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Foreword

This is the tenth in the series of working papers published by
LOGOS, the Student Linguistics Society at the University of Calgary.
These papers represent the current research in progress of students
and faculty members and as such should not be considered in any way
final or definitive. Appearance of papers in this volume does not
preclude their publication in another form elsewhere.

Special thanks to Olga Koutna who edited her 1983 M.A. thesis
for publication in this volume and to Deanna Westby who allowed us
to publish excerpts of her B.A. Honours thesis here. Also included
in this volume is a paper submitted by Dr. Claude Romney (Department
of French, Italian & Spanish) as well as a contribution from Dr. Jim
Anderson entitled "Ancient Languages of Spain". We extend our thanks
to the contributors to this volume and encourage readers to submit
articles for inclusion in the next issue.

We wish to thank Kathy Officer who typed this entire volume.
Special thanks as well to the Graduate Students Association and to
the Department of Linguistics for their financial contributions.

The editors of this volume were Cynthia Grover, Joyce Hildebrand
and Karen Taylor-Browne. Thanks, also, to Mary Pepper for assistance
in proof-reading and for her invaluable advice regarding various details
of the publication of this issue.

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Ancient Languages of Spain

James M. Anderson

Introduction

As is well known, the Basque language of the northeast Hispanic
Peninsula and the southwest corner of France has no substantiated
antecedents. Similarly, ancient Iberian, a preRoman language of
Mediterranean Spain and southern France, perceived only through in-
scriptional material still undeciphered and in some aspects
problematical, also has no identifiable progenitors.

Basque and Iberian existed in adjacent and perhaps overlapping
areas of the Hispanic Peninsula, however, and a kind of linguistic
imbrication may account for the personal names common to both
languages as inscribed, for example, on the Ascoli Bronze Tablet.[1]
The names on this document are from locations thought to have been
situated north of the Ebro river (Aragon), where one would most ex-
pect the commissure of the two cultures and languages. Compare, for
instance, the following:

Basque		Iberian	Basque		Iberian
arrano	'eagle'	arranes	ezker	'left hand'	iskar
arren	'lame'	arrenes	gortarzun	'ardor'	gurtarno
adin	'age'	adin	ilun	'dark'	-illun(ildun)
biur	'twisted'	biur	urdin	'grey-haired'	ordun-
beltz	'black'	bels/beles	zuzen	'right, fair'	sosin-

It is clear from their occurrence on other Iberian inscriptions
that the names on the Ascoli Bronze plaque were not simply Basque, cf.

Name	Location	Name	Location
adinbelaur	Tarragona	biuru	Castellón
iluradin	Azaila	biurtite	Liria
sakariskar	Liria	belasbaiser	Fraga
ildubelesban	Iglesuela del Cid	sosinbiuru	Castellón
iskerbeles	Ilerda	ordin	Santa Perpetua de
ikorbeles	Sagunto		la Moguda
nereildun	Sagunto		

A large number of lexical forms are found throughout Iberian
territory that appear related to Basque.

An inscription on an earthenware bowl, dating to about 100 B.C. (the time when the bowl was made) from La Granjuela, reads ankisaaren (ankisa aren) followed by several metrological signs. The first word appears to have been a proper Graeco-Latin name, cf. Greek 'Αγχίσης and Latin Anchises,[2] used in the nominative of the first declension as was customary (Anchisa). In Greek mythology, Anchises was the father of Aeneas.

The word aren appears to be a Basque form found, for example, with proper names as in Miguel-ar-en-a (the village of Miguel). Aren appears in various Iberian inscriptions from Enserune in southern France and throughout Spain. On the La Granjuela, as elsewhere, it seems to indicate the possessor or owner of the bowl.

An inscription from Liria accompanied by a drawing of a battle scene between spear-throwing and shield-bearing men in canoes and a warrior on shore, reads: gudua deistea,[3] words comparable to Basque gudu 'war' and deitu 'to call.' The Iberian gudu is also found at the Iberian site of Enserune and elsewhere. Of equal interest is an inscription from Mogente which reads: aiduarbegiabe and contains lexical forms comparable to Basque aidur 'evil' and begi 'eye.'

Several Iberian inscriptions were written in an Ionic Greek alphabet of about the fourth century B.C. The transliteration of these documents offers no particular problems although the language is obscure and so far undeciphered. One of these inscriptions, the Alcoy Lead Tablet is presented here, in part, as further corroboration of the notion that Basque lexical forms appear to occur in the Iberian language.

irike orti garokan dadula bask/buistiner bagarok
SSSXV turlbai/lura legusegik baseroke iunbaida/urke basbidir-
bartin irike baser okar tebind balegasikaur isbin/ai asgandis
tagisgarok binike/bin salir kidei gaibigait
arnai sakarisker

An examination of the text reveals a number of words that could be related to Basque on the basis of phonological similarities. As again the meanings of the Iberian words are unknown the second and crucial part of the operation, semantic similarity, cannot be applied.

Alcoy Lead Tablet	Basque	
bai, baida	baita	'also'
lura	lur	'land'
-isker (sakarisker)	ezker	'left'
orti	ortzi	'firmament'
irike	iri	'town'
	iritsi	'to arrive at'

It is interesting to note that the words arnai sakarisker were super-
imposed over the original writing on the left hand margin of the
inscription leaving the impression that the sentence is an instruction,
perhaps to later readers, that the document (found in an area where many
such texts are read from right to left) should be read from the left.

Another lead plaque, the so-called 'Plomo'El Solaig' contains the
sequence of letters ededur comparable to Basque ede 'to drink' and ur
'water.' The word bidedui on the same inscription appears to incorpor-
ate the Basque word bide 'road.'[4]

The list of comparisons between Basque and Iberian could go on but
would still only demonstrate the possibility of relationship since the
important ingredient in the equation of semantic similarity cannot be
established. There does, however, seem to be too many similarities in
form as to preclude pure chance.

Further rapprochement between Basque and Iberian is apparent in
the congruence of their phonological arrangements. Except in loan
words, the phoneme /p/ is rare in Basque and appears to have been even
less frequent in earlier periods of the language. The voiceless labial
stop seems to have resulted from /t/ + /m/ as in *oroit-men → oroipen
'remembrance' or from a phonological split in which /b/ → /p/, cf.
erromako zupi "arco iris" from zubi 'bridge.' The labial fricative /f/
in Basque also appears only in loan words or from another older source.
The modification of Latin words in /f-/ incorporated into Basque as
/ph/ or /b/ supports this conclusion. Similarly, the labial nasal /m/
seems to have originated in Basque from secondary sources, to have been
rare and generally restricted to loan words. In native words it most
likely originated in /nb/ through /mb/ to /m/. Some evidence for this
is found in the Basque word seme 'son' and ancient Aquitanian (believed
by many to have been Basque) sembe-.

Similarly, Iberian names such as adimels and sosimilus on the
Ascoli tablet can be easily reconstructed as earlier *adin beles and
*sosin bilus, based on the occurrence of these forms in earlier texts.

The absence of word initial r- in both Basque and Iberian (and
Aquitanian) is still another indication of the plausibility of inferred
relationship.[5]

A number of other affinities between these languages could be
mentioned, but the fact is that when all is said and done, the Iberian
language has not been and apparently cannot be deciphered on the basis
of comparison with Basque. The reasons, I think, are due to diverse
external influences that came to help shape the Iberian vocabulary,
perhaps not unlike French and more generally Romance influence on
English, or Persian on Armenian, etc.

Greek Influence

Greek influence has clearly contributed to Iberian lexical forms. The incorporation of Greek lexical items into Iberian should come as no surprise since, with Hellenic trading centres firmly established along the Iberian Mediterranean littoral as early as the seventh century B.C., the two cultures were in intimate contact. A Graeco-Iberian symbiosis is clearly manifest at various sites such as Emporion and Alcoy, with varying intensity, over several centuries. Apart from the wholesale borrowing of the Greek alphabet at Alcoy and elsewhere, a pair of Iberian ceramic inscriptions read: kulesuria and kulestileis, the initial part of which can, with some assurance, be equated with Greek Κυλιξ [kuliks] and signifying 'Kylix of Uria' and 'Kylix of Tileis.[6]

The Iberian word sosinbiur (sosin + biur) appears as a likely candidate from Greek Σωσιπολις [sosipolis] 'saving the city' where, perhaps, biur means 'city' in Iberian.[7]

More interesting, however, are a series of Iberian funeral inscriptions that seem to have been written in a kind of pidgin Greek, but employing the Iberian orthographical system. One such document reads:

aretake atinbelaur antalsgar Fulvia Lintearia

The first sequence are may or may not be a supplication to Ares but take seems composed of Greek ta (article or demonstrative) plus ekei (adverb 'in that place'). The word ekei was employed in Greek as a euphemism 'in another world.' Undergoing crasis, ta plus ekei became in Greek takei. Atin Belaur is an Iberian personal name and antalsgar appears composed of anta (adverb 'make other than it is') plus allassō ('to take one thing in exchange for another, alias'). The substantive allos may have been employed here. The form gar, a conjunction in Greek meaning 'for,' appears to lead to the sequence ant-als-gar 'in exchange for' or 'alias.' Fulvia Lintearia, a Latin name, it seems, was adopted in exchange for the Iberian name Atin Belaur.

Celtic Influence

Celtic peoples moved into the Iberian Peninsula as early as the ninth or tenth century B.C. and occupied regions adjacent to the Iberians, especially along the Middle Ebro River Basin and elsewhere in Catalonia. Along the Ebro the two cultures mingled culminating in what has been described as a Celtiberian culture. During the course of this contact, as one might expect, Celtic vocabulary found its way into Iberian as the following lexical items indicate.

Celtic	Iberian
alakko	alakos´
atinia	atin
benna	benna
karnitus	kanites
surika	suritu
tau	tau-
tinko	tinko
tautio	touto

The fact that the borrowings did not pass from Iberian to Celtic is clear from the use of this vocabulary outside the Peninsula.

Besides Greek and Celtic contributions, the prospect that other Indo-European languages may have also provided vocabulary for Iberian must also be considered. Roman influences were felt on the peninsula from the end of the third century, B.C. onward. Some investigators have looked to Latin to help explain the southern Iberian inscription generally referred to as the Gador Lead which contains forms such as ego, stari, etesu, tui, interpreting these words by Latin ego, stare, etesius and tui.[8]

Non-Indo-European North African languages have also been considered as possible contributors to the Iberian lexicon, a matter that again would offer no surprises since Iberian mercenaries often campaigned in Africa and Carthaginians occupied Iberian coastal sites between the sixth and seventh centuries B.C., down to Roman times. The frequently occurring form eban in Iberian documentation has been assumed to be related to Afro-Asiatic eban "(grave)stone."[9]

Conclusion

While it is not known when the Iberians as a cultural and linguistic entity first occupied the Mediterranean lands of the Iberian Peninsula the archaeological record is reasonably clear as to the diverse influences that came to bear on that particular geographical area. From Neolithic times on down to the Iron Age Celts and Romans, a continuous movement of peoples from East to West has occurred, altering again and again the Iberian cultural scene and presumably, based on what appears to be lexical forms of diverse origin, the linguistic landscape.

The extent of Basque influence on the language suggests either a genetic relationship, obscured by diverse influence from other quarters (Greek, Celtic, Latin, etc.) or, clearly, two cultures in intimate contact in which lexical borrowings were commonplace and augmented by borrowings from other languages.

In either case, the variegated nature of Iberian has and will continue to plague attempts to formulate a precise statement on the structure of the language and will continue to obsfuscate decipherment.

FOOTNOTES

[1]Discovered in Rome in 1908 and preserved in the Palazzo dei
Conservatori, the Turma Salluitana is one of the most important docu-
ments available pertaining to ancient Iberian studies. The inscription,
engraved on a bronze plaque, contains the names of thirty Iberian horse
soldiers. Their troop (turma) distinguished itself in battle during a
campaign in Asculum in 89 B.C. in the Marsic wars for which the soldiers
earned the honour of Roman citizenship and their names immortalized in
bronze. These proper names have served to identify a number of
linguistic units in the Iberian documents of a previous period.

The names on the plaque were divided to correspond to the place
of origin of each soldier such as Salluvia or Salduvia, Llerda, and
so forth. Not all the place names have been identified but the
majority of the troop appears to have originated in northeastern
Spain—possibly Aragon—but clearly in the region between the Pyrenees
mountains and the river Ebro.

[2]See Oroz Arizcuran.

[3]Tovar, A. p. 61.

[4]For these and further examples, see Galera Isern.

[5]For a fuller statment of phonological similarities between
Basque and Iberian, see Michelena.

[6]See Siles, J.

[7]Michelena.

[8]See Maluquer and Fry.

[9]Tovar, p. 65.

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On the Place of Gascon Among
the Romance Languages

Olga Koutna

Introduction

The Gascon language is spoken in southwestern France, in the
region geographically limited by the Pyrenees, the Atlantic Ocean and
the Garonne River (see Map 1). It has a number of peculiar linguistic
features that set it apart from the other Occitan languages but are
shared by the Iberian languages. Some medieval documents written by
Provençal grammarians show that at the time Gascon was already regarded
as a language independent from Provençal. The Leys d'Amor, a grammati-
cal codex from the 14th century, calls it a foreign language, with the
same status as French, English, Spanish and Italian (Leys II, 388).

Achille Luchaire was the first scholar who stressed the close
affinity of Gascon with Spanish:

> "En effect, le gascon constitue, à certains points
> de vue, un parler sui generis, intermédiaire entre
> nos patois de langue d'oc et l'espagnol, avec
> lequel ses rapports deviennent d'autant plus
> étroits, pour la phonétique et le lexique, qu'on
> se rapproche davantage des Pyrénées."

(Luchaire 1879:194)

Neverthless Luchaire considered it as one of the Gallo-Romance languages.
This view is generally accepted by other Romanists. Carlo Tagliavini
(1969:361) points out some correspondences between Gascon and the
Iberian languages, but in his classification Gascon is again grouped
with the Gallo-Romance languages as a part of Provençal. Pierre Bec
(1963:8), although implying in his classification an affinity of
Gascon with Ibero-Romance, classifies it as a member of the Gallo-
Romance group.

Robert Hall in his External History of the Romance Languages
(1974:26) treats Gascon as one of the dialects of southern France
without mentioning the slightest affinity of it with the Iberian
languages. He only states that "Gascon shows certain markedly dis-
tinctive features...., so that some have wished to set it up as a
separate variety, distinct from the other South French dialects."

Gerhard Rohlfs (1935, 1955, 1970), who examined Gascon from the
point of view of comparative linguistics, found that in many features
of phonetics, morphology, syntax and vocabulary there are striking

Map 1

GASCONY
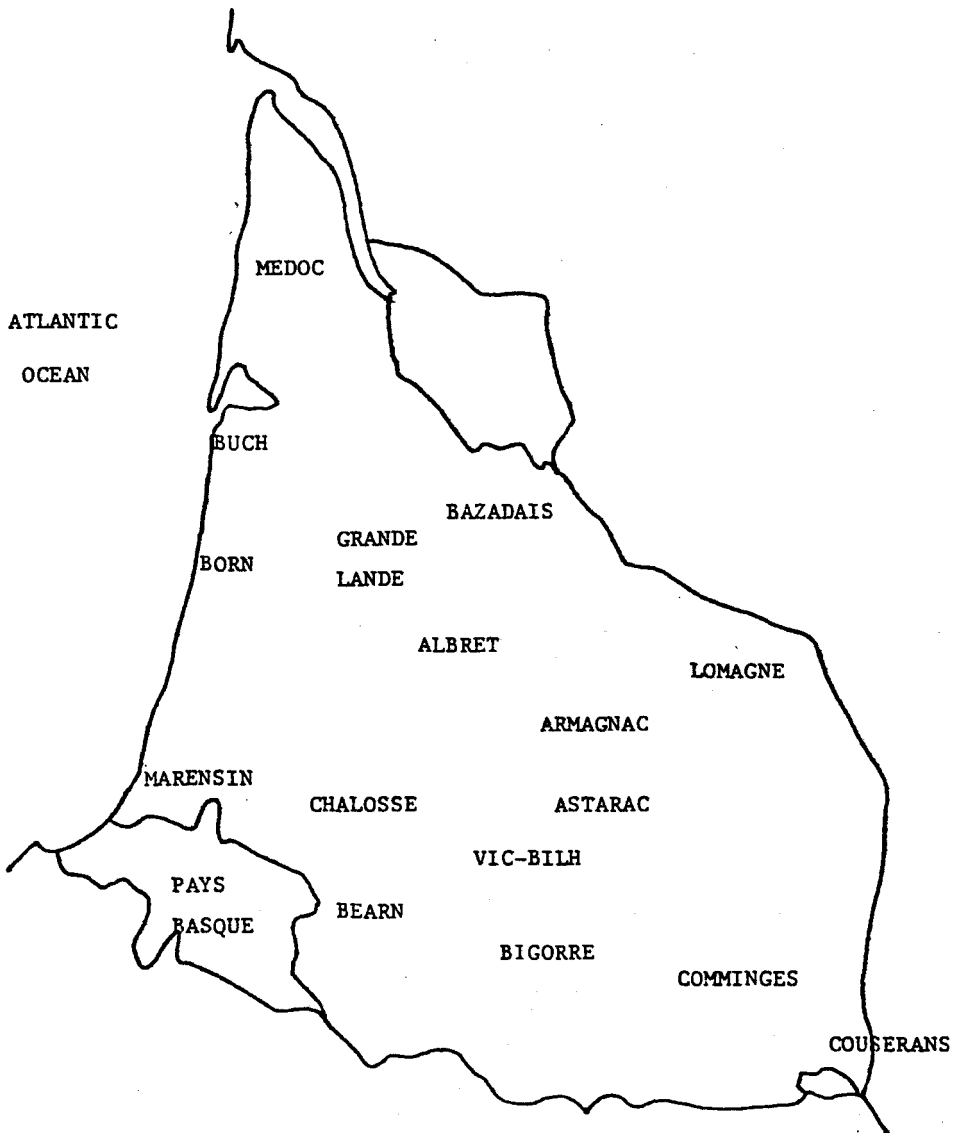
correlations between Gascon and the languages spoken on the other side
of the Pyrenees, especially Catalan and Aragonese. According to him,
these languages form a Pyrenean unity which is distinguished from both
the Gallo- and Ibero-Romance languages:

> "Gascón y catalán son hablas pirenaicas enclavadas
> entre las lenguas hispánicas y la familia
> galorrománica que participan de modo distinto en
> ambos sistemas lingüísticos."

> (Rohlfs 1955:663)

A similar point of view is expressed in _Manuale di linguistica
romanza_ by B. E. Vidos (1959:286). In his opinion Gascon, which is
usually placed with the Gallo-Romance languages, shows many linguistic
correspondences with the languages of Northern Spain, especially with Aragonese
and Catalan, forming a link between French and Spanish, just as Catalan,
which belongs to the Ibero-Romance family, joins Provençal with Spanish.
Thus the terms 'Gallo-' and 'Ibero-Romance' do not truly reflect the
linguistic reality. The Pyrenees appear as a zone of transition rather
than as a line of separation between these two linguistic groups. It
is thus possible to speak about a 'Pyrenean' Romance, which comprises
languages spoken on both sides of the Pyrenees, i.e., Gascon, Aragonese
and Catalan.

Kurt Baldinger explains the so-called Pyrenean unity as a matter
of shared linguistic conservatism rather than as a genetic relation-
ship:

> "Du point de vue synchronique, actuel, le gascon
> se rattache donc à la Péninsule Ibérique qui,
> elle aussi, a été souvent très conservatrice ...
> Puisque la plus grande partie du domaine occitan
> était plus favorable aux innovations, les rapports
> anciens du gascon avec la Péninsule s'accentuaient
> encore au cours des siècles. Ce rapprochement
> secondaire explique surtout certains traits communs
> entre le gascon et le catalan, relevés par M. Rohlfs."

> (Baldinger 1958:268, 287)

It is the intention of this study to investigate the place of
Gascon among the other Romance languages, more precisely to determine
whether it belongs to the Gallo- or the Ibero-Romance group of lan-
guages. For this purpose a number of objective tests based on the
statistical methods of linguistic classification will be used. None
of these tests has been previously applied to Gascon.

The study consists of four sections. The first presents a brief
survey of some existing classifications of the Romance languages. In
the second and third sections, two methods of classification based on
phonology and morphology are applied. A classification based on the lexi-
con is presented in the fourth section.

1.   Classifications of the Romance Languages

To anyone who knows French, Italian and Spanish, the similarities
between Italian and Spanish seem obvious; and it has often been noted
that a French speaker feels more at home with Italian than with Spanish.
And yet, according to the most generally accepted classifications of the
Romance languages (e.g., von Wartburg's East-West division), Spanish
and French belong to one branch and Italian to the other. When one
attempts to investigate the degree of similarity and difference among
these languages, one comes into conflict with the above-mentioned
classifications. Since the beginning of Romance linguistics as an
independent discipline, many linguists have attempted to solve the
problem of conclusive classification of the Romance languages, and
even before there was such a discipline there were attempts at classi-
fication, the earliest known being that of Dante, who arbitrarily
divided the languages into three groups according to their word for
'yes.' Other, more rational classifications appear in the works of
Renaissance writers like J. J. Scaliger and Benedetto Varchi.

