THE UNIVERSAL CONSISTENCY HYPOTHESIS AND THE PREDICTION OF WORD ORDER ACQUISITION STAGES IN THE SPEECH OF BILINGUAL CHILDREN

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Quechua-speaking children in Peru speak Spanish with variable word order in the VP and the NP; the alternative patterns stem from Quechua and Spanish. The younger the child, the more predominant are the V-final and N-final phrases, as in Quechua. Here we investigate whether the newly acquired Spanish V-medial clause and N-initial phrase patterns are learned in a sequence predicted by a theory of linguistic change. Several plausible alternatives that are consistent with the Trigger-Chain Theory or Universal Violation Hypothesis, and with the Universal Consistency Hypothesis (UCH) of Hawkins 1979, were checked against recorded speech by Peruvian bilingual children of three different ages. Our quantitative analysis strongly supports the UCH—in particular, Hawkins' Universals I and III. These predict that the V-medial clause pattern emerges before the postnominal genitive, and this in turn precedes the use of the postnominal adjective. Our data also justify strengthening two of the principles in the UCH.*

Quechua-speaking children in Peru impose the syntax of their native language on their Spanish speech—in particular, its word order. Typologically, Quechua is a postpositional non-rigid V-final language, while Spanish is a prepositional V-medial language (cf. Greenberg 1966). Their fusion in the speech of the Peruvian bilingual child gives rise to an unusual variety which preserves the Quechua word order, but adopts prepositions (cf. Escobar 1978, Cerrón-Palomino 1972, Minaya & Luján 1979, and Luján et al. 1981, 1983).

To acquire the educated Spanish norm, the child needs to make major word order adjustments, involving the positions of the main verb and of the head noun in their phrasal units. In this study we investigate whether there is a consistent order for these adjustments, and whether it is constrained by a theory of linguistic change. That is, does the child first learn to place the verb before its complements, or the noun before its modifiers? Or are these changes acquired simultaneously? Alternatively, are the modifications randomly distributed across individuals?

To answer these questions, we construct several hypotheses that are consistent with two current opposing theories of linguistic change: the Trigger-Chain Theory (Lehmann 1971, 1973) and the Universal Consistency Hypothesis (UCH; Hawkins 1979). These hypotheses are tested against data consisting of recorded speech by 5, 7, and 9 year old Peruvian bilingual children. We find that the percentage of occurrence of relevant word orders indicates that the

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child first acquires the target order in the VP, and then that in the NP. The sequence selected by the quantitative analysis is predicted by the UCH, and offers no support for the Trigger-Chain Theory.

1. **PERUVIAN BILINGUAL CHILDREN'S SPANISH.** In the early Spanish usage of Quechua-speaking children in Peru, clause and phrasal order like that of Quechua shows high frequency. By contrast with the educated norm, which has the word order characteristics of standard Spanish,¹ the main verb is often placed finally in the clause, following its modifiers and objects, while the head noun is characteristically preceded by its modifiers. These features have been extensively reported for both adults and children whose native language is Quechua, in their initial phase of learning Spanish. Escobar distinguishes what he calls 'bilingües incipientes' (beginning bilinguals); and Cerrón-Palomino 1976a, 1980 points out similar facts in relation to 'castellano andino' (Andean Castilian), i.e. the Spanish—heavily influenced by the Quechua language—which is spoken by bilingual highlanders (cf. Mendoza & Minaya 1975, Minaya 1976, 1978, Minaya & Luján 1979, Miranda 1978).

We thus assume an early stage (ES) of Andean Spanish as spoken by Peruvian speakers whose native language is Quechua. The main features that are typologically relevant are as shown in Table 1, side by side with those of Quechua and standard Spanish.²

<table>
<thead>
<tr>
<th>Quechua</th>
<th>Early Stage</th>
<th>Standard Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>SOV</td>
<td>SVO</td>
</tr>
<tr>
<td>POST</td>
<td>PREP</td>
<td>PREP</td>
</tr>
<tr>
<td>GN</td>
<td>GN</td>
<td>NG</td>
</tr>
<tr>
<td>AN</td>
<td>AN</td>
<td>NA</td>
</tr>
</tbody>
</table>

Table 1.

Table 1 shows the clause and phrase orders that are considered basic (and typologically relevant), i.e., the pervasive and most neutral word-order. Since neither Quechua nor Spanish is rigid in its clause word order, each has additional non-basic variant patterns. Quechua allows OSV, OVS, and SVO (cf. Parker 1965, 1976, Cerrón-Palomino 1976b, 1980, Soto-Ruiz 1976; see also Greenberg’s Appendix I), while Spanish is known to have VSO, VOS, and OVS as variants for the clause, and the alternate pattern AN for the adjective (Gili y Gaya 1961, Ramsey 1956; cf. also Greenberg’s Appendix II). Following Greenberg’s criteria, we assume SVO, SVOV, and NG to be variant patterns for the ES.³

The comparison made explicit in Table 1 strongly suggests that the basic

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¹ The educated Peruvian norm is quite different from standard Spanish in other respects, such as agreement rules and the use of anaphoric pronouns (cf. Pozzi-Escot 1972).

² The following abbreviations are used: S = subject; V = verb; O = object; Po/Post = postposition; Pr/Prep = preposition; G/Gen = genitive; A/Adj = adjective.

³ We will not consider NA a variant for the adjective in the ES, since the pattern is quite rare then. Other remarkable grammatical differences between that stage and subsequent varieties (including the educated norm) are not reflected in its typological classification. Foremost are the total lack of gender, number, and person agreement; the frequent omission of articles and other NP specifiers; object omission to signal an anaphoric object; the omission or over-use of prepositions; and the use of duplicate clitic pronouns.
word-order features of the ES are borrowed from Quechua, a notable exception being the type of adposition. Minaya & Luján 1979 attempts to account for this disparity by arguing that Quechua word order is transferred in toto, but that the child is operating with a knowledge of the affix/word distinction. Word order is thus copied at the relevant level, namely that of the word unit. Prepositions (as well as articles and other specifiers) must constitute an exception to the massive word-order transfer, simply because they correspond to Quechua postpositions, which are not words but inflectional suffixes. Children often delete prepositions (articles and other specifiers, over-use them, or use a non-standard lexical choice; but they never misplace them. The assumption that language learners are able to distinguish affixes from words strongly predicts that they will not borrow postpositional suffixes along with other word order features into a prepositional language, but it allows them to borrow prepositions together with other word order characteristics into an originally postpositional language.4

The utterances below illustrate the basic patterns of the ES, with objects preceding their verbs, and genitives and adjectives preceding the noun they modify:5

(1) O V
  Su nariz se agarra.
  her nose REFLECTIVE she-grabs
  ‘She grabs her nose.’ (H 2:3)

(2) O V
  Volantín antes hacían.
  somersault before they-did
  ‘They used to do somersaults.’ (C 49:80)

(3) GEN N
  de mi tía Rosalinda su hijito
  of my aunt her little-son
  ‘my aunt Rosalinda’s little son’ (A 68:111)

(4) GEN N
  de una señora su frazada
  of a woman her blanket
  ‘a woman’s blanket’ (H 16:24)

(5) ADJ N
  tu chiquito oveja
  your small sheep
  ‘your small sheep’ (P 22:31)

(6) ADJ N
  todo frío agua
  all cold water
  ‘all cold water’ (A 63:102)

4 The latter consequence seems confirmed by the numerous Mexican indigenous languages which have borrowed Spanish prepositions along with other word order features (cf. Huasteca NahuaI and Mixteca Nahual, in Langacker 1979).

5 Information in parentheses refers to region, consultant, and tape numbers. The regions are Ayacucho (A), Cuzco (C), Huara (H), and Puno (P).
Clearly, the ES differs typologically from standard Spanish in two main respects: the position of the main verb in a clause, and that of the head noun in relation to its modifiers. The attributive adjective is almost never placed post-nominally—the typical position of restrictive adjectives in the standard norm. Rather, it obeys the Quechua pattern, preceding the head N.

Standard Spanish is often described as being a free word-order language, since major sentence constituents may appear in several different sequences. However, ES word orders for the clause and the genitive are not among those used in the standard language; i.e., neither preverbal nominal objects and modifiers, nor prenominal genitives, occur in the standard language, although the V-final pattern occurs as a minority variant in the Peruvian educated norm. In addition, the prenominal adjective is used as a variant pattern for appositive and emphatically stressed restrictive adjectives; but it is not used for neutral restrictive adjectives, which normally occur in postnominal position in standard Spanish (cf. Luján 1980) as well as in the Peruvian educated norm. Given the differences indicated, bilingual children at the ES must make three major word-order modifications in their speech when they learn the educated norm taught in the schools: SOV > SVO, GN > NG, and AN > NA.6

In the acquisition process, the bilingual children’s Spanish goes through an extended intermediate stage, spanning four or five years, which is characterized by variation among orderings (such as SOV/SVO, GN/NG, and AN/NA), and by the occurrence of duplicate verbs in a hybrid pattern VOV (Mendoza & Minaya 1975, Minaya 1976, 1978, Minaya & Luján 1979).7 In this second phase, the predominant patterns at the different succeeding ages are not immediately apparent; i.e., it is undecidable which VP and NP orders are the basic ones when the speech of all children is considered. The extended intermediate stage acts then as a transition between the ES and standard Spanish, and presents the features shown in Table 2.

