

TRANSFER AS EVIDENCE FOR PHONOLOGICAL SOLUTIONS*

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1. INTERNAL AND EXTERNAL EVIDENCE

Since, during the structuralist and classical generative eras, the truly central concern of linguistic research was structure, non-structural facts usually came to fall outside the repertory of arguments which were at that time felt to be most appropriate in linguistic description. Descriptive problems were thus typically resolved on the basis of *internal evidence* alone, that is, facts belonging to the structural system as such. Extra-structural or *external evidence*, on the other hand, found only slowly its way into the descriptive and theoretical discussion, historical evidence first and then various other kinds of external data. It took, however, remarkably long before evidence from contrastive analysis and the study of transfer began to be seriously utilized in theoretical and descriptive contexts. Actually, it is not until the past few years that contrastive data and transfer data have begun to play any role at all for these purposes within the dominant schools of linguistics.¹

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¹ To some scholars it has always been clear, though, that contrastive analysis and transfer study may be valuable also for descriptive research. Note, e.g., Haugen (1955/1972:297):

[I]t can be shown that any advances we may make in bilingual description will rebound to the benefit of monolingual description. Where alternative analyses are possible in the latter, as they still are in far too many cases, bilingual description may provide us with the key to a preference for one or the other analysis.

Cf. also Fisiak (1975:341) for references on the so-called language characterology of the

A recent example from Scandinavian linguistics of the use of contrastive analysis and transfer analysis to evaluate descriptive solutions is Karlsson (1977). In this article, Karlsson adduces observations of how Swedes transfer Swedish quantity patterns into Finnish so as to shed light upon the descriptive interpretation of Swedish quantity put forth by Eliasson & La Pelle (1973).² Departing from the assumption that it is not possible on descriptive grounds to make a unique choice among various conceivable solutions for Swedish quantity, Karlsson tries to "ascertain what empirical evidence may possibly be obtained for the non-uniqueness problem from the interference in pronunciation which arises when Swedes are confronted with the quantity system of Finnish" (1977:3; my translation). And he specifies (1977:7-8; again my translation):

In what follows I will attempt to show that the quantity rules [rules (1a) and (1b) below proposed by Eliasson and La Pelle (1973) /SE/] are not just technical constructs in the description which are needed in order to generate phonetically correct surface forms, given a certain structurally based hypothesis about the deep phonological forms, but that the rules also have clear empirical correlates which show up as interference phenomena in foreign language learning, more specifically, in the encounter of the quantity systems of Swedish and Finnish. I will in other words give some concrete empirical arguments which support Eliasson's and La Pelle's (1973) structurally based analysis.

In this paper, I will discuss a little further some of these transfer data and how they bear upon the evaluation of the descriptive solution.

2. THE DESCRIPTIVE AND CONTRASTIVE BASIS

Before we begin to deal with transfer and its relevance to descriptive solutions, we must, however, say something about the structure-internal facts in Swedish, which is the source language (SL) in this case, and Finnish, which is our target language (TL).

Some of the most basic quantity patterns at the phonetic and phonological level in the two languages are shown in *Table 1*.

Level	SWEDISH				FINNISH			
	(stressed syllable within morpheme)							
Phonological	/VC/	...	/VCC/	...	/VC/	/VVC/	/VCC/	/VVCC/
Phonetic	\							
	...	[¹ V:C]	[¹ VC:]	...	[VC]	[V:C]	[VC:]	[V:C:]

Prague School. Zwicky's (1975:154f.) listing of data which have been employed in recent phonological analysis includes numerous other types of external evidence.

² This solution is commented upon further in Eliasson (1978b).

Table 1. Some basic quantity patterns in Swedish and Finnish. (V stands for a vowel, C for a consonant, and VV and CC for phonological clusters made up of two identical segments).

The Swedish and Finnish quantity patterns illustrated there differ in several quite important respects. For one thing, in Swedish, length appears basically only in stressed syllables, whereas in Finnish it also occurs in unstressed position. Second, Swedish possesses only two of the quantity types which Finnish has. Third, there obtains in Swedish a more complicated relation between the phonological and the phonetic level than in Finnish, since the Swedish phonological sequence /VC/ corresponds not to phonetic [VC], but to phonetic [V:C] in stressed position within morphemes.

