use of the infinitive—in comparison with the participle—is due to the fact that it is very prominent in adults' input to children. Moreover, some of children's so-called errors may arise directly from adults' input to children. Bowerman (1985), for instance, makes reference to an error made by a German child, reported by Mills (1985): *die Grossmama* zu *den Affe* 'the grandmother *to* the monkey' (i.e. the monkey's grandmother). The error is the use of the preposition *zu*, instead of the appropriate preposition *von*. But she points out that adult German uses *zu* and *von* interchangeably in many constructions, e.g. 'the top *zu/von* this bottle', 'the cover *zu/von* the book', and the like. Thus it is very likely that this type of error is due more to the child's overly productive application of a

---

3) Note that in studies such as Clancy *et al.* (1986) NPs that appear immediately after verbal expressions such as *jump over, bump into, stand on,* etc. are treated as direct object NPs. In other words, the verbal expressions are analysed as transitive verbs.

pattern present in the linguistic input that s/he has already received than to anything else (Bowerman, 1985). Similarly, adults' input to children—at least in English, as Fox's (1987) study has amply demonstrated—may consist of far more sentences with the relativized NP in direct object or intransitive subject function in the relative clause than sentences with the relativized NP in transitive subject function in the relative clause. It will probably not do much good to test children's interpretation of sentences with relative clauses unless the distinction between intransitive and transitive subject in relation to direct object is also maintained strictly in experiments.

Finally, the relevance of the AH to L1 acquisition of relative clauses must also be tested thoroughly on the basis of children's data from a much wider range of languages although in some languages, admittedly, it will not always be so easy to collect data from young children as from grammatical descriptions and/or adult speakers (e.g., Tavakolian, 1981).

Before ending this section it is worth discussing briefly one general application of linguistic typology to FLA studies. One of the heated debates in FLA is whether or not children start their L1 acquisition with a fixed, pre-structured universal set of semantic notions or meaning categories. Slobin (1973, 1985) argues that they do (also see Clark and Carpenter (1989), and Clark in press; but cf. Slobin (1997) for his more recent open-minded position on the status of the universal semantic space); in his view L1 grammatical categories or forms are mapped directly onto such a universal "semantic space", mediated by linguistic input and operating principles that children draw upon in order to work out the grammar of L1, e.g. the canonical sentence schema strategy, the conjoined clause strategy, and the like.

Bowerman and her associates, however, have called into question the validity of the pre-structured universal semantic space, thereby arguing that it is much more flexible than, and not so invariable cross-linguistically as, Slobin (1973, 1985) claims. For instance, Choi and Bowerman (1991) have convincingly demonstrated that English and Korean children lexicalize differently the components of motion events from as early as 17-20 months. From this they have been able to draw the inference that children do not map spatial words directly onto non-linguistic spatial concepts (i.e. the pre-structured universal semantic space) but that they are very sensitive to the (language-particular) semantic structure of L1 virtually from the onset of their L1 acquisition

(also Bowerman, 1985, 1996a, 1996b). To put it differently, "there is diversity in children's starting [form-function mapping] options" (Bowerman, 1985, p. 1305).

However, Bowerman (1985, p. 1304) admits that it is not the case that "children are conceptually so flexible that all structure is provided by the input". She suggests that, although they may initiate their L1 acquisition with different form-function mapping options (both within and across languages), children may do so only within certain limits. Thus starting options are "structured enough [for linguists] to account for the [diverse] ways in which children depart from the semantic system displayed in the input" (Bowerman, 1985, p. 1304). In particular, she proposes that children's starting options be placed on "accessibility hierarchies", that is with some options more accessible to children than others, albeit all available right from the beginning of the development of grammar (but cf. Slobin, 1985). But how might this kind of relative accessibility be determined in the first place? In order to answer this Bowerman (1985, p. 1306) appeals to linguistic typology, thereby arguing that "the relative accessibility for children of alternative schemes [or starting options] for partitioning meaning in a given conceptual domain is correlated with the *frequency with which these schemes are instantiated in the languages of the world* [italics original]". As the reader can see, this is partly the way, for instance, the AH is constructed on the basis of the observation that more languages relativize on direct object than on indirect object, more languages relativize on indirect object than on oblique, and so forth. Said in a general way, the more frequently a given form or structure occurs in the languages of the world, the more accessible that form or structure is taken to be.