<table>
<thead>
<tr>
<th>Early Stage</th>
<th>Intermediate Stage</th>
<th>Standard Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>SOV/SVO</td>
<td>SVO</td>
</tr>
<tr>
<td>PREP</td>
<td>PREP</td>
<td>PREP</td>
</tr>
<tr>
<td>GN</td>
<td>GN/NG</td>
<td>NG</td>
</tr>
<tr>
<td>AN</td>
<td>AN/NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Table 2.

Examples of SVO clauses, postnominal genitives, and the less frequent postnominal adjectives—all of which gain dominance in the transitional period—are illustrated by the following utterances:

(7) V N GEN

*Murió su primo de mi mamá.*
died her cousin of my mom
‘My mother’s cousin died.’ (C 58:94)

6 SOV > SVO here refers to (basic) types, not to actual occurrence of such clauses. Subjectless sentences are allowed in both Quechua and Spanish; thus a more accurate description of the change in the primary data would be OV > V0.

7 See Minaya & Luján 1982a,b for a grammatical account of the VOV pattern.
The bilingual child also utters sentences with duplicate verbs:

(8)  
\[
\text{Sus bultos de la señora carga el tauca.}
\]
her bundles of the lady carries the porter

‘The porter carried the lady’s bundles.’ (P 30:46)

(9)  
\[
\text{Ahí están casitas chiquitas ahí.}
\]
there are houses small there

‘There are the small houses.’ (A 77:123)

(10)  
\[
\text{Ahí el patito chiquito está}
\]
there the ducky little is

‘The little duck is there.’ (A 63:102)

The bilingual child also utters sentences with duplicate verbs:

(11)  
\[
\text{Conozco a los cabritos conozco.}
\]
I-know ACC the little-goats I-know

‘I know the little goats.’ (C 49:80)

(12)  
\[
\text{Había como una carretita había.}
\]
was like a little-cart was

‘There was like a small cart.’ (P 30:46)

An undifferentiated intermediate stage, as defined in Table 2, poses the question of whether the major changes involving the position of the main verb, the genitive, and the attributive adjective are acquired simultaneously or sequentially. In what follows, we investigate this question in the light of two current opposing theories of linguistic change, using a multiple regression analysis of sociolinguistic data.

2. Theories of Linguistic Change. Two pertinent theories have been proposed to account for linguistic change—specifically, for how it proceeds. One is the Trigger-Chain Theory advocated by Lehmann 1971, 1973 and by Vennemann 1974, 1975. This theory, which may also be called the Universal Violation Hypothesis (UVH; Hawkins 1979), holds that linguistic change must spring from an initial violation of a synchronic universal. This violation in turn triggers subsequent changes in order to restore consistency with the putative universals.

An alternative view is the UCH of Hawkins 1979. This claims that linguistic change must take place within the bounds imposed by synchronic universals, thereby excluding violations of them at any stage in the evolution of a language. The UCH was originally formulated on the basis of eight universal statements involving typological features like those of Greenberg. They all pertain to operator/operator orders, including the type of adposition a language has (preposition vs. postposition), the position of direct objects and subjects in relation to their V, and the position of the genitive and the attributive adjective with respect to their head N. These universals are hypothesized on the basis of
synchronously attested languages taken from Greenberg’s Appendix II, reproduced here (as presented by Hawkins 1980) in Table 3.\(^8\)

In contrast to the two-term implicational universals postulated by Greenberg, Hawkins’ universals are multi-term, involving at least three structural properties of word order expressed in a logical formula such as \(P \supset (Q \supset R)\), and allowing no exceptions. For instance, Hawkins’ Universals I–IV exclude six unattested language types of the 24 types defined by all the different possible combinations of word-order features and types of adposition in Greenberg’s classification:\(^9\)

\[
\text{(13) IMPLICATIONAL UNIVERSALS} \quad \text{LANGUAGE TYPES EXCLUDED}
\]

| I. SOV \(\supset\) (AN \(\supset\) GN) | 18 & 22 |
| II. VSO \(\supset\) (NA \(\supset\) NG) | 4 & 8 |
| III. (PREP & \(-\)SVO) \(\supset\) (NA \(\supset\) NG) | 4 & 20 |
| IV. (POST & \(-\)SVO) \(\supset\) (AN \(\supset\) GN) | 6 & 22 |

Table 3 also lists unattested Types 5 and 13, which are consistent with the universals, but are predicted to be rare by Hawkins’ distributional principle of Cross-Category Harmony (CCH; to be discussed below). The sixteen attested types are all permitted by the given universals.

Hawkins’ UCH includes three hypotheses concerning the dynamics of linguistic change and the quantitative distribution of languages across types. Two of these are the Doubling Acquisition Hypothesis and the Frequency Increase Hypothesis, both of which are formulated with reference to synchronic universals of the form \(P \supset Q\), where \(P\) and \(Q\) are basic word-order properties. The third hypothesis is the distributional principle of CCH (Hawkins 1980).

The Doubling Acquisition Hypothesis (DAH) states that, at two successive stages in the evolution of a language, if \(P\) is acquired as a variant structure from the earlier uniquely \(-P\) stage, then (a) \(Q\) must already be present at the earlier stage (whether or not as a doublet with \(-Q\));\(^{10}\) or (b) if it is not present,

\(^8\) The figures in this table are only approximate, as language families or groups are counted as individual languages by Hawkins. Greenberg’s original data provide no information as to the actual number of languages in each family or group cited.

\(^9\) Here we use the exceptionless versions of Universals III and IV, which in Hawkins 1980 are III’ and IV’. His alternative statistical versions of these are:

| III. PREP \(\supset\) (NA \(\supset\) NG) | *(Types 4, 12, 20) |
| IV. POST \(\supset\) (AN \(\supset\) GN) | *(Types 6, 14, 22) |

These would also exclude the attested Types 12 and 14; however, Hawkins (1980, fn. 2) notes that apparent attestations of Type 14 are actually of Type 15. Hawkins (ms) finds no examples of Type 14 in a much wider, corrected language sample; thus POST \(\supset\) (AN \(\supset\) GN) is indeed exceptionless. Type 12 is attested but rather rare: Greenberg shows only one language (Arapesh), while Hawkins (ms) cites four languages.

For our Peruvian bilingual data, only Universals I and III will be directly pertinent. We will refer to Table 3 when comparing possible word order developments with the status (attested vs. non-attested) of language types defined by the different stages that may link the ES with educated Peruvian Spanish.