The earliest classifications from our own tradition of linguis-
tics (which began about 150 years ago) are usually based on geographi-
cal, political, cultural or historical grounds. Very often they take
into account only the standard or literary languages. The 'minor'
varieties are either ignored or referred to in footnotes as if they
were dialects of the standard languages. In his great Grammatik (1836:
44) F. Diez, 'the founder of Romance linguistics,' distinguished only
six Romance languages, which he divided into three groups: an eastern
(Italian, Rumanian), a southwestern (Portuguese, Spanish) and a north-
western (Provençal, French). Wilhelm Meyer-Lübke (1890, 1920) treats
nine Romance languages, grouping them geographically from East to West:
Rumanian, Rhetic, Italian, Sardinian, Provençal, French, Spanish,
Portuguese. Catalan is considered a variety of Provençal, while
Franco-Provençal is considered part of French. Edouard Bourciez (1930)
deals with eight Romance languages. He reserves a chapter each for
Italian, Rhetic and Rumanian, then analyzes French, Franco-Provençal
and Provençal in one chapter, Spanish and Portuguese in another, thus
implying that France and the Iberian Peninsula are linguistic entities.

One of the first systematic classifications based on linguistic
evidence was suggested by George L. Trager (1934). He deals with 12
languages or dialect groups, classifying them according to phonological
and morphological criteria into two main groups, which he calls
'eastern' and 'western.' The western group consists of two subgroups:
Ibero-Romanic (Spanish, Portuguese) and Gallo-Romanic (Catalan, Provençal,
French, Franco-Provençal, Gallo-Italian, Rhetic). The eastern group also
includes two subgroups: Island Romanic (Sardinian, Dalmation) and Penin-
sular Romanic (Italian, Rumanian).

Walter von Wartburg (1936), by examining the distribution of sig-
nificant traits of Romance phonology, also arrived at an East-West
division of the Romance world. He found that the fundamental line of

demarcation between these two areas goes along the northern Apennines from
La Spezia on the Mediterranean to Rimini on the Adriatic coast. The
criteria for dividing the Romania into East and West are the treatment
of Latin final /s/ and intervocalic /p, t, k, s/. In the western part
/-s/ is preserved and the intervocalic stops and intervocalic /s/ are
voiced. On the contrary, in the eastern part intervocalic /p, t, k, s/
are preserved and final /s/ is lost.

Robert Hall (1950), whose classification is also based on phonology,
gives a somewhat different division of the same languages. By applying
the comparative method he reconstructs a Romance family tree which dif-
fers significantly from the two previous classifications, for he finds
that the East-West division in the Romance languages is secondary, the
first split being between Proto-Southern and Proto-Continental Romance.
In his division Italian is grouped with the Western languages.

The above-mentioned classifications are based, implicitly or ex-
plicitly, on the assumption of a family-tree model. According to this
theory, a change, for example the merger of Latin $\breve{\imath}$ and $\bar{e}$ in Proto-
Continental Romance, divides Romania into two parts. Each part then
undergoes its own independent evolution until another change causes a
further split. This genetic approach provides a convenient way to ex-
plain the historical continuity between members of the Romance family
of languages. It is the reason why the genetic classification still
occupies the primary place in introductory textbooks on Romance linguis-
tics. On the other hand, the family-tree model hardly reflects the true
historical development of these languages.

In the late forties and in the fifties some new proposals for the
classification of the Romance languages appeared. A statistical method
attempting to evaluate the evidence quantitatively was developed in
order to provide not only a classification, but at the same time a
measure of the divergence among the languages. The earliest attempt
was made in 1949 by Mario Pei, who measured the divergence of seven
modern Romance languages from Latin, taking as his criterion the evolu-
tion of stressed vowels. Pei's results do not show the degree of con-
temporary divergence among the languages from each other but only the
divergence of each one from Classical Latin.

In 1959 Joseph E. Grimes and Frederic B. Agard measured the diver-
gence among seven Romance languages on the basis of their most important
phonological correspondences, both vocalic and consonantal. They
arrived at a division "into a Western group with a high degree of in-
ternal similarity, and the rest." The Western group consisted of Spanish,
Portuguese, Catalan and French, and "the rest" were Italian, Rumanian
and Sardinian.

At about the same time John Rea (1958) calculated cognate retention
rates on the basis of a hundred words of eight Romance languages (French,
Spanish, Rumanian, Catalan, Italian, Sardinian, Portuguese, Rheto-Romance).
His results suggest that the Romance languages do not fall into two well-
defined Western and non-Western groups, as is usually assumed, but rather
cluster around Italian, the only exception being Rumanian which appears
to be the most eccentric language.

A few years later Heles Contreras (1963) made an attempt to classify the Romance languages on a morpho-syntactic basis. By applying seven morpho-syntactic parameters, developed by others, to passages from philological texts of seven languages and Classical Latin, he, like von Wartburg *et al.*, obtained a division into a Western group and an Eastern group. The Western group included French, Catalan and Portuguese and the Eastern group comprised Spanish, Italian, Rumanian and Sardinian. The most surprising fact is that Spanish, according to Contreras, falls into the Eastern group (and is separated from its nearest neighbor, Portuguese).

In the late sixties a binary system of evaluation based on a combination of genetic and descriptive features was developed. In this system a set of supposedly important parameters was established, such as: 'Latin vowels $\bar{\imath}$, $\bar{e}$ resulted in one phoneme (or not),' 'prepositive or postpositive article,' 'nasal vowels exist as phonemes (or not).' By means of a binary procedure these parameters allowed comparison of the languages and calculation of their respective divergences. The method which was most widely accepted by other scholars was the one elaborated by Žarko Muljačić. His results are, in most respects, totally different from the classifications of his predecessors: they confirm neither the East-West division (Rumanian is closer to Spanish than to Italian) nor Hall's Continental-Southern division.

Independently, Maria Iliescu (1969) applied a similar method for classifying the Romance languages on the basis of morphological features alone. Iliescu's results also fail to confirm the East-West division of these languages. Both methods will be discussed in more detail in the following sections.

Later Muljačić's method was further extended by G. B. Pellegrini (1970) and Giuseppe Francescato (1973, 1974, 1980).

Finally, in 1974 Robert Hall selected 25 phonological, morphological, lexical and syntactic isoglosses which divide the whole Romania (of the 9th century A.D.) into North Gallo-Romance, Ibero-Romance, Italo-Romance, Sardinian and Pre-Rumanian.

According to the genetic classifications, the Romance languages fall into a Western and an Eastern group. The former consists of two subgroups: Gallo- and Ibero-Romance. The latter is not so well defined. In the Eastern group are Rumanian and Dalmatian, but the place of Sardinian and Italian is disputed. Trager and von Wartburg include them in the Eastern group, while in Hall's classification Sardinian is part of the Southern group and Italian is placed with the Western group. The quantitative classifications confirm the East-West division as regards phonology and morpho-syntax (except that Contrera's study placed in Spanish with the Eastern group). As for vocabulary, there is not such a clear grouping.

Map 2

GEOGRAPHICAL DISTRIBUTION OF THE ROMANCE LANGUAGES
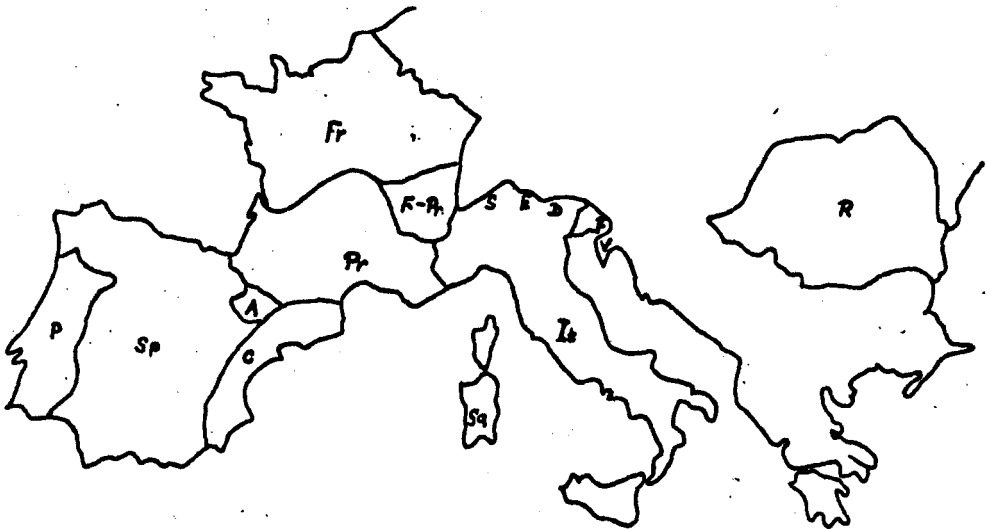
2. Application of Muljačić's Method

Muljačić (1967) compares twelve Romance languages: Rumanian (R), Vegliote (V), Italian (I), Sardinian (S), Friulian (F), Engadinese (E), Provençal (Pr.), Franco-Provençal (FPr.), French (Fr.), Catalan (Cat.), Spanish (Sp.) and Portuguese (P). The grographical distribution of these languages is shown on Map 2.

His method is based on a binary system of evaluation. In this system he has drawn up a list of 40 questions covering indicative features of phonology, morphology and syntax. For each feature a plus or minus is marked opposite each language. The plus always corresponds to the first part of the question. When it is not possible to give a clear binary answer, the sign ± is used to mark a bipolar answer. The difference between a plus and a minus counts for two points, the difference between a plus or a minus counts one point. The first language is compared with the second, third, fourth, etc. The points of differences are counted up and the languages showing the fewest differences are considered most closely related.

I have added Gascon (G) and Aragonese (A) to Muljačić's list of languages as well as eight questions to his list of significant features and repeated the tabulation of points. The information about the Gascon linguistic material comes from Le Gascon by G. Rohlfs, and Initiation au gascon by R. Darrigrand. The Aragonese data are from Gramatica de la lengua aragonesa by F. Nagore, and El dialecto aragonés by M. Alvar.

First let us discuss each question with regard to Gascon in more detail.

1.   Phonological/non-phonological accent.   +

Unlike French, Gascon does not have a simple rule for predicting on which syllable of a word the accent will fall. Thus, the accent is phonemic, e.g.:

/kantá/   'he sang'
/kánta/   'he sings'

2.   Two/more than two vowel classes.   +

By 'vowel classes' Muljačić means the opposition between closed and open vowels. There are only two vowel classes in the Gascon system. The series of front vowels comprises the high-mid close /e/ and the lower-mid open /ε/; the series of back rounded vowels includes /o/. The main variants of the latter are close [o] in open syllables and open [ɔ] in closed syllables.

3. <u>Triangular/quadrangular vowel system.</u>   +

The Gascon vowel system is as follows:
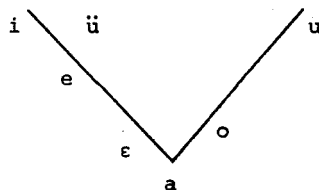
4. <u>Three level/four (or five) level vowel system.</u>   +

As can be seen on the previous triangle, the Gascon system
distinguishes four degrees of height.

5. <u>Phonologically long vowels exist/do not exist.</u>   -

There is no phonemic distinction between long and short
vowels in Gascon. The vowels are rather of medium length.
Though vowels are somewhat longer when accented than when
atonic, there are no really long vowels.

6. <u>The nasal vowels exist/do not exist as phonemes.</u>   -

The nasal consonants are always sounded in Gascon so that
unlike French this language has no nasal vowel phonemes.

7. <u>The long consonants exist/do not exist.</u>   +

As in Italian, double consonants are geminated in pro-
nunciation; for example, /pállo/ 'pale' contrasts with
/pálo/ 'shovel.'

8. <u>The Latin final s   maintained/not maintained</u>
    <u>in pronunciation.</u>   +

The Latin final /s/ is pronounced in Gascon, e.g.:

                res   > /arrés/   'nobody'
                avunculus > /únkles/   'oncle'

9. <u>Prepositive/postpositive article.</u>   +

The article, whether definite or indefinite, precedes its
noun and agrees with it in gender and number, e.g.,:

                /lu (ün) país/   'the (a) country'
                /la (üa) muntáña/   'the (a) mountain'

10. Ipse/ille used as articles. _____ -

There are two series of Gascon definitie articles, both
originating from Latin ille:[1]

$$\text{illu} > \begin{matrix} \text{/et/} \\ \text{/lu/} \end{matrix} \qquad \text{illa} > \begin{matrix} \text{/éro/} \\ \text{/la/} \end{matrix}$$

11. Several case forms of the same number distinguished /
one case form only. _____ -

Gascon retained a two-case system (a nominative and an
oblique case), at least for masculine nouns, until the
Middle Ages. From these two cases only the oblique is
preserved,[2] for example:

> filium > /hiy/   'son'
> lupum   > /lup/   'wolf'
> nepotem > /nebút/ 'nephew'

12. Animate objects marked with/without a preposition.   +

If the direct object is a person, it is introduced by the
preposition à, for example:

> /ka bist a peyrót/   'he saw Peter'
> /ke sérki a marío/   'I am looking for Mary.'

13. The plural formation made by means of endings / in
another manner. _____ +

Nouns and adjectives ending in a vowel or a consonant form
their plural by adding -s:

> /la pórto/   /las pórtos/   'door'
> /lu pan/   /lus pans/   'bread'
> /négre/   /négres/   'black'
> /hort/   /horts/   'strong'

But nouns ending in /s/ have the same form for both
singular and plural:

> /lu pas/   /lus pas/   'step'
> /espés/   /espés/   'thick'

14. <u>Three degree/two degree demonstrative pronoun system.   +</u>

Gascon has three distinct forms of demonstratives:

(1) /akéste/   (2) /akét/   (3) /asét/
     /akésto/   /akéro/   /aséro/.

/akéste/ denotes what is near (in time or place) in relation
to the speaker; /akét/ indicates what is near in relation to
person addressed; /asét/ refers to what is more or less re-
moved from both the speaker and the person addressed.

The demonstratives are derived from *accu-iste, *accu-ille
and *acce-ille, respectively.

15. <u>The comparative adjective made by means of 'magis'/'plus'. +</u>

The adjectives form their comparative of superiority by means
of /mɛs/, /mey/ derived from Latin <u>magis</u>, e.g.:

/ke soy mɛs maláut ke tü/   'I am more sick than you.'

16. <u>The final /t/ of the 3rd person plural maintained/
not maintained.   –</u>

The final /t/ of the 3rd person plural has been dropped, e.g.:

        cantant   > /kánton/   'they sing'
        cantabant   > /kantábon/   'they were singing'
        cantaverunt > /kánten/   'they sang'.

17. <u>The function of Classical Latin inchoative suffix -esc-   +
maintained/not maintained.   –</u>

In Gascon spoken in the Pyrenees the majority of verbs be-
longing to the third conjugation (verbs in -ir) takes the
form called inchoative, i.e., they add the infix /-eš-, -esk-/
between the stem and the ending of the first, second and third
person singular, and the third person plural. The inchoative
form is limited to the present indicative, present subjunctive
and imperative. Examples:

Present Indicative: /partéši/   'I leave'   /partím/ 'we leave'
                     /partéšes/   /partíts/
                     /partéš/   /partéšen/

Present Subjunctive: /partéskoy/   /partiám/
                     /partéskos/   /partiáts/
                     /partésko/   /partéskon/

Imperative: /partéš/

In other varieties of Gascon this infix has been extended to the
first and second person plural in present, and tends to spread
over other tenses.

18. The imperfect indicative of the verb 'to be' derived
    from 'esse'/from another verb.   +

    The imperfect indicative of the verb 'to be' comes from the
    imperfect of Latin esse:

eram > /ɛ́ri/	eramus > /ɛró̃m/
eras > /ɛ́ros/	eratis > /ɛró̃ts/
erat > /ɛ́ro/	erant > /ɛ́ron/.

19. Several types/one type of ending for the imperfect
    indicative.   +

    According to the three conjugations, Gascon has three distinct
    types of endings for the imperfect indicative.[3] The forms of
    these endings are seen in the following paradigm:

    I   /kanatábi/   /kantábom/
         /kantábos/   /kantábots/
         /kantábo/   /kantábon/

    II   /báti/   or /batébi/   /batɛ́m/   or /batébom/
         /bátɛs/   /batébos/   /batɛ́ts/   /batébots/
         /bátɛ/   /batébo/   /bátɛn/   /batébon/

    III /sentíbi/   /sentíbom/
         /sentíbos/   /sentíbots/
         /sentíbo/   /sentíbon/.

20. The future I comes from 'cantare + habeo'/another formation. +

    The future tense is formed by combining the infinitive with
    the present indicative of the verb /abé/'to have'.[4] The forms
    are as follows:

                    /kantaréy/   /kantarám/
                    /kantarás/   /kantaráts/
                    /kantará/   /kantarán/.

21. The present perfect tense of the verb 'to be' formed with
    the same auxiliary verb (e.g., It. sono stato) / with
    another auxiliary verb (e.g., Fr. j'ai été, Po. tenho sido). +

    The present perfect, as well as all other compound tenses,
    of the verb /está/[5] 'to be' is formed with the same auxiliary,
    e.g.:

/ke sóy estát maláut/   'I have been sick.'

22. The present perfect tense of the reflexive verbs made   +
    with the auxiliary verb habere or tenere / with esse.   -

    In the present perfect tense the reflexive verbs are con-
    jugated with the auxiliary verb /está/ 'to be', e.g.:

        /ke séy negát/   'il s'est noyé'.

    However, when the reflexive verb is followed by a direct ob-
    ject, the auxiliary /abé/ 'to have' is used, for example:

    /ke méy labát las mas/   'je me suis lavé les mains'
    /ke sa kupát la cáma/   'il s'est cassé la jambe'.

23. The auxiliary verb habere/tenere is used.   +

    The verbe habere is used in Gascon as the auxiliary verb.

24. The stressed non gave two forms/one form.   -

    Only one form derived from the Latin stressed non is found
    in Gascon - /non/.

25. The Latin vowels ĭ,ē resulted in/did not result in one
    phoneme.   +

    The Latin i and e fell together resulting in close /e/, e.g.:

            seta   >   /sédo/   'silk'
            apicula   >   /abéyo/   'bee'
            nigrum   >   /négre/   'black'.

26. Stēlla > stēla / stēlla > stĕlla.   +

    The classical Latin stēlla was altered in Spoken Latin to
    stēla which is the base of Gascon /estélo/ 'star'.

27. The Latin vowels ŭ,ō resulted in/did not result in one
    phoneme.   +

    The reflex of Latin ŭ,ō was close /o/. In Modern Gascon this
    sound has become /u/, e.g.:

            nepotem >   /nebút/   'nephew'
            vocem   >   /buts/   'voice'
            furnum   >   /hor/   > /hur/   'oven'.

28. The vowel of the penultimate syllable of inherited
    proparoxyton words usually maintained/usually not   +
    maintained.

    Usually the proparoxytons have been reduced by the loss of
    the vowel of the penultimate syllable as can be seen from
    the following examples:

medicu	>	/medže/			'physician'
paupere	>	(paubre)	>	/praube/	'poor'
cadere	>	(cadre)	>	/kay/	'to fall'.

    There are, however, cases where the vowel is maintained after
    the shift of accent, for example:

patina	>	/padéno/	'stove'
aquila	>	/akvílo/	'eagle'
lacrima	>	/legrémo/	'tear'.

29. The criterion of the open syllable was important in
    remote times (in connection with diphthongization)/   -
    was not important.

    Unlike in French, the open syllable did not play an important
    role in Gascon. The vowels in these syllables were not
    diphthongized, e.g.:

seta	>	/sédo/	'silk'
pede	>	/pɛ/	'foot'.

30. The intervocalic voiceless consonants /p,t,k,s/ maintained/   +
    further developed (voiced, etc.).

    The voiceless stops /p,t,k/ and /s/ in the intervocalic position
    (/k/ only before /a,o,u/) were transformed to their voiced
    counterparts, e.g.:

amica	>	/amígo/	'friend'
urtica	>	/urtígo/	'nettle'
apicula	>	/abéyo/	'bee'
lupa	>	/lúbo/	'she wolf'
maturum	>	/madü/	'mature'
maritare	>	/maridá/	'to marry'
casa	>	/kázo/	'house'.

    Beside a vast area where these consonants were voiced there
    exists a region where they were preserved (except /s/) until
    the present day. This peculiar pronunciation is found in the
    Béarnais dialect of the Aspe valley and Baretous in the
    Pyrenees:

```
apicula    >  /apéyo/          'bee'
betulu     >  /betút/          'birch'
formica    >  /arrumíko/       'ant'.
```

31. The Latin phonemes /k,g/ followed by the palatal vowels
    /e,i/ have today parallel reflexes (e.g. It. cento, gente
    with /č, ǧ/) / do not have any parallel reflexes (e.g. Fr.
    cent, gent with /s,ž/).   -
    _____

    These phonemes do not have parallel reflexes in Gascon. /k/,
    when word and syllable initially followed by /e,i/, resulted
    in /s/, e.g.:

```
cepam        >   /sébo/         'onion'
cibatam      >   /sibádo/       'oats'
furcellam    >   /hurséro/      'distaff'.
```

    The evolution of /g/ in the same position was as follows:
    g + e,i > /ž/, e.g.:

```
genuculum    >   /žúy, žuéy/   'knee'
faginam      >   /hažíno/      'stone marten'.
```

32. The Latin phoneme /k/ (correspondingly /g/) gave the same
    reflexes before /e,i,yod/ (e.g. It. cento, città, braccia)
    did not give the same reflexes.   -

    As can be seen from the following examples the phoneme /k/
    before /e,i/ and yod gave, unlike in Italian, different re-
    flexes. When initial, it became /s/:

```
cepam        >   /sébo/         'onion'
cinctam      >   /sínto/        'belt';
```

    when intervocalic it gave /z/:

```
cocinam      >   /kuzíno/       'kitchen';
```

    at the end of a word it went to /ts/:

```
luce         >   /lüts/         'light'
voce         >   /buts/         'voice';
```

    under the influence of yod the reflex was /s/ or /š/:

```
vicia        >   /béso/         'vetch'
fascia       >   /héšo/         'tier, step'.
```

    The reflexes of /g/ have been as follows:

```
generum      >   /žendre/       'son-in-law'
fageum       >   /hay/ or /hač/ 'beech'.
```

33. The same/different reflexes developed from the classical
    /i̯/ and /ge/, /gi/.   +

   The Classical Latin /i̯/ and /ge/, /gi/ are represented in
   Gascon by the same sound which can be, according to the
   region, either /ž/ or /y/, e.g.:

                genuculum   >   /žuey/, /yuy/   'knee'
                iocum   >   /žok/, /yok/   'game'

34. The labial element of the group qu̯ is in some way
    maintained/disappeared a long time ago.   +

   The group qu̯ has maintained its labial element, at least in
   some positions, for example:

                quattuor   >   /kwoáte/   'four'
                quando   >   /kwoán/   'when'.