The other important aspect of such accessibility hierarchies as the AH is, of course, that they are meant to be implicational by nature. For instance, the possibility of indirect object relativization in a given language implies that of direct object relativization and also of subject relativization and so forth in that language. Bowerman (1985, p. 1309) also alludes to this particular aspect of accessibility hierarchies by suggesting that in FLA various L1 sub-systems may "hang together in a larger, semantically coherent pattern" with the effect that having learned about conceptual domain X children can "develop expectations about what meaning distinctions will be important" in conceptual domain Y (cf. Hawkins's (1987) interpretation for the order of acquisition of implicational

universals as defined in (1) above). This does certainly represent one exciting possibility of applying linguistic typology to L1 acquisition (Bowerman, 1985); implications for FLA thereof, however, remain to be recognized and fully understood because "much more research is needed before we can make claims about universal 'starting points' for the meanings of grammatical morphemes" (Slobin, 1997, p. 276).[4]

4. Accessibility to Relativization in SLA

In practical terms it is much more difficult to test the validity of the AH—and of other universals for that matter—in SLA, as opposed to FLA, because SLA does not involve only L1 (or the learner's native language (NL)) but also L2 (or the learner's target language (TL)). The magnitude of L2 research in this respect can easily be appreciated because each language involved in a contact situation can theoretically serve either as L1 or as L2. Thus, if one confines oneself to two languages in contact, one is not dealing only with one possible constellation of X as L1 and Y as L2 but with two possible constellations of X as L1 and Y as L2 on the one hand, and of Y as L1 and X as L2 on the other; if three languages, X, Y and Z, are involved, it means that there are six possible constellations, each language functioning as either L1 or L2 in relation to the others; and so on. The role of L1 in L2 acquisition is an important one in that L1 has a bearing on the way L2 is acquired, what part of L2 is acquired earlier rather than later, etc. because, unlike L1 acquirers, L2 learners are expected to bring their knowledge of the specific L1 grammar among others to the task of L2 acquisition (e.g., Bley-Vroman, 1989). As will be demonstrated below, L1 has indeed proven to be a significant variable in the L2 acquisition process insofar as the AH is concerned.

As Comrie (1984, p. 15) observes, the AH "has spawned a vast amount

---

4) Slobin (1997) is firmly of the view that the basis of accessibility hierarchies should ultimately be sought in terms of cognitive and processing variables (e.g. children's cognitive development), not by mere statistical sampling of languages as suggested by Bowerman (1985). No linguistic typologists will argue against this view but it must also be borne in mind that the relative accessibility of starting options must first be determined prior to turning to cognitive and processing variables for possible explanation. Moreover, mere statistical sampling of languages may turn out to be a more efficient, and productive way of determining the relative accessibility of starting options than by collecting child acquisition data from a wide range of languages.

of relevant literature in the second language acquisition area, showing how the theoretical conclusions reached by Keenan and Comrie (1977) translate fairly directly into valid predictions about the acquisition of relative clauses in a second language, though also noting more specific points where the fit between the two areas is less than perfect." Indeed it seems that no other typological properties have been investigated in SLA as thoroughly as has the AH. Moreover, the validity of the AH has been tested much more widely in SLA than in FLA. This may perhaps not be a total accident because linguistic typology has been accepted—more enthusiastically but no less critically—as a viable theoretical framework in SLA than in FLA (Gass & Ard, 1980, 1984; Eckman, 1984, 1991; Eckman, Moravcsik & Wirth, 1989; Gass, 1989, 1996 *inter alia* in SLA, as opposed to Bowerman (1985) and few other passing references to linguistic typology in FLA).

It was Gass (1979) who first tested the relevance of the AH to L2 acquisition. She carried out two experiments in which seventeen adult L2 learners of English—with nine different NL backgrounds, Arabic, Chinese, French, Italian, Japanese, Korean, Persian, Portuguese and Thai—were asked to give acceptability judgements to the TL (i.e. English) sentences with relative clauses and also to perform the task of converting two separate sentences into a single sentence with a relative clause (for subsequent L2 studies of the AH, see Hyltenstam (1984), Pavesi (1986), Doughty (1991), Aarts and Schils (1995) and Croteau (1995). The most important thing that emerged out of these experiments—especially the combining task—was that the L2 learners' ability to form correctly sentences with relative clauses decreased regressively from the highest position (i.e., SBJ) to the lowest position (i.e., OCOMP) on the AH with the exception of GEN. (Note that in Gass's (1979) work the positions of IO and OBL were collapsed into one position due to their analogous behavior in English relative clauses.)[5] Thus Keenan and Comrie's (1977) AH was relatively well validated by Gass's (1979) L2 data.

---

5) Incidentally, the exceptional behavior of GEN in Gass's (1979) data was taken to be a TL factor in that in English the genitive relative marker *whose* is "particularly unusual and hence more salient" because it is restricted to GEN. Moreover, Gass (1979) points out that, being positioned immediately after the head noun and before the possessed (e.g. *The man whose son just came home* ...), the GEN relative pronoun and the possessed may have been treated as a single unit, thereby functioning either as SBJ or as DO—positions higher on the AH—in the relative clause. Gass (1979) is of the opinion that this may explain why her L2 learners performed better on GEN than on DO and IO.