\(^{10}\) We use ‘doublet’ to refer to syntactic variants as in the theory of linguistic variation, but without prejudging the question of semantic or functional equivalence in any particular case.
### Distribution of Basic Order Types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of languages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. VSO/Pr/GN/NA</strong></td>
<td>Celtic languages; Hebrew, Aramaic, Arabic, Ancient Egyptian, Berber; Nandi, Masai, Lotuko, Turkana, Didinga; Polynesian languages and probably other Austronesian languages; Chinook, Tsimshian; Zapotec, Chinantec, Mixtec, and probably other Oto-Mangue languages.</td>
</tr>
<tr>
<td><strong>2. VSO/Pr/GN/AN</strong></td>
<td>Tagabili and probably other Philippine Austronesian languages; Kwakiutl, Quileute, Xinca.</td>
</tr>
<tr>
<td><strong>3. VSO/Pr/GN/AN</strong></td>
<td>Milpa Alta Nahuatl.</td>
</tr>
<tr>
<td><strong>4. VSO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>5. VSO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>6. VSO/Pr/GN/AN</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>7. VSO/Pr/GN/AN</strong></td>
<td>Papago.</td>
</tr>
<tr>
<td><strong>8. VSO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>9. SVO/Pr/GN/NA</strong></td>
<td>Romance languages, Albanian, Modern Greek; West Atlantic languages, Yoruba, Edoid group, most languages of Benue-Congo group including all Bantu languages; Shilluk, Acholi, Bari, most languages of Chad group of Hamito-Semitic but not Hausa; Neo-Syriac, Khasi, Nicobarese, Khmer, Vietnamese, all Thai languages except Khamti; many Austronesian languages including Malay, Subtiaba.</td>
</tr>
<tr>
<td><strong>10. SVO/Pr/GN/AN</strong></td>
<td>German, Dutch, Icelandic, Slavonic, Efik, Kredj, Maya, Papiamento.</td>
</tr>
<tr>
<td><strong>11. SVO/Pr/GN/AN</strong></td>
<td>Norwegian, Swedish, Danish.</td>
</tr>
<tr>
<td><strong>12. SVO/Pr/GN/NA</strong></td>
<td>Arapesh (New Guinea).</td>
</tr>
<tr>
<td><strong>13. SVO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>14. SVO/Pr/GN/AN</strong></td>
<td>Rutulian and other Daghestani languages in the Caucasus.</td>
</tr>
<tr>
<td><strong>15. SVO/Pr/GN/AN</strong></td>
<td>Finnish, Estonian, Ijo, Chinese, Algonquian (probably), Zoque.</td>
</tr>
<tr>
<td><strong>16. SVO/Pr/GN/NA</strong></td>
<td>Most Mandingo and Voltaic languages, Kru, Twi, Gâ, Guang, Ewe, Nupe, Songhai, Tonkawa, Guarani.</td>
</tr>
<tr>
<td><strong>17. SVO/Pr/GN/NA</strong></td>
<td>Persian, Iraqvi (Cushitic), Khamti (Thai), Akkadian.</td>
</tr>
<tr>
<td><strong>18. SVO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>19. SVO/Pr/GN/NA</strong></td>
<td>Amharic.</td>
</tr>
<tr>
<td><strong>20. SVO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>21. SVO/Pr/GN/NA</strong></td>
<td>Sumerian, Elamite, Galla, Kanuri, Teda, Kamilaroi and other southeastern Australian languages.</td>
</tr>
<tr>
<td><strong>22. SVO/Pr/GN/NA</strong></td>
<td>No examples.</td>
</tr>
<tr>
<td><strong>23. SVO/Pr/GN/AN</strong></td>
<td>Hindi, Bengali and other Aryan languages of India; Modern Armenian, Finno-Ugric except Finnish group; Altaic, Yukaghir, Paleo-Siberian, Korean, Ainu, Japanese, Gafat, Harari, Sidamo, Chimir, Bedauye, Nama Hottentot; Khinalug, Abkhaz and other Caucasian languages; Burushaski, Dravidian; Nueri and other Sino-Tibetan languages; Marind-Anim, Navaho, Maidu, Quechua.</td>
</tr>
<tr>
<td><strong>24. SVO/Pr/GN/NA</strong></td>
<td>Basque, Hurrian, Urartian, Nubian, Kunama, Fur, Sandawe, Burme, Lushe, Classical Tibetan, Makasai, Bunak (Timor), Kate (New Guinea), most Australian languages, Haida, Tlingit, Zuni, Chitimacha, Tunica, Lenca, Matagalpa, Cuna, Chibcha, Warrau.</td>
</tr>
</tbody>
</table>

Total number of languages = 142

**Table 3.**


Q must be acquired as a variant structure simultaneously with P. But P will not be incorporated if Q is absent (Hawkins 1979:621). The DAH thus allows either the simultaneous or the sequential development of the antecedent and consequent properties of an implicational universal:

(14) a. \(-P \land -Q \Rightarrow P \land Q\)

b. \(-P \land -Q \Rightarrow -P \land Q \Rightarrow P \land Q\)

The DAH explicitly disallows the sequence of events in 15, where the first innovation constitutes a violation of the implicational formula P \(\supseteq\) Q. Note that precisely this sequence of events must take place under the UVH:

(15) \(-P \land -Q \Rightarrow (P \land -Q) \Rightarrow P \land Q\)

The Frequency Increase Hypothesis (FIH) says that if there is an increase in the frequency of P relative to its doublet \(-P\) at two successive stages in the evolution of a language, and if the frequency of Q at the earlier stage was less than 100% (i.e., \(-Q\) doublets were present), then Q will also gain in frequency by the later stage (Hawkins 1979:621–2). That is, if P \(\supseteq\) Q is valid, there can be no frequency increase in the occurrence of a new structure P, in relation to its opposite \(-P\), without a concomitant increase in the frequency of occurrence of structure Q with respect to \(-Q\).

CCH defines word order co-occurrence preferences (e.g., Pr is harmonic with VSO, NG, NA); it states that the dynamics of linguistic evolution tend to move in the direction of more harmonic language types—which, according to this principle, are more numerous (Hawkins 1979:643–7, 1980). Languages which are more harmonic have larger numbers of harmonic orders; and their grammars permit the formulation of a larger number of cross-categorial rules, since they have a comparable balance of operators and operands across the different operand categories (Hawkins 1982).

These three hypotheses, together with Universals I and III, make very precise predictions regarding the acquisition of the word orders of standard Spanish by the bilingual child whose native language is Quechua. In brief, given the language type of his initial speech, no violations of the universals will occur if the VP order starts to change before the NP order is modified.

Most languages can be categorized with some confidence as to their basic word-order patterns. A basic order will be the one most frequent in discourse, the least syntactically constrained, and the most neutral—pragmatically, stylistically, and functionally (i.e., it is not emphatic, and does not result from topicalization or from any other focusing mechanism). This is the order most likely to be assigned ‘underlying status’. There are, of course, cases where some aspect of word order is subject to variability, so that one cannot decide which of the competing orders is basic. In such cases, the variant orders are approximately equal with respect to frequency (50%–50%, 60%–40%, ...), neutrality, range etc.; or else the application of the various criteria gives conflicting results.

An implicational universal that is defined on basic features cannot logically apply when one of its component terms is undecidable as to basicness. However, both the DAH and the FIH still apply with respect to such a universal: their net effect is to constrain, as much as possible, the co-occurrence fre-
quency, at any stage in the evolution of a language, of word order patterns which violate the universal. In particular, these hypotheses effectively preclude the possibility that the ‘plurality type’ of a language at any stage can be one which is a violation of the universal, where by ‘plurality type’ we mean the type defined by the most frequent operator/operand configurations with respect to each aspect of word order.

It is in this spirit that we will analyse the intermediate stages in the acquisition of educated Peruvian Spanish. When we discuss the word-order types at each state, we refer to plurality types; and when we assess these in relation to the predictions of Hawkins’ implicational universals, this assessment will be mediated by the DAH and the FIH—or rather, a modified version of these hypotheses to be proposed below.

3. Alternatives for the Intermediate Stage. For our Peruvian data, several possibilities are to be considered in determining the order of acquisition of the word order features of the educated norm. The alternatives are defined by all the logically possible combinations in which the three major changes (SOV > SVO, GN > NG, and AN > NA) can be sequentially or simultaneously arranged in their chronology. Thirteen alternatives exist; in 16–18, for the sake of perspicuity, we represent the different stages in each sequence only by the innovative patterns. (The stages separated by commas are sequential, those linked by ampersands are simultaneous.)

(16) a. *NG, SVO, NA  
b. *NG, NA, SVO  
c. *NG, SVO & NA  
d. *NA, SVO, NG  
e. *NA, NG, SVO  
f. *NA, SVO & NG  

}  

Universal Violation (UV)

(17) a. SVO, NG, NA  
b. SVO, NA, NG  
c. SVO, NG & NA  

}  

Universal Consistency (UC)

(18) a. SVO & NG, NA  
b. SVO & NA, NG  
c. NG & NA, SVO  
d. SVO & NG & NA  

}  

(Weak) Universal Violation

The alternatives in 16 involve an initial UV, and are therefore consistent with the UVH. The first three alternatives, (a)–(c), introduce a violation of Universal I through the starred development NG. The three remaining UV alternatives, (d)–(f), incur a violation of Universal III by their initial *NA change. Exactly why these are violations will be explained later in this section. In Table 4, we show the language types resulting at each stage as defined by the individual innovations linking the ES and the target educated norm for each of these alternatives. For the sake of simplicity, we do not represent the innovations by the emergence of variant orders or doubling (e.g. GN/NG).

As seen in Table 4, the incoming postnominal genitive in alternatives (a)–(c) and the initial acquisition of the postnominal adjective in (d)–(f) produce,
in combination with the features SOV and Pr, the unattested Types 18 and 20—which are ruled out by Universals I and III, respectively. That is, if the children’s language adopted NG when it was predominantly an AN, SOV type, as in the ES, then at some point their language would not be like any attested language. Similarly, if they first developed NA when their basic clause order was SOV and their genitives were basically prenominal, then their language would not match at a given point any of the permitted types. Of course, strictly speaking, the incoming minority of these *NG and *NA variant orders in each set of alternatives would not immediately produce the unattested types, which are defined over basic features. It is not until the innovations become majority variants that the pertinent universals are contradicted, in the sense discussed above.