Two prominent aspects of Swedish quantity, which are reflected in *Table 1*, may in generative formalism be expressed by the two subrules (1a) and (1b) (cf. Eliasson & La Pelle 1973:139, 141, respectively).³

(1) (a) *Vowel lengthening* (the main case)

$${}^1V \rightarrow {}^1V: / - (C) \left(\begin{matrix} l \\ r \\ n \end{matrix} \right) \left\{ \begin{matrix} + \\ V \end{matrix} \right\}$$

Condition: C must be an obstruent if followed by *l*, *r* or *n*

(b) *Consonant lengthening* (.=half-length)

$$C \rightarrow C / \left[\begin{matrix} {}^1V \\ -\text{long} \end{matrix} \right] -$$

Subrule (1a) will generate the correct quantity in examples such as:

Context	Phonological form	Phonetic form	
- C#	/dæk/	[¹ dæ:k]	'table cloth'
- #	/dæ/	[¹ dæ:]	'you' (sg., familiar)
- C+C	/dæk+s/	[¹ dæ:ks]	'of (a) table-cloth'
- C+V	/dæk+a/	[^x dæ:ka]	'set the table'
- +C	/dæ+s/	[¹ dæ:s]	'of (the word) <i>du</i> '
- +V	/dæ+a/	[^x dæ:a]	'address by <i>du</i> '
- CV	/degel/	[^x de:gel]	'crucible'
- V	/biu/	[¹ bi:u]	'cinema'
- Cl	/ragl+a/	[^x ra:gla]	'stagger'

³ Strictly speaking, lengthening in Swedish is one unitary process assigning the feature [+long] to a segment, either a vowel or a consonant, under certain specified conditions.

Subrule (1b) will lengthen the first post-vocalic consonant in, e.g., items of the type /dagg/ 'dew', yielding intermediate /dag.g/, etc. In addition, a fusion or reduction process will convert an intermediate structure /C.C/ with identical phonological consonants into phonetic [C:] (cf. Eliasson & La Pelle 1973: 141f.). Hence, the complete derivation of the item *dagg* will be:

Underlying form	/dagg/
Stress assignment	'dagg
Lengthening	'dag.g
Fusion of geminates	'dag:
Phonetic form	['dag:] 'dew'

On the other hand, for the Finnish quantity patterns in *Table 1*, scholars generally just presuppose the phonological convention in (2).

(2) Phonological geminates are realized phonetically as long segments.

The Swedish lengthening process in (1) together with consonant reduction and the Finnish convention (2) thus account for the relations between the phonological and phonetic representations of quantity which appear in *Table 1* above.

The Swedish structures in *Table 1* include the phonological quantity type /VCC/ where CC consists of two identical consonants. Phonetically, the first of these consonants will, as we have mentioned, be lengthened to half-length by subrule (1b) and, moreover, due to reduction, the two phonologically distinct segments will articulatorily be realized as a single segment. But it should be noted that, as stated here, subrule (1b) will also apply to the first consonant in a cluster made up of two different consonants. Not only does consonant lengthening affect such morphemes as /akk/ 'alas' and /ass/ 'A flat', which become [ak.k] and [as.s], respectively (and finally phonetic [ak:] and [as:]), but it also affects morphemes of the type /aks/ 'ear (of grain)' and /ask/ 'box', which run into [ak.s] and [as.k], respectively, at the phonetic level.

A partly similar phenomenon also shows up in Finnish and is formulated by Karlsson in the following way (1977:12; my translation):

$$(3) \left[\begin{array}{c} C \\ +\text{son} \end{array} \right] \rightarrow [\text{half-long}] / \left[\begin{array}{c} V \\ +\text{stress} \end{array} \right] - CV$$

In other words, in Finnish a sonorant becomes half-long in the environment between a stressed vowel and a consonant followed by a vowel. As examples of this process Karlsson adduces words like [kan.sa] 'people' and [kel.po] 'capable' from underlying /kansa/ and /kelpo/, respectively. In contrast, there occurs no lengthening of the sonorant in [kans:a] 'together with' from phono-

logical /kansa/. These facts of the two languages may be summed up as in *Table 2*.