Further evidence in support of the AH also comes from the fact that in nearly all instances where the L2 learners failed to form relative clauses by not following the instructions given—i.e. "avoidance" in the sense of Schachter (1974)—relative clauses were formed on higher positions on the AH than the intended ones (Gass and Ard, 1984; but cf. Akagawa, 1990, who found no comparable evidence from Japanese L2 learners).

In Keenan and Comrie's (1977) original cross-linguistic survey it was discovered that resumptive pronouns—pronominal 'copies' of relativized elements in relative clauses—were more likely to be utilized for lower positions than higher positions on the AH. This was also found to be the case with all the L2 learners of English in Gass's (1979) study irrespective of whether or not their NLs made use of resumptive pronouns in relative clauses (Gass & Ard, 1984). But at the same time L2 learners speaking NLs with the pronoun-retention strategy (i.e. use of resumptive pronouns in relative clauses) were more likely to employ resumptive pronouns than L2 learners speaking NLs without. Thus there was also evidence in support of the L1 effect of pronoun retention on at least the three highest positions on the AH, i.e. SBJ, DO and IO/OBL. However, insofar as relativization on the two lowest positions on the AH, i.e. GEN and OCOMP, was concerned, no statistically significant differences were noted between the two groups of L2 learners. The use of resumptive pronouns for GEN and OCOMP may thus well be consistent with the predictions of the AH although it cannot be ruled out completely that at least the speakers of languages with the pronoun-retention strategy may still have been "relying on the patterns of their own NLs" (Gass, 1979, p. 337).

This inverse relationship between the AH and the use of resumptive pronouns in L2 acquisition of relative clauses, well evident in Gass's data, is further supported generally by Hyltenstam's (1984) investigation of the use of resumptive pronouns in relative clauses by L2 learners of Swedish, with Spanish, Finnish, Greek and Persian as their NLs. In common with English Swedish does not rely on the pronoun-retention strategy and can relativize on every position on the AH, whereas those NLs differ in the positions that can be relativized on and also in the optional and obligatory use of resumptive pronouns. Hyltenstam's results conform well with the predictions of the AH, albeit not perfectly. With the positions of GEN and OCOMP inverted, however, the conformity increases to a greater extent (cf. Gass, 1979). Overall, the use of resumptive pronouns in the L2 learners' output is inversely related to the AH with the effect that the

frequency of occurrence of resumptive pronouns in relative clauses increases as one moves down the AH.

Hyltenstam's (1984) study also revealed that the frequency of occurrence of resumptive pronouns in the L2 learners' production of Swedish relative clauses was in direct proportion to the degree to which resumptive pronouns are used in relative clauses in their NLs. Persian uses resumptive pronouns for more positions on the AH than does Greek, whereas both Spanish and Finnish completely lack the pronoun-retention strategy. Persian speakers were thus found to make the most extensive use of resumptive pronouns in their production of Swedish relative clauses, followed by Greek, Spanish and Finnish speakers in that order. The point is that the inverse relationship between the AH and the use of resumptive pronouns in the L2 learners' output notwithstanding the effect of L1 on L2 learners' acquisition of relative clauses was also discernible in Hyltenstam's data, very much as in the case of Gass's original study.

The AH is a chain of implicational universals in that relativizability of any given position on the AH—of course, except for the topmost position of SBJ—implies relativizability of all positions higher than that position. This implicational nature of the AH has also prompted some L2 researchers to explore pedagogical implications of the AH for L2 acquisition. Thus Gass (1982) wonders if it is possible to provide L2 learners with relativization instruction only on a low position on the AH on the assumption that they may be able to make generalizations to the higher positions but not to the lower positions on the AH. This indeed is an intriguing hypothesis, especially in view of the standard pedagogical assumption in at least L2 teaching that instruction on easy structures should precede that on more difficult ones. The question to be asked is whether or not L2 learners are able to 'learn' more than they have been taught. If so, it will surely make more sense to teach students difficult structures first so that they can generalize to easy structures on their own than to teach them easy structures first when it is anticipated that they are unable to make similar generalizations to difficult structures.

This particular hypothesis was tested by Gass (1982) by using two groups of ESL (English as Second Language) classes: one experimental group consisting of thirteen ESL students and one control group consisting of five ESL students. The NLs of these ESL students were Arabic, Italian, Persian, Russian and Spanish. First, both the experimental

group and the control group were given two tests—i.e. grammaticality judgement and production tests—with a view to determining their pre-instructional knowledge of English relativization. The tests revealed that neither group possessed much pre-instructional knowledge of relative clauses; moreover, there was no statistically significant difference between the two groups in terms of performance on the pre-instruction tests. Three days after the tests the experimental group was given instruction only on OBL relativization, whereas the control group was taught along the lines of standard ESL textbooks, that is, instruction first on SBJ, DO and IO relativization, followed by that on GEN relativization with less emphasis. About two days after the conclusion of the instruction the students of the two groups were all tested once again on their knowledge of relativization on all the positions on the AH. The results of the post-instruction tests were quite illuminating. First, the difference between the pre-test and post-test scores of the experimental group was statistically significant, whereas that of the control group was not. Second, with respect to the production task (i.e., combining two separate clauses to form a sentence with a relative clause) the students in the experimental group did generalize from OBL relativization to relativization on the other positions on the AH with the exception of GEN (cf. Gass, 1979). In the control group, on the other hand, learning was limited only to what they had been taught by means of formal instruction. The improvement on the ability of the two groups to relativize on all the positions on the AH between the pre-test and the post-test is summarized in percentage terms in Table 1 (Gass, 1982).