   In the middle of a word this group is rather rare, e.g.:

                aquam   >   /áygwo/   'water'
                linguam   >   /lengwo/   'language'.

   Here the forms without the labial element appear in most of
   Gascony /aygo/, /lengo/.

35. Qu̯, gu̯ + e,i, are/are not palatalized.   −

   The groups qu̯, gu̯ followed by the front vowels, /e,i/
   resulted in /k/ and /g/ respectively, e.g.:

                qui   >   /ki/   'who'
                quem   >   /ke/   'what' 'that'
                *werra >   *gwerra > /géro/   'war'
                *widan >   *gwidan > /gidá/   'to lead'.

   (Germanic /w/ was pronounced in Early Spoken Latin as /gw/.)

36. The Latin phonemes k,g + a are not/are palatalized.   +

   The phonemes /k,g/ followed by /a/ usually remain unchanged,[7]
   e.g.:

                caput   >   /kap/   'head'
                gallina   >   /garío/   'hen'.

37. The consonant clusters kl-, gl- in the word initial position
are not/are palatalized (completely or the second element
only).   +

The initial clusters kl-, gl- do not undergo palatalization
in Gascon, but remain unchanged, e.g.:

clamare	>	/klamá/	'to call'
glandem	>	/glan/	'acorn'.

38. The consonant clusters pl, bl, fl are not/are palatalized
(completely or the second element only).   +

These clusters remain intact as the following examples show:

plorare	>	/plurá/	'to cry'
blandus	>	/ablán/	'soft'
flamma	>	/ehlámo/, /halámo/	'flame'.

39. The consonant clusters -kt-, -ks- did not develop/developed
toward a more palatal direction.   −

The treatment of these consonant clusters was as follows:
the first element of the cluster -kt- resulted in [i̯], e.g.:

factum	>	/hɛyt/	'fact'
lactum	>	/lɛyt/	'milk'.

The cluster -ks- underwent palatalization becoming /š/, e.g.:

laxare	>	/lašá/	'to leave'
texere	>	/tɛšé/	'to weave'.

40. The consonant cluster written as -gn- in Latin did not
develop/developed toward a more palatal direction.   −

The Latin cluster -gn- became /ñ/ in Gascon, for example:

ligna	>	/léño/	'wood'
agnellus	>	/añét/	'lamb'.

41. The Latin /f/ changed to /h/ / remained /f/.   +

One of the most characteristic changes in Gascon is the
passage of /f/ to the aspirated /h/. This change occurs
word initially as well as word medially, e.g.:

festa	>	/hésto/	'celebration'
fratre	>	/hráy/[8]	'brother'
defendere	>	/dehéne/	'to defend'
*gaffare	>	/gahá/	'to take'.

In some regions of Gascony the aspiration is only weak
and sometimes disappears completely, for example:

> formica > /hurmígo/ > /urmígo/   'ant'.

42. **The intervocalic -n- disappears/remains unchanged.**   +

The -n- between two vowels was dropped,[9] e.g.:

luna	>	/lúo/	'moon'
plena	>	/pléo/	'full'
una	>	/úo/	'one'.

This change must be very old for it appears in the most
ancient documents from the 11th and 12th centuries.

43. **The intervocalic -ll- > -r-/in some way maintained.**   +

Another characteristic feature of Gascon is the change of
intervocalic -ll- to -r-, for example:

bella	>	/béro/	'beautiful'
gallina	>	/garío/	'hen'
callare	>	/kará/	'to be silent'.

44. **The final /ll/ in some way maintained/further developed**
(> /t/, /ts/, etc.).   −

The -ll which became word final through the regular loss of
-u, -e, became /t/ in most parts of Gascony:

bellum	>	/bɛt/	'beautiful'
vitellum	>	/bedét/	'calf'
castellum	>	/kastét/	'castle'.

In some mountain valleys (Béarn, Luchon, Aran, Lez, Salat)
it is pronounced as /č/ or as a palatal /tʸ/.

45. **The consonant cluster -nd- maintained/reduced.**   −

By assimilation the group -nd- has been reduced to -n-, e.g.:

prehendere	>	/préne/	'to take'
grande	>	/gráno/	'big'
landa	>	/láno/	'lande'.

46. **The consonant cluster -mb- maintained/reduced.**   −

Similarly the group -mb- has been reduced to simple -m-;

camba	>	/kámo/	'leg'
palumba	>	/palúmo/	'pigeon'.

47. <u>The initial /r/ maintained/further reinforced (rr-, arr-).</u> –

When word initial, the Latin r- is geminated and preceded by the prothetic vowel /a/, e.g.:

rem	>	/arré/	'nothing'
ridere	>	/arríde/	'to laugh'
rivum	>	/arríu/	'stream'.

48. <u>The consonant v > b/maintained.</u>   +

The difference which existed in Latin between /b/ and /w/ disappeared completely in Gascon. There is no /v/ sound in its consonant system. Only /b/ is found in all positions of a word. Examples:

vacca	>	/báko/	'cow'
vivere	>	/bíbe/	'to live'.

On Chart 1 we can see the answers to all 48 questions. As noted earlier, the difference between a plus and a minus counts for two points, a plus versus a ± counts one point only.

When we count up the points of difference we receive the quantitative distances between each of the fourteen Romance languages. This is illustrated on Chart 2.

A look at the distances between Gascon and the other languages shows that the nearest language to Gascon is, surprisingly, Aragonese with only seventeen points of difference. The second nearest language is Catalan (twenty-two points), then follow:

3.	Spanish	(25 pts.)
4.-5.	Portuguese, Provençal	(33 pts.)
6.	Engadinese	(38 pts.)
7.	Italian	(41 pts.)
8.	Sardinian	(43 pts.)
9.	Friulian	(45 pts.)
10.-11.	Franco-Provençal Vegliote	(47 pts.)
12.	French	(54 pts.)
13.	Rumanian	(56 pts.)

According to our results, the distance between Gascon and the Ibero-Romance group is relatively small (Aragonese – 17, Catalan – 22, Spanish – 25, Portuguese – 33), while the Gallo-Romance group, except for Provençal, is much more distant from Gascon (Franco-Provençal – 47, French – 54). It would thus seem that Gascon is closer to the Iberian rather than to the Gallo-Romance languages.

Chart 1

Qst.	R	V	I	S	F	E	Pr.	FPr.	Fr.	Ca.	Sp.	P	G	A
1.	+	+	+	+	±	+	+	+	−	+	+	+	+	+
2.	−	+	+	+	+	−	−	−	−	+	+	−	+	+
3.	+	+	+	+	+	+	−	+	−	+	+	+	+	+
4.	+	+	−	+	+	−	+	−	−	−	+	−	−	+
5.	−	−	−	−	+	−	−	+	+	−	−	−	−	−
6.	−	−	−	−	−	−	−	+	+	−	−	+	−	−
7.	−	−	+	+	−	−	−	−	−	−	−	−	+	−
8.	−	−	−	+	+	+	±	+	±	+	+	+	+	+
9.	−	+	+	+	+	+	±	±	±	+	+	+	+	+
10.	−	−	−	+	−	−	−	−	−	±	−	−	−	−
11.	+	−	−	−	−	−	−	−	−	−	−	−	−	−
12.	+	−	−	+	−	+	−	−	−	−	+	+	+	+
13.	+	+	+	+	+	+	−	±	−	+	+	+	+	+
14.	−	−	±	+	−	−	−	±	−	+	+	+	+	+
15.	+	−	±	−	−	−	±	−	−	+	+	+	+	+
16.	−	−	−	−	−	−	±	±	+	−	−	−	−	−
17.	+	+	+	−	+	+	+	±	±	+	−	−	±	−
18.	+	+	+	+	+	+	+	−	−	+	+	+	+	+
19.	+	+	+	+	+	+	+	+	−	+	+	+	+	+
20.	−	−	+	±	+	±	+	+	+	+	+	+	+	+
21.	−	+	+	±	±	±	+	−	−	−	−	−	+	−
22.	+	+	−	−	±	+	−	−	−	+	+	+	±	+
23.	+	+	+	+	+	+	+	+	+	+	+	−	±	+
24.	−	−	−	+	−	−	−	−	−	−	−	−	−	−
25.	+	+	+	−	+	+	+	+	+	+	+	+	+	+
26.	−	−	−	−	+	+	+	+	+	+	−	−	+	−
27.	−	+	+	−	+	+	+	+	+	+	+	+	+	+
28.	+	−	+	+	−	−	±	−	−	−	±	+	±	±
29.	−	+	+	−	−	+	±	+	+	−	±	−	±	±
30.	+	+	+	+	−	−	−	−	−	−	−	−	±	±
31.	+	−	+	+	+	−	−	−	−	−	−	−	±	±
32.	−	−	+	−	+	+	−	−	−	−	−	−	−	−
33.	−	±	+	−	−	−	+	+	+	+	+	+	+	+
34.	−	±	+	+	−	+	−	−	−	−	−	−	+	−
35.	+	+	−	−	+	±	−	−	−	−	−	−	−	−
36.	+	+	+	+	−	±	+	−	−	+	+	+	+	+
37.	−	+	−	+	+	+	±	+	+	+	−	−	+	+
38.	+	+	−	+	+	+	+	+	+	+	−	−	+	+
39.	+	+	+	+	−	−	−	−	−	−	−	−	−	−
40.	+	+	−	+	−	−	−	−	−	−	−	−	−	−
41.	−	−	−	−	−	−	−	−	−	−	+	−	+	−
42.	−	−	−	−	−	−	−	−	−	−	−	+	+	±
43.	−	−	−	−	−	−	−	−	−	−	−	−	+	±
44.	+	+	+	+	+	+	+	+	+	+	+	+	−	±
45.	+	+	+	+	+	+	+	+	+	+	−	+	−	±
46.	+	+	+	+	+	+	−	+	+	−	+	−	−	−
47.	+	+	+	+	+	+	±	+	+	−	−	−	−	−
48.	−	−	−	−	−	−	±	−	−	±	+	±	+	+

Chart 2

	R	V	I	S	F	E	Pr.	FPr.	Fr.	Ca.	Sp.	P	G	A
R														
V	23													
I	37	26												
S	33	32	30											
F	37	26	32	38										
E	38	25	31	40	19									
Pr.	43	32	38	46	26	29								
FPr.	47	32	36	52	22	23	24							
Fr.	54	39	43	59	29	30	27	7						
Ca.	44	33	39	45	29	30	23	27	36					
Sp.	39	40	38	42	38	39	28	42	49	19				
P	39	44	38	46	44	37	36	36	43	27	16			
G	56	47	41	43	45	38	33	47	54	22	25	33		
A	41	36	44	39	38	39	28	42	49	15	12	22	17	

Footnotes to Section Two

[1]It seems, however, that in some varieties of Gascon there existed another article derived from the Latin pronoun ipse. In some documents from the 12th century one can find family names preceded by this article, e.g., ecclesia de sa Lana. There are still many toponyms which show traces of this article, for example, Sacouma /sakuma/, Sahaja /sahaža/, Soucassau /sukasau/ (cf. Rohlfs 1970:173). Forms derived from ipse survive in Sardinian and Catalan as well. The difference between the article /et/ and /lu/ is dialectal.

[2]There are, however, some sporadic instances of the nominative still preserved, for example:

avunculus	>	/únkles/	'uncle'
soror	>	/sor/	'sister'
juvenis	>	/yuéns/	'young'.

[3]Actually, as the above paradigms show, there is only one set of endings added to different stem vowels. Some Romance languages, however, have reduced the stem-vowel+ending to one set of endings, cf. French chantais, finissais, vendais. Muljačić considers 'ending' to mean stem-vowel+ person indicator.

[4]In Barèges (in the Pyrenees) this normal type of future is unknown. Here, to express a future idea, the following forms are used:

I.   /kantéri, kantáros, kantáro; kantaróm, kantarót, kantaráron/
     'I will sing'

II. /pudéri, pudéros, pudéro; puderóm, puderót, pudéron/
     'I will be able'

III. /sentíri, sentíros, sentíro; sentiróm, sentirót, sentíron/
     'I will feel'.

It seems that these forms go back to the Latin future perfect cantavero, cantaveris, etc.

[5]The Latin verbs esse and stare fused in one verb as in French.

[6]Sporadic examples found all over the Gascon territory suggest that originally this phenomenon must have covered a much larger domaine.

[7]Words like /šibau/ 'horse' are borrowed from French.

[8]In many cases, however, the cluster fr- has been restored under the influence of Provençal or French:

/fray/ 'brother', /frun/ 'forehead', /früt/ 'fruit', etc.

[9]The Latin group -ni- in the intervocalic position resulted in the palatal /ñ/, e.g.:

                      aranea > /aráño/   'spider'
                      tinea   > /teñ/   'moth'
                      junius > /žũñ/   'June'.

In Gers and Landes, however, the loss of -n- is not impeded by a follow-
ing yod (cf. Rohlfs 1970:157) as can be seen from these examples:

                      vinea   > /bío/   'vine'
                      linea   > /lío/   'line'
                      pinea   > /pío/   'pine cone'.

(On the other hand, it is quite possible that -ni- when to /ñ/, which
was later lost.)

3. **Classification Based on Verb Morpho-Syntax**

        The approach applied by Maria Iliescu (1969) in her study
'Ressemblances et dissemblances entre les langues romanes du point de
vue de la morpho-syntaxe verbale' is similar to Muljačić's approach.
She considered the fact that one of the most important factors that
determine the organization of the verb structure of the Romance languages
is the system by which these languages distinguish the regular groups of
conjugation. Since, in her opinion, verbal inflexion is one of the basic
parts of morphology, a subsystem that is even more significant for the
relationships among the Romance languages than phonetics, phonology or
syntax, she made up a list of 48 features to mark the distinctions between
conjugations in the Romance languages. Her study dealt with the follow-
ing dialects: Portuguese, Spanish (more precisely, Castilian), Catalan,
Provençal, French, Franco-Provençal, Sursilvain, Engadinese, Ladin,
Friulian, Italian (Tuscan), Sardinian and Rumanian (see Map 2).

        Her procedure is simply to mark the occurrence or non-occurrence
of each feature by a + or a -, respectively. Then the languages are
compared with one another by counting the number of agreements (whether
plusses or minuses does not matter) between each language and every
other one. The higher number of agreements, the closer the languages
are considered to be.

        In the present morphological testing I will apply the same method.
Basically, I will use Iliescu's list of questions, except I will omit
those that obviously do not have a close relationship to Gascon, as was
shown in the first test (i.e., Sursilvain, Engadinese, Ladin, Friulian,
Sardinian, Rumanian) as well as Franco-Provençal, for which it was not
possible to find answers to all the questions. I will deal with the
following languages: Gascon, Aragonese, Spanish, Portuguese, Catalan,
Occitan, Provençal,[1] French and Italian.

                          List of Questions

INFINITIVE

1.   Three forms of infinitive.
2.   Four forms of infinitive.

PRESENT TENSE

3. Two conjugations.
4. Three conjugations.
5. Four conjugations.
6. The distinction between all conjugations made in the 4th and 5th persons.
7. The distinction made only in the 5th person.
8. The distinction made only in other persons than in the 4th and 5th.

ISOLATION OF THE FIRST CONJUGATION

9. Isolation occurs in the 3rd person.
10. Isolation extended to the 6th person.
11. Isolation extended to the 1st person.
12. Isolation extended to the 2nd person.

UNIFICATION OF ALL CONJUGATIONS

13. Unification of all conjugations made in the 6th person.
14. Unification made in the 2nd person.
15. Unification made in the 1st person.
16. Unification made in the 4th person.

SUBJUNCTIVE

17. The conjugations are not distinguished.
18. Two conjugations.
19. Three conjugations.
20. Isolation of the first conjugation and unification of the 2nd and 3rd conjugations.

IMPERATIVE

21. No distinction between conjugations.
22. Two conjugations.
23. Three conjugations.
24. The distinction between conjugations made in the 2nd person.
25. The distinction made in the 4th person.
26. The distinction made in the 5th person.

IMPERFECT

27. No distinction between conjugations.
28. Two conjugations.
29. Three conjugations.

FUTURE

30. No distinction between conjugations.
31. Two conjugations.
32. Three conjugations.

GERUND

33. No distinction between conjugations.
34. Two conjugations.
35. Three conjugations.

PRETERIT

36. Two conjugations.
37. Three conjugations.
38. Balance of accent of the 1st, 3rd, 6th persons, and the 2nd, 4th, and 5th persons.

PAST PARTICIPLE

39. Three conjugations.
40. Existence of one form in -ut.

Chart 3 shows the occurrence or non-occurrence of each trait for the compared languages.

Chart 4 illustrates the behavior of each language with regard to Gascon.

According to the numerical values of Chart 4, it is now possible to rank these languages as to their morphological similarity to Gascon:

1.-2.	Aragonese, Portuguese	37 points of similarity
3.-4.	Spanish, Catalan	33	"	"	"
5.	Italian	32	"	"	"
6.	Occitan	27	"	"	"
7.	Provençal	20	"	"	"
8.	French	18	"	"	"

Once again Aragonese appears as the nearest language to Gascon, this time sharing the rank with Portuguese. These figures repeatedly show Gascon close to the Iberian languages. The latter clearly occupy, with a high degree of similarity, the first four ranks adjacent to Gascon, while the Gallo-Romance languages are at the opposite end of the rank list, showing a relatively small number of agreements. Surprisingly, Italian appears close to Gascon, having only one point less than Spanish and Catalan.

Another interesting fact emerges when we compare the languages in question, one with another, and make a list based on rank order, as is represented in Table 1. In this table, each language, in turn, occupies the first position and the other languages then follow in the order of their similarity to it. The table reads from left to right in a descending order.

This table indicates that Gascon forms with Aragonese, Catalan, Spanish and Portuguese, a block which tends strongly to cohere. These languages occupy adjacent ranks in six out of nine rows (1st, 2nd, 3rd, 5th, 6th and 9th). In the 4th row, Occitan intervenes in their unity as does Italian in the 8th row. The block is more disturbed by French and Italian in the 7th row.

Chart 3

Qst.	G	Sp.	Po.	Ca.	Oc.	Pr.	Fr.	It.	A
1.	+	+	+	−	−	−	−	+	+
2.	−	−	−	+	+	+	+	−	−
3.	−	−	−	−	+	+	−	−	−
4.	+	+	+	+	−	−	−	+	+
5.	−	−	−	−	−	−	+	−	−
6.	+	+	+	+	+	+	−	−	+
7.	−	−	−	−	−	−	−	+	−
8.	−	−	−	−	−	−	+	−	−
9.	+	+	+	+	+	+	+	+	+
10.	+	+	+	−	−	−	−	+	+
11.	−	−	−	−	−	−	+	−	−
12.	+	+	+	+	+	−	+	−	+
13.	−	−	−	+	+	+	+	−	−
14.	−	−	−	−	−	+	−	+	−
15.	+	+	+	+	+	+	−	+	+
16.	−	−	−	−	−	+	+	−	−
17.	−	−	−	−	−	+	+	−	−
18.	+	+	+	+	+	−	−	+	+
19.	−	−	−	−	−	−	−	−	−
20.	+	+	+	−	+	−	−	+	+
21.	−	−	−	−	−	−	−	−	−
22.	−	−	−	−	+	+	+	−	−
23.	+	+	+	+	−	−	−	+	+
24.	+	+	+	+	+	+	+	+	+
25.	+	+	+	+	+	−	−	−	+
26.	+	+	+	+	+	+	−	+	+
27.	−	−	+	−	−	−	+	−	−
28.	−	+	+	+	+	+	−	−	−
29.	+	−	−	−	−	−	−	+	+
30.	+	+	+	+	+	+	+	+	+
31.	−	−	−	−	−	−	−	−	−
32.	−	−	−	−	−	−	−	−	−
33.	−	−	−	−	−	−	+	−	−
34.	−	+	−	−	+	+	−	+	−
35.	+	−	+	+	−	−	−	−	+
36.	−	+	−	−	−	−	−	−	+
37.	+	−	+	+	−	−	+	+	−
38.	−	−	−	−	−	−	−	−	−
39.	+	−	−	+	+	−	+	+	−
40.	−	−	−	−	−	−	−	−	−

Chart 4

G	Sp.	Po.	Ca.	Oc.	Pr.	Fr.	It.	A
1.	+	+	−	−	−	−	+	+
2.	+	+	−	−	−	−	+	+
3.	+	+	+	−	−	+	+	+
4.	+	+	+	−	−	−	+	+
5.	+	+	+	+	+	−	+	+
6.	+	+	+	+	+	−	−	+
7.	+	+	+	+	+	+	−	+
8.	+	+	+	+	+	−	+	+
9.	+	+	+	+	+	+	+	+
10.	+	+	−	−	−	−	+	+
11.	+	+	+	+	+	−	+	±
12.	+	+	+	+	−	+	−	+
13.	+	+	−	−	−	−	+	+
14.	+	+	+	+	−	+	−	+
15.	+	+	+	+	+	−	+	+
16.	+	+	+	+	+	−	−	+
17.	+	+	+	+	−	−	+	+
18.	+	+	+	+	−	−	+	+
19.	+	+	+	+	+	+	+	+
20.	+	+	−	+	−	−	+	+
21.	+	+	+	+	+	+	+	+
22.	+	+	+	−	−	−	+	+
23.	+	+	+	−	−	−	+	+
24.	+	+	+	+	+	+	+	+
25.	+	+	+	+	−	−	−	+
26.	+	+	+	+	+	−	+	+
27.	+	+	+	+	+	−	+	+
28.	−	−	−	−	−	+	+	+
29.	−	−	−	−	−	−	+	+
30.	+	+	+	+	+	+	+	+
31.	+	+	+	+	+	+	+	+
32.	+	+	+	+	+	+	+	+
33.	+	+	+	+	+	−	+	+
34.	−	+	+	−	−	+	−	+
35.	−	+	+	−	−	−	−	+
36.	−	+	+	+	+	+	+	−
37.	−	+	+	−	−	+	+	−
38.	+	+	+	+	+	+	+	+
39.	−	−	+	+	−	+	+	−
40.	+	+	+	+	+	+	+	+
Total:	33	37	33	27	20	18	32	37

Table 1

G	A	Po.	Sp.	Ca.	It.	Oc.	Pr.	Fr.
Sp.	Po.	A	G	Ca.	Oc.	It.	Pr.	Fr.
Po.	G	A	Sp.	Ca.	It.	Oc.	Pr.	Fr.
Ca.	Po.	G	Oc.	Sp.	A	Pr.	It.	Fr.
A	G	Po.	Sp.	Ca.	It.	Oc.	Pr.	Fr.
Oc.	Pr.	Ca.	Sp.	Po.	G	A	It.	Fr.
Pr.	Oc.	Ca.	Sp.	Fr.	Po.	It.	A	G
Fr.	Pr.	Oc.	Ca.	It.	G	Po.	Sp.	A
It.	G	A	Sp.	Po.	Ca.	Oc.	Pr.	Fr.

