

# Is Basque a syllable-timed language?

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## I. Introduction

Typological studies on Basque are relatively rare. Michelena (1982) touches some points but limits himself, besides theoretical reflections, to morphological and syntactic reasoning; Tovar (1978) applies the statistical methods developed and used by Greenberg to twelve languages (not investigated by Greenberg) with the aim of demonstrating the typological discrepancies of the morphologies of some Indoeuropean and non-Indoeuropean languages<sup>1</sup>. As to my knowledge, neither the older (Michelena 1985 [1961], Gavel 1920)<sup>2</sup> nor the more recent (Txillardegui 1980, Salaburu 1984) studies on the phonology of Basque treat typological questions. And, without any doubt, from a purely theoretico-grammatical point of view, morphology and syntax of Basque seem to be much more challenging at a first glance. Typology is a branch of linguistics which I think will still offer us many new and important insights into the nature and essence of language, especially if it can prove to be capable of assuming a viewpoint which mediates the different levels expressed by the traditional splitting of grammar into components and subcomponents.

There do exist various attempts in the last years to conceive the linguistic types in a component transcending perspective, let me just note Donegan & Stampe (1983). For this sake I think the research finds itself at a starting point and hypotheses should be advanced without, in a first moment, being afraid of making

(1) As to the statistical parallels between Basque and Berber there should be taken into account a long discussion behind the problem of (hypothetically) cognate languages in the origins of Basque. Michelena (1964) offers a short and comprehensive recapitulation of the various issues.

As to the 10 morphological procedures chosen for the statistical opposition the choice of single parameters and the evaluation of the linguistic material is not clearly understandable to the reader and I would advance serious doubts on the fact that languages like German show an index of derivation of 0,11, but an index of composition of 1,13. There obviously have to be taken into account the text-types chosen for the analysis by Tovar: the author of the German text, Günther Grass, is well-known for his neologisms, like in the present text the comparison of the word *teelöffelhart* «hard like a tea spoon»; formations like this are perfectly intelligible to speakers of German, insofar as their formation is completely transparent, but they alter a statistical approach considerably.

(2) This observation is surely not meant as a critique and I do not intend to diminish the outstanding value, in the diachronic and in the synchronic analysis, of these studies.

untenable suggestions. My contribution here will simply try, with the material at hand, to integrate Basque into the recently well-discussed typology of syllable-timing and accent-timing<sup>3</sup> languages.

## II. Typology and syllable- vs. accent-timing

It is fairly impossible to recapitulate in a short paragraph the discussion which has lasted for over 150 years, at least since W. von Humboldt's posthumous *Über die Verschiedenheit des menschlichen Sprachbaus* from 1836 culminating for the first time in Finck's *Die Haupttypen des menschlichen Sprachbaus* in 1910. I have to refer the reader to more recent proposals and summaries that can be found, for example, in Skalicka 1979, Comrie 1981, Ramat 1976, Plank 1985.

In the history of linguistics the terms 'type' and 'typology' have denoted concepts which were slightly different in some respects. Whereas at the very beginning reference was made to something that could be called 'historical types', we find, for example, in Steinthal the interpretation of this term in the simple sense of 'characteristic', in single historically oriented philologies, like the Romance (e. g. Meyer-Lübke), the use of 'type' corresponding to 'systemic entity'; and it is interesting to note the effect the different concepts of typology left on the universals projects of Stanford, Cologne and the UCLA.

I think that not any grammatical characteristic can constitute under given circumstances a type but that it should enter the definition of that concept that only those characteristics which have some kind of bearing upon other grammatical entities should be regarded as type constituents. It is difficult, though, to isolate such characteristics within phonology. Tone probably is not such a characteristic, and neither vowel harmony, as the latter, for example, is strictly limited to a morphological type.

