With warm regards,
Fred 1989

Implicational Universals and Interrogative Structures in the Interlanguage of ESL Learners

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The validity of two implicational universals regarding constituent order in questions is tested in the English speech of 14 native speakers of Japanese, Korean, and Turkish. The interlanguage evidence is found to be generally supportive of the two universals. Some fundamental methodological problems are discussed which are attendant upon testing universals not only in interlanguages but in linguistic systems of any kind.

INTRODUCTION[1]

In recent years, evidence has emerged to indicate the existence of a number of universal tendencies restricting the variability of human language grammars. The consistent cross-linguistic recurrence of certain grammatical patterns suggests that at least some registers of language are subject to stringent structural constraints: much of what could in principle happen in these grammars does not in fact happen.

The facts on the basis of which such universals have been formulated come in most cases from written grammars and are therefore most likely to reflect relatively standard language

varieties, or *primary languages*, in the sense of Lamendella (1977). A question that remains to be answered has to do with the total range of human language forms for which these universals hold. Do they also hold for such nonprimary forms of language as informal styles, child language, pathological speech, or the language of second-language learners?

The precise delimitation of the validity domain of language universals is important for our understanding of the significance of language universals as well as for our understanding of the nature of secondary forms of language. First, if it turns out that some universals initially based on primary language evidence also hold for some nonprimary forms of language, this finding would increase the probability of those universals being without exception within the domain of primary language forms. This would in turn suggest that they are truly essential patterns, rather than accidental findings—artifacts of the language sample they have been based on. Second, the validity of primary-language universals in nonprimary forms of language would also reveal something about these nonprimary language varieties, namely, that they are rooted in the same fundamental language capacity as are primary forms of language.

That these universals do in fact hold for interlanguages, the learner-languages of second-language acquisition, (Selinker, 1972) has been suggested elsewhere in the literature. For example, Eckman (1977, 1985) has proposed that typological markedness correlates with degree of difficulty in second-language acquisition. Gass (1979) has presented evidence that a specific universal, the Accessibility Hierarchy (Keenan & Comrie, 1977), can be used to predict certain facts about native-language transfer in the acquisition of English relative clauses. Hyltenstam (1985), also using the Accessibility Hierarchy, proposes that typologically unmarked features will always be acquired before typologically marked features. And Hawkins (1987) hypothesizes that universals can be used to predict the existence, order of appearance and relative frequency of occurrence of certain structures in child-language acquisition and in interlanguages.

This paper reports on a project that directly addressed the question of whether primary-language universals hold for interlanguages by testing two universals against evidence from second-language data. The two universals at issue both pertain to the structure of questions and they both claim a cross-linguistically consistent correlation between certain order patterns in such structures. The order patterns they make reference to are these:

A. the sentence-initial (vs. non-initial) position of question pronouns in *wh* questions ("Whom should you see?" vs. "You should see whom?"), which will be referred to as *Wh Fronting*;
B. verb-before-subject (vs. subject-before-verb) order in *Wh* questions ("Whom should you see?" vs. "Whom you should see?") which we will call *Wh Inversion*;
C. verb-before-subject (vs. subject-before-verb) order in yes/no questions ("Should you see Joe?" vs. "You should see Joe?"), dubbed here as *Yes/No Inversion*.

The correlation of these patterns is claimed to be (Greenberg 1963, p. 83):

(1) *Wh Inversion implies Wh Fronting* "Inversion of statement order (in *Wh* questions—FE/EM/JW[2]) so that verb precedes subject occurs only in languages where the question word or phrase is normally initial."
(2) *Yes/No Inversion implies Wh Inversion* "This same inversion (i.e., inversion of statement order so that verb precedes subject—FE/EM/JW) occurs in yes/no questions only if it also occurs in interrogative word questions."

In other words, of the three patterns mentioned above, the presence of Pattern C in a language implies Pattern B which in turn implies the presence of Pattern A: subject-verb inversion in *yes/no* questions implies the same pattern in *Wh* questions

which in turn implies the fronting of interrogative words in the same question type. Tables 1 and 2 show the language types permitted and excluded by these principles. The following abbreviations are used in the tables throughout the paper:

VS = verb-before-subject order (Inversion);
#wh = initial positioning of *wh* words (*Wh* Fronting);
YNQ = *yes/no* questions; and
WHQ = *wh* questions.

A priori, there seems to be as little reason to expect that these principles will hold for interlanguages as to expect that they will not. We might be led to expect these universals to hold for interlanguages by two considerations. First, if these particular universals seemed so essential to the proper functioning of a language that one could not imagine that any linguistic system could do without them, it would follow that they would have to be present in interlanguages as well. This, however, is just not so: at least on the face of it, there does not appear to be anything unnatural about Language Types D in Tables 1 and 2. Second, if interlanguages were in all other respects like primary languages, one would then expect interlanguages and primary languages to be structurally alike as well, and this structural similarity would, of course, have to extend to question structures. In actuality, however, interlanguages are in some ways similar to primary languages and in other ways different from them. On the one hand, interlanguages are used by human beings of the same physical and psychological limitations and endowments as primary languages and they serve the same basic communicative functions. On the other hand, the social and psychological status of interlanguages greatly differs from that of primary languages: the former are, in general, not supported by an extended speech community and thus exhibit greater structural variation and instability than do primary languages (cf. Tarone, 1979). In many cases the speaker of an interlanguage is aware of the "imperfections" of his or her speech and will try to change it in the direction of the

Table 1
Language Types Allowed and Disallowed by "Wh Fronting Implies Wh Inversion"

Type	Implicans VS	Implicatum #wh	Illustration	Languages
A	+	+	Whom can John see?	English, German
B	–	–	John can see whom?	Japanese, Korean
C	–	+	Whom John can see?	Finnish
*D	+	–	Can John see whom?	None[3]

Table 2
Language Types Allowed and Disallowed by "Yes/No Inversion Implies Wh Inversion"

Type	Implicans VS in YNQ	Implicatum VS in WHQ	Illustration	Languages
A	+	+	Can John see Mary? Who can John see?	English
B	–	–	John can see Mary? John can see whom?	Japanese
C	–	+	John can see Mary? Who can John see?	Lithuanian
*D	+	–	Can John see Mary? Who John can see?	None

target language. For this reason, an interlanguage speaker is likely to be much more conscious of the form of his or her language than the speakers of primary languages. Thus, given that there are a priori indications in both directions, the question of whether a structural comparison of interlanguages and primary languages will yield additional similarities or additional differences between the two types of systems is indeed an open one which can be answered only by an empirical investigation.