From the morphological testing, it appears that Gascon has the greatest affinity to the Iberian languages and is quite distant from French and Provençal. It is interesting to note that French occupies the last rank for every other language except Provençal, appearing to be highly divergent.

Footnotes to Section Three

[1]Unlike Muljačić and Iliescu, I will make a distinction between Provençal spoken in Provence and Occitan spoken in Languedoc. The data about both languages were obtained from *Manuel pratique de philologie romane* and from *Manuel pratique d'occitan moderne* by Pierre Bec.

4. Lexical Test

In order to set up an objective classification based on Lexical correspondences, it would be ideal to take into account the whole corpus of vocabulary of the language under consideration. Since such a task is not feasible, I selected a sample of about two hundred items to be used in establishing the lexical relationship between Gascon and the same eight languages. The starting point for this sample was Swadesh's list of one hundred items of the so-called 'core vocabulary.' This is assumed to be the section of the lexicon which is universal, independent

of the speakers' culture and containing such essential biological
activities as eating, sleeping, giving birth, dying; such parts of the
body as the head, the eyes, the hands, the feet; such natural phenomena
as water, the sun, the moon; such general concepts as size, colors,
etc. Some of the items from Swadesh's list were eliminated as in-
appropriate for the languages in question, and the list was expanded
to include a number of terms that are frequent in all of those languages.[1]
The choice of Gascon lexical material was limited by the nonexistence of
a bilingual (French-Gascon) dictionary, so the main sources from which I
gathered the data were the *Atlas linguistique de la Gascogne* by J. Séguy,
Initiation au gascon by R. Darrigrand and *Le Gascon* by G. Rohlfs. The
suggestions of my informant from Auch in Gascony, Mr. G. Loubès, were
of great help. Another difficulty was caused by the lack of a dictionary
of Aragonese. Since it was possible to glean about a half of the total
number of lexical items from the *Gramática de la lengua aragonesa* by F.
Nagore, only a partial comparison of Gascon and Aragonese can be made.

The method used is based again on a binary system of evaluation.
An agreement between two items is marked by a plus and no point is
assessed. A disagreement is marked by a minus and counts for two points.
When there is a partial agreement, marked by a ±, whether in form or
meaning between two items, one point is assessed. For example, the
Gascon word /azéru/ and French érable 'maple tree' are considered only
partial cognates, for the Gascon word comes from Latin acer, aceris,
while the French form is derived from the Spoken Latin acerabulus,
which is a compound form of Latin acer and the Celtin *abolos. As for
partial agreement in meaning let us take, for example, the Gascon and
Spanish expressions for 'to love.' In Spanish there are two forms
querer and amar, the second only being shared by Gascon. On the other
hand there exist in Gascon two synonymous terms of which only one is
cognate with the term of another language, e.g., /négre/ 'black' is
shared by all the languages concerned, while /ñaule/ is restricted to
Gascony. The points are then counted up. The lower the number of points
between Gascon and any of the other languages, the more similar to each
other those languages are considered to be.[2]

When we compare each language with Gascon, we obtain the following
results:

> Out of the total number of 204 items French agrees
> with Gascon in 119 cases, disagrees in 68 and partly
> agrees in 17 cases; it means that according to our
> system of evaluation there are 153 points of differ-
> ence between these languages.

> Spanish agrees in 114 cases, disagrees in 69, and
> partly agrees in 21, i.e., there are 159 points of
> difference.

> Portuguese has 113 cases of agreement, 71 of dis-
> agreement and 20 of partial agreement, i.e., 162
> points of difference.

       Catalan - 133 agreements, 53 disagreements, 18
       partial agreements, i.e., 124 points of difference.

       Occitan - 139 agreements, 45 disagreements, 20
       partial agreements, i.e., 110 points of difference.

       Provençal - 133 agreements, 53 disagreements,
       18 partial agreements, i.e., 124 points of dif-
       ference.

       Italian - 125 cases of agreement, 63 of disagree-
       ment, 16 of partial agreement, i.e. 142 points of
       difference.

As noted earlier, it was possible to gather only 97 Aragonese items.
Out of this number, Aragonese shares with Gascon 62 items, differs in
28 cases, and partly agrees in 7, i.e., there are 63 points of dif-
ference between them. Since 97 items constitute 47.5% of the total
test list, we may divide 63 by .475 to obtain an adjusted (or assumed)
difference of 132 points between Gascon and Aragonese. (This figure
is, of course, tentative, since it is based on fewer than half the
data used for the other languages, and it is possible that it might
change significantly if all 204 Aragonese words could be included.)

    The rank order of the languages in question with regard to Gascon
is given in the following table.

Table 2

Degrees of Lexical Difference between
Gascon and Other Romance Languages

1.	Occitan	110	pts.
2.-3.	Catalan, Provençal	124	"
	(Aragonese)	132	"
4.	Italian	142	"
5.	French	153	"
6.	Spanish	159	"
7.	Portuguese	162	"

    The lexical test shows Occitan as the closest language to Gascon,
and the Iberian languages (except Catalan and Aragonese) at the opposite
end of the table. These results, at first glance, seem to be surprising,
for after the phonological and morphological tests one would expect

the Iberian languages to be less distant from Gascon. However, Gascon,
which is ordinarily thought to be a dialect of French, should appear
closer to it. But according to our results even the distance between
Gascon and Italian, belonging to another Romance group, is smaller than
that between Gascon and French. The lexical similarity of Gascon with
Occitan becomes less surprising—and the lexical difference between
Gascon and French becomes more surprising—when one takes into account
the geographical proximity of both languages and their mutual contact.
And it is the lexicon which, of all domains of language, most closely
reflects the contact between two languages. In this case another dif-
ficulty arises. It is, thus, not always possible to distinguish whether
a word these languages share is a result of common inheritance or due
to borrowing, and which language is the donor and which the receiver.

It is interesting to note that Gascon nouns, which in general agree
in gender with French, sometimes differ from it and in such a case they
go along with one of the Iberian languages. For example, the word 'blood'
is masculine in French, but feminine in Gascon (/la san/) as well as in
Spanish (la sangre) and Catalan (la sang). Other examples are /la léyt/
'milk' (**le lait** in French, **la leche** in Spanish, **la llet** in Catalan),
/la méu/ 'honey' (**le miel** in French, **la miel** in Spanish, **la mel** in
Catalan), /la sáu/ 'salt' (**le sel** in French, **la sal** in Spanish and Catalan),
/la bat/ 'valley' (**le val** in French, **la vall** in Catalan, **la valle** in
Aragonese).

Aragonese, showing the highest degree of similarity to Gascon, as for
phonology and morphology, is included only parenthetically in the final
table because of the incompleteness of the lexical material. Neverthe-
less, the obtained results indicate that there probably exists a close
lexical affinity between these languages as well.

The lexical comparison does not indicate close relationship between
Gascon and the Iberian languages, as was the case in the two previous
tests, but it would not appear either that Gascon clearly belongs to
the Gallo-Romance subgroup; although Occitan is closest to Gascon,
Provençal is as far away as Catalan; and French is farther away than
Italian and almost as far from Gascon as are Spanish and Portuguese.
It would thus seem that Gascon vocabulary has a special character and
does not lend itself to precise classification.

Footnotes to Section Four

[1]Swadesh used the so-called 'core vocabulary' for the purpose of
glottochronology, which is based on the assumption that languages change
at a uniform rate as regards the basic lexical items and that this rate
of change is the same for all languages, to calculate the time-depth of
split between two related languages. Glottochronology, which was one of
the central issues of linguistics in the 1950s, is now rejected by most
linguists but continues to be used extensively by archeologists.

[2]Space limitations prohibit listing the nearly 2000 forms on which
the following counts are based. They are available from the author on
request.

5. Conclusion

The case of Gascon shows how the choice of the languages to be analyzed can influence the final results of a classification. This language, generally assumed to be a subdialect of Provençal (term used here in the broad sense of 'the languages of southern France'), turns out to be very closely related to the languages spoken on the other side of the Pyrenees. Therefore, in order to establish an objective classification, every variety, even the so-called 'minor dialects,' should be analyzed. The different rankings of similarity among the languages resulting from the tests applied here also show the importance of the decision about which features to include or exclude from the criteria of classification. When I applied Muljačić's feature system for the first time, the affinity between Gascon and the Iberian languages was evident, but it was far more obvious when I added to the set of questions the seven features which are characteristic of Gascon. It would thus appear to be necessary to take into account even those changes which affect only a small number of languages.

Another important matter is the weight to be assigned to different linguistic features. There is no doubt that the lexical changes are less significant than the phonological and morphological ones, but the question is, how much less they should count? Or, how much more should a change count that affects a large number of languages (e.g., the change of /k/ before front vowels) than one affecting only one or two languages (e.g., the change of the intervocalic -ll- to -r- in Gascon)? Likewise, not all lexical changes are equally significant. For example, the replacement of vinea by vitis in Gascon is not so important as the replacement of nascere by vadere. But again, how much less or more should they count? Or, should the replacement of Latin prehendere by Germanic *gaffon in Gascon be worth more than that of ire by ambitare or by occidere by *tutare?

Of all the proposed methods of evaluation the binary system elaborated by Muljačić seems to be the most objective, provided that all languages and minor varieties as well as all differences in development in the individual languages are taken into account.

Although the results of the various tests differ considerably, they all agree in indicating that Gascon is clearly oriented toward the Iberian languages, especially Aragonese and Catalan. In the phonological and morphological tests, Aragonese appeared to be the closest language to Gascon (in the morphological test tied with Portuguese), and even the partial lexical results implied a close affinity between these two languages. Catalan appeared in all three tests to be the second closest language to Gascon (in the second test tied with Spanish, in the third tied with Provençal). This finding would support the idea of a Pyrenean linguistic zone, different from the Gallo- and Ibero-Romance groups, although sharing some features with both systems, as was suggested by G. Rohlfs and B.E. Vidos.

Another interesting finding is the unexpected similarity of Gascon with Portuguese. In the first test Portuguese appeared as close to Gascon as Provençal, in the second test as the nearest language to Gascon (tied with Aragonese). Further investigation would certainly bring out more correspondences between these two languages. (In 1950 E. Gamillscheg pointed out similarities between Galician-Portuguese and Gascon, but his work had little or no influence on the received classification schemes.)

In view of my results, I would propose a regrouping of the languages under consideration in the following way:

     I.   The languages d'oïl

         (a) French   (b) Franco-Provençal

     II. The languages d'oc

         (a) Occitan (Languedocien)   (b) Provençal

     III. Pyrenean languages

         (a) Gascon   (b) Aragonese   (c) Catalan

     IV. Hispanic languages

         (a) Spanish   (b) Portuguese

The terms of 'Ibero-Romance' and 'Gallo-Romance' must be more precisely defined or else discarded. In most textbooks on Romance linguistics they are used in a broad, unspecified sense based on such criteria as linguistic features, geographical position, substratum, political or cultural factors, etc. According to Amado Alonso (1954: 101-2):

> "Iberorrománico, como concepto auxiliar de la
> romanística, no puede ser más que una de dos:
> lengua romance enclavada en Iberia o lengua
> romance de sustrato ibérico... Iberorromance
> no puede ser más que una de dos: la forma que
> el romance tenia en Iberia durante el imperio
> visigodo y primeros tiempos cristiano-árabes
> o quizá el conjunto de caracteres comunes de
> las lenguas románicas peninsulares... Las
> mismas distinciones valen para el galorromá-
> nico con relación a las Galias."

Therefore from the geographical, historical, political or cultural point of view they are convenient methodological terms, but from the linguistic point of view they are not appropriate. The case of Gascon is instructive. According to the above interpretation of the terms, it should belong to 'Gallo-Romania' only as one of the Romance languages spoken on that territory, but when one takes into account strict linguistic evidence, it should be considered apart.

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Connotations in Translation:
The Names of Animals in *Alice in Wonderland* as Perceived by English and French Speakers

Claude Romney

1. Introduction

Since Bloomfield (1933) first applied the terms denotation and connotation to the field of linguistics, it has become usual to distinguish between the denotative meaning of a word (the definition provided by a monolingual dictionary) and its connotative meaning, i.e., "that aspect of meaning which concerns the emotional attitude of the author and the emotional response of a receptor," according to Nida and Taber (1969:201). Connotations are sometimes termed "additional values" or even "secondary values," but linguists who have written on the theory of translation have all stressed the importance of conveying them from the source text into the target text (see Mounin (1963:166), Nida (1964:171), Nida and Taber (1969:98) and Ladmiral (1979:151 ff.)).

Anyone who is slightly familiar with cross-cultural differences will realize that when a book is read in translation, the connotations are different from those perceived in the original. In fact, before he or she starts reading, say, a novel, the reader already has preconceived ideas about both the denotations and connotations of the words. Even when it is possible to find equivalent denotations in the target language (and this is not always the case), the connotations can be quite different. Mounin (1963:65-66) gives the hypothetical example of a novel about a baker, written in French and taking place in Provence where there are over fifty different names for various kinds of bread, for which there would be no equivalents in another language. In fact, the simple French and English words <u>pain</u> and <u>bread</u>, though denotatively equivalent, suggest totally different additional meanings to a French person (often the visual aspect, the crispness and of course the taste of a <u>baguette</u> or "French stick") and to a North American who will see in his mind a sliced loaf of cottony soft white bread, wrapped in a plastic bag. Bread also plays a far more important part in the French diet, as in France no meal is served without it.

We are therefore not concerned here with individual differences that speakers or readers perceive and which are related to their personal experience, but with cultural discrepancies between two languages, which are common to the majority of speakers originating from the same country (there would, of course, also be differences between the connotations that certain words carry for English speakers of, for instance, British, Canadian and Australian extraction.

According to Nida and Taber (1969:92): "The individual connotations are quickly lost, while the socially determined connotations (which are often purely conventional and therefore learned) are acquired by each speaker as part of his language-learning experience."

Yet if the writer of a literary work and his reader share a common cultural heritage, what happens to the connotations when the book is translated? This is what we decided to find out.

2. Methodology and Choice of Particular Concepts Contained in a Literary Work

There are several ways of studying the connotations contained in a literary work and its translation. One possible method would be a running commentary, similar to the one done by Barthes (1970) who stresses the importance of connotations in the interpretation of literary texts. According to him, connotations give access to what he calls the "plural" of a text which constitutes its richness, its multiplicity of meanings. For the kind of study we are interested in, two commentators or groups of commentators would be needed, one for the source text, and the other for the translation. The comments made would most likely be quite different in the two languages.

Another possibility would be to select certain key ideas or concepts contained in the book and its translation, and apply the semantic differential method developed by Osgood, Suci and Tannenbaum (1957). In this well-known method, subjects are asked to note concepts on a number of scales defined by antonyms such as good/bad, beautiful/ugly, fresh/stale, etc. Each scale has seven points and the informants' answers give a "semantic profile" for the term.

In our study of connotations, ten French (from France) and ten British individuals were asked to free associate on a number of concepts found in a literary work and its French translation. All subjects had post-secondary education, and although some had a knowledge of the other language, no truly bilingual persons were included in the two groups, in order to avoid interference between French and English in the answers.

The work from which the concepts were taken was Lewis Carroll's *Adventures of Alice in Wonderland*, a book deeply rooted in British Culture and tradition, and partly for this reason extremely difficult to translate. Not only are there numerous cultural problems involved in the translation of Carroll's book (see, among others, Weaver (1964), Chapel (1978), Romney-Lewin (1981), and Romney (1984)), but also one can assume that the English-speaking and the French readers react differently when they first encounter the characters, a large number of whom are animals. *Alice* contains over fifty different names of animals: some of them play an important part in the story while others are merely alluded to (Dupont 1966). Our purpose was not to

study them as characters, but to examine the response their names evoke in English and French readers. In fact, according to Sutherland (1970:214), Carroll's remark that "'Words mean more than we mean to express when we use them' [...] seems to imply an awareness on Carroll's part of the capability of most words to evoke personal associations in the minds of interpreters."

It should be pointed out at this stage that although *Alice* is a children's classic, it is also widely read, appreciated and analysed by adults, as evidenced by the large number of studies it has generated since it was first published and even more so in recent years (Guiliano 1980).

The subjects chosen for the present study, all adults, were asked to answer a questionnaire containing a list of the animal characters found in *Alice* including some imaginary animals, and to indicate what associations of ideas the names suggested to them. No mention of Carroll's book was made in the instructions, but in all likelihood, the British informants knew *Alice*, whereas the same was probably not true of all their French counterparts. To some extent this may have influenced the answers of the former group. However, the English-speaking subjects no doubt shared with the author a common linguistic and cultural heritage and therefore saw the world in a different light than the French. Even if they were able to recognize that the animals made up *Alice*'s "beast collection", the characteristics they ascribed to them would have been the ones generally ascribed to them in Britain, and it seemed worth examining if they differed from the image the French have.

3. Connotations Evoked by the Names of Animals in *Alice in Wonderland* in English and in French

Here is a summary of the responses given about the animals, both real and imaginary, which play an important role in Alice's adventures, together with a few others which play a secondary part.

3.1 (White) Rabbit

> "... [Alice] *was considering in her own mind (as well as she could for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.*" (25)

In both languages, the main characteristics of the rabbit seem to be softness and shyness, and its name also evokes the idea of magic. However, several French informants noted that the animal's fur is used for making children's clothes. One even mentioned that the meat is used to prepare a tasty stew.

3.2 Mouse

> "*Alice heard something splashing about in the pool
> a little way off* [...] *and she soon made out that
> it was only a mouse that had slipped in like
> herself.*" (41)

The mouse's name conjures up ideas of smallness, nicety, agility
and silence. In French, a mouse brings presents to children who have
lost their baby teeth (in English the same role is played by the Tooth
Fairy). Also in French, respondents quoted a children's counting song,
"Une souris verte qui courait dans l'herbe."

3.3 Duck, Dodo, Lory and Eaglet

> "... *the pool was getting quite crowded with the
> birds and animals that had fallen into it: there
> were a Duck and a Dodo, a Lory and an Eaglet, and
> several other curious creatures.*" (44)

In both languages, subjects spoke about the duck's ungraceful
appearance and its unharmonious voice. Here again, the French
answered that it was used in several culinary preparations: duck stew,
duck with orange or with turnips. The culinary connotations did not
appear in any of the English responses.

All the English respondents knew that the dodo was a large bird,
now extinct. It was generally described as awkward and sad looking.
Several quoted the expression "dead as a dodo." The French, however,
either did not know what a dodo was, or thought it was an "animal seen
at the zoo," or a "large stupid bird." In French, most of the responses
associated the word "dodo" with sleep, since in French nursery language
this is what it means (from dormir, "to sleep").

The lory is not as well known even in English: seven out of ten
British respondents had no idea what it was. One person thought it
was a strange, long-necked animal, another a small nocturnal mammal.
Only one knew that the lory was a bird that appeared in *Alice* but did
not describe it. Among the French, four guessed that it was a bird,
but described it as "charming" or "sweet singing," probably by analogy
with the loriot ("oriole").

The eaglet is of course less exotic and therefore better known in
both groups. However, the connotations are quite different. In English,
its name evokes awkwardness and budding cruelty, as well as piercing
eyesight. In French, the ideas are totally different: the word aiglon
suggests apprenticeship or learning as well as potential genius. Seven
out of ten individuals mentioned the historical figure of Napoleon's
son, nicknamed "L'Aiglon," since his father was "the Eagle," and cele-
brated by Edmond Rostand, the author of *Cyrano de Bergerac*, in another
play (1900).

3.4 Lizard

> "[Alice] *ran out of the house, and found quite a*
> *crowd of little animals and birds waiting outside.*
> *The poor little Lizard, Bill, was in the middle.*"
> (63)

English and French respondents alike mentioned that the lizard
is small, green, harmless, quick-moving but also lazy and sleepy; it
basks in the sun, often on hot rocks. Its long tail grows back if
broken off. It seems to be a more exotic animal in England, as it
is more common in dry, warm regions. Two of the French informants
pointed out that its skin is used to make handbags.

3.5 Puppy

> "*An enormous puppy was looking down at* [Alice]
> *with large round eyes ...*" (64)

Here responses seem to coincide in both languages. The name
suggests a young, playful and affectionate animal.

