Revue québécoise de linguistique

On Models of Syllable Division

Robert W. Murray

Volume 18, numéro 2, 1989

Le créole haïtien

URI : https://id.erudit.org/iderudit/602657ar
DOI : https://doi.org/10.7202/602657ar

Aller au sommaire du numéro

Éditeur(s)

Université du Québec à Montréal

ISSN

0710-0167 (imprimé)
1705-4591 (numérique)

Découvrir la revue

Citer cet article

Murray, R. W. (1989). On Models of Syllable Division. *Revue québécoise de linguistique*, *18*(2), 151–169. https://doi.org/10.7202/602657ar

Résumé de l'article

Picard (1983, 1987b) soutient que son modèle de division syllabique prédit l'emplacement des frontières syllabiques à l'intérieur de toute séquence de segments pour une langue donnée. Dans cet article, je démontre que ce modèle est inadéquat sur trois points; a) il ne tient pas compte des différentes structures syllabiques propres à chaque langue, particulièrement des séquences du type *VPLV* et *VPGV* (où *P* = explosive, *L* = liquide, et *G* = glide) qui peut être syllabé $V^{\$}PLV/V^{\$}PGV$ ou $VP^{\$}LV/VP^{\$}GV$ selon les facteurs spécifiques de la langue, b) il ne prédit pas l'emplacement approprié des frontières des syllabes pour certaines langues, par exemple Huichol, et c) il ne tient pas compte de l'existence de segments ambisyllabiques.

ON MODELS OF SYLLABLE DIVISION*

Robert W. Murray

Linguists have long dreamed of proposing a set of universal principles which would predict the position of the syllable boundary in any given sequence of segments of any language. There have been two main approaches to this goal. The first, labelled here the distributional approach following Bell 1976, attempts to determine word internal syllabication on the basis of the distribution of segments at word boundaries. For example, in its simpler form it could be claimed that word internal sequences are syllabified in such a way as to create the maximal syllable head[1] which is also found word initially in the language. Accordingly, in a language with word intial *#tr*, a sequence *VtrV* would be syllabified $V^{\$}trV$ not $Vt^{\$}rV$. This distributional approach has had a long chain of adherents ranging from Kuryłowicz (1960) and Pulgram (1970) to Clements and Keyser (1983).

The second approach assumes that syllabication can be determined on the basis of universal principles referring to the relative phonological strength of the segments involved. In its pure form, distributional characteristics play no role. It could be stipulated for example that, word internally, the offset of the syllable coda cannot be stronger than the onset of the neighbouring syllable head. Accordingly, given that *t* is consonantally stronger than *r*, a sequence *VtrV* can only be syllabified $V^{\$}trV$, not $Vt^{\$}rV$. Variants of this type of approach include Hooper (1976) and to some extent Kiparsky (1981).

The many variants of the two approaches have at least one assumption in common; viz., the syllable is not recognized as an independent phonological unit but rather as a unit «to be derived from segmental properties» (Bell 1976, p.249).

* I have benefitted greatly from Yves-Charles Morin's comments on this and related topics. This study was supported by a SSHRC Canada Research Fellowship.

The first purpose of this paper is to argue that the two approaches are inadequate in that neither achieve their stated goal of determining the appropriate syllabication for any given segmental sequence of a language. Although I will focus mostly on the distributional approach, the inadequacy of a strength-based approach will also be evident. I claim further that it is not the case that the approaches simply require further refinement in order to achieve their goal, but rather that they are fundamentally flawed[2]. The second purpose of this paper is to briefly discuss an approach to syllable structure in which the insights gained in previous research find an appropriate place; viz., in a theory of syllable structure preferences.

In my discussion of the distributional approach, I will focus on Picard's (1983 and 1987b)[3] model of syllable division, for it is rooted firmly in the «distributional» tradition and unlike other recent proponents of distributional approaches (e.g. Kahn 1976, Clements and Keyser 1983) Picard considers earlier research (e.g. Kuryłowicz 1960, Pulgram 1970) in some detail. As Picard (1983, p.69) states, his proposed universal model of syllable division contains only two general rules:

> Il ne comporte en effet que deux règles générales, l'une qui insère des frontières syllabiques à certains endroits bien spécifiques, et l'autre qui les déplace dans des conditions tout à fait prévisibles.

The two rules are formulated as follows:

(1) Règle A: Insertion de frontière syllabique (Picard 1983:79)
Dans toute séquence phonologique, $ s'insère après chaque segment [+syllabique] sauf le dernier.

(2) Règle B: Déplacement de frontière syllabique (82)
Si l'output de la règle A crée un groupe consonantique interne qui est inadmissible en début de mot, $ se déplace obligatoirement vers la droite jusqu'à ce qu'il atteigne un groupe qui soit permis.