DATA COLLECTION

Our data were elicited from fourteen informants: six native speakers of Japanese, four of Korean, and four of Turkish. The informants, who ranged in age from 16 to 32 years, were all students in the English as a Second Language Program of the University of Wisconsin-Milwaukee. Their formal study of English averaged about 5-1/2 years and their stay in the United States averaged about six months at the time of the study. Because the data were elicited over a two- to ten-day period, we assume that they indicate a synchronic picture of the structure of each individual interlanguage.[4]

We chose Japanese-, Korean-, and Turkish-speaking subjects rather than speakers of German or French, because the former languages do not systematically exhibit either the implicantia or implicata of the two universals. Because what we were interested in seeing was whether these patterns would be induced to show up in the speech of our informants by the presence of their respective implicantia as predicted by the universals, we had to exclude the possibility of other factors—such as transfer—entering the picture that might be responsible for the acquisition of the implicata.

Although we elicited speech under a variety of circumstances, we will discuss here only that subset of our data which comes from a task designed to tap linguistic behavior that is maximally content-centered and minimally conscious of grammar. The task revolved around story squares. A story square is a series of related drawings that depict events and situations constituting a story (Knowles & Sasaki, 1980). The informant was asked to guess the story by posing questions about the pictures. In the beginning, only *yes/no* questions were allowed to be asked and then later questions of the more efficient type—that is, *Wh* questions. Each informant was tested on two story squares.

In this task the informant used his interlanguage as a communicative tool in pursuit of a goal—to come up with the story behind the pictures—rather than for purposes of completing a grammar exercise.[5] It is for this reason that we feel entitled to assume that the utterances elicited reflect a content-conscious, communicative language variety, and thus are underlain by the same type of unconscious knowledge as that in which primary language utterances most often are rooted. This interlanguage register seems to stand the best chance to reveal something about *acquired*, rather than *learned* knowledge (cf. Krashen, 1978, 1985) and is therefore more legitimately comparable with primary language data than the registers reflected when the interlanguage speaker performs more verbal tasks of a more mechanical kind.

DATA

Our raw data thus consisted of a set of taped questions. The tapes were subsequently transcribed and these transcriptions formed the basis of our analysis. The total number of *Wh* questions we obtained was 224, on the average, 16 for each of our 14 informants. The total number of *yes/no* questions elicited was 432, about 31 per informant.[6] A sample of the data is shown in (3) and (4).

(3) *Data on* yes/no *questions*

1. Did she finished two bottle wine?
2. Is Lou and Patty known each other?
3. Sue does drink orange juice?
4. Her parents are rich?
5. After she completed the bankrobbed, they arrest her or not?
6. Is this story is chronological in a order?
7. Does Joan has a husband?
8. Is Harry was working the same place?
9. Does Joan working in the restaurant?
10. Yesterday is Sue did drink two bottles of wine?

(4) *Data on* wh *questions*

1. Why Sue didn't look solution for her problem?
2. Where Sue is living?
3. Why did Sue stops drinking?
4. Why is Patty's going robbing the bank?
5. What they are radicals?
6. What Sue and Patty connection?
7. Which company is Lou working?
8. Why she was angry?
9. Why doesn't go in the Sue?
10. Why Jim to doing that?

Because the purpose of gathering these utterances was to be able to test the two typological correlations mentioned above, the general problem facing us was this: how could we bring these raw data to bear on the validity of the principles? In particular, we needed to be able to tie any given utterance to a construction, a construction to a general pattern, and a general pattern to an implicational universal.

The first problem we faced was simply determining for any utterance under what conditions it could be recognized as illustrating a given grammatical construction. For example, is the question *Did she finished two bottle wine?* an instance of verb-subject order or is it not? Specifically, we needed to be able to identify such concepts mentioned in the universals as *interrogative word question* (*Wh* question), *yes/no question*, *question word* (*Wh* pronoun), *subject, verb, sentence (-initial position)*, and *inversion*. Although some of these are readily identifiable, others—the last three—have alternative interpretations. Our decisions as to which interpretations to use are described in Appendix A.

Having decided how to analyze sentences in terms of the grammatical patterns mentioned in the universals, we sorted our raw data into two classes of utterances: those that did exemplify one or the other of the three basic order patterns that the universals made reference to and those that did not exemplify them. Tables 3 and 4 provide the counts as relevant for each universal.

Column 1 in both tables lists informants, with native languages given in parentheses (J=Japanese, K=Korean, T=Turkish). The order of informants follows the order of increasing percentages for the implicans. The last line in each table gives aggregate figures.

In Table 3, which has to do with the "*Wh* Inversion implies *Wh* Fronting" universal, Column 2 gives the total number of *Wh* questions obtained for each informant. Column 3 gives the number of those *Wh* questions in which the order verb-subject was manifest, with Column 4 providing the percentages that these numbers constitute of the total number of *Wh* questions obtained. Columns 5 and 6 give absolute numbers and percentages, respectively, for those *Wh* questions exhibiting initial *Wh* words.