Level	SWEDISH (in stressed position)	FINNISH	
Phonological	/VC _a C _b /	/VRCV/	/VRCCV/
Phonetic	[¹ VC _a C _b]	[¹ VR·CV]	[¹ VRCCV]

Table 2. Post-vocalic consonant lengthening in Swedish and Finnish. (R stands for a sonorant, i.e., in this case a nasal or a liquid, and C_a ≠ C_b.)

As is clear from the table, Finnish sonorant lengthening is more restricted than Swedish consonant lengthening, in part with respect to the class of segments on which it operates (in Finnish only sonorants, in Swedish all consonants which are possible in post-vocalic position), in part in regard to the distributional environment (in Finnish only in the context ¹V-CV, in Swedish in every stressed syllable containing a short vowel).

3. INTER-SYSTEMIC TRANSFER

In our remarks on Swedish and Finnish quantity we have so far dealt with the descriptive data themselves and some simple comparisons of the structural patterns in the two languages. With this in mind we may proceed to some observations of how the Swedish quantity system may interfere with the Finnish one. In *Table 3* we list a few typical examples from Karlsson (1977) of the difficulties Swedes have with Finnish quantity.⁴

	<i>Finnish word</i>	<i>Finnish pronunciation</i>	<i>Meaning</i>	<i>Approximations by Swedes</i>
(i)	/tuli/	['tuli]	'fire'	*['tu:li]
(ii)	/kansa/	['kan.sa]	'people'	*['kan·s·a]
(iii)	/kanssa/	['kans:a]	'together with'	*['kan·s·a]

Table 3. Some types of interference in the rendition of Finnish quantity by Swedes. Data from Karlsson (1977).

⁴ Following Karlsson (1977:13), the duration of the second post-vocalic consonant in interim *['kan.s.a], etc., is simply indicated by a raised dot as opposed to the 'overshort' s of the correct TL form ['kan·sa] and the like.

Representing these data a little more schematically, we have the target language structures and approximations indicated in the first three columns of *Table 4*.

Finnish structure (first V stressed)	Finnish pronunciation	Approximations by Swedes	Structural mechanism involved in transfer
(i) /VC/	[VC]	*[V:C]	[V:]: Phonological subrule (1a)
(ii) /VRCV/	[VR·CV]	*[VR·C·V]	[R·]: Phonological subrule (1b) *[C·]: Phonetic detail specification (4)
(iii) /VRCCV/	[VRC:V]	*[VR·C·V]	*[R·]: Phonological subrule (1b) *[C·]: Phonetic detail specification (4)

Table 4. Schematic representations of some interference types in the rendition of Finnish quantity by Swedes and the structural mechanisms involved in this transfer.

The non-native elements of these approximations can be related to three different structural features of the source language. The vowel lengthening in (i), insofar as it does not result from, or is enhanced by, pronunciation rules for the Swedish spelling, must be due to the transfer of the SL subrule (1a) into the Swedes' interim Finnish. Similarly, the lengthening of the sonorant R in (ii) and (iii) of *Table 4* can be ascribed to the SL subrule (1b)⁵. Finally, the durational differences between the Finnish 'overshort' and long obstruents in (ii) and (iii), respectively, are obliterated because of the SL constraint (4) (which is, of course, just a special case of a general convention governing the durations of unstressed segments in Swedish).

(4) A phonetic consonant segment in position VR·V is short.

As a consequence of (4), Swedes will tend to neutralize length distinctions in position C (C) in Finnish structures of the type I VRC (C) V I⁶.

⁵ Theoretically, the sonorant length in (ii) may, of course, arise from a correct application of Finnish sonorant lengthening (3). That Swedish consonant lengthening (1b) has played a role in error type (ii) in *Table 1* seems likely, however, because it has applied in the parallel case (iii) and because the consonant cluster in (ii) has also been subject to the transfer described in (4) below.