Table 1. Improvement on the Production Task in the Two Groups

Control Group		Experimental Group	
SBJ	40%	SBJ	30%
DO	30%	DO	39%
IO	0%	IO	42%
OBL	40%	OBL	57%
GEN	10%	GEN	12%
OCOMP	0%	OCOMP	50%

It should also be pointed out, however, that, although the students in the experimental group—as opposed to those in the control group—generalized to the positions other than the one for which they actually received

instruction, they did make generalizations not only to higher (or more accessible) positions but also to lower (or less accessible) positions, e.g. OCOMP (cf. Doughty, 1991). This indeed is problematic for the hypothesis that Gass (1982) originally set up for her investigation. Nonetheless there is marked improvement on the pre-test in the post-test in the case of the experimental group, whereby Gass's (1982) hypothesis is well supported. From these results, therefore, Gass (1982, p. 139) draws an important implication for language pedagogy to the effect that "a more efficacious model for syllabus design ... would be one in which a more difficult structure preceded an easier one" because L2 learners may come into the classroom, not as passive learners but with the natural abilities to make generalizations from more difficult to less difficult structures. This implication, however, needs to be evaluated in the light of the fact that by definition it takes more time and effort to learn difficult structures than easy ones.

Eckman, Bell and Nelson (1988) replicate Gass's (1982) study by further introducing a few elaborations into the latter's testing method and procedures. They carried out their research with three experimental groups instead of one, with each being taught to form relative clauses on only one AH position, namely SBJ, DO or OBL but, unlike in Gass (1982), they administered no instruction on relativization to the control group. The results of the pre-test were taken into account along with NLs and English proficiency level in order to assign ESL students randomly to one of the four groups. The three experimental groups were then given appropriate instruction on relativization between the two tests, with the control group receiving instruction on sentence combining techniques not related to relative clauses. Two days after the instruction all of the students were given the post-test. The most prominent aspect of the results of the post-test is that the group who performed the best was the OBL group, followed by the DO group, the SBJ group and the control group in that order. Moreover, although the SBJ experimental group generalized somewhat to DO, neither the SBJ group nor the DO group generalized to OBL. Nearly all generalizations were made in the direction of the higher (or more accessible) positions on the AH. These results do indeed seem to confirm the pedagogical hypothesis put forth by Gass (1982). Thus Eckman *et al.* (1988) come to the conclusion that learners actually 'learn' more than they have been taught, thereby challenging the assumption that learners know only what they are taught.

Though the foregoing results are very impressive and reasonably

consistent in support of the validity of the AH in L2 acquisition, in contrast to L1 acquisition, it goes without saying that more research— better planned and constructed—must be carried out in order to draw firm conclusions about the relevance of the AH to L2 acquisition. To that end two comments can be put forward here. First, as in the case of FLA no studies have actually examined L2 acquisition of relative clauses, with the distinction in mind between transitive subject and intransitive subject in opposition to direct object (cf. Fox, 1987). Indeed there is some indication that the distinction may be of vital importance for a better understanding of the role in L2 acquisition of the AH. For example, Aarts and Schils (1995) observe that their Dutch L2 learners of English actually performed better on DO relativization than on SBJ relativization although the difference was statistically non-significant. A quick look at their test questions reveals that SBJ relativization seemed to involve not only intransitive subject but also transitive subject. Eckman *et al.* (1988) also note that there was, contrary to the predictions of the AH, no difference in performance between SBJ and DO relativization. They admit that they have no explanation for this apparent counterexample to the AH. On closer inspection, however, Eckman *et al.*'s pre-test and post-test questions on SBJ relativization involved only transitive subject despite the fact that their relevant instruction on SBJ relativization did not concern only transitive subject but also intransitive subject. It is not entirely clear at the moment how to interpret this discrepancy between the instruction and test questions in terms of its effect on Eckman *et al.*'s students' performance. But what is clear is that in future research on L2 learners' acquisition of relative clauses it may be beneficial to pay due attention to the distinction between transitive subject and intransitive subject relative to direct object.