In Table 4, Columns 2, 3, and 4 have to do with inversion in *yes/no* questions, and the remaining three columns refer to inversion in *Wh* questions. In each set of three columns, the first (2 and 5) gives the total number of questions obtained for that question type, the second (3 and 6) the number of those questions showing inversion, while the third (4 and 7) shows what percentage the inverted questions constitute within the total number of questions obtained in that type. Because both typological implications involve inversion in *Wh* questions—one as implicatum, the other as implicans—counts of this pattern appear in both tables: the values in Columns 2, 3, and 4 of Table 3 are identical to those in Columns 5, 6, and 7 in Table 4.

INTERPRETATION OF DATA

As noted in the previous section, two additional decisions needed to be made in the process of linking up data and generalizations. Because the two typological generalizations

Table 3
Utterance Counts for the Two Patterns of "Wh Inversion implies Wh Fronting"

1	2	3	4	5	6
	Total	VS in WHQ		*#wh* in WHQ	
Informant	WHQ	No.	%	No.	%
SM (K)	16	4	25	16	100
UA (T)	24	13	54	24	100
TS (J)	10	7	70	10	100
MK (K)	10	8	80	10	100
RO (J)	16	14	88	16	100
KO (J)	19	18	95	19	100
MH (J)	21	20	95	21	100
NE (T)	20	19	95	20	100
SI (J)	19	18	95	19	100
BG (T)	22	22	100	22	100
MA (T)	21	21	100	21	100
ST (J)	6	6	100	6	100
TM (K)	14	14	100	14	100
YK (J)	6	6	100	6	100
TOTAL	224	190	85	224	100

to be tested both mention *two grammatical patterns* that occur with some degree of systematicity and a particular *correlation* obtaining between them, our task involved the following steps:

A. Given a grammatical construction manifested in at least one utterance, under what conditions can it be said to reflect a *general pattern* of the interlanguage? For example, provided that the sentence *Did she finished two bottle wine?* is an instance of verb-subject order, what does it take to be able to declare this an instance of a general pattern of *yes/no* question formation in this informant's interlanguage?
B. Given two construction patterns, under what conditions can they be said to fulfill the *implication* claimed by the pertinent universal? For example, how exactly do we show that two constructions—such as subject-verb inversion in *yes/no* questions and subject-verb inversion in *Wh* questions—exhibit the occurrence pattern that is allowed by the "*Yes/No* Inversion implies *Wh* Inversion" universal as opposed to one that is disallowed by it?

Table 4
UtteranceCounts for the Two Patterns of "Yes/no Inversion implies Wh Inversion"

1	2	3	4	5	6	7
	Yes/no Questions			*Wh* Questions		
	Total	VS in YNQ		Total	VS in WHQ	
Informant	YNQ	No.	%	WHQ	No.	%
SM (K)	24	2	8	16	4	25
MK (K)	21	8	38	10	8	80
YK (J)	41	21	51	6	6	100
TS (J)	15	10	67	10	7	70
TM (K)	40	33	83	14	14	100
RO (J)	27	23	85	16	14	88
BG (T)	28	24	86	22	22	100
MA (T)	49	43	88	21	21	100
UA (T)	44	40	91	24	13	54
KO (J)	40	37	93	19	18	95
MH (J)	19	18	95	21	20	95
NE (T)	29	29	100	20	19	95
SI (J)	18	18	100	19	18	95
ST (J)	37	37	100	6	6	100
TOTAL	432	343	79	224	190	85

We will discuss our answers to Questions A and B in *Determining General Patterns* and *Testing Implicational Relations Among Patterns*, respectively.

DETERMINING GENERAL PATTERNS

The universals to be tested pertain to general grammatical patterns or rules, rather than to individual sentence patterns. The question arises, therefore, under which conditions a construction exemplified by a set of utterances can be said to manifest a *general pattern* (or rule) of the interlanguage of the informant.

The range of logical possibilities for setting up criteria for rule status is infinite. The most demanding criterion would be if we required that for a pattern to reflect a rule of the language, it would have to occur in *all* utterances where it could possibly occur. This would mean, for example, that for a language to have the rule of *Wh* Fronting, the *Wh* word would have to be initial in all utterances of all *Wh* questions. At the opposite end, the least stringent criterion would require that the pattern in question should occur in at least *one* utterance. Between the two is the criterion that for a pattern to be general enough to qualify to be a rule, it would have to be present in *some*—more than one but not necessarily all—utterances of the requisite type.

Given the well-known variability of linguistic behavior in general and of interlanguage performance in particular (cf. Tarone, 1979), one occurrence of a pattern cannot be taken to show systematicity—just as one violation of a pattern seems not to be of much significance. In general, the literature on first- and second-language acquisition has opted for a relatively high percentage of occurrence to determine whether a pattern exists: Brown, Cazden, and Bellugi (1973) use 90% on three successive occasions; Cancino, Rosansky, and Schumann (1975) and Irwin and Weston (1975) use an 80% figure; and Andersen (1978) uses percentages of 70, 80, and 90. The choice of any particular criterion will necessarily be arbitrary. We chose 90% in order to be relatively stringent as to what constitutes systematicity. Tables 5 and 6 give our results under the 90% criterion, as well as two alternative criteria for comparison. Plus (+) indicates the pattern in question has reached the percentage threshold, minus (–) says it has not.

In both tables, Column 1 gives the informants' names and native languages. Columns 2 and 6 in both tables repeat from Tables 3 and 4 the percentages at which the pattern in question appeared in the data. The remaining columns give alternative percentage criteria for rule status. The information on *Wh* Inversion is once again given in both tables: Columns 2–5 in Table 5 contain the same figures as do Columns 6–9 in Table 6.