Thus the emergence of either the genitive or the adjective doublets in the ES would lead to the initial violation which, by the UVH, starts the chain of events which eventually restores consistency with the putative universals. However, none of the alternatives thereby defined is entirely consistent with the UVH. In that theory, the initial violation supposedly triggers a multi-member chain of subsequent developments—all ultimately leading to consistency with the universals. Yet in every alternative, the second development suffices to re-introduce UC. Observe in Table 4 that the conjunction of features at the second intermediate stage is always that of an attested language type. Thus one may conclude that, in all these alternatives, the SOV > SVO change is totally superfluous—either as a second or third sequential innovation, or as a simultaneous development. This is because, when emergence of predominant variants NG or NA produces a violation, UC can be most simply restored by developing NA and NG respectively (i.e. leveling of the modifiers in the noun phrase); thus change in clause word-order is not needed.\footnote{It could be argued that the UVH, which portrays change as resulting from the initial emergence of a prohibited type (necessitating a series of readjustments to change to some attested type), should not be required to be consistent with an acquisitional process which is clearly under the continual influence of its end result—the educated norm, as spoken by educated bilingual as well

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\textbf{Table 4.}
sitional SOV languages with both NG and NA, e.g. Persian, Iraqw (Cushitic), Khamti, and Akkadian (Type 17 in Table 3).

Turning now to the UC alternatives in 17a–c, we note that all three have SVO as the initial development. They are all consistent with the four synchronic universals that determine the permissible types, since they define (together with the other pertinent features in the children’s speech) combinations of characteristics known to exist in attested languages. This may be seen in their detailed representations in Table 5.

\[
\begin{array}{cccc}
17a. & \text{SOV} & \rightarrow & \text{SVO} \\
& \text{Pr} & \rightarrow & \text{Pr} \\
& \text{GN} & \rightarrow & \text{NG} \\
& \text{AN} & \rightarrow & \text{NA} \\
& \text{Type 19} & \rightarrow & \text{Type 11} & \rightarrow & \text{Type 10} & \rightarrow & \text{Type 9}
\end{array}
\]

\[
\begin{array}{cccc}
17b. & \text{SOV} & \rightarrow & \text{SVO} \\
& \text{Pr} & \rightarrow & \text{Pr} \\
& \text{GN} & \rightarrow & \text{NG} \\
& \text{AN} & \rightarrow & \text{NA} \\
& \text{Type 19} & \rightarrow & \text{Type 11} & \rightarrow & \text{Type 12} & \rightarrow & \text{Type 9}
\end{array}
\]

\[
\begin{array}{cccc}
17c. & \text{SOV} & \rightarrow & \text{SVO} \\
& \text{Pr} & \rightarrow & \text{Pr} \\
& \text{GN} & \rightarrow & \text{NG/AN} \\
& \text{AN} & \rightarrow & \text{NA/AN} \\
& \text{Type 19} & \rightarrow & \text{Type 11} & \rightarrow & \text{Type 9 (10, 11, 12)}
\end{array}
\]

The language types characterizing all the different stages in the UC alternatives are attested in Table 3. In alternative 17c, we indicate the simultaneous development of NG and NA in the second stage by the appearance of the corresponding doublets. Depending on the details of the increase in frequency of NG and NA, the plurality type at a given moment under this alternative may be 9, 10, 11, or 12. The reader may verify that the four possible combinations allowed by the variant orders in the simultaneous development of 17c correspond to language types attested in Table 3. Thus, if the bilingual children’s Spanish is to remain within the bounds imposed by the universals at every stage in the acquisition of the word orders of the educated norm, then it either must first incorporate the target SVO order, and then NG or NA; or else do both simultaneously.

The remaining set of alternatives, given in 18a–d, all contain simultaneous

as monolingual Spanish speakers. However, the question that remains is: Which comes first? That is, why does the educated norm share SVO, NG, and NA with standard Spanish, when it diverges in many other ways?

More important, the UVH is based much more heavily on the stability of admissible language types than the UCH—which allows for, and even predicts, movement from one admissible type to another. Thus it is much more consistent with the UVH for the initial stage in the acquisition of word order to lead to universal violation, so that the remainder of the stages unfold automatically under the dual (and parallel) influences of the educated norm and the need to attain an admissible type.
developments. They are shown in detail in Table 6, where simultaneous developments are represented by the emergence of corresponding doublets.

Table 6.

These alternatives are hard to classify, as they seem to fall midway between the two competing theories of linguistic change. The DAH, as formulated by Hawkins, allows for the simultaneous development of the antecedent and consequent properties in an implicational universal, as represented earlier in 14a, in addition to the sequential innovation of the consequent followed by that of the antecedent. (Recall that it disallows only the opposite sequential development.) However, allowing simultaneous development entails the probable emergence of a plurality type which violates a universal when the pertinent variant orders reach equal percentages of occurrence:

(19) – P/P & – Q/Q  (Types: – P & – Q; – P & Q; *(P & – Q); P & Q)

Such plurality types are contained in the alternatives of Table 6, where the simultaneous innovations are represented by the emergence of doublets to facilitate verifying the plurality types which violate Universals I and III. We discard these alternatives from the UCH set, but consider them to be weakly consistent with the UVH, since the initial violation required by that theory is not unequivocally present in them. Note that none of the simultaneous changes would individually incur a violation; rather, a violation is introduced indirectly (and for a relatively brief period) through the combined effect of simultaneous changes, doubling, and frequency increase, as presently defined by the DAH and the FIH. We will later propose a stronger version of these hypotheses which will appropriately exclude simultaneous developments that lead to plurality types inconsistent with universals.

We turn now to Universals I and III, repeated below together with the types they exclude.

(20) Universals I and III

| a. SOV ⊑ (AN ⊑ GN) | Excluded types * | *(18, 22) |
| b. (PREP & – SVO) ⊑ (NA ⊑ NG) | | *(4, 20) |

12 Hawkins 1979 cites, from Friedrich’s 1975 data, Italic and Gothic Avestan as having undecided basic order for the genitive and for the adjective, respectively. These dialects may or may not involve plurality types inconsistent with Universals I and III. However, we have no relevant frequency rates which would be crucial in deciding.
We will show how, under appropriate conditions, these implicational formulas rule out a change in the genitive position before that of the main verb in a clause, as well as a change in the adjective position before that in the genitive placement.

An implicational statement excludes any situation where the antecedent term holds true while the consequent term does not. Thus 20a excludes SOV types where (AN $\supset$ GN) does not hold, i.e. where the noun phrase is characterized by AN and NG. The inconsistent combination that results with respect to Universal I is precisely the combination of characteristics that would obtain if the postnominal genitive were the initial development in the Peruvian bilingual children’s speech:

$$(21)\quad *(\text{SOV} \& \text{AN} \& \text{NG}) \quad (\text{Types } *18, *22)$$

A similar argument based on 20b can be made with respect to Universal III. This formula excludes all prepositional languages which are verb-final (or verb-initial) and where (NA $\supset$ NG) is not found, namely those with NA and GN. This defines the inconsistent combination shown below:

$$(22)\quad *(\text{PREP} \& -\text{SVO} \& \text{NA} \& \text{GN}) \quad (\text{Types } *4, *20)$$

Again, it may be observed that this particular combination coincides with the one that would result if bilingual children adopted the postnominal adjective before the postnominal genitive when their speech is predominantly SOV. Note, however, that if the nominal operators remained stable until SVO became the majority clause order, then either the genitive or the adjective could become postnominal first, without violating the universal.

Universals I and III therefore define the following violations:

$$(23)\quad \text{Universal violations}$$

- a. NG $>$ SVO, while AN \hspace{1cm} (violates I)
- b. NA $>$ NG, while Pr $\&$ SOV \hspace{1cm} (violates III)

Note that the unattested types *18 and *20 in fact represent the initial intermediate stage in the UV alternatives of Table 4, where the initial change is precisely as specified in 23a or 23b. That is, the initial violation in one set is brought about by developing NG before reversing the position of the V with respect to its complements and modifiers; in the other set of alternatives, a violation arises by first adopting the change of adjective position before that of the genitive placement.

By contrast, the unlawful combinations 21–22, deriving from Universals I and III, also define the bounds for a sequence of events to remain consistent with the universals, in accordance with the UCH. These would involve excluding the sequence of changes in the corresponding UV’s of 23, as indicated below:

$$(24)\quad \text{a. AN $\supset$ -(NG $>$ SVO)}$$

- b. (Pr $\&$ SOV) $\supset$ -(NA $>$ NG)

These prohibitions are equivalent to the sequence of changes indicated in 25a–b respectively, which prescribe that the word order change in the clause may precede or co-occur with the innovation in the genitive position, and this in turn may precede or be simultaneous with the innovation in the adjective
position:

(25) **UC SEQUENCES OF INNOVATIONS**

a. AN ⊆ (SVO ≥ NG)  (= 24a)

b. (Pr & SOV) ⊆ (NG ≥ NA)  (= 24b)

The three UC alternatives of Table 5 follow these specifications. In all three, the emergence of SVO precedes that of NG when the language has predominant AN—in accordance with 25a. In alternative 17b, the advent of NA precedes that of NG, but with no violation of type 23b, since the language has first incorporated SVO.