Second, there is also some evidence, albeit inconclusive, that linear proximity between the head noun and the relativized position may also bear upon L2 learners' acceptance of relative clauses with resumptive pronouns.[6] Thus Tarallo and Myhill (1983) find that English L2 learners of right-branching languages such as German and Portuguese incorrectly

---

6) By the relativized position is meant the position in which the head noun would appear within the relative clause if the latter were not a relative clause but rather a full independent clause. For example, in *Lee bought the car that Megan had sold Ø two years ago* or *The man who Ø came to see you was a New Zealander* the relativized position is marked by Ø.

accepted relative clauses with resumptive pronouns more often for DO than for SBJ, whereas English L2 learners of left-branching languages such as Chinese and Japanese incorrectly accepted relative clauses with resumptive pronouns for SBJ more often than for DO. Tarallo and Myhill (1983) impute this difference to the fact that in right-branching languages the physical distance between the head noun and the relativized position (indicated by the resumptive pronoun) is shorter in SBJ than DO relativization, whereas in left-branching languages it is the other way around. They suggest that linear proximity between the head noun and the relativized position may play a more important role in L2 learners' acquisition of relative clauses than the AH. However, their data also indicate clearly that in the case of Chinese and Japanese—both left-branching languages—the rates of acceptance of relative clauses with resumptive pronouns for IO (42 per cent) and for OBL (50 per cent) (i.e. preposition *with*) are very similar to the rate for SBJ (49 per cent) (cf. Hamilton, 1995), thereby suggesting that something else is at work here. Nevertheless the role in the L2 acquisition of relative clauses of linear proximity between the head noun and the relativized position awaits further investigation (cf. Hamilton, 1995).

5. Closing Remarks

The relevance of the AH to L2 acquisition seems to have been much better substantiated than the relevance of the AH to L1 acquisition. The data from L1 acquisition have turned out to be rather disappointingly inconsistent when compared with those from L2 acquisition. In L2 acquisition, however, there is a respectable amount of agreement between the predictions of the AH and the data. Even in FLA the testing of the AH itself has shed much light on the L1 acquisition process by contributing to the discovery of processing strategies that L1 acquirers draw upon during the acquisition of L1. Linguistic typology has certainly proven to be a competitive theoretical framework within which questions or issues pertaining to language acquisition cannot only be raised but also be better understood.

Before closing the present paper it may be worth (re-)thinking about the disparity between L1 and L2 acquisition (of relative clauses in particular). In order to accurately determine the role or the validity of

language universals in L1 and L2 acquisition it is very important to understand the nature of this disparity by teasing out such "extra-linguistic exigencies" as "might at times override the predictions made [for instance] by the [AH] on its own" (Comrie, 1984, p. 19). Though it falls outside the purview of the present paper to explore this in any depth, there are at least three things which promptly present themselves as contributing factors. First, L1 acquirers or young children learn their L1 at the same time when cultural, social, perceptual and cognitive systems are being developed (Gass & Ard, 1980). Young children acquiring L1 may in the first instance pay little or no attention to certain grammatical distinctions made in L1 because of the particular way that they construct the world around them—differently from mature L2 learners. For instance, the animacy distinction in Polish and Russian object nouns is a relatively late acquisition, with one accusative inflection used not only for animate but also for inanimate nouns in child speech (Slobin, 1985). This may perhaps be due to the fact that "many inanimate objects in the child's world are grammatically [or conceptually] classified as animate, such as stuffed animals and dolls" (Slobin, 1985c, p. 1187). This certainly will not be the case with L2 learners of Polish or Russian, however. There may thus be a good variety of "extra-linguistic exigencies" to which L1 acquirers must attend during the acquisition of L1. Factors other than the AH, for example, preference for anti-interruption, use of canonical schemas, dispreference of centre-embedding, etc., as has been dem-onstrated in section 3, do have a great impact on the way young children comprehend relative clauses. In fact, so much so that Gass and Ard (1980, p. 445) go so far as to suggest that "patterns in [SLA] may ... correspond more closely to language universals than do patterns in [FLA]". Second, unlike L1 acquirers L2 learners very often undergo formal instruction on relativization in the TL. This is, as a matter of fact, true of at least the L2 learners in all the studies that have been discussed or mentioned in the previous section, with the partial exception of Pavesi (1986). L1 acquirers, on the other hand, never receive exposure to relativization in their NLs through formal instruction. This difference must thus also have a bearing on the way L2 learners performed the way they actually did in the L2 studies in question. There is indeed ample evidence that formal instruction makes very positive contributions to SLA, especially in the areas of acquisition processes, rate of acquisition and the level of ultimate L2 attainment (see Larsen-Freeman & Long (1991) for an overview). The

