CONSONANT COMBINATORICS IN GERMAN

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ABSTRACT
In this paper we present a list of possible (existing as well as typologically relevant non-existing) consonant sequences in German and their combinatorial phonological distributional description. The works of M. Menzerath, H. Bierwisch, and V. Ta- dell were used as source material for sketching out phonotactic rules, methodologically resulting in a phonotactic restrictions generator, the latter being a computer program which was restructured and improved to obtain a better final result. The aim of the work was to find a set $S$ of consonant sequences, fulfilling the condition $|S| = 2$, where $S$ is maximal similar to the set $S$ of German consonant sequences, containing at least consonants and/or affricates.

1. INTRODUCTION
Consonant sequences in German and regularities of their formation have previously been studied and described by Twaddell /24/, Menzerath /11,12/, Mouton /13,14/, Bierwisch /1/, Kopp /15/, Belcher /19,20/, Ta- dell’s group /26/, Bierwisch /1/, Wurzel /14/, Trubetzkoy /23/, Seiler /19,20/, Tadell /24/.

2. PRINCIPLES OF DESCRIPTION
The principles of the description of consonant sequences are as follows:
1) The composition and occurence of German consonant sequences are determined by regularities, part of which are general linguistics rules while the rest are characteristic of the phonological system of the German language, the latter being primary with regard to the general linguistic ones.
2) Syllable structure is regarded as primary with respect to phonemes and capable of dictating phonemes in it (see /18/).
3) The consonant sequences containing a closing consonant sequence not characteristic of the language, i.e. the number of phonemes in it is the number of terminal symbols (the auxiliary symbols are not considered). Each of them is the number of terminal symbols (the consonants in the surface structure) different from $P$, the lowest number of phonemes in the consonant sequences generator, the rest of the consonants are described by the symbols $I$ and $=$ the initial symbol.

3. DEFINITIONS
A consonant sequence is an arbitrary sequence of different consonants within the boundaries of one simple word.
A consonant cluster is a phonetically internal consonant sequence.
A syllable is a sequence of phonemes between two successively different number of syllabic boundaries.
A syllabic boundary is fixed according to the number of phonemes in it.

4. GENERAL PRINCIPLE OF THE GENERATOR
A consonant sequences generator represents a formal grammar which determines one phonological subsystem of a language - the phonotactic of consonant sequences and gives its exact description. According to Chomsky's theory the consonant sequences generator can be described by the formal grammar $D_1$: our paper we deal with the word-internal and word-final consonant sequences.

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7. CONCLUSIONS
A consonant sequence is an arbitrary sequence of different consonants within the boundaries of one simple word.

8. REFERENCES
M. Menzerath, H. Bierwisch, and V. Ta-
dell’s group /26/, Bierwisch /1/, Wurzel /14/, Trubetzkoy /23/, Seiler /19,20/, Tadell /24/.
and it constructs the existing consonant sequences whose structure is acceptable to
the phonological system of the German lan-
guage as well as the non-existing consonant
sequences which are typologically relevant
to the existing ones. It also determines
the position of syllable boundary. The work
of the generator is based on the application
of the hierarchical character of the phono-
logical system of the language where re-
strictions are applied on all levels. This
makes it possible with few restrictions to
obtain from 5.5 million potential sequences.
(a $\sum C_i = 23n3+33+22+21 = 503154$) a
result that in number approximately corre-
sponds to the one in reality. The generator
does not pretend to psychological reality or "natural" processes in the language, but
represents a black-box-type model in which
the application of phonological rules pro-
vides a result close to linguistic real-
ities.

5. FORMAL DESCRIPTION OF THE GENERATOR

The formal description of the generator of German consonant sequences is given in
the form of a grammar where Y marks the de-
ivation rules and X the restriction rules,
and the number following them denotes the
hierarchical level. The number in brackets
refers to the sub-section where the respec-
tive operation is presented in more detail.
The rules with the number 0 (e.g. X-1.0) point out those consonant strings which do
not correspond to the definition of conso-
ant sequences.

Y-1  1  2  3  4  5
(6)  1  K  t
  2  KG  4
  3  B  4
  4  Bt  4
  5  B  4
X-1.0  G  €

X-2.11  G^0 = €

X-2.1.1  G^0 = €

X-2.2.1  G^0 = €

X-2.2.1  G^0 = €

X-2.2.1  G^0 = €

X-2.2.1  G^0 = €

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