3.6 Caterpillar

> "[Alice] *stretched herself up on tiptoe, and*
> *peeped over the edge of the mushroom, and her*
> *eyes immediately met those of a large blue*
> *caterpillar ...*" (66)

In both English and French, respondents described the caterpillar
as a hairy, voracious creature. The idea of metamorphosis was fre-
quently mentioned in French, however.

3.7 Pigeon

> "*... a sharp hiss made* [Alice] *draw back in a*
> *hurry: a large pigeon had flown into her face,*
> *and was beating her violently with its wings.*" (75)

For both categories of respondents, the pigeon is both an
attractive and a repulsive bird. It is pleasant in the country, but
disgusting in town. The carrier pigeon was mentioned only in French,
and only in this language did the name of the bird have literary con-
notations. One of La Fontaine's *Fables* bears the title "Les deux
pigeons," the first line of which was mentioned by several respondents:
> "Deux pigeons s'aimaient d'amour tendre"
> ("Two pigeons loved each other dearly")

3.8   Cheshire Cat

> *"'Please would you tell me,' said Alice [...],*
> *'why your cat grins like that?'*
>
> *'It's a Cheshire cat,' said the Duchess, 'and*
> *that's why.' "* (83)

Of course, the Cheshire Cat is a figment of the imagination, but the English respondents were aware of its proverbial smile and of its faculty to appear and disappear at will.   Among the French, six had never heard of it.   One thought it was a "sumptuous cat," another an "eccentric feline."   Only one mentioned that the Cheshire Cat was a character in *Alice*, but did not elaborate.   As expected, the Cheshire Cat's name generally did not convey any particular meaning in French.

3.9   March Hare

> *"'In **that** direction,' the Cat said, waving its*
> *right paw round, 'lives a Hatter: and in **that***
> *direction,' waving the other paw, 'lives a March*
> *Hare.   Visit either you like: they're both mad.'"*
> (89)

In English, the saying "mad as a March Hare" is well known and all ten informants characterized the March Hare as being made, while two added that they only knew the one that appears in *Alice*.   In French, the phrase does not exist and seven out of the ten French individuals did not give a reply.   Three remembered having read about the March Hare in *Alice*, but did not associate it with particular characteristics.

3.10   Dormouse

> *"There was a table set out under a tree in front*
> *of the house, and the March Hare and the Hatter*
> *were having tea at it: a Dormouse was sitting*
> *between them, fast asleep."* (93)

In both languages, the dormouse is sound asleep.   Two English respondents describe it as being timid, and two associate it with a teapot, because in Victorian England, tame dormice used to be kept in teapots.   This practice of keeping dormice in teapots did not exist in France where teapots were never the indispensable household utensils they are in England.

3.11   Gryphon

> *"[The Queen and Alice] very soon came upon a*
> *Gryphon, lying fast asleep in the sun.   (If you*
> *don't know what a Gryphon is, look at the picture)."* (124)

The gryphon, of course, is not a real animal and Carroll suspected that many of his young readers would not know that it is an imaginary animal with a lion's body and an eagle's beak and wings.

However, all the English-speaking adults we asked answered that it is a fantastic animal found in heraldry and in *Alice*. The reply of seven of our French respondents was that the word griffon suggested heraldry and mythology, not *Alice*, while three mentioned that a griffon was a pedigree dog, which it is, but the breed is more common in France than in Britain.

3.12 (Mock) Turtle

> "[The Gryphon and Alice] *had not gone very far*
> *before they saw the Mock-Turtle in the distance,*
> *sitting sad and lonely on a little ledge of*
> *rock...*" (125)

We asked the question about an ordinary turtle, and not a mock turtle, the French translation of which ("simili tortue," or "fausse tortue") would not have suggested anything at all to the French subjects. "Tortue à tête de veau," as the Mock-Turtle's name has sometimes been translated, describing the creature drawn by John Tenniel, evokes nothing more than a fantastic hybrid. In English, all respondents would have thought of *Alice* and the imaginary animal created by Carroll from the name of the soup made of calf's head instead of turtle meat, too expensive. It seems that in France, turtle soup—and therefore mock-turtle soup—were never very common.

From the answers given by the British, the real turtle appears as a slow, awkward animal. A few individuals relate it to prehistory, travels and Darwin. Two respondents indicated that it is used to make soup. In French, however, the word tortue connotates only the idea of slowness, and, in two cases, the fact that the animal carries its house on its back.

3.13 Crocodile

> "*How doth the little crocodile*
> *Improve his shining tail.*" (38)

In both languages, the reptile's name brings to mind the idea of hypocrisy and danger. It is also characterized by its scaly skin, its sharp teeth, its ugliness and immobility. In French, however, several respondents added that its skin was used to make luxury handbags and shoes.

3.14 Crab and Oyster

> "*an old Crab took the opportunity of saying to her*
> *daughter 'Ah, my dear! Let this be a lesson to you*
> *never to lose your temper!' 'Hold your tongue,*
> *Ma!' said the young Crab, a little snappishly.*
> *'You're enough to try the patience of an oyster!'*" (52)

> "*'I went to the Classical master, though. He was*
> *an old crab, he was!'*" (130)

The crab is perceived in English as an ill-tempered animal; it is, in fact, associated with the adjective <u>crabbed</u> or <u>crabby</u>. In French, only the expression <u>panier de crabes</u> ("a place (of work, etc.) where people argue and fight constantly") connotates the crab's aggressiveness, and the phrase <u>vieux crabe</u> refers to an obstinate old fool rather than to a sour-tempered person. In both languages, respondents indicated that crab meat is a delicacy.

As for oysters, gourmets of English and French extraction mentioned they liked to eat them, but not one of our anglophone informants quoted the expression "patient as an oyster" which is listed in the OED and comes from the length of time it takes the mollusk to produce a pearl. However, several respondents indicated that in English, an oyster evokes the idea of mystery, secrecy and silence whereas in popular French, <u>espèce d'huître</u> would be used as an insult to refer to a stupid person.

3.15 Goose

> "*An arm, you goose! Who ever saw one that size?*"
> (60)

In both languages, the goose is considered to be a stupid and awkward animal and its name is used as an insult.

> "*'You are old,' said the youth, 'and your jaws are*
> *too weak./For anything tougher than suet;*
> *Yet you finished the goose, with the bones and the*
> *beak.'*" (71)

On a gastronomical plane, the English tend or tended (maybe more so in Victorian times) to eat roast goose. In France, goose meat is more common in the Southern part of the country and eaten as <u>confit d'oie</u> or as <u>foie gras</u>, a conserve of the liver of specially and rather cruelly fattened geese, whose food is crammed down their throats through a funnel.

3.16 Frog

> "[The door] *was opened by another footman in livery, with a round face, and large eyes like a frog.*" (79)

In both languages, the frog's name is associated with the colour green, the pond where it lives and leaps, and its croak. In French, several respondents mentioned that frog legs are a table delicacy, which is the reason why in English, the word frog is a contemptuous name for a Frenchman. In fact, in a radio adaptation of *Alice* produced by the B.B.C. in 1978, the frog-footman spoke English with a strong French accent. Of course, Lewis Carroll may not have pictured to himself this character as being French, but nevertheless English readers of this book may well interpret him in this way, whereas in French, frogs do not connote a particular nationality.

3.17 Raven

> "*Why is a raven like a writing-desk?*" (95)

As Carroll himself explained in the preface to the 1896 edition of *Alice*, there is no solution to this purely nonsensical question. In English, however, the bird is generally associated with the colour black, bad luck and death. Several subjects thought of the Tower of London where ravens are still numerous and which had a sinister reputation as a prison. The same grim connotations are found in French, but in this language, the word corbeaux is also used depracatingly to refer to priests, probably because of their black cassocks. In French also, one immediately thinks of the raven of La Fontaine's fable "le corbeau et le renard" which most children memorize in elementary school.

4.   Conclusion

It is clear from our short survey that, as a rule, names of animals have different connotations in French and in English. How then does the translator convey the same ideas in the target language as in the original text? If we go back to the dodo, whose name is associated in English with a large clumsy extinct bird, how can a perfect equivalent be found in French, which would evoke to a majority of readers the same characteristics? The French word dodo immediately brings to mind the idea of sleep, which is not contained in the English. If the denotation coincides in both languages, the connotations are certainly different. Likewise, the March Hare's name does not suggest to a French reader the idea of madness. If, as has been suggested, the translator replaced the March Hare by a dog, a pointer, because of the French proverbial phrase "fou comme un braque" (albeit much less common than the English "mad as a March Hare"), then the description of the March Hare's house, with its fur-covered roof and its

ear-shaped chimneys (91) will have to be changed accordingly.   The
resulting text would no longer be a translation, but an adaptation.

The translator is therefore unable to convey the connotations of
the original.   As far as connotations go, there is always a discrepancy
between the source text and its translation, however accurate, and the
effect on the readers can never be identical.

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Variable Productivity: Evidence from the English Lax Vowel Constraint

Deanna Westby

1. Introduction

1.1 Overview

The productivity of the English Surface Phonetic Constraint which forbids the occurrence of a lax vowel word finally is tested by means of a number of experimental techniques, in order to ascertain whether apparent rule productivity varies in accordance with the particular criteria adopted: borrowing; memory for nonsense forms; a syllable-division language game; and pluralization tasks including both recognition and production.

The results of the experiments reported in section two demonstrate that there exists a methodological difficulty for claims about rule productivity: productivity tests do not all give the same results. For example, speakers make very few errors in repeating nonsense words ending in the disallowed lax vowel, yet no borrowings into English retain a final lax vowel from the source language. In addition, this research has some bearing on the usefulness of the tense/lax distinction for English vowels in such producitivity testing.

1.2 Rule Productivity and Psychological Reality

In the opinion of many linguists, constructing a psychologically real grammar for a language involves more than simply capturing all possible generalizations since a linguistic description does not necessarily reflect the implicit or explicit knowledge of the speaker (e.g., Innes 1974). In order for linguistics to be more than just "a discipline of arbitrary formal taxonomies" (Derwing 1979:209), a theory must be supported by psychological evidence demonstrating that the linguist's generalizations match the speaker's knowledge. That is, an analysis of natural speech can only provide a description of the regularities which appear therein, but cannot determine whether all such regularities should be represented as rules of constraints operating in the speaker's internalized grammar.

1.3 Rule Productivity

The application of a phonological rule or constraint to novel (nonsense) forms has been taken as evidence that the speaker does in fact have access to the content of the rule in question (e.g., Berko 1958). Productivity tests have been used in the past to demonstrate the psychological reality of various phonological rules and regularities.

The extent to which alterations are made to words borrowed by one language from another can demonstrate the productivity of rules which adjust the foreign word to fit the patterns of the borrowing language. Rules of the native language of a language learner have been shown to cause adjustments in his pronunciation of words in the target language; these errors together make up what we call a foreign accent (Kenstowicz and Kisseberth 1979). Language games can produce nonoccurring sequences which may be modified to fit the sound patterns of the language (Sherzer 1970). These modifications provide evidence for the "productivity and psychological reality of the phonological rules and constraints operation in the language" (Kenstowicz and Kisseberth 1979:162).

Rule productivity can also be tested by eliciting responses from subjects or by asking them about what is acceptable in their language. In Berko's (1958) study she elicited plural forms of nonsense words to test the productivity of the regular pluralization rules of English. Messer (1967) tested the productivity of Surface Phonetic Constraints by asking subjects for their judgments as to which of a pair of words sounded more like a possible English word.

All of these methods have been employed to determine the productivity and psychological reality of a rule or regularity.

1.3.1 Borrowings

Borrowed words are a good source of evidence for the application of rules and constraints. For example, data from borrowings suggest that there exists an optional rule in many varieties of English which changes a [d] or [t] to a flap [ɾ] when it occurs intervocalically after a stressed vowel (Schane 1973). There are many examples of words which have a [t] or [d] in the relevant position in a source language and are pronounced with a flap when borrowed into English. Consider certain Spanish words which contain an intervocalic /t/, for example: *Don Quixote* [doŋkix'ote], *matador* [matad'or].[1] These items have undergone the flapping rule (and in the latter case a stress shift) in their borrowed form, and thus follow the pattern of English: [dɒŋkiy'oɾiy] and [m'æɾədɔr]

1.3.2 Foreign Accents

A rule's productivity can also be judged by observing the types of errors made by people learning to speak a foreign language. Speakers of a given language background tend to make the same phonological errors when learning the same second language. In accordance with the contrastive analysis hypothesis (Wardhaugh 1970), these errors result from interference from the speaker's internalized L_1 grammar; the combination of these errors is what listeners perceive as a foreign accent (Kenstowicz and Kisseberth 1979).

1.3.3   Language Games

Language games where speakers are required to change the form of
words, thereby creating novel forms to which the putative rules may or
may not apply, provide additional insights into the speaker's grammar.
If a word is altered such that it no longer follows the patterns of
the language, the player has the option of applying phonological rules
to normalize the new form.

Sherzer (1970) reports that the Cuna Indians of Panama have a word
game called Sorsik Sunmakke (talking backwards) in which the first
syllable of a word is moved to the end of a word. For example, the
word [mola] *cloth* would become [lamo]. This game provides evidence
for the productivity and psychological reality of a regularity in
which voiceless stops are underlyingly represented as voiced geminate
consonants.

1.4   Experimental Manipulations

A somewhat more direct approach to testing rule productivity is
to ask subjects to pronounce or manipulate either nonsense forms or
real words with potential violations of the constraints of the language.
For example, Berko (1958) tested children's knowledge of English
pluralization rules by asking them to pluralize nonsense words such
as *wug, gutch* and *heaf*.

While children performed very well on real words such as *glass*,
they did less well on nonsense words such as *tass*; Berko interpreted
this as evidence that a child may internalize plurals individually
without developing a (productive) rule for novel forms.

1.5   Surface Phonetic Constraints and
the English Lax Vowel Constraint

1.5.1   Surface Phonetic Constraints

In this study we shall be examining the differential effects of
several experimental techniques in testing the productivity of a
Surface Phonetic Constraint of English. Surface Phonetic Constraints
(hereafter SPC's) describe the possible and impossible combinations
of phonetic features at the phonetic level. They are the rough
equivalent in a generative grammar of phonotactic rules in a structuralist
grammar which delineate the possible words in a language by determining
the phonological sequences which may occur.

Shibatani (1973) proposed SPC's as part of a generative grammar
in order to account for constraints which apply at the phonetic level
and whose application domain is the word. Previously, the grammar
relied upon Morpheme Structure Conditions together with the effects

of phonological rules to capture phonetic constraints but Morpheme
Structure Conditions apply at the morphophonemic level and only within
a morpheme. Shibatani states that certain alternations (such as the
plural inflectional ending) can only be explained with SPC's because
the application of the constraint is across a morpheme boundary.

1.5.2   The Lax Vowel Constraint

     The SPC examined in this study is the one which prohibits the
occurrence of a lax vowel at the end of a word in English. This is
not a universal constraint since there are word-final lax vowels in
other languages, for example, French: *Français* [frãsɛ].

     This particular constraint was chosen for study since it would
appear that it is not as strong a constraint as others (e.g., the
aspiration rule); a quick survey of a few speakers showed that although
[pɪk] (without initial aspiration) was difficult to imitate—all speakers
either aspirated the /p/ or changed it to a /b/—there was no difficulty
with nonsense words such as [skɛ] or [flɪ].

     Sapir (1933) discussed the lax vowel constraint and the reactions
of his students when they encountered words which violated it. When
his phonetics students transcribed a non-English word ending in a lax
vowel, they tended to hear and transcribe a glottal stop at the end of
the word. They did not, however, transcribe a glottal stop after
tense or unstressed vowels (e.g., schwa). When asked to repeat these
words, they did so in a "drawling fashion" (p. 59).

     Sapir points out that English allows only three word endings:
tense vowel or diphthong; tense vowel or diphthong plus consonant(s);
and lax vowel plus consonant(s). He proposes that the students had
normalized non-English words ending in lax vowels. By "drawling" the
lax vowel they presumably created an acceptable word-final diphthong,
and addition of the glottal stop "serves as the actualization of a
phonologically required final consonant .... The illusion of the final
glottal stop is essentially the illusion of a generalized final con-
sonant needed to classify the words into a known category" (p.59); lax
vowel plus consonant. The mistaken addition of the glottal stop is
not as common in the transcription of words ending in an unstressed
lax vowel. This is presumably due to the fact that some English words
end in unstressed lax vowels, such as *sofa* [s'ofə] and *Canada* [kʰ'ænədə].

     The reactions of Sapir's students thus demonstrate that the lax
vowel constraint operates at the end of words, but Sapir also suggests
that it operates at syllable boundaries. In the following passage,
Sapir makes reference to type C and type D word classes. These are,
respectively, words ending in a lax vowel plus consonant, and words
ending in a lax vowel:

>"Observe that the apparent inconsistent
>possibility of a nonfinal accented syllable ending
>in a short vowel (e.g., fiddle, butter, double,
>pheasant) is justified by the English theory of
>syllabification, which feels the point of syllabic
>division to lie in the following consonant (d, t,
>b, z, in the examples cited), so that the accented
>syllables of these words really belong phonologically
>to type C, not to type D. Intervocalic consonants
>like the d of 'fiddle' or z of 'pheasant', in spite
>of the fact that they are not phonetically long, are
>phonologically "flanking" or two-faced in that **they
>at one and the same time complete one syllable and
>begin another.**" (p. 59) [emphasis added]

Sapir's observation, although based on intuition, is rather
interesting. The case of intervocalic consonants occurring after a
lax vowel poses a dilemma for syllable division: should the consonant
be used to close the syllable so as to avoid a final lax vowel? Or,
should it be placed in the next syllable in accordance with our in-
tuitions about syllable division? Is there any empirical support for
Sapir's claim that the consonant serves both functions? If so, does
this mean that such consonants are in some sense underlying geminates?
(See section two for data in support of Sapir's view.)

The view that syllables with stressed lax vowels always end in a
consonant is supported by the syllable divisions found in several
English dictionaries: in *Webster's Seventh New Collegiate Dictionary*
(1965), the two pronunciations of the word *Babel* were divided into
syllables as follows: [b'e$bəl] and [b'æb$əl] (where $ = syllable
boundary). In the first pronunciation, the first syllable contains a
tense vowel and is left open; in the second pronunciation, the first
syllable contains a lax vowel and it is closed.

Whether the editors of the dictionaries are actually aware of a
theoretical constraint on syllable division based on the lax vowel con-
straint, or whether they make intuitive judgments is unclear, but the
fact remains that dictionary methods of syllabification (in the sources
consulted) do not violate the constraint.

Another source of evidence supporting the view that the final lax
vowel constraint operates on syllables within the word is a surface
structure constraint in English which dictates that a stressed vowel
must be tense when occurring before another vowel, for example, *variety*
[vər'aiəti] and *pious* [p'aiəs] (Moskowitz 1973). Since a vowel
is in syllable-final position if it occurs immediately before
another vowel, the lax vowel constraint is supported.

1.6   Direction of Normalization: Borrowings, Foreign Accents, and Naive Orthographers

1.6.1   Borrowings

If the lax vowel constraint is productive, then speakers of English, when faced with a foreign or novel (nonsense) word ending in a stressed lax vowel, should normalize these words to follow English phonological patterns.   Evidence from borrowed words suggests that this normalization is realized by changing the lax vowel to the corresponding tense vowel.   For example, the following French words all end in a lax [ɛ]; they have been borrowed into English with a tense final vowel:

French			**English**	
baie	[b'ɛ]		[be]	*bay*
ballet	[bal'ɛ]		[bæl'e]	*ballet*
gourmet	[gʊrm'ɛ]		[gʊrm'e]	*gourmet*
toupet	[tup'ɛ]		[tup'e]	*toupee*

1.6.2   Foreign Accents

The same tensing change is made by speakers of English learning to speak another language; they tend to pronounce all final vowels as tense, even though they may be lax in the target language.   For example, French words ending in [ɛ] are pronounced with a final [e] by English students, and Russian words with a final lax [ɔ] are pronounced with a tense [o].

Such evidence not only suggests the direction in which English speakers will normalize any word which breaks the constraint, but also demonstrates that the constraint is productive.

1.6.3   Naive Orthographers

Another reason to believe that English speakers will tense final lax vowels is provided by the naive orthographers studied by Read (1971). Read examined the spelling systems invented by children as young as three and one-half years.   These children first learned the conventional names of the letters of the alphabet, then used blocks with letters to spell words before learning grapheme-phoneme correspondences.   The children studied by Read all arrived at approximately the same spelling system.   They used a given vowel symbol to represent both a tense vowel (letter names for a,e,i,o,u) and the corresponding lax vowel.

For example, the letter *A* [e] is used to represent the [e] in *day* and the corresponding lax vowel [ɛ] as in *fell* [fɛl].   The following

are some typical invented spellings (pp. 6, 7, 10):

A		[e]				[ɛ]	
	DA	*day*	[de]		FALL	*fell*	[fɛl]
	KAM	*came*	[kem]		LAFFT	*left*	[lɛft]
E		[i]				[ɪ]	
	EGLE	*eagle*	[igəl]		FES	*fish*	[fɪš]
	FEL	*feel*	[fil]		FLEPR	*flipper*	[fl'ɪpr̩]

These naive spellers thus recognize a relationship between tense and lax vowels.

The evidence from the naive orthographers, borrowings, and foreign language students as well as the fact that specific pairs of tense and lax vowels enter into phonological alternations in other languages leads us to believe that these vowels are closely related phonetically, and enable us to predict that the productivity of the lax vowel constraint involves changing a word-final lax vowel to the corresponding tense vowel (just as the productivity of the aspiration rule results in the aspiration of unaspirated initial voiceless stops).