These rules are intended to reflect the following two principles (Picard 1983):

---

2. Although this claim is not new (cf. Bell 1976), it is worth discussing here in light of the sustained popularity of the distributional approach.

3. Essentially the same model of syllable division is applied in Picard (1984) and (1987a).

(3) Principe I (79)

Les langues ont une propension naturelle aux syllabes ouvertes.

(4) Principe II (82)

Dans chaque langue, les seuls groupes consonantiques qui sont permis en début de syllabe sont ceux qui sont également permis en début de mot.

According to Picard, rules A and B can be applied to any given word of a particular language to determine its syllable structure. For example, the syllable structure assigned to the English word *construction* is as follows:

(5)

	construction
Rule A	co$nstru$ction
Rule B	con$struc$tion

But Picard is forced to revise Rule B since he finds an indeterminacy in the syllabic structuring of certain sequences. He argues, for example, that *-sC-* sequences in English can be syllabified *-s$C-* or *-$sC-*; e.g. *par$snip* or *pars$nip*. In the case of French which allows word initial *ps-* (e.g. *psychologue*), Rule A would result in a syllabification *ca$psule*. (Rule B would not apply since *ps-* is an acceptable word initial cluster.) However, since *cap$sule* is totally acceptable for French, some revision of Rule B must be required allowing for the additional shifting of the syllable boundary to the right under certain conditions. Accordingly, Picard (1983, p.89f.) revises Rule B as follows:

(6) Rule B':

Si l'output de la règle A crée un groupe consonantique interne qui est:

a) *inadmissible* en début de mot, $ se déplace **obligatoirement** vers la droite jusqu'à ce qu'il atteigne un groupe qui soit permis;

b) *admissible* en début de mot, $ se déplace **facultativement** vers la droite jusqu'à la dernière consonne du groupe ou jusqu'à la dernière occlusive si celle-ci est suivie d'une liquide ou d'un glide (bold, RWM).

Plosive plus liquid (*PL*) or plosive plus glide (*PG*) sequences receive a special treatment since, according to Picard, a rightward shifting of the syllable boundary in words like *pro$gression*, *cham$p[i]on* subsequent to the application of Rule A does not occur. To exemplify Rule B', he provides examples such as those in (7):

(7)		parsnip	paltry
	Rule A	pa$^{\$}$rsnip	pa$^{\$}$ltry
	Rule B'(a)	par$^{\$}$snip	pal$^{\$}$try
	Rule B'(b)	pars$^{\$}$nip	-
		par$^{\$}$snip	pal$^{\$}$try
	or	pars$^{\$}$nip	(but not palt$^{\$}$ry)

Picard's rules have an alluring simplicity but it is not surprising (particularly in light of Bell's (1976) criticism of earlier work along these lines) that the approach turns out to be inadequate. The central inadequacy of Picard's rules is that they fail to recognize the richness of syllabic structuring possible in languages. In the following, I would like to briefly consider a variety of evidence indicating the inadequacy of Picard's approach (or, for that matter, any such distributional approach) to syllabication. The discussion will focus mainly on *VPLV* and *VPGV* sequences where Picard's rules impose the syllabications *V$^{\$}$PLV* and *V$^{\$}$PGV* in any language with word initial *#PL* and *#PG*. My claim is that even in languages with word initial #PL and #PG, in contradiction to Picard's rules, the syllabications *VP$^{\$}$LV* and *VP$^{\$}$GV* are linguistically possible. Evidence for this claim is found in phonological change, phonotactic constraints, and metrical practices.

Turning first to phonological change, let us consider two cases. In Old Icelandic, the glide j was deleted word internally following a consonant under certain conditions:

(8)	a.	+niðjaR	>	niþiar	«descendants»
	b.	+hirðjaR	>	hirþar	«shepherds»

Although an account of this development based on a purely linear segmental analysis is likely to be unsuccessful, a coherent explanation can be provided on the basis of a particular assumption regarding Old Icelandic syllable structure. Assuming the differential syllabication in (9a) and (9b), the generalization can now be made that the glide was maintained in the onset of head but lost in post-onset position (of the head) (cf. Murray and Vennemann 1983, p.518)

(9)	a.	+niðj$^{\$}$aR	>	niþiar	«descendants»
	b.	+hir$^{\$}$ðjaR	>	hirþar	«shepherds»

There is, of course, a certain arbitrariness about this proposal in isolation since it could be argued that the syllable boundaries have been assumed only in order to make the particular analysis work. It is the case, however, that both theoretical and comparative support for the differential syllabication posited in (9) can be provided.