positive effect of formal instruction on acquisition of relativization in particular received support from Doughty's (1991) L2 study of relativization: two (differently) instructed groups improved significantly more in a variety of written and oral tests than a control group. The advantage was imputed directly to "the instructional techniques that brought the features of relativization into prominence" (Doughty, 1991, p. 463). Reference must, however, be made to Pavesi's (1986) study, in which naturalistic or untutored L2 acquisition of relativization was found to generally conform to predictions of the AH. In this study also there was evidence in support of the positive effect of formal instruction; more tutored learners mastered TL relativization in the five lowest NP categories on the AH than untutored learners. Last but not least, the role of L1 in L2 acquisition, as evident particularly in Gass's (1979) and Hyltenstam's (1984) studies, should never be discounted as irrelevant. In this context, it is worth highlighting the contribution of linguistic typology to research on the role of L1 in L2 acquisition—perhaps one of the most debated issues in SLA (for a brief survey see Gass, 1996). There are two extreme views in conflict. At one end there are those who believe that the role of L1 in L2 acquisition is so significant that [t]hose elements [in the TL] that are similar to [the NL] will be simple for [the L2 learner], and those elements [in the TL] that are different [from the NL] will be difficult (Lado, 1957, p. 2). This view is embodied in *the Contrastive Analysis Hypothesis* (CAH) (for full discussion, see James, 1980). At the other end there are those who argue, in reaction to the CAH, that the role of L1 in L2 acquisition is very minimal, and that there is, in fact, no real difference between L1 and L2 acquisition, with the latter being guided by the same language acquisition device responsible for the former. This view is captured in *the Creative Construction Hypothesis* (CCH), wherein the role of L1 in L2 acquisition is heavily discounted, if not completely thrown out (e.g., Dulay & Burt, 1972, 1974). Eckman (1977) makes an attempt to reconcile these two opposing views by appealing to "markedness differential". This notion is based precisely on the very logical nature of implicational universals that, if the presence of p unilaterally implies the presence of q (i.e., $p \supset q$), p is marked relative to q, whereas q is unmarked relative to p (cf. (1) above; and Hawkins, 1987). The empirical basis of implicational universals is in turn none other than the relative frequency of structural properties across the languages of the world (Eckman, 1996; Bowerman, 1985). Thus for Eckman

markedness is typological markedness. From this the inference can be drawn that those areas of the TL that differ from, and are more marked than, the NL will be difficult for the L2 learner, whereas those areas of the TL that differ from, but are not more marked than, the NL will not be difficult. The advantage of this approach, or *the Markedness Differential Hypothesis* (MDH) as Eckman calls it, is its ability to explain most of the main problems that the CAH is beset with (cf. James (1980) for a review of these problems): e.g. why some differences between the NL and the TL do not lead to difficulty in learning L2, and also why some L2 errors resemble those that are made during the acquisition of the TL as an L1. However, there is still something that the MDH cannot account for. There are areas of difficulty that do not arise from NL-TL differences at all (e.g., Dušková, 1969; Sciarone, 1970). For instance, recall that Hyltenstam (1984) pointed to Spanish and Finnish L2 learners' use of resumptive pronouns in Swedish relative clauses despite the lack of the pronoun-retention relativization strategy in both the NLs and the TL. In other words, there is no difference between the NLs and the TL insofar as the absence of the pronoun-retention strategy is concerned. Nevertheless Spanish and Finnish learners did actually produce relative clauses by using resumptive pronouns. This type of "error pattern" has led Eckman (1984, 1991, 1996) (also see Eckman, Moravcsik & Wirth, 1989) to abandon the MDH in favour of *the Structure Conformity Hypothesis* (SCH), whereby it is now claimed that all language universals that are true of L1s (or primary languages in the sense of Lamendella, 1977) are also true of L2s (or interlanguages in the sense of Selinker, 1972). Given this characterization, the SCH can readily be likened to Hawkins's (1987) PUCA referred to earlier (also see Adjémian, 1976).

References

Aarts, F. and E. Schils. (1995). Relative clauses, the accessibility hierarchy and the contrastive analysis hypothesis. *International Review of Applied Linguistics* 33, 47-63.

Adjémian, C. (1976). On the nature of interlanguage systems. *Language Learning* 26, 297-320.

Akagawa, Y. (1990). Avoidance of relative clauses by Japanese high school students. *JACET Kiyo* 21.

Bley-Vroman, R. (1989). What is the logical problem of foreign language learning? In S. M. Gass and J. Schachter eds., *Linguistic Perspectives on Second Language Acquisition.* Cambridge: Cambridge University Press.

Bloom, L., Lahey, M., Hood, L., Lifter, K., and K. Fiess. (1980). Complex sentences: acquisition of syntactic connectives and the semantic relations they encode. *Journal of Child Language 7,* 235-261.

Bowerman, M. (1985). What shapes children's grammars? In D. I. Slobin ed., *The Crosslinguistic Study of Language Acquisition, vol 1: The Data.* Lawrence Erlbaum, Hillsdale, NJ.

Bowerman, M. (1996a). The origins of children's spatial semantic categories: cognitive versus linguistic determinants. In J. J. Gumperz and S.C. Levinson, eds., *Rethinking Linguistic Relativity.* Cambridge: Cambridge University Press.