For what concerns the dichotomy stress-timed versus syllable-timed languages we find a rather paradoxical state of the discussion<sup>4</sup>. There is not much left from Pike's (1945) original distinction, as from the whole isochrony issue. For what concerns the phonetic approach to the problem we find more recent proposals like the compensatory shortening and especially the studies on intersyllabic coarticulation by Fowler (1981). Bertinetto (1988) not only provides a detailed critique of the relevance of these works for the issue at hand but furthermore collects minutiously all phonological characteristics which parallel the original distinction. The result at the present is that an originally phonetic distinction is much better and clearer defined on phonological grounds and, at least for the moment, we do not dispose of unequivocal phonetic correlations of the distinction.

This distinction is a gradual one. There seem to be languages (like Portuguese; cf. Major 1985) which on a deeper level show characteristics of syllable-timed,

(3) I will use the terms syllable- and accent-timing (or stress-timing) as I will use the terms iso-syllabic and iso-accentual. As the literature and the here following discussion show, neither of these terms is very lucky as the exact phonologically causal motivation is not yet clear enough to allow an unequivocal substitution of the traditional terms. This *manco* and the various issues and redefinitions (like trailer-timed and leader-timed, etc.) are adequately surveyed in Bertinetto (1988).

(4) The most recent and most complete discussion of the various issues is Bertinetto (1988) to whom I will refer throughout the whole study. He presents a critical overlook over the history and the most relevant contributions to the discussion of this issue and, especially interesting, he provides a critical survey over the recent proposals coming from phoneticians.

and on a more production-oriented level show characteristics of accent-timed languages. On phonological grounds this dichotomy refers to the two basically distinct rhythm types which orient themselves, analogously in poetics, on the accent group in one type and on the syllable in the other.

Rhythm is supposed to be to a large extent a perceptual phenomenon (Allen 1975, Martin 1972, Miller 1984) and I would not agree to refuse the isochrony approach altogether, as the relation between perception on the one hand and production and acoustics on the other has in many respects been demonstrated to be non linear and the equation of acoustics and perception has often revealed as being problematic and wrong<sup>5</sup>. Finally Lehiste (1979) demonstrated convincingly that the same time interval is perceived shorter when it is filled with ongoing speech and that there might be an equally non linear relationship between acoustically measurable time and perceived time.

It is a clear outcome of the discussion of these two fundamental rhythm types, that we cannot isolate one single grammatical phenomenon as the basis for the attribution of a given language to the one or the other typological group. Bertinetto proposed already in 1977 (enlarged in 1981) a list of prevalently phonological properties being characteristic for the one or the other type. His recent study (1988) still enlarges the number of criteria:

- 1) accent-timed languages have stronger tendency to reduce vowels qualitatively and quantitatively in unstressed syllables; syllable-timed languages tend to a full vowel articulation in the same context;
- 2) the number of syllables in a word/utterance is always clear in syllable-timed languages; there may be cases of uncertainty in accent-timed languages;
- 3) allegro speech styles are realized in accent-timed languages by the compression of unstressed syllables, in syllable-timed languages through proportional shortening of all syllables;
- 4) accent-timed languages usually allow more complex syllable structures with complex rime structures; syllable-timed languages have a stronger tendency towards CV-syllables;
- 5) in accent-timed languages there may be relative uncertainty about the positioning of a syllable boundary; in syllable-timed languages this uncertainty is, if it exists at all, rare;
- 6) accent-timed languages do have a relatively higher flexibility in the stress position than syllable-timed languages;
- 7) stressed syllables in accent-timed languages can attract segments and make thus stressed syllables heavy; in syllable-timed languages such a tendency does not exist (cf. 5);
- 8) accent-timed languages structurally have shorter intervals between the main-stressed syllables (eventually by introducing secondary stresses with a higher density), syllable-timed languages on the other hand show a higher temporal variation for the length of rhythmical units;

(5) Cf. especially the logarithmic nature of the perception of  $F_0$ , the perception of intensity, all kinds of masking effects etc. It is exactly this discrepancy which can constitute a starting point for developing criteria of objectivization in phonology and linguistics altogether in conscious counterposition to what is usually, not without some feeling of superiority, called hard sciences. What I think linguistics have to prove is that grammatical facts are as hard as physical ones, even in the case the former contradict the latter.