On a theoretical level, the differential syllabication is compatible with any (partial) syllabic phonology which accepts, in one way or another, the following tenets:

(10) a. Consonantal Strength, as expressed in the Consonantal Strength Scale, plays a crucial role in syllable structure:

Consonantal Strength Scale
glides r l nasals fricatives plosives

weaker ——————————— stronger

b. The onset position of the syllable head is the strongest position of the syllable. Evidence for this claim is found in the fact that consonantally weak segments in this position typically strengthen:

Latin iuvenis	Italian giovane	«young»
$^{+}fer^{\$}\underset{\sim}{i}\bar{o}$ >	German Ferge	«ferryman»

c) Post-onset position within the head is weak. Evidence for this claim is found in the fact that segments typically weaken in this position:

Latin	blandum	Portuguese	brando	«soft»
Latin	planum	Italian	piano	«floor»
Sanskrit	praśna	Pāli	pañha	«affection»

d) The likelihood of a consonantally weak segment establishing itself in the onset of the head decreases as the weight of the immediately preceding syllable increases; e.g. all things being equal, $VCC^{\$}\underset{\sim}{i}V$ is less likely than $VC^{\$}\underset{\sim}{i}V$.

The analysis of the Old Icelandic developments in (9) is compatible with tenets (10a-d). The glide was able to establish itself in the onset position of the head following $\breve{V}C$ and was consequently maintained in this strong position. Following

$\acute{V}CC$, however, it was found in post-onset position (of the head) and was consequently weakened and lost.

There is also comparative evidence from the other early Germanic dialects which supports the syllable structures posited in (9) and the environment proposed for glide deletion. Since this evidence has been discussed extensively elsewhere (cf. Murray and Vennemann 1983, Murray 1986, 1988a), I will only briefly cite here the case of West Germanic gemination with the subsequent deletion of the glide in Old English. Examples are found in (11):

(11) $^{+}$sat$^{\$}$i̯an > Old English settan (via $^{+}$set$^{\$}$ti̯an; cf. Old Saxon settian) «to set»

$^{+}$skap$^{\$}$i̯an > Old English scieppan (via $^{+}$sciep$^{\$}$pi̯an; cf. OS skeppian) «to create»

It has been proposed by Murray and Vennemann (1983) that there are two necessary pre-conditions for gemination in VC_1C_2V sequences. First, the two consonants must be in syllable contact; i.e. as $VC_1{}^{\$}C_2V$. Second, the Consonantal Strength of C_2 must be less than that of C_1. Assuming these claims to be correct, gemination in $VCi̯V$ sequences implies an original structure of $VC^{\$}i̯V$. Accordingly, the reconstruction posited for Old Icelandic in (9) finds comparative support from the reconstruction of West Germanic syllable structure based on gemination. It should also be noted that subsequent to gemination, in the analysis in (11) the glide was deleted in Old English in precisely the same environment that was posited for Old Icelandic; viz. $^{\$}C\,i̯$ (cf. 9b).

Although I have only provided a sketch here, I think it is sufficient to suggest that the line of investigation being outlined is worth pursuing. But according to Picard's model, the differential syllabication in (9) is not linguistically possible. His rules require that uniform syllable structures be assumed, viz. $^{+}ni\check{\partial}^{\$}i̯aR$ and $^{+}hir\check{\partial}^{\$}i̯aR$, due to the absence of word initial $\#^{+}\check{\partial}i̯$. Consequently, we face two extreme possibilities. Rejecting Picard's model, we pursue the line of investigation just outlined or we accept the model and look for another explanation for the differential development in (9). The problem in accepting Picard's rules, however,

is that they do not appear to allow for the possibility of providing an analysis in terms of syllable strucuture. It seems that we would be forced back to a purely linear segmental analysis and ultimately be left in the dark regarding the development of the Old Icelandic forms.

The type of differential syllabication assumed for Old Icelandic (involving syllable structures violating Picard's rules) is not a rare case. A similar situation is found in Portuguese in the treatment of *k* in *VkrV* as opposed to *VklV* sequences (cf. Murray 1987a). As shown in (12), original *k* underwent only minor weakening to *g* in the environment *V_rV* but underwent major weakening to a glide in *V_lV*

(12) Minor weakening
a) Latin lacrĭmam Portuguese lágrima «tear»

Major weakening
b) Lt. ŏc(ŭ)lum Portuguese ôlho [oʎo] (via $^{+}$-kl- > $^{+}$-i̯l-) «eye»

How can the two different developments of original ^{+}k be explained? One line of investigation follows a similar path to the one taken in the case of Old Icelandic above, once again assuming a differential syllabication as in (13):

(13) Minor weakening
a. $V^{\$}krV > V^{\$}grV$ (see 12a)

Major weakening
b. $Vk^{\$}lV > V\,i̯^{\$}lV$ (> VʎV) (see 12b)

From this perspective, original *k* underwent major weakening in the offset position of the coda whereas in the onset position of the head it only underwent minor weakening.

Once again, of course, it might be complained that there is an arbitrariness in the analysis. But any arbitrariness begins to dissipate once the proposed syllabications are considered in light of a more general (partial) theory of syllabic phonology which in addition to (10b) (i.e. that the initial position of the head is strong) accepts (14):

(14) The offset of the coda is a weak position.