⁶ The approximations mentioned above illustrate the direct transfer of internal Swedish rules or subrules into interim Finnish. However, the influence from a source language on an approximative target system may also occur so to speak via special *inter-systemic transfer processes* or *interrules*, which do not exist as internal rules either in the grammar of the SL or in the grammar of the TL, but develop as links between the source system and the approximative target system in a language learning or language contact situation. See, e.g., Eliasson (1978c:231, 236 fn. 5). Cf. also Andersen's (1973:781

4. TRANSFER AS EXTERNAL EVIDENCE

Returning now to the use of external evidence in order to evaluate descriptive solutions, we notice that the transfer types in Swedish approximations to Finnish pronunciation indicated in *Table 4* seem to provide considerable support for the kind of descriptive analysis of Swedish quantity which we summarized in section 2 above. The portion of Swedish lengthening affecting vowels, i.e. (1a), together with orthographic reading rules, may be thought to have resulted in the interference in (i) in *Table 4*, and the subpart of Swedish lengthening affecting consonants, i.e. (1b), yields positive transfer in the sonorant in (ii) there and negative transfer in the sonorant in (iii). Thus Swedish consonant lengthening has clearly left its mark on this interim variety of Finnish and, in addition, vowel lengthening may have played a definite role.

However, for Finnish VC, one often encounters the alternative error type *[VC:] with consonant lengthening according to (1b) instead of vowel lengthening according to (1a). Like Karlsson (1977:16), we may ask whether this error type means that, while keeping the consonant lengthening rule, we must reject the vowel lengthening rule (1a) in Swedish descriptive grammar and postulate instead phonologically distinctive vowel quantity. The answer to that question is not necessarily a straightforward yes. Even though this is not very clear from most current theories of phonology, it is reasonable to assume that many structural phonological processes have both an *interpretive* and a *generative* function (cf., e.g. Eliasson (forthcoming) and references there). That is, we must be able to employ the phonological processes in a grammar both to induce phonological representations from phonetic forms (sometimes with the assistance of subsidiary strategies) and to generate phonetic forms from phonological representations. Provided we do at all accept the idea that there are different structural levels in language and the assumption that these levels play at least some role in linguistic performance (such as in the language user's attempts to analyze new, unclear, or ambiguous data), we will have to reckon with the possibility that Finnish [VC] structures may be interpreted so to speak, via the equivalent of a consonant lengthening rule like (1b) rather than a vowel lengthening like (1a). What this means is, that

*"adaptive rules" and Wurzel's 'Adaptionsregeln' (1977a, 1977b:274). Earlier descriptions of inter-systemic connections include Haugen's (1954, 1955) diaphonic relations, diacritics, and so forth. We may recall also Haugen's (1955/1972:300) account of what is the purpose of "bilingual description", namely that "[i]n making such comparisons we are attempting to reconstruct the principles on which the speakers have made their identifications" and moreover (Haugen 1954/1972:277) that "a bilingual description is thus more than two monolingual descriptions laid side by side, for it attempts to equate units of the one language with units of the other". It is evident that inter-systemic processes must often be assumed to include certain 'universal' features.

from a Swede's point of view, a Finnish sequence [VC] may be ambiguous. By 'backwards' derivation (derivation from the phonetic to the phonological level) using the vowel length rule (1a), we would induce a phonological structure /VC/, but using the consonant length rule (1b) we would obtain the structure /VCC/. Now, because the durational differences stand out far more in the vowel than in the consonant portion of VC sequences in Standard Swedish, it is natural that a Swede should be much more prone to adjust his impression of the consonant than of the vowel in Finnish [VC] structures and thus to induce a phonological structure */VCC/. This interference seems likely since a short vowel duration in a stressed syllable in Standard Swedish signals typically (though not always) that at least two phonological consonants follow within the same morpheme (Eliasson & La Pelle 1973). Schematically, we have the following two cases involving interference.⁷

Actual phonetic form	[VC]	[VC]
Perceived phonetic form	*[V:C]	*[VC:]
Recovery of geminates	↓	↓
Deletion of consonant length	↓	'VC·C
		↓
Deletion of vowel length	↓	'VCC
	'VC	↓
Destressing	↓	↓
Phonological form	/VC/	/VCC/

Generatively, the induced sequences /VC/ and /VCC/ may quite naturally be realized as [V:C] and [VC:], respectively, in the interim Finnish spoken by Swedes.