TESTING IMPLICATIONAL RELATIONS AMONG PATTERNS

The next and final step in testing the typological implications involves comparing evidence on the pairs of patterns that the implications relate and deciding if each occurrence pattern is in conformity with the pertinent implication or not.

Let us examine Table 5 for conformity with the "*Wh* Inversion implies *Wh* Fronting" universal. A violation of this universal would be present if a given informant showed a "+" in Column 4 (90% criterion for inversion in *Wh* Questions) and a "–" in Column 8 (90% threshold for *Wh* Fronting). A configuration of "+" in Column 4 and "+" in Column 8 would be a confirming instance of the universal. The other two possible combinations of plusses and minuses in Columns 4 and 8, respectively ("– –" and "– +"), both of which involve the absence of the implicans, would not be taken to confirm, but would nevertheless be consistent with, the universal. Inspection of Table 5 reveals no violations at the 90% threshold. In fact, Table 5 shows a ceiling effect, because all informants fronted the *Wh* word 100% of the time. It follows from this ceiling effect that the "*Wh* Inversion implies *Wh* Fronting" universal holds true for our data at all percentage criteria.

Let us turn to Table 6 and examine the data for conformity with the "*Yes/No* Inversion implies *Wh* Inversion" universal. A violation of this universal would be present if a given informant

Table 5
The status of the two patterns of
"Wh Inversion implies Wh Fronting"

1	2	3	4	5	6	7	8	9
	VS		%		#*wh*		%	
Informant	in WHQ	100	90	80	(in WHQ)	100	90	80
SM (K)	25%	–	–	–	100%	+	+	+
UA (T)	54%	–	–	–	100%	+	+	+
TS (J)	70%	–	–	–	100%	+	+	+
MK (K)	80%	–	–	+	100%	+	+	+
RO (J)	88%	–	–	+	100%	+	+	+
KO (J)	95%	–	+	+	100%	+	+	+
MH (J)	95%	–	+	+	100%	+	+	+
NE (T)	95%	–	+	+	100%	+	+	+
SI (J)	95%	–	+	+	100%	+	+	+
G (T)	100%	+	+	+	100%	+	+	+
MA (T)	100%	+	+	+	100%	+	+	+
ST (J)	100%	+	+	+	100%	+	+	+
TM (K)	100%	+	+	+	100%	+	+	+
YK (J)	100%	+	+	+	100%	+	+	+
TOTAL	85%	–	–	+	100%	+	+	+

showed a "+" in Column 4 (90% threshold for *Yes/no* inversion) and a "–" in Column 8 (90% threshold for Inversion in *Wh* Questions). As before, all other possible combinations of plusses and minuses would be consistent with the universal. Inspection of the data at the 90% criterion reveals one case of a violation: informant UA, who at this criterion level is inferred to have inversion in *Yes/no* questions but not in *Wh* questions. At the 90% criterion level, all other informants are consistent with the "*Yes/no* Inversion implies *Wh* Inversion" universal. The same would be true at the 80% criterion.[7]

We conclude based on this evidence that both of the universals are upheld. The "*Wh* Inversion implies *Wh* Fronting" universal has no exceptions, and the "*Yes/no* Inversion implies *Wh* Inversion" universal holds, with one exception, namely, UA.

Table 6
The status of the two patterns of
"Yes/no Inversion implies Wh Inversion"

1	2	3	4	5	6	7	8	9
	VS		%		VS		%	
Informant	in YNQ	100	90	80	in WHQ	100	90	80
SM (K)	8%	–	–	–	25%	–	–	–
MK (K)	38%	–	–	–	80%	–	–	+
YK (J)	51%	–	–	–	100%	+	+	+
TS (J)	67%	–	–	–	70%	–	–	–
TM (K)	83%	–	–	+	100%	+	+	+
RO (J)	85%	–	–	+	88%	–	–	+
BG (T)	86%	–	–	+	100%	+	+	+
MA (T)	88%	–	–	+	100%	+	+	+
UA (T)	91%	–	+	+	54%	–	–	–
KO (J)	93%	–	+	+	95%	–	+	+
MH (J)	95%	–	+	+	95%	–	+	+
NE (T)	100%	+	+	+	95%	–	+	+
SI (J)	100%	+	+	+	95%	–	+	+
ST (J)	100%	+	+	+	100%	+	+	+
TOTAL	79%	–	–	+	85%	–	–	+

AN ALTERNATIVE INTERPRETATION OF THE UNIVERSALS

Because the choice of percentage criteria is arbitrary, but the universal we are testing is an empirical claim that is supposed to be either true or false, it seems unreasonable to us that the determination of its truth or falsity should ultimately be dependent on an arbitrarily chosen criterion for deciding whether a grammatical construction reflects a general pattern.

An additional, alternative method of assessing data against implicational universals exists, however, that will allow an escape from this bind. This method is based on a reinterpretation of typological implications as making quantitative predictions. Hawkins (1987, p. 464) points out that Jakobson's (1968) famous monograph on child language, aphasia, and phonological universals derived a quantitative prediction from implicational universals: If P then Q then the quantity of successful production instances of property Q in acquisition will be greater than or equal to the quantity for property P. Our formulation of this idea is stated below, cast as an explicit reformulation and reinterpretation of the typological universals with which we are concerned:

(5) "Wh *Inversion implies* Wh *Fronting*" *restated*
"The relative frequency of occurrence of subject-verb inversion in *Wh* questions is never larger than the relative frequency of occurrence of the fronting of the *Wh* word".

(6) "Yes/No *Inversion implies* Wh *Inversion*" *restated*
"The relative frequency of occurrence of subject-verb inversion in *yes/no* questions is never larger than the relative frequency of occurrence of subject-verb inversion in *Wh* questions."