Consonantal weakening in the offset position of the coda is expected. Accordingly, all things being equal, the major weakening of original *k* in the environment _$ versus minor weakening in $_ (see 13) is expected.

The differential syllabication in (13) receives comparative support from Italian where *VklV* undergoes gemination (thus, as in the case of West Germanic, implying heterosyllabication as *Vk$lV*) but *VkrV* does not (implying *V$krV*) (cf. Murray 1987a for details):

(15) a. Latin ŏc(ŭ)lum Italian occhio (via $^{+}$Vk$lV > Vk$klV > Vk$k i̯V) «eye»

b. Latin lacrĭmam Italian lagrima «tear»

Although this would once again seem to be a fruitful line of investigation, according to Picard's rules there appears to be no basis for proposing the syllabications in (13), given the existence of word initial *#kr* and *#kl*. As in the case of Old Icelandic, Picard's model would seem to block the possibility of a syllable-structure-based analysis, necessitating a (likely unenlightening) linear segmental interpretation of the Portuguese data.

It is evident that the syllable structures imposed by Picard's model will prove inadequate in many cases in accounting for phonological change. But Picard's model not only presents difficulties in the interpretation of phonological change, it also makes impossible the statement of certain phonotactic regularities. A case in point is found in Modern Icelandic where, according to Vennemann (1972, p.3f.), the following constraint holds:

(16) Phonotactic Constraint for Modern Icelandic
A stressed vowel is long in an open syllable but short in a closed syllable.

This generalization can only be made on the assumption of the syllable structures in (16):

(17)	vĭt$ni	«witness»	but	vī$trir	«wise»
	ĕp$li	«apple»		skō$pra	«to roll»
	vĭs$na	«to wither»		vō$kva	«to water»
	ĕk$la	«to lack»		sē$tja	«to set»

One might argue that the introduction of the syllabication in (17) represents an (unnecessary) increase in complexity; e.g. *Vp$lV* on the one hand but *V$prV* on the other. But this apparent complexity results in a uniformity that can be expressed in a syllabic phonology recognizing phonological weight (e.g. Vennemann 1978, Hyman 1985)[4]. The weight of the stressed syllable of examples such as those in (17) is standardized at two morae. Furthermore, the syllabications are in accordance with (10) above. If Picard's model were adopted, statements of phonotactic regularities such as (16) would have to be given up, for forms such as *ĕp$li* and *ĕk$la* directly contradict Picard's claim that *Vp$lV* and *Vk$lV* are linguistically impossible in a language having word initial *#pl*, *#kl*, etc.

Besides difficulties in dealing with phonological change and phonotactic regularities, there is also a further type of evidence involving the syllable structure of *VPLV* and *VPGV* sequences which can be mentioned here; that is, the evidence of verse construction in languages such as Sanskrit, Ancient Greek, Latin, and early Germanic which are sensitive to syllable weight. Since the basic characteristics of verse construction in these languages are well known and have been discussed extensively elsewhere (e.g. Murray 1988a and references there), I will only touch upon some relevant points here.

Varma (1929, p.94) observes that in Sanskrit verse, as in the verse of many other languages, two phonological units can be distinguished. Labelled light versus heavy grade in traditional works, these units reflect the distinction between light and heavy syllables made in a syllabic phonology such as Vennemann 1978:

(18)

Light Syllable	Heavy Syllable
v̆$	v̄$
	v̆C$
	v̆CC$
	etc.

The important point for our discussion is that the initial syllable of **any** *v̆CCV* sequence is heavy in Sanskrit verse. This implies in the case of *v̆PLV* sequences, for example, the syllable structure *v̆P$LV* (Varma 1929, p.94). According to

4. See Murray (1988b) for a discussion of syllable and word weight in Old English and Hock (1986) for a discussion of the concept «mora».

Varma (1929), this syllabication is also in accordance with the intuitions of the ancient Indian grammarians themselves whose rules state that *pitre* will be divided *pit/re* and not *pi/tre*, *mukta-* will be divided *muk/ta-* and not *mu/kta-*. The same treatment of *v̆PLV* (as well as *v̆PGV*) is found in Homeric Greek (cf. Lejeune 1972, Murray and Vennemann 1982) and early Germanic verse (cf. Hermann 1923, Murray and Vennemann 1983, Murray 1988a).