Two other possible changes would be the addition of a glottal stop after a lax vowel (cf. Sapir's students); and lengthening or diphthongizing the lax vowel (e.g., [dɛ] would be pronounced [dɛʔ], [dɛa], or [dɛ:]).

1.7 Variable Productivity

Whorf (1956) presents a structural formula which will generate all of the monosyllabic words of English as well as possible but non-occurring English words. Whorf states that:

> "...by the time the child is six, the formula has
> become ingrained and automatic; even the little non-
> sense words the child makes up conform to it, explor-
> ing its possibilities but venturing not a jot beyond
> them. At an early age the formula becomes for the
> child what it is for the adult; **no sequence of sounds
> that deviates from it can even be articulated without
> the greatest difficulty.**" (pp. 223 ff.) [emphasis added]

Whorf's view is that it is extremely difficult to break morpheme structure rules (or SPC's) and pronounce a word which cannot be generated by the formula.

Messer (1967) conducted an experiment to test whether children can discriminate between monosyllabic words which are possible according to Whorf's formula and words which are not. He presented children between the ages of 3;1 and 4;5 with pairs of words, one of which

could be generated by the formula and one which violated it.   The
children were asked which sounded more like a word or which better
described an object.

Messer found a significant tendency in his subjects to choose the
words predicted by the formula.   Moreover, in a repetition task,
the children made minimal changes to individual phonemes so as to
render the words more English-like.   Messer thus demonstrated that
children's speech is governed by the structural formula even at a very
young age.   One purpose of the present study, then, is to discover
whether the pronunciation of all words which violate the formula is
as difficult as Whorf suggests.

Another experiment which demonstrates that non-English sound
sequences are more difficult to pronounce was conducted by Paula
Menyuk (1968).   She presented children between the ages of 4;5 and
8;3 with pictures and names, some of which were possible English
words and some of which contained consonant sequences which are not
grammatical for English but are possible in other languages.   The
children were required to point to the picture to which the name
applied (having heard the names associated with each of the five
pictures), to repeat each name after it was pronounced by the experi-
menter, or to repeat the five names after the whole set had been
presented.   In all tasks the response time was greater for the un-
grammatical names and in the reproduction tasks the children had much
more difficulty in reproducing the ungrammatical sequences.   This study
also supports the view that non-English sound sequences are more dif-
ficult to pronounce for English speakers.

Brière (1968) studied difficulties English speakers have in over-
coming phonological interference in learning to pronounce sounds from
other languages.   He had his subjects listen to and repeat a tape
recording of words containing non-English sounds.   After each repeti-
tion, the subjects were given instructions on how to produce the
sound and they were told which English sounds it was comparable to.
Two of the sounds tested were [ŋ] and [ž] in initial position.   The
subjects found [ŋ] to be much more difficult to pronounce in initial
position than [ž], even though [ŋ] has a considerably higher frequency
in English.   In discussing this study, Moskowitz (1973) proposes that,

> "... it may be that the low frequency of the frica-
> tive plus the high frequency of the velar nasal
> with respect to the morphological processes to
> which it is psychologically connected, cause this
> result: namely that the phonotactic restrictions
> on the fricative can be violated with greater
> ease.   It is doubtful that any speaker of English,
> despite an ability to produce word-initial [ž] is
> not aware of its non-English sound." (pp. 250-251)

In other words, Moskowitz claims that English speakers are aware that
[ž] is not a native English sound, and thus have less difficulty mov-
ing it to a new position because it is already slightly foreign.

Another explanation for the difference in the ease of breaking SPC's is that English speakers make an analogy between the word and the syllable. Since [ž] is permissible in syllable-initial position, as in *measure*, it is not as difficult to position it at the beginning of a word as is [ŋ] which never occurs at the beginning of a syllable (dictionary editors may not show that [ž] is permissible syllable-initially via the invalid argument that it does not occur word initially). This latter hypothesis seems to be a less complex explanation than the former.

The relative ease with which SPC's for vowels can be broken has not been investigated. It is our hypothesis, however, that SPC's for vowels will be more easily violated than those for consonants. For example, some English paralinguistic utterances contain final lax vowels (e.g., *baa baa* [bæ] *blacksheep*), but none contain initial unspirated stops or initial /kt/ clusters. We propose that there will be a continuum of productivity varying from borrowings in which the constraint is one hundred per cent productive, to imitation, in which the constraint is not productive. Furthermore, if the tense/lax distinction is not a uniform phenomenon with regard to productivity tasks, it may be the case that the constraint is more likely to apply to some vowels than to others.

Further evidence that task demands may affect apparent productivity comes from the study done by Menyuk discussed above. Menyuk obtained different results in production and perception tasks when testing children's responses to grammatical and nongrammatical phonological sequences. When the children simply had to memorize a set of names corresponding to five coloured circles, the ability to learn and remember the set generally increased with age.

When the children were asked to repeat the set of names, the results were quite different. There were no children who could correctly reproduce an ungrammatical set of five words. The number of children who could repeat a grammatical set varied at each age level with the oldest children doing slightly better than the preschool children. Thus, as Menyuk concludes, the data from the production tasks fails to reveal the differences in learning abilities at given age levels which appear in the recognition tasks. In other words, "the child reveals one aspect of his competence when he produces utterances on demand, in accordance with linguistic rules, and another when he recognizes correct usage of these rules." (Anisfeld and Tucker 1967:1202). The different types of tasks seem to involve different aspects of the child's competence.

Similarly, Anisfeld and Tucker (1967, discussed below) found different results in recognition and production tasks involving children's pluralization ability not only in the level of difficulty (which is what usually distinguishes the two methods) but also in the pattern of errors. "The two procedures were seen to have tapped different aspects of the S's linguistic knowledge " (p. 1216).

Since some rules are more productive than others and since experimental method can affect the apparent productivity of a rule, we will be testing the productivity of the lax vowel constraint using a variety of experimental techniques. Thus both the application of the rule and the effectiveness of the methods will be tested.

1.8 English Phonotactics and Pluralization

The knowledge of English pluralization rules provides a good testing ground for the lax vowel constraint. Methods previously employed by Anisfeld and Tucker (1967), Berko (1958), and Messer (1967) to treat children's knowledge of the pluralization rules and SPC's of English will be used in this study to test the subject's knowledge of the lax vowel constraint. We will be employing the production tasks described in the Berko and Anisfeld and Tucker studies, and the recognition tasks from the Anisfeld and Tucker and Messer studies.

In the production task of Berko's experiment, a child was shown a picture of one figure and given its (nonsense) name. The experimenter then presented a picture of two of the figures and asked the child to produce the name pluralized. For example, "*This is a wug. Now there is another one. There are two of them. There are two ....*" (p. 155).

Anisfeld and Tucker criticized Berko's use of the numeral before the blank, suggesting that it provided extra information and that a better understanding of the child's knowledge might be gained by having him produce the singular form once he has been given the plural and vice versa. Anisfeld and Tucker used both singular and plural formation rules in their tasks. In their recognition tasks, they provided the child with a picture of one figure and two names, asking the child to choose the best name; two pictures (one figure and two figures) and one name, letting the child choose the picture to which the name applied; and two pictures and two names asking which name referred to which picture.

Messer used methods similar to those of Anisfeld and Tucker to test the children's knowledge of SPC's on consonants. He also simply asked subjects to choose the form which sounded more like a word.

All of these methods will be used to test for our adult subjects' knowledge of the lax vowel constraint. For example, a subject may be asked which of two pictures shows [pɛz]. If the subject chose a picture of two figures it would appear that the lax vowel constraint was not applied since the singular form (minus the /-z/ plural marker) would violate the constraint and would not be a grammatical English word (*[pɛ]).

1.9 Summary

The existence of the lax vowel constraint has been supported by Sapir's writings and shown by the methods in which dictionaries divide words into syllables, borrowings, and foreign accents. Adjustments made by English speakers to words that end in lax vowels are expected to be in the direction of tensing the lax vowel as predicted by the close relationship found between tense/lax pairs found in other languages and the spellings of naive orthographers.

Rule productivity tests have been done in the past by such people as Messer, Sherzer, Moskowitz, Menyuk, and Brière and it has been found that different rules may not be equally productive and that different methods can yield different results.

Although Whorf claims that SPC's cannot be broken without greatest difficulty, we expect that the lax vowel constraint is not hard to break and its productivity will vary with experimental methods.

2. Experiments*

2.1 Introduction

The hypothesis that different methodologies might lead to different conclusions regarding the productivity of the lax vowel constraint (LVC) was tested by comparing adult subjects' performance on a variety of experimental tasks. In each case, the data of interest include the **degree** to which subjects avoid final lax vowels (in terms of the percentage of items normalized), the particular **strategies** used, and the **direction of normalization** (e.g., tensing, "drawling," insertion of glottal stops, reduction to schwa, etc.).

The tasks include **repetition**, which presumably taps immediate perceptual categorization as well as production ability; **memorization**, which reduces immediate memory effects and allows subjects to reconstruct the final vowel (this is intended as a rough analogy to the foreign accent phenomenon); **a syllable transposition** task which can "strand" lax vowels in word-final position (e.g., river /vɚrɪ/); and three **picture labelling** tasks involving a choice between possible and impossible plurals (e.g., /spez/ vs. /spɛz/) and between singulars and plurals (e.g., singular /skɛz/ or /skes/ vs. plural /skez/). In the latter case, performance on picture-naming tasks involving final -*l*, -*n*, and -*r* stems (e.g., /pɛlz/ vs. /pɛls/) serves as a baseline for determining whether the technique is appropriate for tapping knowledge of at least some SPC's on pluralization.

2.2 Experiments[2]
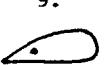
2.2.1 Pilot Studies

The **repetition** and **memorization** tasks were administered in informal
pilot studies in order to determine whether the lax vowel constraint
would have any effects worth pursuing.

In the **repetition** task, five adults and one 3-year old child were
asked to repeat 18 nonsense words as picture names including 8 ending
in [ɨ], [ɪ], [ə], [ʌ], [æ], [ɛ], [ʊ] and [ɔ] (see Figure I). Each
name was presented by the experimenter in a sentence frame (e.g.,
This is a .... or *This looks like a* ....). The adults were able
to repeat almost every name as they heard it. It was noted that
alterations were made in some lax vowels as follows: [ɨ] → [ɪ],
[ə] → [ʊ], [ɛ] → [ʌ], [ʊ] → [u] and [ə], and [ɔ] → [ə]. The other
lax vowels were repeated correctly. The child, who was given the test
three times, made a great number of changes including: [ɛ] → [ə] (3
errors); [ɪ] → [ʌ] (3 errors); [ʊ] → [ə], [ʌ] (3 errors); [ɨ] → [ɪ],
[ə] (3 errors); [ɔ] → [o] (1 error); [ə] → [ʌ] (1 error); [ʌ] → [ə]
(1 error); and [æ] → [ɑ] (1 error). The child made at least one error
in each of the lax vowels but made no errors in repeating words ending
in tense vowels or consonants nor did the adults.

Figure I

NAMES AND PICTURES FOR PILOT STUDIES

1.	2.	3.	4.	5.
[gəl'ɪt]	[ǰɨ]	[bli]	[drow]	[næs]
6.	7.	8.	9.	10.
[strɪ]	[θu]	[nə]	[stʌ]	[dəz'ey]
11.	12.	13.	14.	15.
[nəpr'æ]	[nʌk]	[klɛ]	[powt]	[ɪtrʊ]
	16.	17.	18.	
	[bɔ]	[bib]	[əf'ɒ]	

(Some of these figures were adapted from the film "Shared Nomenclature,"
Ohio State University, 1972.)

The general conclusion to be drawn from this initial attempt is that although the LVC is, as we saw in section one, as "regular" as other SPC's of English, and equally powerful as a condition on the phonemicization of borrowed words, it does not afford the native speaker the kind of difficulty suggested by Whorf. However, knowledge of the constraint—even if attributable to incidental learning—may be tapped by examining error rates (e.g., are there more errors on final lax vowels?) rather than normalization data. Rank orderings or error rates could provide a better basis on which to claim that there exists a behavioral correlate to LVC.

One problem with the task is that the experimenter may not have pronounced the word identically for all subjects. This was remedied in later experiments by recording and monitoring all stimuli and responses on audio tape. Also, subjects were screened for foreign language experience.

The pilot study for the **memorization** task involved only one subject. He was asked to memorize the name of the objects presented in Figure I, and was asked to recall them three hours later. The subject was observed to use mnemonic strategies, perhaps due to the large number of items. For examply item 16, [bɔ], was remembered as the first part of *buoy* [bɔy]. Since the subject obviously was not storing these words as they were presented to him (with a word-final lax vowel), we cannot see clear reconstruction effects for the ungrammatical words.

In the revised memorization experiment, each subject wwas presented with a smaller number of items to memorize. Secondly, the names and pictures were altered so as to make an association with an existing object more difficult. For example, the subject found that the picture of item 6, [strɪ], looked like a piece of string, and learned the name as "*string* minus -*ng*." Lastly, the names were purposely constructed so as to suggest to the subject a connection with the English meaning. This decreased the range of mnemonic strategies available to subjects. For example, [stæ] provides the consonant cluster *st-* to connect the nonsense word to its English meaning *nest*.

2.2.2   Experimental Tasks

The tasks in Experiments 1, 2, 3, 4, 5, and 7 were administered in a single 45-minute session for each of eight adult subjects. The six tasks were presented in different orders for each subject.

2.2.2.1   Experiment 1:   Repetition

The repetition task was presented first to all but the first subject. Since the task involved repetition of non-English nonsense words, it was thought that the subject should have had no previous experience with final lax vowels to ensure that his first attempts at repetition would be naive.

Subjects: The eight male subjects were Engineering students at The University of Calgary. All were between the ages of 19 and 23 and all were known to the experimenter and participated in the experiment on a voluntary basis. All were native speakers of English with limited knowledge of other languages, and none reported any hearing or speech problems.

Materials: Ten sentence frames were composed for the target nonsense words (e.g., *This is called a* /wʌ/), and each frame was used for two items, for a total of 20 test sentences.

The nonsense items were monosyllabic or disyllabic words; seven ended in consonants or consonant clusters and the remaining thirteen ended in vowels, either lax or tense (where these terms are meant to distinguish between the vowels which are and are not subject to LVC). The nonsense words were positioned at the end of the sentences in order to ensure that final vowels would not be affected by subsequent articulations.

Each of the 20 sentences described a brightly colored picture of a cartoon animal presented on a four-inch by five-inch file card. The sentences and pictures were shown to all of the subjects in the same order.

Procedure: The first seven subjects were tested for all six tasks individually in a quiet room. Their voices and the voice of the experimenter were recorded on a Sony TC-580 reel-to-reel tape recorder in order to allow for monitoring of any variation in the stimuli received by the subjects, and to allow for later transcription of the responses. The eighth subject was tested for all six tasks in a quiet hallway and his responses were recorded on paper. Each subject was first questioned about his previous linguistic experience.

The instructions pointed out that the nonsense names and pictures were "silly" because they were to be used in experiments with young children (see section three for discussion on this point). The subjects repeated each of the twenty sentences while looking at the picture it described. This task lasted approximately two minutes.

Results: The raw score data from Experiment 1 is found in Table 1. Exact repetitions are marked with 'R'; changes from the experimenter's pronunciation are transcribed. The vowel [ɨ] was deleted from the analysis, since, on the basis of the recordings, the experimenter doubted her ability to produce the vowel consistently. Percent correct repetition by vowel is shown in Table 2.

A two-way analysis of variance was performed with factors Percent Correct (C) collapsed across subjects and Syllable Structure (SS) (final consonant, lax vowel, or tense vowel). The overall F was significant ($F_{(2,18)} = 5.17$, $p < .05$), indicating that either or both of the factors had an effect. Examination of all means reveals that the errors

Table 1

RAW SCORES OF REPETITION

WORDS	SUBJECTS							
	1	2	3	4	5	6	7	8
[tɒ]	R	R	R	R	[a]	R	R	R
[næy̆]	R	R	R	R⁄	R	R	R	R
[swɛ]	R	R	R	R	R	R	R	R
[bud]	R	R	R	R	R	R	R	R
[wʌ]	R	R	R	R	[ə]	R	R	R
[pæ]	[a]	R	R	R	[æ]	[æ]	[ɑ]	R
[kli]	R	R	R	R	R	R	R	R
[ðɛst]	R	R	R	R	R	R	R	R
[flʊ]	[ə]	[ə]	[ʊə]	[ə]	R	R	R	R
[bəd'o]	R	R	R	R	R	R	R	R
[θər]	R	R	R	R	R	R	R	R
[vɔ]	[ə]	[ə]	[ə,o]	[o]	[ə]	[o]	R	[ə]
[gæŋk]	R	R	R	R	R	R	R	R
[fu]	R	R	R	R	R	R	R	R
[sɪ]	R	R	R	R	R	R	R	[i]
[dorl]	R	R	R	R	R	R	R	R
[če]	R	R	R	R	R	R	R	R
[sprə]	R	R	R	R	R	R	R	R
[šɛk]	R	–	R	R	R	R	R	R

Table 2

PERCENT CORRECT REPETITION BY VOWEL

Vowel	% Correct	
[ɔ]	12.5	
[ʊ]	50	
[æ]	50	prohibited word finally
[ʌ]	87.5	
[ɪ]	87.5	
[ɒ]	87.5	
[ɛ]	100	(not permitted word finally)
[i]	100	
[o]	100	
[u]	100	permitted word finally
[e]	100	
[ə]	100	

were almost entirely attributable to **lax** vowels (66.7% correct vs. 95.8% correct for tense vowels and 100% correct for consonants). A separate analysis of variance with factors Subjects (S) by Sylllable Structure again shows a significant effect of SS, $(F (2,14) = 49.00, p < .01)$, but no significant subject differences $(F (7,14) = 2.14, p > .05)$. We can thus conclude that in repetition, alterations are most likely to be make to **lax** vowels in word-final position, as predicted by the lax vowel constraint.

Discussion: In spite of the low overall error rates, the results support a repetition difficulty difference between vowels which may and may not occur word finally: only one vowel which is allowed in word final position, [ɒ], showed any errors at all; at 87.5% correct (7/8 correct, with one [ɑ] rendition) it does not pattern very differently from the 100% correct scores attained by **all** of the vowels normally

occurring in that position. This is in sharp contrast to the spread
of 12.5 to 100% for the lax vowels. This wide spread is rather
interesting, for it suggests that the lax vowels cover a broad range
of repetition difficulty, while the tense vowels and [ə] all show
nearly perfect performance (note that [ɛ] is 100% correct). The notion
of a difficulty ordering is worth pursuing; however, one should not be
surprised if the ordering revealed in this task is less sensitive than
one would wish, due to apparent ceiling effects. Finally, the few
changes that can be discerned do **not** follow from a tensing prediction.
Instead, we find /ɔ/ change to /ə/ or /o/, /ʊ/ to /ə/, /æ/ to /ɑ/,
/ʌ/ to /ə/, and /ɒ/ to /ɑ/.

2.2.2.2 Experiment 2: Syllable Division

Subjects: The subjects tested in this experiment were the same as
those in Experiment 1.

Materials: The word list for the syllable transposition task consisted
of 51 items. Seventeen of the items were real English words; the re-
maining 44 were nonsense words, none of which violated the SPC's of
English. The words were all disyllabic and varied not only in terms
of phonemic content, but also in stress pattern, number of consonants
in initial, medial, and final position, and tenseness of the first
vowel (which was to be moved to word-final position).

Procedure: The subjects were tested under the same conditions as in
Experiment 1. This task was presented to the subjects as a language
game, similar to the familiar Pig Latin. Subjects were read the in-
structions which asked them to switch the order of the syllables in
each word (e.g., birdhouse-housebird). The experimenter then presented
the items in Word List 1.

It was discovered in an informal pre-test that subjects may adopt
a strategy of dividing the word before a single medial consonant, but
also place a copy of that consonant at the end of the newly created
word (e.g., *river* /vɚ -rɪv/). If such a strategy was adopted by a sub-
ject, this was pointed out by reading a standard explanation after the
26 items of List 1. (This turned out to be necessary in every case.) Sub-
jects were then read new instructions which altered the task such that
the experimenter would read the original word, then say the first
syllable of the "game" word (e.g. *river, ver……*). The subject was to
complete the new word by adding the first syllable of the old word.
The rest of the list was treated in this way. The purpose of this task
was to note whether subjects would allow a word to end in a lax vowel
when the syllable division was indicated by the experimenter; altera-
tions to final vowels would then suggest difficulty in breaking the
lax vowel constraint.