The specifications for a UC sequence are also met by the four alternatives in Table 6, which we have classified as weakly consistent with the UVH. In 18a–b and 18d, the emergence of SVO precedes or is simultaneous with that of NG, as stated in 25a. In 18c, the appearance of NG precedes that of SVO; but 25a is not contradicted, since the language also adopts NA in the first stage. In 18a and 18c–d, the appearance of NG precedes or coincides with the emergence of NA, in accordance with 25b. In 18b, this sequence of events is reversed without contradicting 25b, since the language initially also incorporates SVO.

That these weak UV alternatives can meet the specifications for UC sequences, while giving rise to universal-violating plurality types, seems counter to Hawkins' intent in elaborating his hypotheses of word order change. It will clarify our later discussion if we can reformulate some of the notions in the UCH so that it unequivocally excludes such plurality types. Now, the violating types in the weak UV sequences arise through the combined effect of the following factors:

(i) The existence of doubling.

(ii) The lack of constraints on the co-occurrence (in the same sentence) of co-existing variants.

(iii) Allowing the simultaneous development of an antecedent and a consequent property of an implicational formula.

Given that Factor (i) must be taken for granted, we should consider if either Factor (ii) or (iii) may be modified so as to not give rise to the offending plurality types.

Suppose there were a constraint, in the case of simultaneous developments, to the effect that speakers would keep pairs or triples of innovative features, P & Q & R, in utterances separate from those that bear the outgoing variants −P & −Q & −R, without mixing the members of the two sets. Translating the constraint to our data, it would require that the bilingual child should not mix the Quechua and the Spanish NP and VP patterns. Recall that the plurality types in the UV alternatives arise by the co-occurrence of NG with AN, and of GN with NA in the prepositional SOV type. Thus, if usage keeps SOV and GN with AN, on the one hand, and SVO and NG with NA, on the other hand, for the necessary transitional period, then no unattested types could attain plurality status.

But such a constraint is ad-hoc and highly unlikely, imposing quite an extraordinary characteristic on simultaneous developments. In the general case,
that of sequential innovations, speakers must be expected to mix novel features
with already established ones (e.g. – P & Q; P & Q). Moreover, the constraint
is not supported by our data. Our bilingual children do in fact mix Quechua
and Spanish patterns. For instance, our data show (Quechua) prenominal and
(Spanish) postnominal genitives in both SVO and SOV sentences:

\[(26) \quad S \quad V \quad O \quad _{\text{GEN}} \quad N \]

*Un señor le ha quitado de la señora su quinua.*
a man *dat* has taken of the lady her quinua
‘A man has taken the lady’s quinua [a type of edible seed].’ (A 68:111)

\[(27) \quad S \quad O \quad V \quad _{\text{GEN}} \quad N \]

*De ese chiquito su perro diferente es.*
of that little-boy his dog different is
‘That little boy’s dog is different.’ (C 49:80)

\[(28) \quad O \quad V \quad S \quad _{\text{GEN}} \quad N \]

*Sus bultos de la señora carga el tauca.*
her bundles of the lady carries the porter
‘The porter carries the lady’s bundles.’ (P 22:31)

Similarly, (Spanish) postnominal adjectives can be found in V-medial and V-
final clauses:

\[(29) \quad S \quad V \quad O \quad _{\text{N Adj}} \]

*Una vez su madre le mandó a traer agua caliente.*
Once her mother *dat* sent to bring water hot
‘Once her mother sent her to bring hot water.’ (H 16:24)

\[(30) \quad S \quad O \quad V \quad _{\text{N Adj}} \]

*Y mi hermano aquí otro paloma hembra había chapado.*
and my brother here another dove female had caught
‘And my brother had caught another female dove here.’ (P 22:31)

Indeed, there is no evidence that the choice of the various structural features
in any given sentence is anything but independent, in the statistical sense. Thus
the frequency of a given word order type can be appropriately predicted as
simply the product of the relative frequencies of its component word-order
features.

Since the constraint on simultaneous developments cannot be maintained,
Factor (ii), unconstrained co-occurrence of co-existing variants—as well as (i),
the existence of doubling—must be taken for granted. This means that Factor (iii) is open to modification. We now propose a modification of the DAH and FIH, which will explicitly refer to the avoidance of universal-violating plurality types, and which we feel reflects more directly the intent of Hawkins’ theory:

(31) **Revised DAH/FIH:** Given one or more implicational universal(s) which exclude(s) certain word order type(s), no change in the frequency of structural variants will occur whose sole result would be the increase in the frequency of the excluded type(s) at the expense of some permitted type(s); to the extent that a change of frequency within a category has, as its major result, such an increase of the excluded type(s), this change will be disfavored. This formulation pertains both to doubling acquisition (involving a change from zero frequencies) and to frequency increase (involving a change from non-zero frequencies).

We can see how 31 will appropriately exclude the simultaneous development of the antecedent and consequent properties of a universal. At the moment when Q structures first arise, the frequencies of both P and Q are zero. Thus minority P structures cannot arise at the same time, since virtually all of these would be involved in P & ~Q sentences. Indeed, P structures are highly unlikely to arise or proliferate until after some time lapse, when there is a substantial minority of Q structures.

Our modification then will effectively give rise to universal-consistent plurality types like 32b–c at two successive periods, linking a preceding stage 32a, characterized by majority ~P and ~Q, and a following stage 32d, with predominant P & Q:

(32) a. ~P & ~Q
   b. ~P & ~Q; ~P & Q
   c. ~P & Q; P & Q
   d. P & Q

It is obvious that plurality types without violations, as in 32, must be the rule—since Q structures, having emerged earlier than P structures, will tend to reach majority status at stage 32c, appropriately preceding the emergence of majority P structures at stage 32d.

If the analysis of our data is compatible with one of the UV sequences of Table 4, then the UVH will be seen as pertinent to the acquisition context. If the data are more compatible with one of the UC sequences in Table 5, then the UCH will gain support—together with our rejection of alternatives 18a–d from this class, and our proposed modification for the DAH and FIH. However, if the analysis is compatible with one of the weak UV alternatives (Table 6), then neither theory would be clearly preferable; in that case, our classification will have little relevance, and our proposed modification will be unwarranted. In §4, the competing alternatives are tested against recorded data from the bilingual Peruvian children.

4. **Quantitative Analysis and Results.** We examined the frequency of occurrence of the variant patterns OV/VO/VOV, GN/NG, and AN/NA in the speech of nine bilingual children of both sexes, clustered evenly in three age
groups: 5, 7, and 9 years old. Each child had been born and raised in one of the four most populated cities in the Peruvian highlands (Cuzco, Ayacucho, Huaraz, and Puno). The seven and nine year olds attended the first and third grades, respectively, of the public school, where instruction is carried out exclusively in Spanish. The five year olds, for the most part siblings of the older children, were not in school, but they spent time at a parochial park where they received religious instruction. Most of the children’s parents knew little Spanish, being in general ‘beginning bilinguals’ (cf. Escobar), belonging to the lowest social stratum, and holding occupations such as vendors on the ground in public markets. All the children were Quechua and Spanish speakers; their recorded conversations contain only Spanish, with no instance of code-switching or use of Quechua in the sample analysed.

The data for the present study consist of nine hours (one hour per child) of both elicited and spontaneous tape-recorded conversations, randomly selected from three distinct contexts: (1) an adult interviewing a child, (2) a child interacting with peers, and (3) a child interacting with peers and an adult interviewer. The recordings were done midway in the school year by interviewers who were themselves bilingual, or who spoke the regional Spanish. In Table 7, we show the number of tokens per age and syntactic pattern.

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Table 7.

Since the pattern with the duplicate verbs can be counted either as VO or OV, we split their total evenly between the opposing VP patterns, and incorporate them in the average percentages of verb positions for the three ages. In Table 8, we indicate the percentages of occurrence of the alternate orderings.

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<td>GN/NG</td>
<td>63%/37%</td>
</tr>
<tr>
<td>AN/NA</td>
<td>91%/9%</td>
</tr>
</tbody>
</table>

Table 8.

13 The data used in this study come from a large-scale national sampling survey sponsored by the Peruvian Ministry of Education. The project was initiated to implement the Peruvian Educational Reform Act of 1972, which officially recognized the bilingual national situation by acknowledging Quechua as a national language. Two important aims of the reform have been (1) to describe the varieties of Spanish spoken by Peruvian children and adults, so that a standard Peruvian Spanish can be formulated; and (2) to use this information (a) in the implementation of language programs, and (b) in teaching Spanish as a second language in bilingual schools.