9) esp. for points 1), 3) and 8) accent-timed languages show a higher amount of intrasyllabic compensation than syllable-timed languages;

10) for essentially the same reasons there is a stronger tendency in accent-timed languages to intersyllabic compensation and to compensatory shortening;

11) speakers of accent-timed languages show a higher tolerance for extreme shortening and eventually complete reduction and elision of unstressed syllables than speakers of syllable-timed languages;

12) in accent-timed languages the use of prosodic features in stressed syllables is essentially different from the use of prosodic features in unstressed syllables; this difference is not so strictly defined in syllable-timed languages.

The tendencies presented so far are built especially upon characteristics of the one or the other of the phonological types under discussion here. But the direction of argumentation can also take other typological starting points and reconduct to observations with respect to syllable- and accent-timing rhythmical structures. Bertinetto (1988) notes, for example, in a footnote that:

13) languages with vowel harmony tend to be iso-syllabic. As virtually only languages which make extensive use of agglutination in their morphology show vowel harmony, and vowel harmony seems to be a means to syllable perception within a word, one can probably assume that agglutinating languages generally have a stronger tendency towards syllable-timing.

I have been summarizing so far the, to my opinion, uncontroversial different characteristics of segmental and prosodic entities and their interplay between accent-timed and syllable-timed languages especially from Bertinetto (1977, 1981, 1988), but also from den Os (1983) and Dauer (1983, 1987). I would add one more difference:

14) accent-timed languages have a stronger tendency to an allophonically longer VOT or, in case of phonemic consonant aspiration, a higher variation of the minimum and maximum values of the VOT within a given stop category than syllable-timed languages.

In the following section I will try to comment as many of these characteristics as possible with special reference to the Basque language. As for the complete lack of specific phonetic studies this analysis will remain somewhat incomplete. I will concentrate especially on the phonological categories which, at the present, can be treated more uncontroversially. In spite of some recent tentatives of phonetic description (Aurrekoetxea s.d. [presumably 1982], Etxebarria 1987, Urrutia et al. 1988) we unfortunately do not find the language specific discussion of recent issues in phonetic sciences. And I once again want to stress the outstanding value of Navarro Tomas' (1925) study, *Pronunciación Guipuzcoana*, which is, in spite of the more than 60 years of research in between and the technical progress, the most interesting phonetic study of Basque from the point of view of the theoretical impostation and the most accurate from the technical and descriptive point of view, besides being the only one which offers data for an analysis under more recent aspects of phonetic research.

### III. Syllable vs. accent-timing in Basque

III.1. The only acoustical measurements we can base our analysis on are the ones published by Navarro Tomas in 1925. As we already mentioned these

are not only the first (and last) reliable descriptions of Basque, but they represent also one of the first coherent acoustical presentations in general. Navarro Tomas explicitly describes the Gipuzkoan variety of Basque but, as far as we can conclude from the articulatory description of process-like events, he treats a variety which comes fairly close to nowadays standard *euskara batua*, the unified Basque standard<sup>6</sup>.

In 1925 formant frequencies were not measurable for technical reasons. We thus can only conclude 'negatively' from the Fo-frequencies. The fundamental frequency basically has two functions<sup>7</sup>: a) provide the intonational structure, and b) the realization of accent (in concomitance with stress, i.e. intensity, and quantity, i.e. length of a vowel). Besides the fact that we do not have uncontroversial proofs for the quality of the accent in Basque, we cannot conclude directly from a Fo-structure of a bisyllabic words like *gure* «our» with a fundamental frequency of 195 Hz on both vowels, or *gora* (200 Hz-200 Hz), and neither from slight differences like in *borra* (150 Hz-155 Hz) etc. to the influence the fundamental frequency has on the realization and especially perception of accent, as even a lowering of the fundamental frequency in final position can mean rising in pitch<sup>8</sup>. The situation does not change considerably in three-syllabic words: *gogorra* (155-155-160 Hz respectively), *goratu* (150-150-160 Hz). But what we can conclude, for the issue at hand, with very high probability is that no one of the vowel undergoes a qualitative reduction which could be termed considerable, as we would not expect that a reduction affects only the oral articulators and not the glottal activity. But I have to stress, that for a completely uncontroversial statement on behalf we would need a more detailed phonetic analysis of the formant structures, indicating the exact timber changes within a word/utterance.