Bowerman, M. (1996b). Learning how to structure space for language: a crosslinguistic perspective. In P. Bloom, M. A. Peterson, L. Nadel and M. F. Garrett, eds., *Language and Space.* Cambridge, MA: MIT Press.

Choi, S. and M. Bowerman. (1991). Learning to express motion events in English and Korean: the influence of language-specific lexicalization patterns. *Cognition* 41, 83-121.

Clancy, P. M., Lee, H., and M.-H. Zoh. (1986). Processing strategies in the acquisition of relative clauses: universal principles and language-specific realizations. *Cognition* 24, 225-262.

Clark, E. V. (in press). Emergent categories in first language acquisition. In M. Bowerman and S. Levinson, eds., *Language Acquisition and Conceptual Development.* Cambridge: Cambridge University Press.

Clark, E. V. and K. L. Carpenter. (1989). The notion of source in language acquisition. *Language* 65, 1-30

Comrie, B. (1984). Why linguists need language acquirers. In W. E. Rutherford, ed., *Language Universals and Second Language Acquisition.* John Benjamins, Amsterdam.

Comrie, B. (1989). *Language Universals and Linguistic Typology.* Blackwell, Oxford.

Cook, V. J. (1985). Chomsky's universal grammar and second language learning. *Applied Linguistics* 6, 2-18.

Croteau, K. C. (1995). Second language acquisition of relative clause structures by learners of Italian. In F.R. Eckman, D. Highland, P. W. Lee, J. Mileham and R. R. Weber, eds., *Second Language*

Acquisition and Pedagogy. Lawrence Erlbaum, Mahwah, NJ.

de Villiers, J. G., Tager Flusberg, H. B., Hakuta, K., and M. Cohen. (1979). Children's comprehension of relative clauses. *Journal of Psycholinguistic Research* 8, 499-518.

Doughty, C. (1991). Second language instruction does make a difference: Evidence from an empirical study of SL relativization. *Studies in Second Language Acquisition* 13, 431-469.

Dulay, H. and M. Burt. (1972). Goofing, an indicator of children's second language strategies. *Language Learning* 22, 234-252.

Dulay, H. and M. Burt. (1974). Natural sequences in child second language acquisition. *Language Learning* 24, 37-53.

Dušková, L. (1969). On sources of errors in foreign language learning. *International Review of Applied Linguistics* 7, 11-36.

Eckman, F. R. (1977). Markedness and the contrastive analysis hypothesis. *Language Learning* 27, 315-330.

Eckman, F. R. (1984). Universals, typologies and interlanguage. In W. E. Rutherford, ed., *Language Universals and Second Language Acquisition.* John Benjamins, Amsterdam.

Eckman, F. R. (1991). The structural conformity hypothesis and the acquisition of consonant clusters in the interlanguage of ESL learners. *Studies in Second Language Acquisition* 13, 23-41.

Eckman, F. R. (1996). A functional-typological approach to second language acquisition theory. In W. C. Ritchie and T. K. Bhatia, eds., *Handbook of Second Language Acquisition.* San Diego: Academic Press.

Eckman, F. R., Bell, L., and D. Nelson. (1988). On the generalization of relative clause instruction in the acquisition of English as a second language. *Applied Linguistics* 9, 1-20.

Eckman, F. R., E. A. Moravcsik and J. R. Wirth. (1989). Implicational universals and interrogative structures in the interlanguage of ESL learners. *Language Learning* 39, 173-205.

Felix, S. W. (1984). Maturational aspects of universal grammar. In A. Davies, C. Criper and A. P. R. Howatt, eds., *Interlanguage.* Edinburgh: Edinburgh University Press.

Fox, B. A. (1987). The Noun Phrase Accessibility Hierarchy reinterpreted: Subject primacy or the absolutive hypothesis? *Language* 63, 856-870.

Gass, S. (1979). Language transfer and universal grammatical relations. *Language Learning* 29, 327-344.

Gass, S. (1982). From theory to practice. In M. Hines and W. Rutherford, eds., *On TESOL '81*, TESOL, Washington D.C.

Gass, S. (1996). Second language acquisition and linguistic theory: the role of language transfer. In W. C. Ritchie and T. K. Bhatia, eds., *Handbook of Second Language Acquisition*. San Diego: Academic Press.

Gass, S. and J. Ard. (1980). L2 data: their relevance for language universals. *TESOL Quarterly* 14, 443-452.

Gass, S. and J. Ard. (1984). Second language acquisition and the ontology of language universals. In W. E. Rutherford, ed., *Language Universals and Second Language Acquisition*. Amsterdam: John Benjamins.

Gass, S. M. (1989). Language universals and second-language acquisition. *Language Learning* 39, 497-534.

Goodluck, H. and S. Tavakolian. (1982). Competence and processing in children's grammar of relative clauses. *Cognition* 11, 1-27.

Hakuta, K. (1981). Grammatical description versus configurational arrangement in language acquisition: the case of relative clauses in Japanese. *Cognition* 9, 197-236.