Hence, we realize that, as the issue stands at the present time, the occurrence of the error type *[VC:] instead of *[V:C] for Finnish *VC does not resolve that part of our descriptive problem which involves the existence or not of vowel lengthening. What this interference type actually corroborates is that differences in vowel duration are more important than differences in consonant duration for the perception of quantity relations in Swedish syllables. In other words, it points to the importance of a kind of surface phonetic distinctness or dissimilarity⁸. However, this interference type does

⁷ Note, not necessarily distinctiveness in the technical (phonological) sense. It is most important to observe that quantity in Central Standard Swedish hardly ever results in truly minimal phonetic pairs with sound differences in a single position or segment (as, e.g., *t* and *d* contrast in the minimal pair ['tu:r] 'tour' vs. ['du:r] 'major key'. This striking suggests that quantity in Swedish must to a large extent be prosodic rather than segmental in nature. Cf. Eliasson (1978b:118).

⁸ The schemes given here are supposed to picture structural relations. They are not intended to imply any ordering of steps in performance, or the like.

not say anything definite about the phonological interpretation. The solution for Swedish quantity referred to above does not take into account surface distinctness only, as if this criterion could be considered in isolation from the remaining structure of the language, but integrates the analysis of quantity into a total description of Swedish phonology, where factors such as the dependence of length on stress, the relation of length to morpheme structure (phonotactics), and the morphophonetics of vowels and consonants are essential elements (see *ibid.*). It is clear, then, that by itself the interference pattern *[VC:] mostly illustrates just one out of several different aspects of Swedish quantity, namely, phonetic distinctness or the emergence of partly separate phonetic units. But it is essential to remember here that the very notion of phonology implies precisely that phonological structures may differ from phonetic ones. Also other aspects than purely phonetic dissimilarity must therefore be explored in settling questions of phonemicity (as was done already by structuralist phonologists such as Trubetzkoy and others). If we thus accept the prevailing opinion that the realm of phonology is not exhausted by a kind of systematic phonetic description, we will naturally expect contrastive and transfer phonology to be correspondingly complex.⁹

⁹ Parenthetically, we may recall another fact concerning transfer. As *Fig. 1* below suggests, transfer is, not only structurally, but also in other respects, a highly intricate phenomenon.

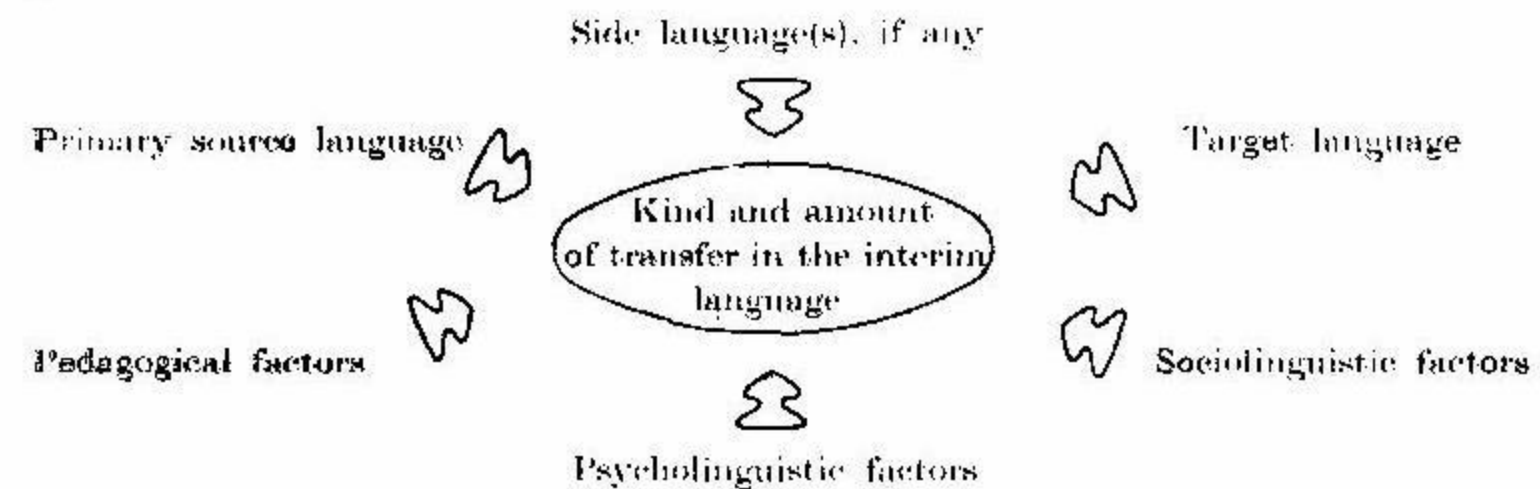


Fig. 1. Some structural and nonstructural factors affecting the appearance of linguistic transfer