For what concerns the quantitative reduction of vowels in Basque the measurements by Navarro Tomas (1925) are much more directly transferable to the present discussion. The vowels in bisyllabics seem of nearly equal length with slightly longer realizations in final position, but (partly) independent of the accent: *gara* (25 cs-30 cs); *garra* (21 cs-26 cs); *bete* (20 cs-22 cs), etc.; in trisyllabics the picture does not change considerably: *aitona* (15-14-20 cs); *oria* (19-17-25 cs); *apika* (20-17-23 cs). In trisyllabics the length difference thus between the second and the third vowel becomes a little bit more conspicuous than in bisyllabics, but still we are far away from values of quantity differences of accent-timed languages.

From a perceptual point of view (point of perception), for the judgement of which I admit for the moment a completely personal approach, the sharpness of vowel reduction in Basque has to be considered of being more of the Spanish-Italian type than of the German-English one. Also the rhythmical structure of Basque songs like «Bedeinkatua» or «Pasaiko herritik» by Mikel Laboa points to this direction. They are characterized by very continuous intensity structures without crescendos or decrescendos indicating little intensity changes within a metrical unit, as well as without considerable length changes on the single notes. This fits perfectly with Navarro Tomas' observation that «junto a estas indicaciones figura insistentemente en mis notas la observación de que la diferencia entre

(6) All measurements cited in this section stem directly or indirectly from Navarro Tomas (1925) if not stated explicitly a different source.

(7) We obviously leave linguistic tone aside here.

(8) I want to recall the different meaning of the concepts Fo, pitch and tone.

sílabas acentuadas e inacentuadas no es de ningún modo en las palabras guipuzcoanas tan clara y distinta como en español. Además, dicha diferencia no puede ser considerada, según queda expresado, sino como una mera tendencia prosódica, sin el carácter ni la significación de un rasgo fonético suficientemente definido» (1925: 644-5)<sup>9</sup>. He, thus, confirms these (syllable-timing) characteristics to a still more radical point than I proposed.

III.2. One of the typological differences between syllable- and accent-timed languages lies in the clarity of the number of syllables in a given word/utterance. Whereas there can be doubts in accent timed languages, there are never doubts in the syllable timed type. A situation like the reduction and deletion of the suffix vowel in German *haben* «to have», the subsequent assimilation of the nasal results in a possible phonetic representation of something like [habm] with a syllabic nasal. Phonetically this can, for the lack of the oral release of the stop, equally or even better be analyzed as a preglottalized nasal. But the question of the syllabicity of the final consonant and therefore of the number of syllables remains open. In faster speech-styles this problem is solved by the complete deletion of the oral or glottal element respectively. But in normal colloquial pronunciation there exists uncertainty about the number of syllables. Analogous examples can be cited from virtually all accent-timed languages.

This problem is inexistent in Basque. Note that this does not mean that the number of syllables remains constant during the whole course of the phonological derivation. There are processes of vowel deletion (like in *ezazu* but *bar(e)zazu*), of diphthongization (like in *ama+iru*—>[aj]) and others, with subsequent resyllabification processes, but, first, these processes typically take place in V-syllables and therefore do never increase the complexity of confining syllable-onsets or codas by assigning to them a remaining consonant of a deleted syllable, and second the resyllabification process operates unequivocally with assigning the quality of syllabicity<sup>10</sup>.

III.3. As an effect of the reduction and deletion of unstressed vowels and the association of remaining consonants to confining syllables, accent-timed languages show a higher complexity of possible syllable structures. This leads to a fact which is too often ignored in phonological theory: some accent-timed languages systematically can show a much higher complexity of consonant sequences in the syllable coda than in the syllable onset. German is just one example for this case, where a sequence of four consonants is allowed in the coda but not in the onset, and where the principles governing the onset structure are much more rigid than the principles governing the coda structure. All the four-and most

(9) One intuition which comes through these lines cited here is that a prosodical analysis (by the speaker-listener and hence also by the linguists) cannot be based exclusively on articulatory and/or acoustic grounds. This observation was not obvious at Navarro Tomas' time and is one of the testimonies for the outstanding work he did not only in Bascology but also in Indoeuro-pean and Romance philology and linguistics.