Hamilton, R. L. (1995). The Noun Phrase Accessibility Hierarchy in SLA: determining the basis for its developmental effects. In F. R. Eckman, D. Highland, P. W. Lee, J. Mileham and R. R. Weber, eds., *Second Language Acquisition and Pedagogy*. Mahwah, NJ: Lawrence Erlbaum.

Harada, S. I., T. Uyeno, H. Hayashibe and H. Yamada. (1976). On the development of perceptual strategies in children: a case study on the Japanese child's comprehension of the relative clause constructions. *Annual Bulletin of the Research Institute Logopedics Phoniatrics* 10, 199-224.

Hawkins, J. A. (1983). *Word order universals*. New York: Academic Press.

Hawkins, J. A. (1987). Implicational universals as predictors of language acquisition. *Linguistics* 25, 453-473.

Hyltenstam, K. (1984). The use of typological markedness conditions as predictors in second language acquisition: the case of pronominal copies in relative clauses. In R.W. Andersen, ed., *Second languages: A Cross-Linguistic Perspective*. Rowley, MA: Newbury House.

Jakobson, R. (1941). *Kindersprache, Aphasie, und Allgemeine Lautgesetze*. Uppsala: Uppsala Universitets Aarskrift.

Jakobson, R. (1968). *Child Language, Aphasia and Phonological Universals*. Mouton: The Hague.

James, C. (1980). *Contrastive analysis*. Essex: Longman.

Keenan, E.L. and B. Comrie. (1977). Noun phrase accessibility and universal grammar. *Linguistic Inquiry* 8, 63-99.

Lado, R. (1957). *Linguistics Across Cultures: Applied Linguistics for Language Teachers*. Ann Arbor: University of Michigan Press.

Lamendella, J. (1977). General principles of neurofunctional organization and their manifestations in primary and non-primary language acquisition. *Language Learning* 27, 155-196.

Larsen-Freeman, D. and M. H. Long. (1991). *An Introduction to Second Language Acquisition Research*. London: Longman.

Mills, A. E. (1986). *The Acquisition of Gender: A Study of English and German*. Berlin: Springer Verlag.

Pavesi, M. (1986). Markedness, discoursal modes, and relative clause formation in a formal and an informal context. *Studies in Second Language Acquisition* 8, 38-55.

Rutherford, W. E., ed. (1984a). *Language Universals and Second Language Acquisition*. Amsterdam: John Benjamins.

Rutherford, W. E. (1984b). Description and explanation in interlanguage syntax: state of the art. *Language Learning* 34, 127-155.

Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics* 10, 209-231.

Schachter, J. (1974). An error in error analysis. *Language Learning* 24, 205-214.

Sciarone, A.G. (1970). Contrastive analysis: Possibilities and limitations. *International Review of Applied Linguistics* 8, 115-131.

Sharwood Smith, M. (1994). *Second Language Learning: Theoretical Foundations*. London and New York: Addison Wesley Longman.

Sheldon, A. (1974). The role of parallel function in the acquisition of relative clauses in English. *Journal of Verbal Learning and Verbal Behavior* 13, 272-281.

Slobin, D. I. (1973). Cognitive prerequisites for the development of grammar. In C.A. Ferguson and D.I. Slobin, eds., *Studies of Child Language Development*. New York: Holt, Rinehart and Winston.

Slobin, D. I. (1982). Universal and particular in the acquisition of language. In E. Wanner and L. Gleitman, eds., *Language Acquisition: The State of the Art*. Cambridge: Cambridge University Press.

Slobin, D. I. (1985). Crosslinguistic evidence for the language-making capacity. In D.I. Slobin, ed., *The Crosslinguistic Study of Language Acquisition 2: Theoretical issues.* Hillsdale, NJ: Lawrence Erlbaum.

Slobin, D. I. (1997). The origins of grammatical notions: Beyond the individual mind. In D.I. Slobin, ed., *The Crosslinguistic Study of Language Acquisition 5: Expanding the Contexts.* Mahwah, NJ: Lawrence Erlbaum.

Slobin, D. I. and T. G. Bever. (1982). Children use canonical sentence schemas: A crosslinguistic study of word order and inflections. *Cognition* 12, 229-265.

Song, J. J. (2001). *Linguistic Typology: Morphology and syntax.* Harlow and London: Pearson Education.

Tarallo, F. and J. Myhill. (1983). Interference and natural language processing in second language acquisition. *Language Learning* 33, 55-76.

Tavakolian, S. L. (1981). The conjoined-clause analysis of relative clauses. In S. L. Tavakolian, ed., *Language Acquisition and Linguistic Theory.* Cambridge, MA: The MIT Press.

Jae Jung Song
School of Language, Literature
and Performing Arts
University of Otago
PO Box 56
Dunedin
NEW ZEALAND
E-mail : jaejung.song@stonebow.otago.ac.nz