Results: The subjects' responses are given in Table 3, categorized by
the type of syllable division performed. Column I, headed V/C, indi-
cates a division between the first vowel and the medial consonant:

Table 3

EXPERIMENT 2: RAW SCORES BY SUBJECT

	(I) V/C	(II) ¢	(III) C/C	(IV) C/V		(I) V/C	(II) ¢	(III) C/C	(IV) C/V
Word Type 1 - V C V - [-tns]					**Word Type 3** -VCCV-				
n'æfɪsk	7	0	0	0	g'ɪltek	0	2	6	0
b'ɪvi	4	2	0	1	g'æstov	0	3	5	0
g'ɛpʊr	4	4	0	0	p'olfæz	1	0	7	0
f'æzəl	3	4	0	1	vedr'ɪs	5	1	1	0
r'ʊlʌp	1	6	0	0	s'ɛldəm	0	0	8	0
d'ɛsɪŋ	2	6	0	0	'onli	0	0	8	0
w'ɪbət	6	2	0	0	bl'ɪstər	2	2	3	1
ð'æfec	7	1	0	0	forg'ɛt	0	0	8	0
z'ašəm	6	2	0	0					
p'ʊkey	7	1	0	0					
t'ʊgəθ	7	1	0	0	**Word Type 4** medial affricates				
θ'ɪfest	7	1	0	0					
bet'əd	5	3	0	0	y'ɛči	0	8	0	0
nɛvər	2	5	0	1	h'ʊjep	4	4	0	0
pl'ɛžər	3	5	0	0	pej'ɪk	2	5	0	1
r'ɪvər	7	0	0	0					
s'ʊti	7	1	0	0					
prəd'us	8	0	0	0	**Word Type 5** medial -r-				
v'ɪdəm	2	6	0	0					
					č'orɛg	1	4	0	3
					k'orɛz	0	3	0	5
Word Type 2 - V C V - [+tns]					sm'orʊk	4	4	0	0
					l'orɪt	3	5	0	0
l'eygɔr	4	3	0	1	fɛrbon	4	3	0	0
f'imo	8	0	0	0	g'ori	0	4	0	3
s'ʌlep	1	7	0	0					
r'onɪj	7	1	0	0					
p'ɒgen	5	3	0	0	**Word Type 6** medial -ŋ-				
m'uden	6	2	0	0					
'ošen	4	3	0	0	j'ɒŋɛr	0	4	0	4
p'epɔr	6	2	0	0	m'ɛŋɛr	0	3	0	4
st'ʌmek	5	3	0	0					
k'ʊpi	6	2	0	0					
bik'ʌm	8	0	0	0	**Other**				
					ʌfr'ed	8	0	0	0
					w'æygən	4	4	0	0

e.g., v'ɪ/dəm → d'əmvɪ. In the case of words ending in a lax vowel, such a division places the vowel in word-final position, and alterations may be examined. Column II, headed ¢ , indicates use of the **consonant copying strategy**: e.g., v'ɪd̸əm → **d'**əmvɪd. Column III, C/C, is relevant only for words with medial consonant clusters, and indicates division between the two consonants (e.g., g'æs/tow → t'owgæs). However, such items may also, alternatively, be treated as V/C (e.g., st'owgæ), ¢ (st'owgæs), or even as Column IV, which was intended to represent divisions such as f'æz/əl → 'əlfæz.

When the copying strategy was first observed, it was assumed that this was a special strategy for avoiding final lax vowels, and it was expected that the C/V column would contain a preponderance of items as /v'ɪdəm/ → /dəmvɪd/. However, Table 4 shows that this is not the case.

Table 4

DISTRIBUTION OF RESPONSE TYPES BY VOWEL TENSENESS

Vowel Type	V/C	¢	C/V	Total
Lax	64.2%	33.8%	2.0%	100%
Tense	47.3%	41.7%	11.0%	100%

The strategy applied to both types of final open syllables, and there seems to be a greater tendency to close syllables ending in a tense vowel. Thus, the results do not support the hypothesis that final lax vowels will more often be subject to the syllable-closing strategy.

Table 4 also demonstrates that the most frequent response type is in fact one in which the syllable is left **open** word finally (V/C), in accordance with a syllable division leaving the medial consonant at the beginning of the second syllable. The three exceptions to this division are [ɛ], [ʌ], and [ɔ], all of which are subject to the lax vowel constraint. This seems to offer some support to the notion that the restricted vowels are subject to the "non-final" constraint. However, other vowels subject to the constraint, [ʊ] and [ɪ] pattern with the tense vowels in allowing more open syllables.

Table 5 presents the percentage of times each vowel was left in an open syllable. When the vowels are placed in a rank order according to the amount of responses which left each vowel in an open syllable, there does not seem to be a clear distinction between tense and lax vowels, but rather a progression in the ease with which a vowel can be left in

an open syllable, although there does seem to be a greater concentration of lax vowels at the lower end of the scale.

Table 5

PERCENTAGE OF RESPONSES IN OPEN SYLLABLES BY VOWEL

Vowel	Percentage Open Syllables	Vowel	Percentage Open Syllables
[ɛ]	34	[o]	73
[ʌ]	37	[æ]	74
[ɪ]	53	[u]	75
[e]	62	[ə]	81
[ɒ]	69	[i]	100
[ʊ]	71		

When a subject is warned against using the copying strategy, what does he do? Table 6 suggests that the syllable-closing tendency is difficult to overcome, reducing from 46% to 31.5% syllable divisions; the V/C division prevails: all of the reduction in ¢ responses, as well as all C/V responses become V/C.

Table 6

PERCENT RESPONSES BY RESPONSE TYPE BEFORE
AND AFTER INSTRUCTIONS TO AVOID ¢

	V/C	¢	C/V	Total
Before	39.0	46.0	15.0	100
After	68.5	31.5	0	100

This experiment was also designed to examine alterations made to lax vowels when placed in word final position by the game rule. Overall, lax vowels were altered in some way only 18% of the time when they occurred word finally; tense vowels were always pronounced accurately. This again suggests that the tense/lax distinction appears only as a rather weak effect on error rates. This alteration took many forms:

some lax vowels were raised (e.g., [ɛ] → [ɪ] one occurrence); some
were tensed (e.g., [ɔ] → [o] six times), [ʊ] → [u] three times, and
[ɛ] → [e] once); some were lowered (e.g., [ʌ] → [ɒ] twice); some were
centralized (e.g., [ʊ] → [ə] and [æ] → [ʌ] once each); and some were
given an offglide (e.g., [ɪ] → [ɪᵊʸ] twice, and [ʊ] → [ʊˀ] once).
Overall, there was no consistent pattern to changes in the lax vowels.

Discussion: This experiment gave mixed results concerning subjects'
use of LVC. On the one hand, the final lax vowels were not altered
in any theoretically relevant ways, and the syllable-closing strategy
was neither excessively nor even principally applied to word-final
lax vowels. On the other hand, the only vowels which were altered in
production were those subject to the lax vowel constraint. The results
can be explained in a general way in terms of the following English
syllable-structure tendencies:

    (a)   medial consonants begin the second syllable,

    (b) word-final syllables are closed (cf. Sapir 1933).

Although one is tempted to propose a third strategy:

    (c) word-final lax vowels are disallowed

such a strategy is subsumed by strategy (b). The fact that medial con-
sonants always belong with the following vowel, regardless of whether
the preceding vowel is tense or lax, runs counter to the practice of
the editors of English dictionaries, who avoid breaking syllables so
as to leave a lax vowel in syllable-final position. In fact the data
show a slight preference in this experiment for subjects to leave most
vowels in open syllables! At any rate, we find here no behavioral
correlate to the descriptively useful tense/lax distinction as regards
internal syllable division. It would appear that the syllable struc-
ture strategies outlined above are more salient to the English speaker
than the weaker LVC.

    Sherzer (1970) did not report any use of the consonant copying
strategy in Sorsik Sunmakke. He simply provided sample words from the
game which would shed light on questions he had put forward. He gave
examples like *saban* → *bansa* and *sapan* → *bansab* as evidence that voice-
less stops pattern as consonant clusters, but did not state whether
this strategy was used 100% of the time by these speakers or whether
the consonant copying found in the current experiment was ever used
(e.g., *saban* → *bansab*).

    The lesson to be learned from this task is that not all productivity
tests will tap underlying knowledge. Whereas Experiment 1 provided
evidence that the constraint plays a role in repetition, Experiment 2
provides no such evidence in terms of restrictions on syllable structure.
In addition, it is fortunate that **both** tense and lax words were examined
in the copying strategy: although the [vɚ-rɪv] phenomenon seemed to be

a very convincing argument to the effect that English speakers avoid open syllables ending with lax vowels, this is seen to be only a consequence of a broader tendency to close all syllables word-finally. The fact that the strategy was adopted at all and by every subject supports Sapir's flanking theory.

One question which remains unanswered is whether such results demonstrate anything about the strength of English LVC in comparison with other types of rules. For example, if the results of a similar experiment in some lesser known language had shown a powerful effect (a definite preference for the ¢ strategy for lax vowels, much higher rates on lax vowel endings, and consistent normalization of lax to tense vowels), no one would have been surprised. After all, there is independent evidence that LVC is productive (borrowings, foreign accents), that language games reveal interesting facts about phonological processes (e.g., Scherzer 1970), and that the tense/lax distinction has some psychological validity for English speakers (Moskowitz 1973; Read 1972). The status of the syllable in phonology and the process of syllable division are far from being well understood. While this experiment has inadvertently served as a demonstration of this fact, it has also revealed a number of interesting tendencies which may suggest some directions for further research.

Words with medial /ŋ/ had a unique pattern of syllable division. Although fifty percent of these items were divided after the [ŋ], (e.g., mɛŋɚ → ɚmɛŋ), all other cases were treated as C/C—as though the original word had contained /ŋg/: /mɛŋɚ/ → /gɚmɛŋ/. Since there is no [g] in the stimulus word, this may be a spelling effect. However, it is equally possible that the medial /ŋ/ represents an underlying /ng/ sequence (see, for example, Fromkin 1975 for such an analysis). One step toward resolving this issue would involve having illiterate (but otherwise normal) English speaking adults, as well as pre-literate children, attempt the game. The fact that the subjects never divided words with medial /ŋ/ before the [ŋ] is probably due to its distribution in English: it never occurs word- or syllable-initially. This is of special interest in the present study, since such a restriction is quite analogous to the lax vowel constraint: lax vowels never occur word- or (at least according to dictionary editors) syllable-finally. Why then, the difference in the strength of these two constraints? One might speculate that there is a fundamental difference in the articulatory difficulty in producing disallowed sequences of vowels and consonants (just as *sgtlzk is more difficult than *æiouʌiau), or perhaps that the lax vowel constraint is **not** in any performance-related way a syllable structure constraint after all, but only a word-structure constraint. If one argues that lax vowels are permitted in internal syllable-final position (e.g. /rɪ-vɚ/), then the analogy to word-final position would make the constraint much easier to break. One must also consider the possibility that the constraint is not linguistically significant (e.g., it does not enter into any morphophonemic alternations), and is thus nothing more than an accidental pattern in the language—one which might be accidentally learned.

Another interesting pattern emerges in the items *afraid* and
/vədr'ɪs/. These were the only two items with medial consonant clus-
ters which were rarely divided as C/C. Possible explanations for this
lie in the stress patterns and the particular consonant clusters in-
volved. The only other word in the list which had stress on the
second syllable was *forget*, which was treated as C/C. The difference
between *forget* and the above two words lies in the consonants which
make up the cluster: [dr] and [fr], the consonant clusters in the
two atypical items both occur word-initially in English wereas [rg]
does not. This fact might result in a tendency to keep these consonants
together as a cluster. However, two other items, *blister* and /g'æstow/,
contain permissible initial /st/, yet were divided between consonants
8 times out of 15. Perhaps, then, the shift in stress to the final
syllable somehow brings about greater cluster cohesion. However, the
data are too sparse to justify such a conclusion at this point. None-
theless, it would not be difficult to expand this task so as to include
a greater variety of clusters and a balanced number of stress patterns
in order to test this hypothesis property.

A third point of interest involves a number of times which were
divided phonetically rather than phonologically. In two words which
involve progressive assimilation, the assimilation appears in the
created word even though the two interacting sounds had been separated
by the transposition rule. For example, two subjects (one not included
in the reported data) divided the word [rõnɨ̆ɟ] between the [o] and the
[n], yielding [nɨ̆ɟrõ]. Even though the vowel no longer immediately
preceded the nasal, it was still nasalized.

Four out of eight subjects divided the word *wagon* between the /æ/
and the /g/. In normal pronunciation, the /æ/ is partially assimilated
to the /g/ by an offglide: [wæʸgən]. Two of the four subjects kept the
offglide on the /æ/ even though it has been separated from the /g/.

These irregular divisions could, perhaps, be explained by assuming
that subjects sometimes operate on surface representations—that is,
that phonological rules are sometimes applied before the syllable divi-
sion. On the other hand, it is possible that some phonologically pre-
dictable variants such as the [æʸ] have different degrees of perceptual
salience either across allomorphs, across listeners, or both. Either of
these speculative solutions would account for these results, but it is
unclear to what extent speakers and phones can vary in this way.

Another interesting result is that 65% of the medial affricates
which fell in the ¢ column were split into a stop plus either a frica-
tive or an affricate. For example, [y'ɛči] was split as both [šiyɛt]
and [čiyɛt]; [h'ʊɟ̆əp] was divided as [ɟ̆əphʊd]; and [pəɟ̆'ɪk] was changed
to [ɟ̆ɪkpəd]. This pattern could be attributed to orthographic influ-
ences (e.g., *yet/chy*). To control for this, here again it would be
useful to have both illiterate adults and pre-literate children attempt
the task. Such results are obviously relevant to the enduring question
as to whether [č] should be represented as one segment or as two ([tʃ])
(Fromkin 1975).

Finally, in two of the English words, the subjects clearly used orthographic cues to determine the pronunciation of the new word. In the words *produce* [prəd'us] and *afraid* [əfr'ed], the changed words became *'duce-pro'* [duspro̱] and *'fraid-a'* [fredæ̱]; the final vowels are both apparently spelling pronunciations.

2.2.2.3   Experiment 3:   Memorization

Subjects: The subjects in this experiment were the same as those in Experiment 1.

Materials: A list of 13 monosyllabic, vowel-final nonsense words was compiled for the subjects to memorize as "foreign" words. Each nonsense word was paired with a common English word which served as its gloss. The English words were all concrete, highly imageable nouns, some of whose meanings or phonetic content helped in recall of the nonsense words (for example [stæ] and its gloss *nest* share a consonant cluster; the consonant of [zʊ] is the sound made by its gloss *bee*. These intentional memory aids were included in order to reduce the time it took the subjects to learn the words, and to impose some limits on the mnemonic strategies subjects were likely to use. Since it was only the quality of the vowel which was being monitored, mnemonic strategies involving the initial consonants were not expected to interfere with the results.

The nonsense words consisted of an English consonant or consonant cluster followed by a tense or lax vowel.

Procedure: The testing was done under the same environmental conditions as in Experiment 1. The tape recorder was on throughout the memorization process so that all of the subjects' attempts at the nonsense words would be retained. This task took about fifteen minutes to complete.

The experiment consisted of four parts. In Part I, the experimenter read both the nonsense words and the corresponding English words, asking the subject to repeat after her. In Part II, the experimenter read through the list of nonsense words in random order asking the subject to recall the English glosses. This procedure was repeated until the subject could give all or most of the English meanings. In Part III, the experimenter read the list of English words in random order and asked the subject to supply the nonsense word. The learning criterion was one perfect trial. Part IV was the final test, which took place twenty-five minutes later, after several intervening tasks. In this task, the subject was asked to provide the appropriate nonsense words when given the English words in random order. This final test took approximately one minute.

Results: Analysis of the memorization results was divided into three parts. The first part involves subjects' repetition of the experimenter's pronunciation of the nonsense words during the initial learning

trials. Percent correct repetitions out of the total number of attempts at the nonsense words were calculated for each vowel and are presented in rank order in Table 7.

Table 7

PERCENT CORRECT REPETITION, EXPERIMENT 3

Item	Percent Correct	
kʊ	52	
nʌ	60	
bɔ	67	
stæ	71	ALL DISALLOWED WORD-FINALLY
lɪ	73	
mɨ	74	
zɒ	96	
shɛ	96	
gri	100	
pru	100	ALL PERMITTED WORD-FINALLY EXCEPT [ɛ]
dre	100	
flə	100	
stro	100	

As can be seen from Table 7, there is a fairly clear difference in repetition success between vowels which may and may not occur word-finally. Only [ɛ] is misclassified; as in Experiment 1 [ɛ] is rendered more accurately than the other vowels subject to the constraint. Although more sophisticated techniques could be brought to bear on a larger amount of data, it seems quite clear that repetition errors are fairly predictable on the basis of the phonotactics of the vowel in question: vowels subject to LVC rank lowest in terms of percent correct repetition.

The percentages of correct attempts during the learning trials were also calculated for each vowel, and these are presented as a rank order listing in Table 8. Although there were very many mistakes in this section, and although they were largely due to the fact that the

subjects had simply not yet learned the items, predicting error rates on the basis of the tenseness of the final vowel misclassifies only /zɒ/, which misses the "permissible in final position" category by only one rank.

Table 8

PERCENT CORRECT RECALL, EXPERIMENT 3
LEARNING TRIALS

Item	Percent Correct	
nʌ	25	
mɨ	29	
bɔ	30	ALL DISALLOWED WORD-FINALLY
shɛ	31	EXCEPT [zɒ]
stæ	31	
kʊ	37	
zɒ	40	
lɪ	52	
dre	56	
flə	68	
gri	72	ALL PERMITTED WORD-FINALLY
pru	78	
stro	100	

The final test results were analyzed according to the percentage of the subjects who provided the correct nonsense word, and once again the rank order was calculated as in Table 9, and again only one item, /lɪ/, is miscategorized on the basis of a tense/lax prediction.

The difficulty orderings for the vowels in the first part and the final test of the experiment were compared by a Spearman's Rank Correlation Coefficient analysis. A positive correlation was found between the two orders ($r_s = 0.86$, $z = 2.98$, $p < .01$) confirming a consistent difficulty ordering for memorization and pronunciation.

Table 9

PERCENT CORRECT RECALL, EXPERIMENT 3
FINAL RECALL TASK

Item	Percent Correct	
kʊ	12.5	
stæ	37.5	
nʌ	7.5	DISALLOWED WORD-FINALLY
bɔ	37.5	
mɨ	50	
shɛ	50	
dre	50	
zɒ	62.5	
lɪ	62.5	PERMITTED WORD-FINALLY
gri	75	EXCEPT [lɪ]
prʊ	87.5	
stro	100	
flə	100	

The average rank order for the two data sets (repetition and re-call) as shown in Table 10 is as follows: [ʊ], [ʌ], [ɔ], [æ], [ɨ], [ɪ], [ɛ], /[ɒ], [i], [u], [ə], [o]. Notice the clear grouping of lax vs. tense vowels: those vowels which are prohibited in word-final position are ranked 1 through 7, while those permitted in word-final position are ranked 8 through 12.

Finally, a few comments are in order regarding the direction of normalization; the distribution of responses is shown in Figure II. In the repetition portion of the experiment, only /ɔ/ followed the tense/lax prediction: 3 out of 7 alterations were to /o/. The vowel /æ/ drifted toward /ɒ/, /ɑ/, and /ʌ/ (backing), /ɨ/ drifted toward /i/-/ɪ/ (fronting), the vowel /ʌ/ migrated toward /ɑ/, /ə/, and /ɛ/, and the vowels /ʊ/, /ɔ/ and /ɪ/ showed a trend toward /ə/ substitution. In the final memorization task, the errors were somewhat scattered across the vowel chart. One would require much more data and more sophisticated cluster analyses in order to make sense of this spread.

Table 10

AVERAGE OF RANK ORDERS FOR REPETITION
AND FINAL RECALL TASKS
EXPERIMENT 3

Item	Mean Rank Order	
kʊ	1.00	
nʌ	2.50	
bɔ	3.00	DISALLOWED WORD-FINALLY
stæ	3.50	
mɨ	6.00	
lɪ	6.75	
shɛ	7.00	
zɒ	7.75	
dre	8.50	
gri	10.50	PERMITTED WORD-FINALLY
pru	11.00	
flə	11.00	
stro	11.80	

Figure II

DISTRIBUTION OF RESPONSES FOR FINAL RECALL TASK: EXPERIMENT 3

Figure II

(cont'd.)