(10) This is one of the reasons which make some fundamentals of the recent development of generative phonology, the CV-phonology, more than doubtful: there is a whole language type, where the association of a given segment on the CV-tier is not uncontroversial. And it does not help to associate such a segment to two positions, as such a segment then at the same time should be, under certain conditions, e.g., the (only) coda of one syllable and contemporarily represent the whole following syllable. I.e., I do not doubt the formal representability but the phonological plausibility. The CV-tier, at least as it is conceived, is a too strong simplification.

of the three-consonant codas of German syllables are the result of a diachronic vowel deletion: cf. *Hengst*, *Markt*, *Ernst*. The difference, thus, between accent-timed and syllable-timed languages with respect to the complexity of syllable structure is more specifically radicated in the coda and only secondarily in the onset.

The syllable structure of Basque is relatively simple. This holds fundamentally for both consonantal positions, the onset and the coda<sup>11</sup>. The basic form of the syllable is (C)(C)V(C)(C) with a) heavy segmental restrictions<sup>12</sup> (like the general restriction against final labial consonants governing the lexical representations); and b) a strict application of the criteria of the sonority hierarchy as a sequential limitation.

A rough presentation of some of the sequential limitations is as follows: after an initial plain stop there has to follow a vowel or a sonorant consonant; after an initial affricate (i.e. *tx-*, *\*ts-* does not exist, *tz-* virtually only in derivational affixes and in expressive augments) only vowels are admitted; the same holds for the sibilants, the initial fricative *f-* which is generally of non-Basque origin might be followed by a vowel or a liquid, whereby the *fr-* *fl-* clusters have to be considered fully integrated by now. Partly integrated on the other hand are the *s(C)(C)-* onsets like *speaker* (pronounced with a prothetic [e]<sup>13</sup> the same holds for *staff* [estaf] and words with both prothetic and non-prothetic forms like *strip-tease*; the latter have to be considered adopted but not adapted, thus foreign<sup>14</sup>. The constraint against *r-* onsets seems not to work any more productively (cf. Etxeberria et al. 1987).

Te coda of a syllable in Basque can be formed by one or by two consonants. Certain consonants (like the above mentioned labials) are excluded from this position, two-consonant codas underly extremely strict restrictions (esp. only certain sonorant+obstruent-clusters admitted, the only possible obstruent cluster is *-st*, like *bost*).

III.4. The relative uncertainty on the positioning of syllable boundaries refers essentially to two situations:

a) a given consonant cluster can in fact be split up in more than one way, e.g. *trans.port*, *tran.sport*, and various languages even *transp.ort*, without violating the language specific syllabification restrictions;

b) that speakers show inter- and even intraindividual fluctuation with positing syllable boundaries in ambiguous structures of a). This is not the case in Basque. Even three-consonant clusters (the most complex structure that can show up) are unambiguously split in the way like *lan.bro*. The only uncertainty could arise in the structures like the ones named in footnote 13 above, but see for example

(11) It is surprising that none of the phonological or phonetic studies on Basque mentions the concept of 'syllable', neither do the classical or the more recent grammars. Michelena's (1985 [1961]) *Fonética Histórica Vasca* has a chapter on consonant clusters, which treats, among other things internal clusters. Although these are usually split up by a syllable boundary it is easy to detect the possible onset combinations and codas. But for the historical perspective see below, section IV.

(12) It would exceed by far the present work to present all segmental and prosodic restrictions in the phonotactics of Basque phonology. I have to refer you to a more extensive presentation in Hurch & Oñederra (in prep.).

(13) According to the possible offset structures which will be stated below a sillabification like [es.pi.ker] seems more probable.