By contrast in Latin verse the first syllable of a *v̆PLV* sequence was not treated as a heavy syllable. According to Allen (1973, p.137), the evidence of both early Latin verse and accent placement indicates that the initial syllable of a *v̆PLV* sequence was light: «These sequences must therefore have functioned as complex releases of the following syllable: Thus *tenĕ.brae, pă.tris, pŏ.plus.*»

In some traditional studies (e.g. Sievers 1901, p.308[5]), such metrical patterns were appropriately treated as reflecting language specific differences in the syllabic structuring of the sequences involved where *v̆$PLV* (with an initial light syllable) would be assumed for languages like Latin but *v̆P$LV* (with an initial heavy syllable) for languages like Sanskrit (as well as Homeric Greek and early Germanic). Once again, however, the latter structure is in contradiction with Picard's principles of syllable division and it remains unclear as to how such variation would be accounted for in Picard's approach.

I believe that the above discussion, brief as it is, is sufficient to indicate that not only Picard's approach but any distributional approach involving a simplistic model of word internal syllable division based on distributional patterns evident at word margins faces insurmountable obstacles in attempting to account for diachronic change, phonotactic regularities, and characteristics of verse construction. I would like also to note at this point that models based on strength hierarchies fare no better. Such models are typically based on proposed universals making reference to a strength hierarchy such as the one in (10a) above. For example, on the basis of the hierarchy in 19a, Lowenstamm (1981, p.593)[6] proposes the definition of the «Universal Syllable» in (18b):

5. It should be noted that Sievers (1901:291) does allow for the possibility of an artificial pronunciation in verse; cf. Murray (1988a:147) for discussion.

6. I should point out here that Lowenstamm (1981) explicitly argues against distributional approaches such as Kahn (1976).

(19) a. vowel
glide
sonorant
fricative
stop

b. In a string of segments, a *syllable* is a maximal substring such that:

A (i) no segment is lower on the hierarchy than both its immediate neighbors
(ii) no two segments of equal ranking on the hierarchy are adjacent.

B the onset is maximal within the limits of (A).

It is evident that the syllable structures posited above such as $VP^{\$}LV$ (cf. 9a, 13b, 15a, and 17) are incongruous with Lowenstamm's definition.

We have so far focused mainly on the syllable structure of intervocalic plosive plus liquid and plosive plus glide sequences. Picard's (1983, p.90) model, however, allows for other syllable structures which would also appear to be problematic. In particular, Rule B' (see 6 above) provides only for an **optional** shift to the right of the syllable boundary. The original intention of this rule was to account for the proposed indeterminacy in English words such as *parsnip* ($par^{\$}snip$~$pars^{\$}nip$). There exist, however, languages where this rule appears to be **obligatory**. Huichol, for example, has word initial *pt-*, *pk-*, and *mt-* and no word final consonants. These clusters also occur word internally between vowels where (according to McIntosh 1945; see also Bell 1976) they are syllabified $Vp^{\$}tV$, $Vp^{\$}kV$, and $Vm^{\$}tV$:

(20) pti$^{\$}$ú$^{\$}$k^{w}a$^{\$}$i «he ate»
pep$^{\$}$tá$^{\$}$k^{w}i$^{\$}$ka «you will sing»

Picard's model only allows for an **optional** shift of the syllable boundary in these cases, thus implying the syllabications $V^{\$}ptV$, $V^{\$}pkV$, and $V^{\$}mtV$, with $Vp^{\$}tV$, $Vp^{\$}kV$, and $Vm^{\$}tV$ occurring only optionally. Although the details of Huichol syllable structure must remain an open question here, it seems unlikely that such highly marked syllable heads (viz., $^{\$}pt$, $^{\$}pk$, and $^{\$}mt$) would be tolerated in intervocalic position.

Finally it is worth mentioning that Picard's model fails to recognize ambisyllabic segments. Although some linguists (including Picard 1984 himself as well as Selkirk 1982) have argued that the notion of ambisyllabicity need not be introduced into syllabic phonology, Vennemann (1982) cites evidence suggesting the appropriateness of postulating ambisyllabic segments for Standard German[7]. In this language, the following phonotactic constraint holds:

(21) Phonotactic Constraint 1 (Standard German)
Lax vowels (in stressed position) can only occur in closed syllables.

a)	[rɔ k]	Rock	«skirt»
b)	[lē$bɛn$dIÇ]	lebendig	«lively»

Taking into consideration this phonotactic constraint only, a form such as *Roggen* ([rɔgən]) «rye» could be accounted for on the basis of the syllable structure in (21):

(22) [rɔ g$ə n]

Standard German, however, has another relevant phonotactic constraint:

(23) Phonotactic Constraint 2 (Standard German)
The coda of a syllable is always voiceless.

a.	Tag	[tāk]	«day»	(cf. Tage, [tā$gə)
b.	Wodka	[vɔ t$ka]	«vodka»	
c.	Jagd	[jākt]	«hunt»	(cf. jagen, [jā$gə n])

The proposed structure in (22) would represent a violation of this constraint. But the structure [rɔ $gə n] represents a violation of the phonotactic constraint in (21). By contrast, in assuming ambisyllabicity, it can be stated that [g] in *Roggen* belongs to the offset of the coda (thus allowing [ɔ]) **and** the onset of the head (as in 24) and is accordingly not subject to Phonotactic Constraint 2:

7. Problems arise in the attempt to develop an argument for ambisyllabicity on the basis of English data, for the assumption of syllable structures such as *hæp$i* (happy), as assumed for example by Donegan and Stampe (1978, p.31), accounts for much (all?) of the characteristics usually attributed to ambisyllabicity in English; for further discussion, cf. Kahn (1976) and Murray (1987b) among others. It is also worth noting here that Picard's approach fails to consider the interrelationship of stress and syllable structure; cf. Murray (1987b), Vennemann (1988a).