[stro]   [bɔ]

[mɨ]   [nʌ]

[flə]   VOWEL CHART
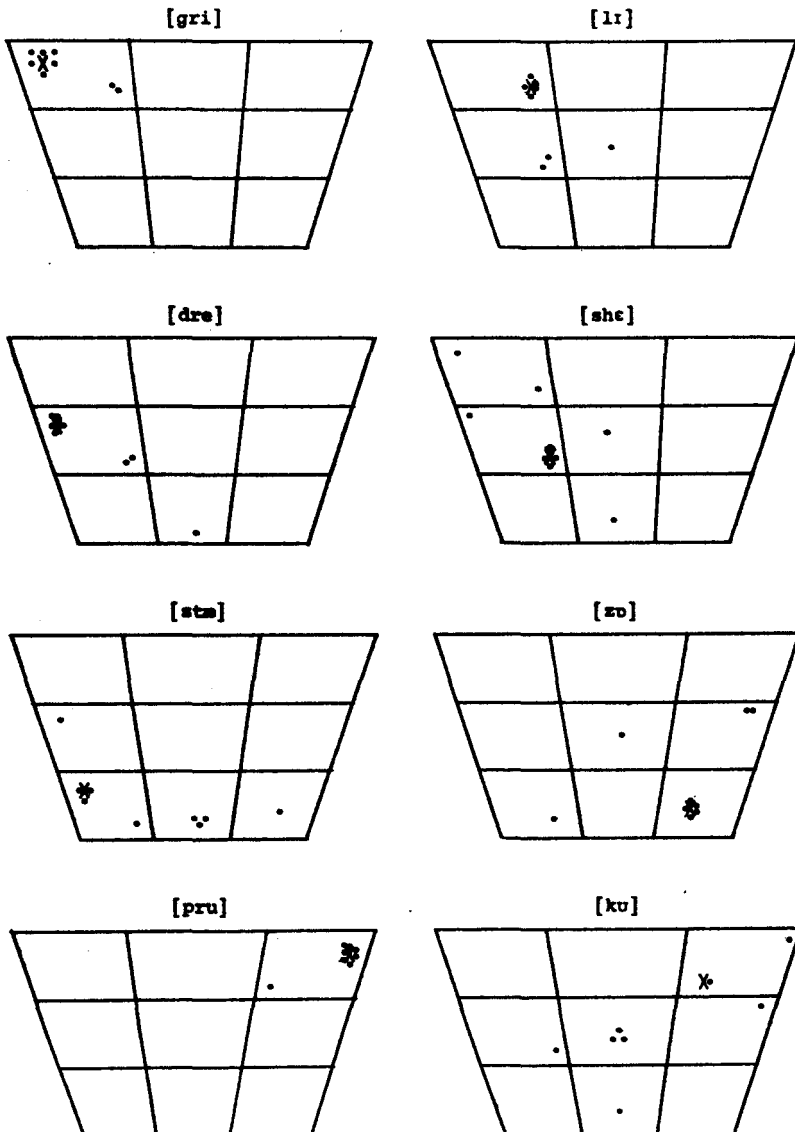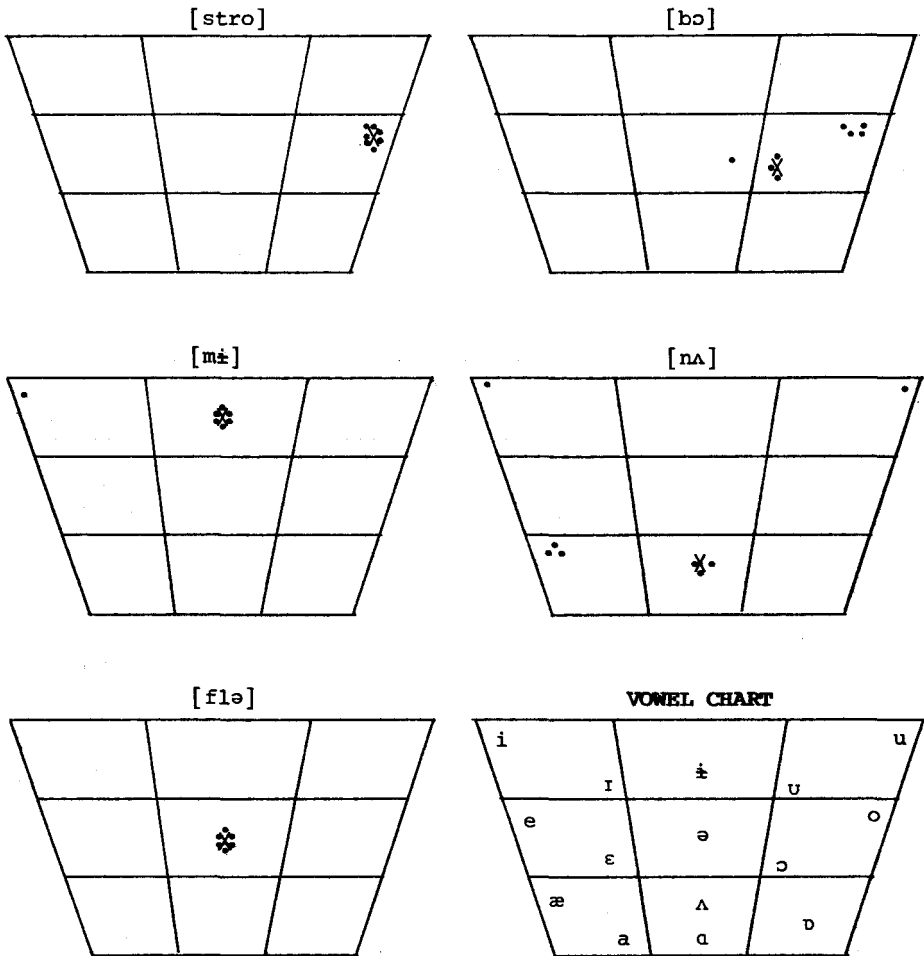
Where, X = target vowel, and

    • = subjects' attempts at target vowel

Discussion: Each sub-task in this experiment again revealed that error rates are consistently ranked in terms of LVC: those items which violate LVC have the greatest error frequencies. However, the data are insufficient to allow one to discover patterns in the alterations to such vowels. It may be of interest to pursue the study of recall errors in such a task in order to determine whether the errors reflect the types of miscategorizations found in studies of vowel perception (e.g., Assman, Nearey and Hogan 1982). Such a result would have implications for both types of results: in vowel perception studies, vowels are often presented in isolation; if the English SPC prohibiting the occurrence of such stimuli as **words** has an effect on vowel perception, miscategorizations should be similar to those found in the present. However, the converse argument may also be advanced: *a priori* constraints on vowel perception/categorization may fully explain the results of the present study (or a greatly expanded memorization task).

2.2.4   Experiment 4: Picture Labelling
        (Two Words, One Picture)

Subjects: The subjects in this experiment were the same as in Experiment 1.

Materials: The 30 pictures used in this experiment were colorful cartoon drawings of people and of real and invented animals. Half of the four-inch by five-inch file cards depicted only one figure and the other half showed two.

The test words consisted of 30 pairs of items; some were existing English words, corresponding to the pictures of people and real animals, and the rest were monosyllabic nonsense words (all of which conformed to the SPC's of English) matched randomly with one- or two-figure cards.

The test list was a random mixture of 30 pairs of words from seven sets. The first set contained three "singular" words ending in sonorants (r, l, n) and their "plurals" ending in /-z/ (e.g., [/pɛl/-/pɛlz/). The second set contained four words ending in tense vowels or diphthongs plus their regular plural forms (+/-z/) (e.g., /sti/-/stiz/). Set 3 consisted of five pairs in which the first member ended in a sonorant (r, l, or n) plus /-s/ and the second member ended in the sonorant plus /-z/ (e.g., /pɛls/-/pɛlz/). Set 4 (two pairs) distinguished between singular and plural on the basis of voicing agreement after tense vowels rather than sonorants (e.g., /skes/ (sg.) -/skez/ (pl.). Set 5 consisted of the crucial items to be used for testing the lax vowel constraint. It involved seven pairs of words, both of the words of the form C(C)Vz, in which one member contained a lax vowel and the other a tense vowel (e.g., /drɪz/-/driz/). It was predicted that the form with the tense vowel would be chosen as the plural since the backformation of a singular from CVz [-tns] would yield a stem which violates the lax vowel constraint.

Set 6 involved three pairs of the form bVz [-tns] (e.g., /bɪz/-/bɛz/). This allows one to compare the ease with which the lax vowel constraint can be violated for different vowels in the same consonant frame. Set 7 contained the real English words. (See Table 11 for a summary of the test types).

Table 11

SAMPLE ITEMS FROM EACH SET IN EXPERIMENT 4

	Sample Item	Purpose
1.	pɛl - pɛlz	Singular vs. plural with overt marker: sonorant stems
2.	sti - stiz	Singular vs. plural with overt marker: tense vowel stems
3.	pɛls - pɛlz	Separate morphemes: proper name ("Pelse") (sg.) vs. plural (pell-pells); sonorant stems
4.	skes - skez	Same as 3 but with tense vowel stems
5.	drɪz - driz	Same as 3 but with tense vs. lax stems
6.	bɪz - bɛz	Forced choice of plural from two non-plural lax stems
7.	ant - ants	Real English words

All subjects were given the items in the same random order; the plural was read first for half of the pictures and the singular form was read for the other half (the presentation order within pairs was also randomized across pairs).

Procedure: Subjects were tested in the same environment as in Experiment 1. Each of the 8 subjects was instructed to choose one of each pair of words as the best name for what he saw in the picture. This experiment took approximately five minutes.

Results: The results of Experiment 4 were divided into three sections. The first section, involving sets 1 and 2, simply tested whether subjects would make use of the regular plural formation rules in choosing the **plural** or **singular** form of a word to describe a picture of one or more figures. In a Chi Square analysis, it was found that the subjects did, in fact, use the plural marking cues in their choice between the two words ($X^2 = 16.68$, $p < .05$).

In Sets 3 and 4 subjects were tested for use of a plural voicing agreement SPC in their choices (e.g., /pɛls/-/pɛlz/). Since the choices were non-random and in the predicted direction ($X^2 = 8.31$, $p < .05$) we may conclude that subjects were making use of the rule. Since we have evidence that subjects are able to base their judgments on the voicing agreement rule for sonorants and tense vowels, we conclude that this type of task is appropriate for testing rule use.

In the crucial third part of the experiment (Set 5), the subjects were expected to choose between two words as names for a picture on the basis of their knowledge of LVC. In this case, however, the choice behavior was random ($X^2 = 1.61$, $p > .05$), indicating that the subjects did not make use of the information about the preceding vowel.

Discussion: It would appear that the non-use of LVC is task specific. One subject, who had trouble with the task, was prompted with the suggestion that he decide what **one** of the creatures would be called. He concluded that a picture showing two animals must be [bez] and not [bɛz] since "one couldn't be called a [bɛ]"; however, he did not use this knowledge on subsequent items.

The first two sections of this experiment demonstrate that the subjects did not simply assume that the nonsense items were irregular plurals, since in cases where the sonorant rule governed the choice (e.g., /lorz/-/lors/ for a plural picture), and in cases where either form would be allowed (e.g., /bli/-/bliz/ for a singular figure) they chose the forms with plural markers as plurals (Sets 1 and 2), and decided what constituted a plural marker on the basis of the preceding consonant (Set 3). Unfortunately, Sets 4 and 5 provided too little data for analysis.

The error rate for Set 5 was 39.3%, much higher than for Sets 1, 2, and 3 (12.5%, 12.5%, and 14.1%, respectively). It would appear that although the picture labelling task does cause subjects to access two aspects of pluralization (-Ø marks singular and -z marks plural; only -z is a plural marker after r, n, or l), it does not tap knowledge of the lax vowel constraint. Subjects rejected /nɑr/ and /nɑrs/ as plurals, but accepted either /bɛz/ or /bez/.

Further analysis of the frequency of error for each vowel was not carried out due to the small amount of data.

2.2.2.5   Experiment 5: Picture Choice
          (One Word, Two Pictures)

Subjects: The subjects in this experiment were the same as those in Experiment 1.

Materials: The pictures used were like those employed in Experiment 4; one of each pair depicted a single person/animal, the other card showed two. Each item from a word list containing 35 monosyllables was randomly

matched with one such pair of pictures. The word list contained six
sections, similar to those of Experiment 4. Section 1 contained
words ending in sonorants (singulars) and sonorants plus /-z/ (plurals).
Set 2 consisted of words ending in vowels and vowels plus /-z/.
Section 3 contained words ending in sonorants plus /-s/ (singulars).
Section 4 contained words ending in vowel plus /-s/ (singulars).
Section 5 was the crucial section for testing LVC, since it consisted
of words ending in a lax vowel plus /-z/ (e.g. /bɪz/). It was pre-
dicted that these names would be matched with cards with single figures
since, if the words were considered to be plural, the singular form
(minus /-z/) would break LVC. However, such words could serve as proper
names for the individual animal (e.g., "Spizz"). Section 6 contained
real English words.

Procedure: The subjects were tested under the same conditions as in
Experiment 1. Each subject was instructed to choose the picture to
which each name referred: sometimes the singular picture was pre-
sented on the right, sometimes on the left; this was varied across
pairs but kept constant across subjects. This experiment took about
six minutes.

Results: The results are divided into three sections. On each trial,
a word from Set 1 or 2 (see Experiment 4) was to be matched with the
appropriate picture, presumably on the basis of the regular plural for-
mation rule of adding a /-z/ after vowels and sonorants. The subjects'
choices were non-random ($X^2 = 14,07$, $p < .05$) and in the predicted
direction. The fact that subjects seldom chose a picture of two figures
for a woord with no sibilant ending indicates that they were not think-
ing of such words as irregular plurals.

In the second section of this experiment, one item was eliminated
before the analysis was performed. The word [gɪns], by analogy with
the English word *fence*, was expected to obtain the same results as
[dərs] and [dɛls]. However, this was not the case, since an epenthetic
[t] intruded, allowing subjects to perceive the word as /gɪnts/ (the
plural of /gɪnt/). Once this item was removed it was found that the
number of items in the section was too small for data analysis; this
section of the experiment was run again as Experiment 6 (below).

In the third section of the analysis, subjects chose between singu-
lar and plural pictures for items such as /θʊz/ (predicted to be viewed
as singular; otherwise one would backform the singular */θʊ/. The
choices in this case were found to be random ($X^2 = 1.66$, $p > .05$).

Discussion: As in Experiment 4, the lax vowel constraint was not ac-
cessed in distinguishing between singular and plural pictures, although
as is shown in Experiment 6 below, subjects were able to use another
rule, the voicing assimilation rule for sonorants, to distinguish them from
plurals.

2.2.2.6   Experiment 6: Repetition of
           Second Section of Experiment 5

Subjects: The four subjects were all native speakers of English with
restricted exposure to other languages and no speech or hearing dis-
orders. They were all known to the experimenter and were willing to
do the task voluntarily. The two male subjects were 21 and 52 years
old and the female subjects were 26 and 46 years old.

Materials: The pictures used in this experiment were the same as in
Experiment 5. The word list contained the three words from Set 3 in
Experiment 5 as well as two additional words ending in /ls/, /rs/ and
several distractors.

Procedure: The subjects were tested individually in a quiet room and
their responses were recorded on paper by the experimenter.

    The experimenter read the instructions to each subject and then
read the word list. This task took approximately two minutes.

Results: Only one error was made (Subject 3, *tors*): choices were non-
random and in the predicted direction (X^2 = 16.97, p < .05).

Discussion: This indicates that, as in Experiment 4, the subjects are
able to make a choice between two pictures based on their knowledge of
the voicing assimilation of the plural rule for sonorants, although
they did not use a LVC in Experiment 5 above.

2.2.2.7   Experiment 7: Two Words, Two Pictures

Subjects: The subjects were the same as in Experiments 1 to 5.

Materials: The pictures were like those used in Experiment 5.

    Each of 24 monosyllabic word pairs was matched with a pair of pic-
tures and the subject was asked to assign each of the words to one or the
other of the pictures. All of the subjects were read the same list of
words in the same order. As in the previous experiments, the word list
was a mixture of words from different sets. Set 1 pairs contained one
word ending in a sonorant (l, 4, or n) and the same word plus /-z/
(e.g., /dur/-/durz/). Set 2 pairs contained one word ending in a vowel
and the same word plus /-z/ (e.g., /spu/-/spuz/). These two types in-
volved the use of the rules of regular plural formation.

    Set 3 word pairs contained one word ending in a sonorant plus /-s/
and the same word ending in the sonorant plus /-z/ (e.g., /dɛls/-/dɛlz/).
Set 4 word pairs contained one word ending in a vowel plus /-s/ and the
same word ending in the vowel plus /-z/ (e.g., /vos/-/voz/). Sets 3
and 4 thus involved the use of the voicing agreement rule.

Set 5 word pairs consisted of two words ending in /-z/, indentical except for the fact that the vowel in one word was lax while the vowel in the other word was tense. This section tested whether subjects would choose the form with the lax vowel as plural, since the singular form without the plural marker /-z/ would violate the LVC (e.g., /drɪz/-/driz/).

Procedure: The subjects were tested under the same conditions as in Experiment 1. Each subject was instructed to assign each of the names read to him by the experimenter to one of the two pictures. The words were presented in the same order with the same pictures for each sub-ject except subject 8. The word pairs were always read in the same order in the list, but the order of presentation was varied within pairs. This alteration, however, differed for the eighth subject. The picture of the single figure was always on the subjects' left. This test lasted approximately four minutes.

Results: The results for this experiment were divided into three sec-tions. The first section tested the subjects' ability to use the plural formation rules to choose between the two names (e.g., /dur/ (sg.) vs. /durz/ (pl.)). The choices in this section were non-random and in the predicted direction (X^2 = 14.13, p < .05). Subjects were thus able to access the rule in making their decisions. The second section tests the subjects' ability to make the choice based on the voicing assimila-tion rule (e.g., /dɒs/ (sg.) vs. /dɒz/ (pl.)). Again, the choices in this section are non-random, and in the predicted direction (X^2 = 12.86, p < .05).

The third section tests subjects' ability to make the choice on the basis of the LVC (e.g., /tɛs/ (sg.) vs. (pl.) /tez/). The choices were random (X^2 = 6.26, p > .05).

Discussion: The first two sections of this experiment show that the subjects did not view nonsense words as irregular plurals, and that they were able to make use of two phonological rules in their decisions. Section 3 seems to indicate that the LVC is not a deciding factor. It was noted, however, that 5 of the 11 errors in Section 3 were due to the single pair /smæz/-/smɒz/; this would account for the negative results. It was therefore decided that a more sensitive experiment should be designed (see below).

2.2.2.8   Experiment 8: Repetition of Experiment 7;
           Additional Items

Subjects: The four subjects tested in this experiment were the same as in Experiment 6.

Materials: The pictures used in this experiment were those used in Experiment 7. Since the word list was longer, some of the pictures were used more than once.

The word list from Experiment 7 was used along with several new items for each section; a total of 18 different Set 5 pairs was employed.

Procedure: The subjects were tested under the same conditions as in Experiment 6. Each subject was read the instructions and then presented with the word list. This test lasted approximately fifteen minutes.

Results: As in the previous pluralization tasks, the data for Sets 1 through 4 were non-random and in the predicted direction (Sets 1 and 2 combined: $X^2 = 21.12$, $p < .05$, Sets 3 and 4 combined: $X^2 = 24.48$, $p < .05$). However, the Set 5 data are also non-random and in the predicted direction ($X^2 = 19.86$, $p < .05$).

Discussion: This experiment showed that the subjects were able to access the relevant SPC in order to distinguish between singulars (proper names) such as /bɛz/ and plurals such as /bez/. Here the error rate is only 12.5% (9 out of 72 responses) items, compared with 39.3% in Experiment 4 and 39.6% in Experiment 5. This suggests that the forced double matching technique does result in access of the constraint in distinguishing between singulars and plurals.

3.   **General Discussion**

As shown in the experiments of this study, the lax vowel constraint is available to subjects in some tasks, but they do not access it fully. It appears as an influence in the error rates in memory and imitation (both harder in words that break LVC), in a forced-choice task (two words/two pictures), and in the syllable-division task in that the only changes in V/C words were to lax vowels, but never with 100% effect. The syllable structure strategies in the language game overpowered the LVC and subjects just did not use it in the first two of the pluralization experiments. A speaker of English can operate without knowledge of this rule because no environments for its application occur. For example, LVC does not enter into any morphological alternations in which misapplication of the rule would result in errors. Instead, speakers simply learn the English lexicon without final lax vowels and if the constraint is internalized by some individuals, this is perhaps best described as incidental learning.

The results of the syllable-division experiment suggest that the LVC is not operative at the syllable level, and thus it is easier to break at the word level; the subjects allowed a syllable to end in a lax vowel. This is significant because dictionary editors, in their syllable divisions, implicitly claim that it is operative at the syllable level. This experiment has both resolved the syllable-level question, and explained why the constraint is weaker at the word level (analogy to open lax-vowel-final syllables word-internally).

In spite of suggestions from Moskowitz (1973) and Read (1971) that tense/lax relationships between vowels are available to speakers, this knowledge has no discernable effect on normalization. None of the data showed a significant tendency to normalize lax vowels by tensing them. With a much larger sample some patterns might emerge, but it would not likely be a tensing pattern (e.g., other strategies such as centralizing and inserting an offglide were as common as tensing strategies).

Borrowing is probably the only criterion for rule productivity that approaches 100% application. Hsieh (1970) also found a rule (a Taiwanese tone sandhi rule) to have low productivity in nonsense words yet the rule is productive in borrowings (Smyth 1983, personal communication).

Our data show that the LVC may not be very productive for an individual, even though the speech community might always observe it. One might claim that DeSaussure's (1955) *langue/parole* distinction better captures this than Chomsky's (1965) *competence/performance*: we assume that an individual speaker does not need to know the rule (he does not have it in his *parole*) although the speech community as a whole will always apply it in borrowings (*langue*). Chomsky's *competence/ performance* distinction would suggest that all speakers do have the distinction internalized (competence) but just fail to use it on these tasks (performance failure). Probably a solution would lie in sociolinguistic investigations of how the speech community gradually "vetoes" foreign pronunciations so as to normalize the words.

In summary, experimental investigations of rule productivity provide interesting insights into the psychological representation of linguistic rules including task- and subject- dependent factors which account for variable productivity.

FOOTNOTES

[1]Stress is indicated throughout this paper by an apostrophe immediately preceding the stressed syllable.

[2]For detailed information regarding specific tasks, see Westby (1983) *Variable Productivity: Evidence from the English Lax Vowel Constraint.*

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From Student Papers

The following are taken from introductory linguistics students'
exam papers and essays (with the spelling reproduced as actually
written):

~~~~~~~~~

Q. What is the second stage in language acquisition?
A. The holocaustic stage.

~~~~~~~~~

Q. How do children learn language?
A. Through imitation and enforcement.

~~~~~~~~~

"[A creole] arises out of a need to communicate, i.e. Hatian Creole
arouse out of a need for Africans on plantains to communicate in a
language that could be understood by all the slaves."

~~~~~~~~~

"Another factor for the unconsistency [of English spelling] may be
traced back to the printers who for financial reasons, used the old
plates of outdated spellings and pronunciations instead of spending
extra money to replace them with new spellings."

~~~~~~~~~

"The allomorphs of the Hungarian plural are O.K."

~~~~~~~~~

"Every day scientists and doctors are opening up new doors and dis-
covering new locations of everyday functions."

~~~~~~~~~

Re: Slips of the tongue.
"It is a common problem among the public and the linguists and
psychologists feel that the slips are brain-related and with research
help can be given to the victims."

~~~~~~~~~

[A suggested psychological test to determine the dominant language of
a fluent bilingual]
"Call his mother."

~~~~~~~~~

"American Indian languages are often polysymtomatic."

~~~~~~~~~

"Swahili belongs to the Afro family."

~~~~~~~~~

"The Baltic language family includes Yellow Russian."

~~~~~~~~~

"Etruscan is a linguistic isolate spoken in Ontario; originally from Middle Europe."

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"Progressive assimilation is the elimination of phonemes from a word with preservation of its meaning."

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"Regressive assimilation is the addition of unnecessary phonemes."

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Alternative term for metathesis (student had forgotten the word): "metamorphonic reversal".

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"Swahili is a gluttonic language."

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