(14) Correspondingly, one would not posit a possible German onset *pt-* for the existence of forms like *ptolemäisch*.

the syllable division in Navarro Tomas (1925: 636-7) with clear *eus.caldunen, guz.tiz*.

Point 7 in the above list treats a third possibility of diverging syllable structures in one lexical representation: according to speech-styles, and therefore to the relative weight of a given accent, there can apply resyllabification processes in accent-timed languages which make stressed syllables still heavier by assigning to them consonants which in, for example, polarizing styles are assigned to one of the confining unstressed syllables (usually the following). My native-speaker informants agreed unequivocally that phenomena like this do not apply in Basque.

III.5. As to points 9) and 10) of the above list, the acoustic phonetic durational patterns we can, still basing the analysis on a reordering of the measurements by Navarro Tomas (1925), make some statements. Intrasyllabic compensation denotes the phenomenon that the durational properties of single segments might not be under local control but might be dependent on larger units, like the syllable or the foot (and maybe even the word).

There seems to be some controversy on how to interpret intrasyllabic compensation. Whereas Vayra & Avesani & Fowler (1987) observe a stronger inclination to intrasyllabic compensation in English than in Italian, they conclude that English presents some kind of tendency towards syllable-timing, at least at the syllable level. Bertinetto (1988) replies to this argument explicitly that no syllable-timed language shows compensation on the syllable level but rather at the word level. His conclusion goes right in the opposite direction, i.e., «iso-accentual languages have more intrasyllabic compensation, essentially for the same reason why they have more intersyllabic compensation».

Navarro Tomas (1925) gave fairly accurate duration measurements for basically four syllable types (V, CV, CVC, VC) in bisyllabics, trisyllabics and in words composed of four syllables<sup>15</sup>; moreover he measured the duration of the single consonants, of the syllables and of the feet in connected speech (in the reading of poetry even the duration of pauses). The single elements responsible for intrasyllabic and intersyllabic compensation thus are easily detectable and analyzable.

The mean vowel duration in trisyllabics is in V-syllables 18cs, in CV-syllables 18cs, in CVC-syllables 19,5cs and in VC syllables 18,6cs; in bisyllabics in CV-syllables 22,6cs, in CVC-syllables 18cs; in words composed of four syllables the vowel in a V-syllables amounts to 16cs, in a CV-syllable to 16,2cs and in a VC-syllables to 17,2cs. The mean duration of a consonant [g] in bisyllabics (in syllable initial position) amounts to 13,7cs in CV-syllables and to 11cs in CVC-structures; in trisyllabics the same consonant is realized with a duration of 15cs in CV and of 11cs in CVC. I did not confront the final consonant position in bisyllabic and trisyllabic words, as the number of the measured items is too small for being able to make claims on single consonants and on the other hand the intrinsic length differences between the single consonant classes is too obvious for equalizing the values under one single consonant set, as it was impossible to calculate the vowel length in some more detail (e.g., according to the vowel quality).

(15) The number of the analyzed words composed of five syllables is unfortunately too small for making useful reliable claims.

The following numbers are the result of my own calculations based on the measurements by Navarro Tomas (1925).

At this point we are already able to make some statements on the compensation phenomena. In which way ever we interpret these numbers for the syllable- and accent-timing approach (cf. the above mentioned discussion), Basque does not show a particular inclination, neither to intrasyllabic, nor to intersyllabic compensation in whatever domain. The duration only slightly varies depending on the syllable structure, within the single word length groups, and in particular this slight variation seems to go the opposite way (except for bisyllabics), but the durational variation is too small, as to claim seriously a significant change. The values for the vowel duration give a picture which seems to be a little bit more sensible within the intersyllabic perspective (e.g. the word): so the vowel length in CV-syllables differs from 22,6 cs in bisyllabics, to 18,0 cs in trisyllabics and finally to 16,2 in words composed of four syllables (cf., for example the durational patterns of *barka* and *barkatzen* within the same text in Navarro Tomas 1925: 634).