(24) $ [rɔ gə n][8]

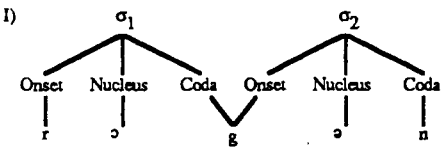
Standard German appears to present a strong case in favour of ambisyllabicity. Consequently, if one accepts the idea of introducing syllable boundaries into phonological analyses in order to make linguistic generalizations, it would seem that, at least for some languages, the concept of ambisyllabicity must also be introduced. It is not clear how ambisyllabicity (or at least the problems associated with it) could be dealt with in Picard's model.

How then are distributional or strength-based approaches to face the above set of problems? One position which has had proponents ranging from Grammont (1950) to Árnason (1980) and Lowenstamm (1981) among others is to assume two types of syllables, e.g. phonological and phonetic. In such approaches, phonological syllables typically would be those structures which are in accordance with a particular principle or a set of universal principles governing syllable structure whereas all other syllable structures would belong to the set of phonetic syllables. For example, Grammont (1950, p.99) introduces a distinction between phonological and phonetic syllables, stating that the phonological syllable consists of «une suite d'apertures croissantes suivie d'une suite d'apertures décroissantes». Árnason (1980) introduces a similar division to account for apparent contradictions in his analysis of Icelandic and Lowenstamm (1981, p.576) argues for a distinction between the «theoretical» syllable and the «intuitive» syllable.

There are, however, various problems with this type of approach. One of these is that those who propose to distinguish two types of syllables do not appear to have provided detailed discussions of the characteristics of the two types. Although Lowenstamm (1981, p.576) states that «the «theoretical» syllable and the «intuitive» syllable may or may not coincide (this will depend on whether or not particular grammars contain statements readjusting syllable structure)», there would appear, to date, to be no set of principles governing such «readjustments». In the

8. The flat structure in I or the hierarchical structure in II among others can be substituted for 24:

I)



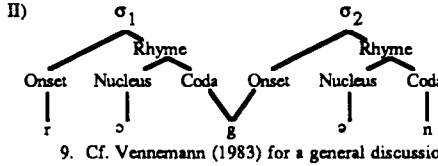
absence of such principles, the impression is left that the main motivation for the introduction of the dichotomy in the first place was simply to cover up inadequacies in the original analysis.

A second problem, it seems to me at least, is that such approaches typically do not recognize the topics discussed in this paper as being particularly interesting. That is, language specific variation in syllable structure (e.g. $VP^{\$}LV$ versus $V^{\$}PLV$) is dismissed as simply involving some kind of «readjustment» or «resyllabification» in which there may or may not be a linguistically interesting generalization. There seems to be the danger here of avoiding a fascinating question; viz., what are the more general characteristics of a language from which its syllable structure is derived? The adoption of the distributional principles to syllable structure is dangerous as it can (and does) blind linguists to phenomena incongruous with such principles. (See the warning issued by Bell 1976, p.260).

I conclude that distributional approaches (as well as strength-based approaches) of the type outlined above are inadequate in that they do not and cannot attain their stated goals. But where does this leave us? Does the failure of simplistic models of syllable division imply that we should give up on syllable structure and toss out syllabic phonology all together? No, for there is a way to treat syllabic phenomena in a coherent fashion; viz., in terms of a theory of syllable structure preferences[9]. In this type of approach, the knowledge about syllable structure that we have gained over the years can be consolidated without necessitating the introduction of two types of syllables, nor of «readjustments».

A preference theory for syllable structure provides a means for ranking existing syllable structures in terms of their relative preference on a given parameter. It does this on the basis of preference laws. The Syllable Contact Law, for example, provides a means of evaluating the relative preference for any existing syllable contacts in a language:

II)



9. Cf. Vennemann (1983) for a general discussion of the theoretical framework assumed here. For detailed applications, see Murray and Vennemann (1983), Lutz (1986), Murray (1988a), and Vennemann (1988b).