The advantage of this approach is that it eliminates arbitrary decisions as to thresholds for determining the presence or absence of a grammatical pattern or rule in a language. Instead of worrying about absolute existence criteria, all that is necessary is to compare the percentages at which the two constructions mentioned in the implication occur and declare the implication to hold if the implicatum's percentage is at least as high as that of the implicans. In other words, rather than requiring that the implicatum be *present* whenever the implicans is, we require that the implicatum *occur at least to the extent* the implicans does.[8]

With the range of arbitrary choices eliminated, we are now provided with a single answer to whether or not a given

language system conforms to a typological implication. A further and more significant advantage of this approach, which we will call the Relative Existence Interpretation (REI), is that the claims it makes are stronger than the more traditional, absolute approach that we took in *Determining General Patterns* and *Testing Implicational Relations Among Patterns*, which we call the Absolute Existence Interpretation (AEI). Specifically, the REI entails the AEI but not vice versa. Every time a typological implication is declared to hold by the REI, it is also judged to hold by the AEI, but not vice versa: there are situations that are consistent with a typological implication if taken under the AEI but which violate it under the REI. This is because the REI will show an interlanguage to violate a typological implication every time the implicans' frequency of occurrence is greater than that of the implicatum, whereas the AEI rules out only a subset of such cases: those in which the frequency figure of the implicans happens to fall above the existence criterion adopted while the implicatum's frequency figure falls below it. See Appendix B for a detailed illustration of this point. (In an argument similar to the one we put forth in Appendix B, Hawkins (1987, p. 464) demonstrates that the quantitative prediction of a universal logically implies the order-of-acquisition prediction of the universal.) In Tables 7 and 8 we indicate the evaluations of the two implicational universals by both methods.

The two tables have the same format. Column 1 in both tables lists the informants together with their native languages. Columns 2 and 3 repeat the percentages at which a given pattern occurred. Column 4 evaluates each typological implication by the AEI method using the 90% criterion. Column 5 evaluates the typological implication at issue by the REI. Existence decisions for each pattern are given in parentheses; Y and N indicate whether or not the typological implication holds by that method.

The net results of the evaluation are summarized in (7).

Table 7
Evaluation of "Wh Inversion implies Wh Fronting"

1 Informant	2 VS	3 #wh (in WHQ)	4 AEI (90%)	5 REI
SM (K)	25%	100%	(– +)Y	Y
UA (T)	54%	100%	(– +)Y	Y
TS (J)	70%	100%	(– +)Y	Y
MK (K)	80%	100%	(– +)Y	Y
RO (J)	88%	100%	(– +)Y	Y
KO (J)	95%	100%	(+ +)Y	Y
MH (J)	95%	100%	(+ +)Y	Y
NE (T)	95%	100%	(+ +)Y	Y
SI (J)	95%	100%	(+ +)Y	Y
BG (T)	100%	100%	(+ +)Y	Y
MA (T)	100%	100%	(+ +)Y	Y
ST (J)	100%	100%	(+ +)Y	Y
TM (K)	100%	100%	(+ +)Y	Y
YK (J)	100%	100%	(+ +)Y	Y
TOTAL	85%	100%	(– +)Y	Y

(7) Summary evaluation of the two universals

	AEI (90%)	REI
"Wh *Inversion implies* Wh *Fronting*"		
Number of confirming/consistent cases	14	14
Number of disconfirming cases	0	0
"Yes/No *Inversion implies* Wh *Inversion*"		
Number of confirming/consistent cases	13	11
Number of disconfirming cases	1	3

We conclude from this that under the REI, as under the AEI, the second of the two implications holds in the majority of our individual interlanguages and the first holds without exception.

Table 8
Evaluation of "Yes/No Inversion Implies Wh Inversion"

1 Informant	2 VS (YNQ)	3 VS (WHQ)	4 AEI (90%)	5 REI
SM (K)	8%	25%	(– –)Y	Y
MK (K)	38%	80%	(– –)Y	Y
YK (J)	51%	100%	(– +)Y	Y
TS (J)	67%	70%	(– –)Y	Y
TM (K)	83%	100%	(– +)Y	Y
RO (J)	85%	88%	(– –)Y	Y
BG (T)	86%	100%	(– +)Y	Y
MA (T)	88%	100%	(– +)Y	Y
UA (T)	91%	54%	(+ –)N	N
KO (J)	93%	95%	(+ +)Y	Y
MH (J)	95%	95%	(+ +)Y	Y
NE (T)	100%	95%	(+ +)Y	N
SI (J)	100%	95%	(+ +)Y	N
ST (J)	100%	100%	(+ +)Y	Y
TOTAL	79%	85%	(– –)Y	Y

EXCEPTIONS

How much weight should we attach to the exceptions we found to the "*Yes/No* Inversion implies *Wh* Inversion" universal? There are two points to be made here. The first is to note that two of the three exceptions to the universal under the REI interpretation are the informants NE and SI, both of whom achieved 100% on inversion in *yes/no* questions and 95% on inversion in *Wh* questions. The 95% figure for NE corresponds to 19 inversions of 20 possible inversions, and for SI it corresponds to 18 inversions of 19 possible inversions; that is, for each, the difference is only one token. As we noted before in our rejection of the 100% criterion under the AEI interpretation, a difference of one data item is not, in our view, significant.

Hence, we do not view NE or SI as constituting true disconfirming cases. In contrast, the third exception is UA again, whose frequency of inversion in *Wh* questions (54%) is far below that in *yes/no* questions (91%). Therefore, of the three apparent exceptions to the REI interpretation of the "*Yes/No* Inversion implies *Wh* Inversion" universal, only one (UA) is of any significance.