14 We will say more in §5 about types of adult bilingual speech to which the bilingual children are most likely exposed.

15 The interviewers were for the most part senior students in linguistics or education at the Universidad Nacional Mayor de San Marcos. They were trained by and worked under the supervision of the staff of the Instituto Nacional de Investigación y Desarrollo de la Educación, with L. Minaya as coördinator.
per age and syntactic category; the outer cells contain coefficients relevant to syntactic category and age.\textsuperscript{16} The percentages on the left in each cell of Table 8 correspond to Quechua word orders; those on the right to Spanish patterns. These figures show that the VP doublets appear earlier than the genitive doublets, which in turn precede the onset of the innovative postnominal adjective. Note that the stage when the child has approximately equal percentages of Quechua and Spanish patterns is found at age 5 for the VP, but at age 7 for the genitive; for the adjective, it must occur around age 8. It is evident that the onsets of the emergence of the innovating Spanish patterns are sequentially arranged as in 33, which abbreviates the sequence of developments of the UC alternative (17a) of Table 5:

\begin{align*}
(33) & \text{SVO > NG > NA}
\end{align*}

A multivariate statistical analysis supports these results.\textsuperscript{17} A multiple regression analysis with stepwise selection of significant factors was set up in which operator/operator and order was the dependent variable, with the following as possible explanatory factors: syntactic category (VP order, genitive position, and adjective placement), age and sex of speaker. Only syntactic category and age were selected as significant at the 5\% level by the analysis, with the coefficients shown in the outer cells of Table 8. These support the chronological sequence of developments as indicated in 33. Our analysis thus favors one of the three UC sequences, out of the thirteen plausible alternative hypotheses. These results are all the more impressive because the UV alternatives outnumbered the ones compatible with the UCH by more than 3 to 1.

Now, according to the percentages of Table 8, the children's spoken language should have the typological characteristics indicated in Table 9.

<table>
<thead>
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<th>AGE 5</th>
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<th>AGE 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV/SVO</td>
<td>SVO</td>
<td>SVO</td>
</tr>
<tr>
<td>PREP</td>
<td>PREP</td>
<td>PREP</td>
</tr>
<tr>
<td>GN</td>
<td>GN/NG</td>
<td>NG</td>
</tr>
<tr>
<td>AN</td>
<td>AN</td>
<td>NA</td>
</tr>
<tr>
<td>Type 19/11</td>
<td>Type 11/10</td>
<td>Type 9</td>
</tr>
</tbody>
</table>

\textbf{TABLE 9.}

Although there is a slight predominance of the Quechua patterns for the VP and the genitive at ages 5 and 7, respectively, the difference is not sufficiently large to identify them as basic at either age.\textsuperscript{18} Quite clearly, the basic features

\textsuperscript{16} The probability $p$ of obtaining the Spanish word order for a clause or phrase is estimated to satisfy

\[
\log \frac{p}{1-p} = \log \frac{s}{1-s} + \log \frac{a}{1-a} + \log \frac{u}{1-u}
\]

where $s$ is the coefficient in Table 8 associated with the clause or phrase type, $a$ is the coefficient associated with the age group, and $u = .51$ is an over-all average effect. The program VARBRUL 2S, which calculates maximum likelihood estimates of the coefficients, was used (Sankoff 1979).

\textsuperscript{17} The VOV instances were not included in the statistical calculations, but their 50/50 split incorporation among the VO and OV variants would not materially change the results.

\textsuperscript{18} The children have variant patterns for the three syntactic categories at all three ages; those not shown in Table 9 are thus minority variants (either emerging or disappearing, as the case may be), and are not typologically relevant.
of the different age levels strongly suggest that the ES we have initially assumed must precede age 5. Since age 9 has the characteristics which are basic in the Peruvian educated norm and in standard Spanish, then ages 5 and 7 would represent two intermediate levels defined by the advent of SVO and NG, respectively. Compare them with the intermediate stages of the UC alternative (17a) favored by the analysis—repeated in Table 10, along with a detailed list of the languages representative of each stage.

<table>
<thead>
<tr>
<th>EARLY STAGE</th>
<th>INTERMEDIATE 1</th>
<th>INTERMEDIATE 2</th>
<th>STANDARD SPANISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>← SOV/SVO</td>
<td>← SVO</td>
<td>SVO</td>
</tr>
<tr>
<td>PREP</td>
<td></td>
<td>← PREP</td>
<td>PREP</td>
</tr>
<tr>
<td>GN</td>
<td>← GN</td>
<td>← GN/NG</td>
<td>NG</td>
</tr>
<tr>
<td>AN</td>
<td>← AN</td>
<td>← AN</td>
<td>NA</td>
</tr>
<tr>
<td>Type 19 (1 lg: Amharic)</td>
<td>Type 11 (3 lgs: Norwegian, Danish, Swedish)</td>
<td>Type 10 (8 lgs: German, Slavonic, Icelandic, Dutch, Kredj, Maya, Efik, Papiamento)</td>
<td>Type 9 (21 lgs: Romance languages, Albanian, Modern Greek, West Atlantic languages, Yoruba, Edo group, Bantu languages, Shilluk etc.)</td>
</tr>
</tbody>
</table>

The typological features of the children’s speech at ages 5, 7, and 9 are clearly similar to those of the three stages following the initial ES of UCH sequence 17a. However, the word order features of their speech at age 9 differ in an important way from those of the Peruvian educated norm and the standard language, as regards variant orders that do not occur in the latter varieties. Standard Spanish does not have the patterns SOV and GN; however, the Peruvian educated norm has a minority percentage of V-final clauses, but no prenominal genitives. But these are variants still occurring at a rate of 30–35% at age 9. Thus, for all practical purposes, the speech of the older children may be considered as representing a third or final intermediate stage, marked by the advent of a majority of postnominal adjectives. Indeed, one should think of the intermediate stages in Table 10 as characterized by the advent of the majority new variants SVO, NG, and NA, since it is not their first emergence which occurs at each of the successive three age levels.

5. DISCUSSION. Before discussing other potential explanations for our results, we will show how they support the three hypotheses which integrate the UCH along with the implicational universals. We will then consider the theoretical consequences of our findings.

Our analysis gives empirical support to the intermediate stages of the UC sequence of events represented in Table 10; it rejects any role for the mechanism fundamental to the UVH, whereby change or innovation must start with an initial violation of a synchronic universal. In addition, the quantitative analysis gives support to the existence of an ES with the characteristics as initially postulated. The figures for the youngest group indicate a slight predominance of the OV pattern, and a very strong prevalence of prenominal genitives and adjectives.
Besides corroborating Hawkins’ Universals I and III, our data are also consistent with each of the three hypotheses which extend his UCH. These bilingual children’s speech attests to the emergence and dynamics of word order patterns as constrained by our version of the DAH/FIH, while the intermediate stages favored by our analysis form a sequence that is optimally consistent with the CCH principle. The latter predicts, as most probable, a sequence of changes moving progressively toward the more preferred language types—i.e. those which have more CCH and, according to the principle, are more numerous. Of the three UC alternatives originally considered, only the sequential one selected by our analysis has a continually improving CCH progression. In Table 11, we indicate the type of language for each successive stage of the three UC alternatives, and the number of languages of each type in Greenberg’s sample.\(^19\)

Clearly, alternative 17a shows the best CCH progression, as indicated by the increasing number of languages attested at each stage.\(^20\) The opposing sequential alternative 17b does not have a progression compatible with the CCH principle, since the intermediate stage 2 in this alternative would represent moving in the direction of the very rare Type 12—for which the only language in Greenberg’s sample is Arapesh (New Guinea). Indeed, Type 12 has even been regarded as an exception to a stronger version of Universal III, **PREP ⊂ (NA ⊂ NG)**, considered by Hawkins (see fn. 9). Thus the abundance of Type 10 languages vs. the marginal status of those of Type 12 is consistent with the second stage innovation of NG rather than NA. As for alternative 17c, this involves passage through an even rarer configuration, with an even more improbable loss of CCH. Indeed, as will be seen later in connection with the linguistic input provided by the bilingual adults’ speech, the CCH principle appears to be the single strongest influence on the children’s language, moving

\(^{19}\) Languages with undecidable basic order are excluded from the sample; but these are relatively rare or transitory (cf. Hawkins 1980), and we may expect those with a near-majority Type 12 component to be very rare.

\(^{20}\) Since the last stage (equated with Type 9) is the norm which is taught and must be learned at the public schools, one might be inclined to think that this stage is predetermined, and therefore should not be considered a stage necessarily arrived at by mere CCH progression. Such thinking, however, neglects important facts about languages in contact in general, and about Quechua/Spanish contact in particular. Where languages have been in contact for long periods of time, the imposed assimilation of a prestige norm or dialect has quite commonly produced hybrid systems, with new features not shared by the native or the imposed language. Thus there is really no good reason to attach any special status to the incorporation of the NA leading to the final stage, or to expect it to be a feature that must be necessarily learned. Many salient grammatical and phonological features of the educated norm have never been assimilated in the 450 years of language contact in Peru (cf. Escobar, Pozzi-Escot).
it in the direction of those language types that exhibit a more harmonic balance in their operand/operator basic orderings.