(25) Syllable Contact Law

> The preference for a syllabic structure $A^{\$}B$, where A and B are marginal segments and a and b are the Consonantal Strength values of A and B respectively, increases with the value of b minus a. (Murray and Vennemann 1983, p.520)

The Syllable Contact Law differs from the distributional or strength-based principles discussed above in that it does not impose a particular syllable structure on a given sequence of segments but only provides a means of determining the relative preference for given syllable contacts. As evident in the Syllable Contact Law, the preference laws do, however, recognize the important role that phonological strength plays in syllable structure. It is also recognized that distributional factors are reflected in syllable structure in, for example, Vennemann's (1988b, p.32) Law of Initials:

(26) Law of Initials

> Word-medial syllable heads are the more preferred, the less they differ from possible word-initial heads of the language system.

The preference laws reflect some aspects of both distributional and strength-based approaches while at the same time explicitly recognizing the richness of syllabic structuring possible in language and rejecting simplistic models of syllable division.

The rejection of simplistic models of syllable division, far from leading to chaos as many fear, opens up a multitude of exciting research areas. I will mention only three of these here:

a) The diachronic manifestation of preference laws. The preference laws provide a principled basis for the explanation of language change in general and for accounting for the generalization patterns evident in language change, in particular (see, e.g., Murray 1988a, Vennemann 1988b).

b) The synchronic manifestation of preference laws. Since linguistic structures are organized in terms of preference laws, implicational statements are possible. In fact the claim has been made that if a language does not tolerate a particular structure on a given parameter it will also not tolerate any less preferred structures on that parameter (Murray 1988a:§2.2, Vennemann 1988b, p.3). An

example from syllable structure would be that if a language system has both *VklV* and *VkrV*, the syllabication $V^{\$}klV$ implies $V^{\$}krV$ (whereas of course $V^{\$}krV$ does not imply $V^{\$}klV$). This implicational relation follows from the Syllable Contact Law since the failure to tolerate the more preferred contact $k^{\$}l$ implies that the even less preferred contact $k^{\$}r$ will also not be tolerated.

c) The hierarchical arrangement of preference laws. It is clear that the laws of one system (the morphological system, for example) may conflict with the laws of another system (the phonological). But there are also conflicts among the laws of a particular system. The preference for shorter (lighter) utterances resulting, for example, in vowel deletion conflicts with the preference for sequences of ideal *CVCVCV* syllables. A necessary task is to determine, where possible, a hierarchal arrangement of the preference laws both within and between systems[10].

These areas, only three of the many opened up by an investigation in terms of preference laws, remain closed to investigators assuming models of syllable division of the type discussed in this paper. Simplistic models of syllable division must be rejected; they are not worth the sacrifice.

Robert W. Murray
University of Calgary

10. See Murray (To Appear) for a discussion of various phonological processes in terms of their motivations.

Références

ALLEN, W. Sydney (1973) *Accent and Rhythm*, Cambridge, Cambridge University Press.

ÁRNASON, Kristján (1980) *Quantity in Historical Phonology: Icelandic and Related Cases*, (*Cambridge Studies In Linguistics*, 30.) Cambridge, Cambridge University Press.

BELL, Alan (1976) «The Distributional Syllable», Juilland, Vol. 2 [Phonology], 1976, pp.249-262.

BELL, Alan and Joan Bybee Hooper (eds.) (1978) *Syllables and Segments*, Amsterdam-New York-Oxford, North-Holland.

CLEMENTS, George N. and Samuel Jay Keyser (1983) *CV Phonology: A Generative Theory of the Syllable*, Cambridge, MIT Press.

DAVIS, Stuart (1982) «Rhyme, or Reason? A Look at Syllable-Internal Constituents», *Berkeley Linguistics Society* 8, pp.525-532.

DONEGAN, Patricia J. and David Stampe (1978) *The Syllable in Phonological and Prosodic Structure*, Bell and Hooper 1978, pp.25-34.

DRESSLER, Wolfgang U. et al. (eds.) (1981) «Phonologica 1980», Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.

DUNCAN-ROSE, Caroline and Theo Vennemann (eds.) (1988) *On Language: Rhetorica, Phonologica, Syntactica: A Festschrift for Robert P. Stockwell*, New York, Routledge.

GRAMMONT, Maurice (1950) *Traité de phonétique*, 4th ed, Paris, Librairie Delagrave.

HERMANN, Eduard (1923) *Silbenbildung im Griechischen und in den anderen indogermanischen Sprachen*, Göttingen, Vandenhoek and Ruprecht, [2nd ed., 1978.]

HOCK, Hans Henrich (1986) «Compensatory Lengthening, In Defense of the Concept «Mora»», *Folia Linguistica* 20, 431-460.

HOOPER, Joan Bybee (1976) *An Introduction to Natural Generative Phonology*, New York, Academic Press.