The second point concerns the validity of our interpretation of the test. Whereas by our logic there is now only one exception to the "*Yes/No* Inversion implies *Wh* Inversion" universal, we must consider a possible factor that might have influenced our results, and that might require placing greater weight on exceptions than we might otherwise. One might argue that the experimental conditions under which we elicited the data were biased in favor of the universal. In other words, one might argue that behind the one significant exception that we found there is a more pronounced trend against the universal which would have surfaced, in the form of more exceptions, in the context of a different kind of elicitation procedure. The bias in question would have come from the fact that in the course of the task our informants faced—having to guess a story based on pictures—it was pragmatically quite appropriate by the standards of English to ask *yes/no* questions of the confirmation-seeking type, which may be uninverted in English (cf. "The waitress was Harry's lover?" pronounced with rising intonation). This fact could have depressed the frequency of inversion in *yes/no* questions. Because, according to the universal, *yes/no* questions are the less preferred context for inversion to take place, one might suspect that the experimental conditions helped the universal to prevail. Had the setup excluded the possibility of subjects producing confirmation-seeking questions, more inverted *yes/no* questions would have been produced and thus a less clear preference for inversion in *wh*-questions would have been evident. Had this been the case, the universal would have fared worse than it did.

In light of this consideration, we decided to test four native speakers of English using the same elicitation procedure to determine whether this pragmatic factor might have played a role in the interlanguage speakers' responses. Our reasoning was this: if we found native speakers of English to invert in *yes/no* questions significantly more than the interlanguage speakers did, lack of inversion in the interlanguage data would not be attributable purely to pragmatic conditions and thus the experimental setup would not be deemed responsible for biasing the results. If, however, we found native speakers to invert *less than or in the same amount* as the interlanguage speakers, then the lack of inversion in the interlanguage data could be ascribed (at least in part) to pragmatic conditions and the claim could be made that the experimental conditions depressed the frequency of occurrence of inversion in *yes/no* questions and thus biased the outcome of the test of the universal.

The chart in (8) shows the percentage of native speaker inversion in the *yes/no* questions and in the *Wh* questions. Considering the aggregate data, we see that 91% of the native speakers' *yes/no* questions were inverted. Table 4 shows that 79% of the interlanguage speakers' *yes/no* questions overall were inverted. The ranges of inversion of the two sets of speakers also differ: for native speakers, the range of inversion is 80–100%, while for the interlanguage speakers the range shown in Table 4 is 8–100%.

These data reveal that the native speakers did invert in *yes/no* questions significantly more than did the interlanguage (IL) speakers. Either the IL speakers have a syntactic rule of inversion in *yes/no* questions which is different in some way from that of native speakers, or they have a different (more permissive) pragmatic rule for the use of noninverted questions than do native speakers. Whichever is the case, the fact is that the IL speakers inverted less frequently than did the native speakers. Hence, by our reasoning above, we conclude that the experimental conditions did not bias the outcome in favor of the universal. Thus, all in all, we may be justified in taking our results simply at face value.

(8) Native speaker data on inversion in *yes/no* questions

Informant	YNQ	VS in YNQ	% of VS in YNQ
MD	15	12	80
SG	25	25	100
JJ	25	24	96
WM	39	34	90
TOTAL	104	95	91

We conclude, therefore, that under the Relative Existence Interpretation, the two universals are upheld by our interlanguage data. We note that the "*Yes/No* Inversion implies *Wh* Inversion" universal has one exception (UA). Because the REI entails the AEI, we conclude also, and with greater confidence than in the previous section, that our data uphold the Absolute Existence Interpretation of the two universals; however, we have so far no explanation for the one exception to the "*Yes/No* Inversion implies *Wh* Inversion" universal.

EXPLAINING THE DATA

Having concluded in the previous section that the two universals in question hold in general for our interlanguage data, let us now take up the matter of why this is the case. In particular, we wish to raise two questions with respect to our findings: (1) Why do our data generally conform to the universals tested? and (2) Why is there one significant exception?

Let us begin with the former. It is of course possible our results are caused by flaws in our methodology. We tested the universals against a relatively small set of subjects, and we obtained from each a relatively small sampling of sentences. With further testing, it may emerge that there are more exceptions to the universals. In addition to this, it is possible that our results may be flawed by a ceiling effect: we may have

chosen subjects whose proficiency level in English was too high to enable an adequate test of the universals. If this were true, it would most likely be the case with the "*Wh* Inversion implies *Wh* Fronting" universal, in which all of our subjects fronted 100% of their *wh*-words. The literature is of no help here because we do not know of other studies that looked at the acquisition order of *Wh* Inversion and *Wh* Fronting.

Because we have no clear evidence that our methods were unsound, let us therefore assume that they are valid, and consider once again the first question, which is why our results generally conform to the universals tested. Perhaps the most straightforward way to answer this question is to hypothesize that it is simply in the nature of things for our results to be this way. What we observed is a specific instance of the more general phenomenon that all human languages, interlanguages included, obey a set of universal constraints. If one takes this position, then one would expect that any universal generalization tested against interlanguage data would be supported by those data, and that no interlanguage will violate any primary-language universal. This expectation can be stated explicitly in the form of the following hypothesis. (See Hawkins, 1987, for a similar hypothesis)

(9) *Interlanguage Structural Conformity Hypothesis (Interlanguage SCH).* All universals that are true for primary languages are also true for interlanguages.

Our conclusions are consistent with this hypothesis. Because the Interlanguage SCH is but an instantiation of the more general idea that primary language universals are true of *all forms of nonprimary languages*, which we might call the General Structural Conformity Hypothesis (General SCH), then, to the extent that that Interlanguage SCH is true we have a little bit of evidence also for the General SCH.[9]

This brings us to the second question: Why, if universals hold, in general, for interlanguages, should the "*Yes/No* Inversion implies *Wh* Inversion" universal have one exception?