The word order types excluded by Universals III and I are PREP & – SVO & NA & GN, and SOV & AN & NG, respectively. Since there is no question here of postpositional or VSO structure, the relevant excluded types are *(SOV & NA & GN) and *(SOV & AN & NG). Given that the early stage is SOV & AN & GN, our modified DAH/FIH prohibits the increase of either NA or NG over zero frequency, since this would result solely in the production of numerous types which violate universals. Even simultaneous innovation of NA and NG is disfavored—since any gradual initial increase from zero frequency would, at the outset, produce only quantities of both excluded types, at the expense of SOV & AN & GN (the quantity of SOV & NA & NG produced being mathematically negligible).

Thus, under the modified hypothesis, the only permitted innovation would be SVO. At first, while SVO remained a low-frequency structure, innovations of NA or NG would continue to be disfavored. But eventually, when a substantial minority of SVO was being produced, innovations of NG and/or NA could take place. The hypothesis also predicts that each increase in frequency of these postnominal modifiers would tend to occur only following or during increases in SVO frequencies. Figure 1 (overleaf) shows how these constraints are realized in our data.

Note that Hawkins’ DAH and FIH are formulated in statements of the form P ⊁ Q; and they are phrased in terms of the sequence of innovation or acquisition of the Q feature and the P feature. Thus they cannot be directly generalized to three-term statements such as P ⊁ (Q ⊁ R), since one cannot speak of innovating (Q ⊁ R) before P, or of increasing the frequency of (Q ⊁ R) before that of P; (Q ⊁ R) is not a structural feature. However, our modification of the DAH and FIH, while retaining the essence of Hawkins’ ideas, allows a direct generalization to any universal which excludes one or more combinations of structural features.

As originally formulated by Hawkins, the UCH allows 7 courses of development for the bilingual children’s acquisition, out of 13 possible alternatives. In relation to our data, it defines a larger number of possibilities than the UVH (cf. 16a–f, Table 4). It thus proves to be a weaker theory, even though it contains more principles. In the original UCH, the DAH and FIH, together with the word-order implicational universals, define all the permitted alternatives (sequences 17a–c and 18a–d of Tables 5–6); but the burden of work falls mostly on particular formulations of the word-order universals. In our proposed revision, however, Universals I and III select the initial set of 7 alternatives, out of which the revised DAH/FIH eliminates four (18a–d, Table 6). The CCH principle further restricts the remaining set of 3 to one possible alternative: 17a. Thus, in the revised version, the various principles integrating UCH share equally the burden of work in constraining the choices. To the extent that the proposed revision succeeds in drastically reducing the number of possible alternatives for linguistic innovation, the theory is effectively sharpened and clearly superior to the UVH.
We turn next to an assessment of other facts pertaining to the children's native language and their immediate linguistic input—facts which might compete with UCH in providing an explanation for the sequence of developments found in their speech. One of these concerns the variant word-order patterns found in Quechua.

As already indicated, Quechua has SVO as a variant order for the clause, but no variant patterns for the genitive or the attributive adjective. This fact may appear to cast doubt on the role of word order universals in determining the SOV > SVO initial change. It could be surmised that this initial change is greatly (or mainly) facilitated by the existence of the SVO pattern in the native language—though there would be some resistance to the GN > NG or the AN
> NA modifications, given that the postnominal genitive and adjective do not occur in Quechua. From such a perspective, the observance of universal consistency of the stages in Table 9 is a mere accident.

Quechua has been described as basically SOV, but also as a relatively free word-order language (Parker 1965, 1976). Present-day descriptions of various main varieties agree on this fact, though there seem to be dialectal differences in the types of clause word orders that are allowed as variants. Cerrón-Palomino 1976b, 1980 and Soto-Ruiz 1976, in describing the Peruvian varieties of Junín-Huanca and Ayacucho-Chanca, respectively, list SVO, OSV, and OVS as variants. Soto-Ruiz points out that SVO is a common arrangement, while Cerrón-Palomino goes on to indicate that the V-initial patterns are unacceptable (although VOS is listed as a variant in the San Martín variety described by Coombs et al. 1976).

However, the fact that Quechua allows variant clause arrangements, in particular the SVO pattern, cannot be taken as seriously undermining the UCH account. Though little is known about the functions of word order variation, there is small doubt that low-frequency variant clause orders are used for the purposes of topicalizing and focusing, and are thus to be sharply distinguished from the neutral basic clause arrangement. Indeed, given the lack of solid evidence about cross-language word order influence (to say nothing about its acquisition by bilinguals), the very existence of the Quechua SVO variant—which may be defined as meaningful in the discourse context—could just as well retard the acquisition of the identical but neutral Spanish pattern. Viewed in this light, the acquisition of SVO as a basic (neutral) pattern—from a previously predominant SOV—must be a result just as novel as the acquisition of the postnominal genitive and adjective from previous prenominal categories. We thus adhere to the stronger claims deriving from Hawkins’ word order universals; and we hold them to be equally valid for both the rigid and the non-rigid SOV languages that have come into contact with (usually European) SVO languages. In other words, if the children’s native language were a rigid SOV type (such as Japanese, Korean, or Turkish), we should expect a sequence of developments similar to that predicted for the Peruvian Spanish variety whose substratum is the non-rigid SOV Quechua.

We now consider the role which the children’s linguistic input may play in determining the sequence of innovations carried out in the acquisition process. It may be observed that, in the utterances analysed, VP’s with objects occur more frequently than NP’s with genitives, which in turn are more numerous than NP’s with adjectives (Table 7). If similar frequency relations exist in the adults’ speech, it could be argued that the children simply learn the ordering rules for the most frequently used constructions first. That is, in using adult speech as a model, the children might give priority to modifying their own constructions which are most saliently in conflict with this model. To dispel

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21 Of course, as a general principle, the notion cannot be true—in view of the fact, well-known in the literature, that children’s speech very often exhibits constructions that have zero frequency in adults’ speech.
this notion, we need to consider the word order characteristics of bilingual adults’ speech, which constitute the children’s linguistic input, in conjunction with the educated Peruvian norm taught at school.

In a very detailed study, Muysken 1981 described the stratified speech of bilingual and monolingual speakers of Spanish in Ecuador, in the context where Quechua is the most pervasive indigenous language. Since we lack data from Peruvian adult bilinguals, we will endeavor to demonstrate that the Ecuadorian data may well reflect a close similarity with the Peruvian bilingual context, as regards word order within major constituents (cf. Luján, Sankoff & Bordelois 1982). The Ecuadorian data are drawn from five types of subjects: three groups of bilinguals (incipient, Quechua-dominant, and Spanish-dominant) and two groups of Spanish monolinguals (lower-class and middle-class). 22

In the percentages given for various types of VP, V-final ordering predominates only with respect to adverbs (78%). In VP’s with direct objects or prepositional or clause complements, and in copula plus predicate phrases, the predominant order is V-initial, with percentages ranging from 66% to 90%. 23 With respect to the direct object, one quarter are V-final, while three-quarters are V-initial. A clear majority of postnominal genitives and adjectives is reported. No figures are given with respect to the adjective, although it is claimed that 100% are postnominal. The number of instances reported per syntactic pattern is shown in Table 12.

<table>
<thead>
<tr>
<th>OV</th>
<th>VO</th>
<th>VOV</th>
<th>TOTAL</th>
<th>GN</th>
<th>NG</th>
<th>TOTAL</th>
<th>AN</th>
<th>NA</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>246</td>
<td>0</td>
<td>306</td>
<td>2</td>
<td>26</td>
<td>28</td>
<td>0</td>
<td>a few</td>
<td>?</td>
</tr>
</tbody>
</table>

Table 12.

According to these figures, the Ecuadorian and Peruvian situations are not very different. Extrapolating the trend shown by the Peruvian children beyond age 9, one arrives at figures similar to those characterizing adult bilingual speech of Ecuador. The proportion of OV phrases falls from approximately 40% (at age 5) to 30% (at age 7) to 25% (at age 9)—and, for the Ecuadorian adults, to 20%. The genitive is found more frequently in postnominal position in the Ecuadorian data, but the figures are not much different from what one could expect of bilingual adults in Peru. In Table 13, we give the percentages corresponding to our subjects and Muysken’s.