Hence, for what concerns the vowel duration we have in Basque the same tendency as in Japanese (as reported in Port & Dalby & O'Dell 1987 and discussed in Bertinetto 1988) and we would be inclined to ascertain Bertinetto's view that the lack of intrasyllabic and the presence of intersyllabic compensation (at some higher level) still can be a typical sign for syllable-timing.

III.6. The acceptability of an extreme shortening of unstressed vowels in accent-timed languages was shown by Bertinetto & Fowler (1988 - in press) and also reported in Bertinetto (1988). It is, among others, a result of the style-dependent temporary compression of unstressed syllables in this phonological type. They grouped cognate English and Italian words (like *superfluous* and *superfluo*) and tested the acceptability of the shortening of the first vowel in these words through native speakers of both languages. The expected result was that for Italian speakers the unacceptability was reached much faster whereas English subjects showed much more indifference towards the shortening. My informants<sup>16</sup> confirmed, without leaving any trace of a doubt, that temporal compression alters the perceptual acceptability to in a considerable way. Plurisyllabic words like *presidente*, *solidaritate*, *polizia* and others must have a fully articulated [i], for example, otherwise they are judged unacceptable<sup>17</sup>.

III.7. Some Bizcayan dialects of Basque are said to show (remnants of) vowel harmony<sup>18</sup>. In the noun declension the determiner suffix *-a(-)* can be heightened to [e] after the dissimilation of a stem-final *a* —> *i*. Vowel harmony shows up in agglutinating languages and seems to have the function of keeping together the polymorphic word structure under one phonetic feature. And this polymorphic character of the unit word in agglutinating languages might be the reason for which agglutinating languages rather tend to the syllable than to the accent type. Although Basque morphology has been loaning many morphological items, categories and concepts from the surrounding Romance (and histori-

(16) At the present I am not able of quantifying the results of my interviews.

(17) This very same phenomenon is well known from the study of contrastive linguistics, see Hurch (1986).

(18) I have some doubts whether we are really dealing with vowel harmony in Basque, as the application is extremely restricted in few morphological classes and categories and, moreover, the domain is not necessarily the whole word. For typology of vowel harmony cf. Rédei (1977). How far the loss of vowel harmony might be an index for the loss of agglutination still has to be an object of research.

cally probably also non-Romance) languages, it has always resisted typologically maintaining its own morphological system, even in its weaker points.

III.8. *Euskara batua* (as all the varieties spoken in Spain) does not possess aspiration neither phonemically nor allophonically. As far as my own spectrograms and the spectrograms published, for example, in Etxebarria (1987) show, there is no essential difference in the voicing lag of the VOT between Basque and Spanish plain stops<sup>19</sup>. One problem connected with the regularization of the VOT is the extreme intensity difference between stressed and unstressed syllables and correspondingly an extreme difference between the articulatory energy in these positions. As this difference is still stronger in accent-timed languages than in the syllable-timed type, we postulate as one characteristic the stronger variation of VOT in accent-timed and, conversely, relatively less variation in syllable-timed languages. VOT is not necessarily linked to high articulatory amount but, the other way round, high articulatory energy favors a longer VOT, parallel to the preference of consonant aspiration in stressed over unstressed syllables.

III.9. There are few arguments of the list of characteristics above which I did not comment on. They are dealing with essentially two problems: a) the positioning of the accent and relative accentual processes, and b) the acoustic analysis of allegro speech styles. As I already deplored above there does not yet exist a clear qualitative description of, e.g., the Basque vowel timbres, neither do we have a phonetic description of vowel reduction phenomena in style-phonology. And finally, whoever has studied Basque phonology must be aware of the controversial position taken with respect to accent positioning processes. The present paper cannot be the place to enter this discussion, even reassuming the different opinions, arguments and counterarguments would take us too far away from the topic proposed here. Thus I prefer to leave these two points as provisos until further research will be ready to make the presentation more fruitful<sup>20</sup>.