As noted before, to our way of thinking, UA is the only exception to the universal among our 14 subjects, and the only counter example to the Interlanguage SCH. While we have no explanation for why UA's interlanguage was exceptional, we would, nevertheless, like to suggest that it is at least plausible that he performed the way he did.

Our suggestion is that the relative amount of effort that is presumably required to produce or process a *yes/no* question in English is less than that required for a *Wh* question. Assuming that base forms from which *Wh* questions and *yes/no* questions are derived resemble the skeletal propositional structures of the question types, then in the formulation of the *Wh* question, two syntactic steps must be taken—fronting the *Wh* constituent and inverting the subject and verb—whereas in the formulation of the yes/no question, only one syntactic step must be taken, namely, inverting the subject and verb. Hence, from a production/processing viewpoint, *Wh* questions should be more difficult than are *yes/no* questions because they require more of the learner. If this reasoning is sound, then it would be expected that if there were an exception to a universal generalization in some interlanguage, it would be in the direction of the learner having greater success on less complex structures as opposed to more complex structures.

The foregoing suggested reason for exceptions to the "*Yes/No* Inversion implies *Wh* Inversion" universal cannot by itself account for all our data. This is because if only this processing principle (that learners learn first or do better on less complex structures and learn later or do worse on more complex structures) is at work, then, on our analysis of the complexity of these structures, we would expect *no* compliance with the universal at all. But our results show general compliance with the universal. Furthermore, even if the processing claim is seen as true but limited by the principle embodied in the Interlanguage SCH, an interaction that would correctly predict general compliance with the universal, we would still expect more exceptions to the universal than just one. Therefore, we do not have a true explanation for why we have only the one exception (UA) to the universal.

CONCLUSION

The focus of this study was the testing of two implicational universals against interlanguage evidence. We may conclude that, construed as claims about relative frequency, one of the two universals is fully borne out by our data, and the preponderance of our evidence supports the other. Thus, our findings are generally consistent with the Interlanguage Structural Conformity Hypothesis as stated in (9).

In closing we wish to draw attention to the conceptual problems surrounding the testing of language universals. At the core of the difficulty stood the fact that traditionally stated implicational universals, when referring to a language *having* one construction also *having* another, presuppose criteria for existence of a pattern, whose criteria, however, remain unstated.

We see two possible solutions to this seemingly "only methodological" but actually truly substantive problem. One solution might be to attempt to establish a frequency percentage criterion for what it takes for a language to have a systematic pattern or rule. Statistical studies on the relative frequencies with which native speakers use various constructions may eventually yield a reasonable frequency threshold by which to define the presence of a rule in a language. The other solution would be to state implicational universals differently: namely, to look for correlations in relative frequencies, rather than correlations of presence and absence, of grammatical patterns.

It should be clear that our problems with testing implicational universals were somewhat aggravated by, but not crucially related to, the fact that the linguistic systems involved were interlanguages. The same problems would arise in testing universals in other secondary forms of language—such

as child language or pathological speech—and also in testing them in primary forms of language. Our lesson therefore extends beyond the domain of interlanguage research. If linguists are to continue to make statements about patterns existing in languages—as is done in descriptive studies—and to presuppose the existence of rules by claiming correlations of grammatical patterns, or rules across languages—as is done in typological work—the establishment of criteria for rule status is a *sine qua non*. If, on the other hand, there is no nonarbitrary threshold for establishing what it takes for a pattern to be systematic enough to amount to a rule, we need to abandon unqualified reference to the existence of rules and resort to statistical and relative concepts of existence.

NOTES

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[2]Greenberg does not explicitly refer to inversion in *wh* questions to the exclusion of inversion in *yes/no* questions or inversion in other question types, but the discussion he appends to this universal makes the intent clear.

[3]Ultan (1978) lists Khasi as a Type D language. However, based on Roberts (1891) and Rabel (1961), we have concluded that Khasi is either Type B or Type C because there is no inversion in either question type and the *wh* word's initial position is optional.

[4]The data discussed in this paper constitute part of a larger set. In addition to one-time data relevant to the two syntactic universals, we have also elicited longitudinal data on interrogative structures, as well as phonological data—both one-time and longitudinal—for the testing of three typological implications in phonology having to do with consonant clusters. The results of the phonology project were reported in presentations at the Winter Meeting of the American Linguistics Association in December 1983 and in Stockholm, Sweden, in the winter of 1986.

[5]The interview sessions took place in a room in which the informant and investigator sat in comfortable office chairs placed around a low coffee table. During the session, the informant wore a neck-suspended microphone; the audio-recording equipment, connected with a Crown D60 tape deck, was in an adjacent room. The atmosphere in the interview room was moderately informal.

[6]Although we were aiming at obtaining a minimum of 10 *yes/no* and 10 *wh* questions for each of the two story squares, we did not always manage to elicit this many of each type. In some cases, informants guessed the complete story on the basis of fewer than ten queries in each category. Also, informants did not always act according to our instructions in that they formulated *yes/no* questions when the instructions called for *wh* questions and vice versa.

[7]Note that at the 100% level, which we rejected as unreasonably stringent because of the variable character of acquisition data, the "*Yes/No* Inversion implies *Wh* Inversion" universal has two more violations, by informants NE and SI.

[8]On the idea that the implicans-implicatum relationship in a typological generalization is correlated with frequency, see also Zipf (1965), Greenberg (1976), and Schwartz (1980) and Hawkins (1987).

[9]There is some evidence from first language acquisition that bears on the General SCH with respect to these universals. While the "*Wh* Inversion implies *Wh* Fronting" universal seems to hold for child language, evidence on inversion in the two kinds of questions appears to be mixed (Klee 1985). Children's preference for inversion in *yes/no* questions over *wh* questions has been reported by Klima and Bellugi (1966) while examples of the opposite preference have been noted in Erreich 1984. However, given the difference of criteria used in these studies for establishing the presence of a structure in a linguistic system, it is not clear that the results are indeed contradictory.