<table>
<thead>
<tr>
<th>Peruvian children</th>
<th>OV</th>
<th>VO</th>
<th>VOV</th>
<th>GN</th>
<th>NG</th>
<th>AN</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 years</td>
<td>38%</td>
<td>37%</td>
<td>25%</td>
<td>63%</td>
<td>37%</td>
<td>91%</td>
<td>9%</td>
</tr>
<tr>
<td>7 years</td>
<td>32%</td>
<td>52%</td>
<td>16%</td>
<td>54%</td>
<td>46%</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>9 years</td>
<td>26%</td>
<td>67%</td>
<td>7%</td>
<td>36%</td>
<td>64%</td>
<td>38%</td>
<td>62%</td>
</tr>
<tr>
<td>Ecuadorian adults</td>
<td>20%</td>
<td>80%</td>
<td>–</td>
<td>7%</td>
<td>93%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 13.

22 Interestingly, the figures obtained for the basic word-order patterns indicate almost no difference between the speech of Quechua-dominant bilinguals and lower-class Spanish monolinguals, or between that of Spanish-dominant bilinguals and middle-class Spanish monolinguals. So a three-layer stratification would constitute a more accurate description in relation to word order features.

23 See Muysken’s Table VI (p. 38).
These figures indicate that Andean Spanish in Ecuador is the same type as the Peruvian educated norm and the standard language, i.e. Type 9. The main difference, then, lies not in the basic orderings, but in the variant orders OV (and, to a lesser degree, GN) exhibited by Andean Spanish—variant patterns which are not found in the standard language. No data are available on the speech of Ecuadorian bilingual children; accordingly, there is at present no evidence that the Andean Spanish of that region evolves through other word order types during the acquisition process. However, from the comparison in Table 13, it is not at all implausible that the bilingual children in Ecuador go through stages similar to those established for their Peruvian counterparts.

Bilingual children in the northern Andean region grow up surrounded by Quechua and Spanish monolinguals and bilinguals with various degrees of proficiency, and with the word order characteristics described by Muysken. It is likely that these features are similar, in the relevant aspects, to the speech of adult bilinguals in Peru; i.e., that they have a total predominance of postnominal genitives and adjectives, a clear predominance of VO, but about a 20% minority of OV. These data contribute to a much stronger case for the universals and the CCH principle—and against the possibility that relative frequencies of objects vs. genitives and adjectives are the main factors determining the sequence of word order adjustments made by the children while acquiring the educated norm. Note that the children first undertake the modifications in the VP even though in the adult model they are exposed to a very substantial degree of word-order variability in that unit. (Recall that the educated norm also has OV as a variant pattern.) These modifications first involve very large numbers of VOV constructions, which have negligible frequency in the adult language. At the same time, the children initially maintain their genitives and adjectives in prenominal position, although prenominal modifiers are rare or non-existent in adult speech.

If our observations are confirmed by data from bilingual adults from Peru, then the initial OV > VO change carried out by the bilingual child seems largely motivated by pressures to achieve a cross-categorial balance of operator preposing/postposing (CCH), together with the constraints represented by the synchronic universals and the DAH/FIH in the stronger version we have proposed. The type of adposition (PREP) of the ES is in disharmony with the final position of the noun and verb operands; Type 19, represented by this stage, is in fact a very rare type both in Table 3 and the expanded sample of Hawkins, ms. CCH predicts that a non-preferred and infrequent type of language will come under increasing pressure to re-introduce a balance; and one might expect the prediction to be more easily fulfilled in the contact situation. If patterns of adult speech exerted a stronger influence, the child would first carry out the leveling of postnominal modifiers on the model offered by his sociolinguistic context, thereby achieving the permitted Type 17 (SOV, Pr, NG, NA). But transition

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24 This interpretation is not in agreement with Muysken’s own, since he claims that the Ecuadorian variety is SOV, NG, and NA. See Luján, Sankoff & Bordelois for a re-analysis of his data.

25 The Peruvian educated norm shares the V-final pattern with Andean Spanish (with different frequencies depending on regions), but not the prenominal genitive.
to this type would infringe on our stronger version of DAH/FIH (cf. 18c in Table 6). Our claim, however, is not that the adult speech has no influence; note that the OV > VO change is in fact in accordance with the adults’ basic SVO. Rather, we claim that, in the child’s attainment of the basic word orders of the target language, his linguistic input must be subordinate to the joint pressure exerted by the implicational universals, the DAH/FIH, and the CCH principle.

The subsequent changes in the noun operators to postnominal position also offer, in light of the adults’ speech, a stronger argument in favor of the CCH principle as the main factor determining the observed intermediate stages. It is well known that the adult bilinguals’ Spanish contains a small minority of prenominal genitives (though these do not occur in the Peruvian educated norm), but a virtual absence of prenominal adjectives. However, bilingual children again choose to introduce the postnominal genitive before adopting the postnominal adjective despite the fact that this is not as clearly motivated by a conflict with the adult model. Again this change involves a construction which is absent from the adult model (and unattested in the speech of Muysken’s subjects): the so-called double possessive, bearing pre- or postnominal genitive plus a possessive determiner before the head noun, as in exx. 3–4 and 8. AN > NA as second innovation, or the simultaneous incorporation of NG and NA, are alternatives within the UCH and the revised DAH/FIH (cf. Table 5). But, as previously noted, they define chronological sequences not favored by the CCH principle, since they involve transition through non-preferred language types.

Thus CCH, as a universal principle defining co-occurrence preferences which are motivated by a grammar’s tendency to maximize cross-categorial generalizations, provides a principled account of language distribution across types (the more harmonious ones being more numerous), as well as of the dynamics of language evolution and acquisition in the contact situation. Specifically, it answers the question of why the position of the noun should be related to both verb and adposition orders. As a necessary supplement of the set of implicational universals, it goes beyond the description of word order correlations, in a direction that explains why and how such correlations affect language acquisition and evolution. If our conclusions are warranted, they emphasize the importance that bilingual data and language acquisition by bilinguals be studied in the light of a theory of universal grammar and linguistic evolution.

The UCH postulates precise implicational and distributional universals of word order, which cannot be assumed to be acquired by children separately from the language(s) they learn. To induce such principles from their own experience, children would have to be exposed to a variety and areal coverage comparable to Greenberg’s original 30-language sample. Thus it is reasonable to assume that such universals are innate, and that (along with other universal principles) they play a central organizational role in selecting and shaping the experiential data which children extract from their immediate context. While

universal principles may receive relative empirical validetry through the historical changes spanning several generations of monolingual speakers, the data afforded by speakers in areas of language contact provide ideal laboratory conditions for thoroughly validating them by means of straightforward quantitative analysis. Language contact studies may thus bear crucially on theories of language acquisition and of universal grammar.

According to the UCH account developed in this study, children’s linguistic input plays a secondary role in the stages of their acquisition of the basic word orders of the target language. By contrast, it seems to play a more prominent role in relation to the establishment of the variant patterns in the bilingual speakers’ Spanish. The transition required from the set of characteristics at age 9 to those shown in the adult data from Ecuador involve no change in basic features; both varieties are Type 9, as in the standard language. The changes are instead manifested as (a) the radical reduction of the Quechua-inherited variant patterns GN and AN to almost complete disappearance, and (b) the maintenance of a 20% minority of the variant order OV borrowed from Quechua.

6. Conclusions. The results here reported shed light on problems of basic word order and of the stages observed in the acquisition process—in particular, that which takes place in areas of language contact. We have examined several hypotheses having direct implications for two current opposing theories of linguistic change, regarding the order of acquisition of three word-order features. A quantitative analysis of the linguistic data has provided evidence that innovations are constrained by observance of linguistic universals, thereby disqualifying the notion that the change process must be initiated by a violation of a synchronic universal. This study thus provides empirical support, from bilingual variation data, for the UCH, for Universals I and III, for the DAH and FIH, and for CCH as formulated by Hawkins 1979, 1980 to account for diachronic data and language distribution across the basic types. In addition, our analysis warrants a strengthening of the DAH & FIH, which will insure that the chronological stages followed by co-existing minority and majority variants will always remain within the bounds dictated by synchronic universals, but also severely limits the number of choices for linguistic innovation. Most importantly, our results highlight the overriding influence of the universals and the UCH in shaping the main course of developments in language acquisition in the contact situation, as compared to the influence that may be exerted by the models offered by the sociolinguistic context.

This study offers, in addition, novel results for the syntactic description of a large dialectal area of Spanish—namely, that which has been influenced by Quechua. At the same time, it provides an over-all picture of how two syntactically diverse languages, Quechua and Spanish, interact in the contact situation. The word order acquisition stages postulated will have important consequences in the study of variability in Peruvian Spanish, as well as in other dialect areas of Latin America that are characterized by the presence of large indigenous populations; linguistic variation in these areas has long been recognized to be dependent upon the degree of influence of various indigenous
languages. It is also well known that features characterizing the various acquisition stages in children’s speech are often preserved as variable styles in their adult speech, along with the standard norm assimilated in the acquisition process. This study has thus shown that acquisition, as well as variability data, can be most insightfully interpreted within a comprehensive theory of linguistic change.

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