#### IV. Historical Evidence

As the discussion on syllable- and accent-timing structures has exceeded by large the phonetic frame, and, in fact, it is more than questionable whether we can establish these categories on purely phonetic grounds, phonological evidence from other than classical internal sources of alternation can and should be adduced. As mentioned above in a note, contrastive linguistics can contribute to the study of the issues at hand by showing how many prosody (syllable-) induced processes, for example, a speaker of Italian applies when learning an accent-timed language like German or English (cluster splitting, vowel epenthesis in final position, resyllabifications, etc.), or, vice versa, how different process types speakers of an accent-timed language apply when learning a syllable-timed language. One probably can go through the whole range of the so-called external evidence for detecting the type-dependent differences. In the remaining paragraph I will just put some emphasis on the historical and diachronic evidence for the syllable-timing character of Basque.

(19) Data on the VOT in Spanish have been published in various studies, like in the original work on VOT, Lisker & Abramson (1964).

(20) For this topic there probably has to be mentioned especially the Ph. D. dissertation by P. Etxebarria (EHU/UPV, Vitoria-Gasteiz, 1988-89).

In older and pre-literary stages the syllable structure of Basque was probably still less complex than it is now. Correspondingly all scholars seem to agree that only one single consonant could open a syllable in the onset (obviously besides the vowel onsets). Today's initial clusters of plain stop plus sonorant consonant were historically broken up in, e.g., Latin and Romance loanwords. This could happen on the one hand through vowel epenthesis (e.g. Lab. *adarallu*, Sp. *ladrillo*; c. *liburu*, Sp. *libro*, etc.) and on the other hand through the loss of the initial stop (Gip. *langa* < Lat. *planca*; c. *luma* < Lat. *pluma*, etc.). Similarly in such clusters the final stop consonant was lost, when showing up in composition and derivation, i.e. a coda simplification: c. *bana* < *bat+na*; e. *bain(a)naiz*, etc.)<sup>21</sup>. In the sequence of two nasals, like *m+n* normally the tendency is stronger towards the labial articulation in initial position, whereas the coda of the first syllable is deleted: Lat. *damnum* > c. *damo*<sup>22</sup>.

Stop clusters arising in composition were and are systematically simplified: e. *polit+ki* > *poliki*, c. *bat+tu* > *batu*, *nik dakit* > *nitakit*, etc., as in this context a final stop followed by an initial sibilant resulted in an initial affricate: c. *batzu* < *bat+(t)zu*. In the sequence final sibilant + initial sonorant consonant we have loss of the first element (Michelena 1985 [1961]: 351): Lab. *iraleku* < \**iratz(e)leku*, cf. forms like *enaiz*, *eluke* comprising the negation *ez*, and cf. *hizlan*, *esnatu*. A well-known, and still productive process affricates the sequence of two sibilant fricatives (Hurch & Oñederra 1987): *etzan*, *etzen*, etc., but also deletion of the syllable coda with sibilants in general: c. *diotsut* < \**diots+zut*.

We cannot go into detail here with all diachronic and historical processes in general which change the syllable structure from higher marked to less high marked. But we want to provide evidence for the claim that a) Pre-Basque probably had a still less marked syllable structure than modern Basque, b) that the higher marked syllable structures are mainly due to the influence of the confining Romance languages and c) that in historical synchronic and in diachronic phonology we find a whole series of changes which make the syllable structure less marked.

Finally we want to conclude that the diachronic development (as well as the synchronic [segmental] phonology) of a language of the syllable timed type should be characterized, in general, by a greater amount of segmental and prosodic processes which lower the complexity of the syllable structure. We already mentioned the case of the diachrony of German with respect to the coda structures, we showed some instances of the historical development of Basque and we know, for example, even much more analogous tendencies from the diachrony of the Romance languages<sup>23</sup> to ascertain this assumption. But a broader linguistic investigation of strictly phonological criteria for the typology still has to be done.

## V. References

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(21) Cfr. Michelena 1985 [1961]: 347ff. As we showed in Etxeberria et al. (1987) this process is not productive any more. Cfr. more recent forms like *plastikoa*, *presaka*.

(22) In Etxeberria et al. we showed that this process is still governing the lexical representations of Basque today.

(23) As it would be interesting to have a closer look to (the history of) Portuguese phonology, which seems to behave rather different from the other Romance languages.

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