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APPENDIX A

DECISIONS ON IDENTIFICATIONS OF GRAMMATICAL CATEGORIES

To be able to decide whether a given sentence does or does not exemplify some grammatical pattern, we needed to know how to identify the grammatical categories and relations that figure prominently in our typological generalizations. Specifically, we needed to be able to identify such concepts mentioned

or implied in the Greenberg (1963) universals as *interrogative word question* (*wh* question), *yes/no question*, *question word* (*wh* pronoun), *subject*, *verb*, *sentence(-initial position)*, and *inversion*. Although, as mentioned in the text, the identification of some of these terms presented no problems, in three instances—the last three mentioned—there were alternatives from which to choose.

a. *verb:* Should the term *verb* be taken to refer to main verbs—whether inflected or not—or to verbally inflected constituents—whether main verbs or auxiliaries? Our data exemplified both patterns. In an utterance such as *Did she finished two bottle wine?*, only the auxiliary is inverted with the subject; in a sentence such as *What is reading Mary now?*, the main verb is inverted as well. We decided that both patterns would be taken to exemplify verb-subject order. The basic reason for this decision was the desire to render the two typological statements maximally predictive. If we interpreted subject-verb inversion to apply to main verbs only, the "*Wh* Inversion implies *Wh* Fronting" universal could be used to explain the occurrence of *Wh* Fronting in languages like German where inversion involves the main verb (e.g., *Wen siehst du?* "whom see-2nd-pers you" "Whom do you see?") but it could not be used to explain the corresponding fact about English because in this language, in which the auxiliary, rather than the main verb, is inverted, the implicans would not obtain. If, on the other hand, we had gone the opposite way, the case of English would have been explained by the universal, but German would have been left out.

It should also be noted that because *What is reading Mary now?*-type sentences (where the whole verbal phrase is inverted, rather than just the auxiliary) are ungrammatical in English did not prevent us from scoring such sentences as exemplifying subject-verb inversion. We did not require that interlanguages comply with the universals on the specific terms on which English happens to comply with them. All we required was that they comply with them in some way. This decision is consistent with Bley-Vroman's warning (1983)

Table A-1
Comparison of Absolute and Relative Existence Interpretations

Frequency Figures		Evaluations	
Implicans	Implicatum	AEI (90%)	REI
88%	88%		
"	89%		
	90%		
"	91%		
89%	88%		*
"	89%		
"	90%		
"	91%		
90%	88%	*	*
"	89%	*	*
"	90%		
"	91%		
91%	88%	*	*
"	89%	*	*
"	90%		*
"	91%		

against analyzing interlanguages from the target language's angle, rather than on their own terms.

b. *sentence(-initial position):* Greenberg's statement talks about initial position; we took this to refer to sentence-initiality. The question that now arises is this: in an utterance like *Yesterday, who did you see?*, is the question word sentence-initial or not? Our decision was to interpret the notion *sentence* as referring to the core part of an utterance, with loosely joined adverbial phrases such as *yesterday* in the above sentence discounted. Thus, we did consider the question word fronted in examples of the above type.

c. *inversion:* Strictly speaking, the term *inversion* per-

tains to the availability of two order patterns in a linguistic system: one the *basic* one and the other *changed* from the former. Our problem was whether we should indeed interpret the presence of inversion in a language in this literal sense or whether it could simply mean the existence of a verb-before-subject rule regardless of whether the order subject-before-verb also occurs in the language. Because in the languages on which Greenberg based his statements and that we were familiar with, the former, literal interpretation of the term applies, that was what we required for our interlanguages. To carry through on this decision, we needed to have available information on declarative order in our informants' interlanguage. Thus, following the task in the course of which the informant had to guess the story depicted in the story squares, the informant was asked to summarize the story. These summaries, which necessarily contained declarative sentences, provided comparative data to complement the questions elicited, so that we could establish verb-subject order in questions contrasting with subject-verb order in statements.

APPENDIX B

COMPARING THE ABSOLUTE AND RELATIVE EXISTENCE INTERPRETATION

That the Relative Existence Interpretation (REI) entails the Absolute Existence Interpretation (AEI) is exemplified in Table 9. This table represents a hypothetical case in which the existence criterion assumed under the AEI is 90% and in which the frequency figures for implicans and implicatum range between 88 and 91%. The asterisk marks cases in which a typological universal is violated.

For the AEI to rule out a situation, it is necessary that the implicans has and the implicatum has not reached the existence threshold, which for illustration is 90% here. This is so

in four cases: when the implicans is at 90% or more and when the implicatum is at 89% or less:

implicans	implicatum
91%	89%
91%	88%
90%	89%
90%	88%

Both the AEI and the REI rule out these four cases. The REI, but not the AEI, rules out two additional cases: the 89%–88% and the 91%–90% situations. The 89%–88% case is allowed by the AEI: because neither implicans nor the implicatum has reached the existence criterion and a "minus-minus" pattern is allowed by the typological implication. The 91%–90% is also legitimate by the AEI: both implicans and implicatum have reached the criterion of existence and, once this is the case, the AEI does not care which of the two is more frequent. The REI, however, cares about relative frequency on all frequency levels and thus it rules out the 89%–88% and 91%–90% cases.

Although for illustrative purposes in this instance the existence criterion for the AEI was set at 90%, the same reasoning holds for any arbitrarily chosen existence criterion. Thus, all cases that are ruled out by the AEI are ruled out by the REI. In addition, there are some cases ruled out by the REI that are not ruled out by the AEI. This means that in all cases in which the REI is true, the AEI will be true also, but not vice versa. Therefore, the REI entails the AEI but not vice versa.