Accordingly, transfer has many causes, both non-structural and structural. Among the structural causes, different factors may differ in strength. It seems reasonable to suppose that neither the degree of *strength of interfering* which is connected with a particular source language phenomenon, nor the degree of *susceptibility to interference* which shows up with a given target language phenomenon need be constant under all grammatical conditions. The strength of interfering and the susceptibility to interference are likely to vary when different components of the grammar, or different parts of a given grammatical component, are involved, and they need not necessarily always be assumed to be the same even for two individual rules or units of the same formal type within the same component. (Nor, for that matter, are difficulties limited to error types and amount of

Moreover, apart from the matters regarding descriptive analysis, contrastive analysis and transfer which we have now touched on, we should emphasize the fact that the relation between available internal and external evidence may vary a great deal. In principle, there are numerous possibilities, a few of which are listed in *Table 5*.¹⁰

The degree of motivation of a given descriptive solution in regard to:	A	B	C	D	E	F
(a) internal evidence	—	—	—	+	+	+
(b) external evidence	—	0	+	—	0	+

Table 5. Some potential over-all relations between internal and external data in regard to their verifying power. A plus (+) means that data on the whole support, a minus (—) that they tend to contradict, and a zero (0) that they neither support nor contradict a particular solution.

When, as in case A and F in the table, internal and external evidence concurs, it is not difficult, of course, to come to a decision regarding a given solution. As one of many examples of case A, we may mention the highly abstract phonological interpretations of Swedish *š* and *ç* as /sk, sj, stj, skj/ and /k, tj, kj/, respectively, which were current in Swedish linguistics during the early seventies. The synchronic descriptive evidence which was invoked in favor of these solutions consists largely of frail structural remnants from earlier historical periods, and these interpretations have neither received any convincing support from more extensive descriptive facts (Eliasson 1973), nor from interference data (see Eliasson 1976 and 1978c:219–21, 227–30 for dis-

errors, but are also a question of latency time for correct production and perception of constructions, forms, and so forth.) When in addition extra-structural causes are taken into account, the picture becomes even more involved. Besides, in agreement with these assumptions is the observation that the nature of transfer will change somewhat as learning goes on. Different stages of progression result in partly different varieties of transfer. On the basis of limited or unrepresentative data, the language learner may easily make certain generalizations which later turn out to be erroneous in the light of the total structure of the target language.

¹⁰ It must be kept in mind that both internal and external evidence may each by itself be extremely multifaceted. All the 'interesting' descriptive problems in various languages are precisely those cases where different types of internal evidence diverge. When in *Table 5* we talk about internally or externally well-motivated solutions, we thus do not mean that *all* internal or external facts necessarily point in the same direction, but just that the greater part of these data do so.

cussion). Case F, on the other hand, may be illustrated by means of consonant lengthening in Swedish which is, as we have seen, both descriptively and contrastively well founded. However, it may be harder to arrive at a definite decision in cases B and E where the available extra-structural information does not suffice to elucidate unambiguously a certain structural problem. The interference type *[VC:] instead of [VC] in the interim Finnish of Swedes might be said to be such a phenomenon. And a veritable crux would arise if structural and non-structural data could be shown to point indisputably in quite opposite directions as in cases C and D.

In conclusion, what emerges is that external data and external verification are no less complex than purely internal facts and internal argumentation. The verifying power of transfer data, like that of other external data, will depend on a number of circumstances and assumptions. At the same time, however, there remains the fact that evidence from transfer is extremely important in linguistic analysis for by studying transfer we can, in particularly striking ways, lay bare patterns which are otherwise well encapsulated in fairly stable linguistic systems. Thus even though evidence from transfer may at times be difficult to interpret in an entirely unambiguous fashion, it is nevertheless an essential and indispensable mirror of many facets of the internal structure of language.

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