HULST, Harry van der and Norval Smith (eds.) (1982), *The Structure of Phonological Representations*, Parts 1 and 2, (*Linguistic Models* 2 and 3.) Dordrecht, Foris

HYMAN, Larry M. (1985) *A Theory of Phonological Weight*, Dordrecht, Foris.

JUILLAND, A. (ed.) (1976) *Linguistic Studies offered to Joseph Greenberg*, 3 Volumes, Saragota, Anma Libri

KAHN, Daniel (1976) *Syllable-Based Generalizations in English Phonology*, Bloomington, Indiana University Linguistics Club.

KIPARSKY, Paul (1981) «Remarks on the Metrical Structure of the Syllable», Dressler et al. 1981, pp.276-297.

KURYŁOWICZ, Jerzy (1960) «Contribution à la théorie de la syllabe», in Jerzy Kuryłowicz, *Esquisses linquistiques* (1960), pp.193-220, Wrocław, Zakład Narodowy Imienia Ossolińskich Wydawnictwo Polskiej Akademii Nauk.

LEJEUNE, Michel (1972) *Phonétique historique du Mycénien et du Grec ancien*, Paris, Klincksieck.

LOWENSTAMM, Jean (1981) «On the Maximal Cluster Approach to Syllable Structure», *Linguistic Inquiry* 12, pp.575-604.

LUTZ, Angelika (1986) «The Syllabic Basis of Word Division in Old English Manuscripts», *English Studies* 67, pp.193-210.

McINTOSH, John B. (1945) «Huichol Phonemes», *International Journal of American Linguistics* 11, pp.31-35.

MURRAY, Robert W. (1986) «Urgermanische Silbenstruktur und die westgermanische Konsonantengemination», *Beiträge zur Geschichte der deutschen Sprache und Literatur* 108, pp.333-356.

MURRAY, Robert W. (1987a.) «Preference Laws and Gradient Change, Selected Developments in Romance», *Canadian Journal of Linguistics* 32, pp.1-18.

MURRAY, Robert W. (1987b.) «Nuclear Phonology and Aspiration and Flapping in English», *Calgary Working Papers in Linguistics* 13, pp.27-41.

MURRAY, Robert W. (1988a.) *Phonological Strength and Early Germanic Syllable Structure*, Munich, Fink.

MURRAY, Robert W. (1988b.) «The Shortening of Stressed Long Vowels in Old English», *Diachronica* 5, pp.73-108.

MURRAY, Robert W. (To Appear) «On Epenthesis», *Folia Linguistica.*

MURRAY, Robert W. and Theo Vennemann (1982) «Syllable Contact Change in Germanic, Greek, and Sidamo», *Klagenfurter Beiträge zur Sprachwissenschaft* 8, pp.321-349.

MURRAY, Robert W. and Theo Vennemann (1983) «Sound Change and Syllable Structure[: Problems] in Germanic Phonology», *Language* 59, pp.514-528.

PAUL, Hermann (ed.) (1901) *Grundriß der germanischen Philologie*, 2nd ed., Vol. 1, Strasbourg, Trübner.

PICARD, Marc (1983) «Deux régles universelles de démarcation syllabique», *Revue québécoise de linguistique* 12, pp.69-102.

PICARD, Marc (1984) «English Flapping and Aspiration Revisited», *Canadian Journal of Linguistics* 29, pp.42-57.

PICARD, Marc (1987a.) «L'épenthése consonantique, constraintes phonologiques et syllabiques», *Revue québécoise de linguistique* 16, pp.267-284.

PICARD, Marc (1987b.) «Conditions and Constraints on Syllable Division», *Linguistics* 25, pp.361-82.

PULGRAM, E. (1970) *Syllable, Word, Nexus, Cursus*, The Hague, Mouton.

SELKIRK, Elizabeth O (1982) «The Syllable», Hulst and Smith (1982), pp.337-383.

SIEVERS, Eduard (1901) *Phonetik*, Paul 1901, pp.283-319.

VARMA, Siddheshwar (1929) *Critical Studies in the Phonetic Observations of Indian Grammarians*, London, The Royal Asiatic Society.

VENNEMANN, Theo (1972) «On the Theory of Syllabic Phonology», *Linguistische Berichte* 18, pp.1-18.

VENNEMANN, Theo (1978) «Universal Syllabic Phonology», *Theoretical Linguistics* 5, pp.175-215.

VENNEMANN, Theo (1983) «Causality in Language Change, Theories of Linguistic Preferences as a Basis for Linguistic Explanations», *Folia Linguistica Historica* 6, pp.5-26.

VENNEMANN, Theo (1988a) «The Rule Dependence of Syllable Structure», Duncan-Rose and Vennemann 1988, pp. 257-283.

VENNEMANN, Theo (1988b) *Preference Laws for Syllable Structure and the Explanation of Sound Change: With Special Reference to German, Germanic, Italian, and Latin*, Berlin-NewYork-Amsterdam, Mouton de Gruyter.