

# **SALT: THE INCREMENTAL CHEMISTRY OF LANGUAGE ACQUISITION**

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## **Abstract**

This e-paper continues the examination of language as a quasi-molecular system from the point of view of a chemist who happens to ask, “What if the words were atoms?” Ideas of Pattern Theory (Ulf Grenander) are used as a kind of generalized chemistry. The Hungarian folktale *A Só* (Salt) is represented as a sequence of syllabic triplets. Small portions of the text are fed to a quasi-chemical reactor working according previously described principles of acquisition and categorization of generators. The gradual development of categorization and aggregates of syllables is illustrated.

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## Introduction

This e-paper directly follows and complements the previous one [1], the introduction, literature review, content, and discussion of which will not be repeated here except for two notes.

First, my primary subject of interest is atomistic systems in general, within the framework of Ulf Grenander's Pattern Theory [2,3], which encompasses both molecules and utterances, as well as practically everything perceived by senses and/or reason.

Second, my previous attempt to analyze a fragment of the Hungarian folk tale *A só* (Salt) [4] in the same manner as *The Three Little Pigs*, i.e., regarding words as generators [1], showed no promise because of the agglutinative nature of Hungarian.

There were too few words that could be centers for categorization and generator acquisition because most functional morphemes stayed appended within the word limits. Here I attempt to analyze the same text, taking **syllables** as generators and gradually adding sentences into the focus of attention.

The choice of text was dictated by its availability on the Web in both text and audio forms, as well as by its cultural origins. The folk tale is a perfect window into the language because of its transparency, simplicity of context, universality of human experience, and repetitions. The folk tales are relics of the earlier stages of language evolution when the complexity of life and ideas did not press hard on the language, extruding multilevel sculptures of wired together fragments that needed a long attention span and training to understand. The tales correspond to the bygone era when the entire society spoke the same language. A folk tale is like a book of one page, so that you do not need turning pages in order to follow the plot, while keeping in mind what was on the previous pages, now out of sight. The tale is designed to be told, not written. Moreover, it is designed for children. Repetition is the mother of learning.

I am not a speaker of Hungarian. My knowledge of the language is limited to superficial familiarity with grammar and some experience with translating into Russian the poetry of the highly original, passionate, and innovative Hungarian poet Endre Ady (1877-1919).

I choose Hungarian because it seems to be the opposite of English, has the phonetic system of writing, a fixed stress, a very rational, slim, and non-redundant grammar, and could **not** be understood by most readers of this paper, if such be found. Therefore, the aspects of structure, which are in the heart of Pattern Theory, as well as chemistry, will not be obstructed by cultural and semantic predisposition. With Hungarian, the aspects of grammar and alternation will not be too overpowering, as it could happen, for example, with much more exuberant Russian or Turkish.

The Hungarian syllables should be perceived here as small labeled atomistic objects capable of forming linear chains. As a chemist would say, the syllables are

monomers and the phrases are polymers, while phonemes are the true atoms of language. Oligomers, i.e., short linear fragments, are called here **blocks**.

I myself, however, cannot be free of bias. I have a personal impression of Hungarian as a very elegant, graceful, and beautiful creation of language evolution, although modern special texts—probably, in any language—might make a different impression.

Regardless of that, it seems that the fragmentation of speech into syllables is as arbitrary as division into words. I feel, for example, a big discomfort when the numerous forms of the noun in Hungarian and Finnish are considered cases because I see the endings as just postpositions written together with the root and other markers.

The problems with hyphenation that arise in languages with long words, such as Russian and Hungarian, can be very complicated. The syllable segmentation that I use here is arbitrary, but biased by my instinctive desire to bring the syllable as close to the morpheme as possible. One cannot know what a morpheme is in an unfamiliar language, but I cannot ignore my own knowledge. For example, the old word *bátyámuram*, to address an older person, literally “my brother my lord”, splits phonetically, with my Russian phonetic habits, into *bá-tyá-mu-ram*, but I see its morphologic constituents as *bá-tyám ur-am* (or, *báty-ám* or, splitting the long *á*, *bá-tya-am*).

I doubt there is the “right” way to segment speech in a written text. The ancient scribes did not know the space between the words and modern Chinese does without it, being naturally syllabic. Therefore, I just leave it as I choose because I am not interested here in the factual truth, often disputed in linguistics, but in the operational truth: I don’t know what it is, but let us see how “it” behaves. Ultimately, I believe only in phonological facts but I am not qualified to represent them. The “facts” of the written language are just conventions, more or less reasonable. The sound is a physical fact.

I inserted the pauses from the available soundtrack. In most cases, the pause coincides with a punctuation mark, but not always. The STOP is the full stop.

I am convinced in the leading role of prosody and pitch in early language acquisition by infants, on which there is a large and growing body of solid experimental work, off the battlefields of formal linguistics. I mark the stressed syllables by capitalization, but I realize that this is somewhat arbitrary, too. Some longer Hungarian

words have an additional stress and the sentence often starts with a raised pitch. Should I mark all monosyllabic words stressed? I simply do not know. To complicate the picture, in Hungarian, as in Russian, a single consonant can be a morpheme, which is more typical for polysynthetic languages. Such a lean loner may not be a legitimate syllable, but it is definitely a generator in the sense of Pattern Theory [2,3].

The descent to the level of phonemes is an intriguing task, for which Italian is a good medium. Until then, I take the syllable segmentation for granted. Therefore, I do not pay attention to the generator identification here, unless some special cases of markers.

## Illustrations and discussion

The following is a description of an experiment. By no means is it a computer simulation of some realistic object. This is only an illustration of principles. THIS IS ONLY A TEST. I use computer only for the purpose of representation of the text and sorting out the results. The MATLAB output is further easily converted into tables with MS Word Table functions.

If this is an experiment, we have to describe its subject participant. I prefer to call the subject **robot-child**. It is an imaginary system that can be described only approximately and vaguely. It possesses tunable memory and attention span and is supposed to learn something from the input.

The strings of syllables are fed into the robot-child's mind (which I see as a kind of a chemical reactor) where they are digested into overlapping triplets. It is important that the **original string is not remembered**, but its stable repetitive fragments, as well as new knowledge, could be.

The memory stores:

1. The syllables.
2. Relatively stable bonds of some of the syllables with the neighbors in the original strings.
3. Classes (categories) obtained as result of simple local operations.
4. Some non-syllabic generators as grammar markers.

The chemistry of the mind of the robot-child is defined by simple local rules. For all the explanations see [1], which is absolutely necessary for understanding this paper.

At each step, a sentence from the text is added to all the previous ones and the total is analyzed as a whole. This is not exactly what happens during the language acquisition, but further modifications in the direction of realism are possible. By the realism I mean here a fast forgetting of most details of the freshly perceived utterances.

## Step 1

MATLAB input: P1=char ('STOP', 'volt', 'EDY', 'szer', 'egy', 'Ö', 'reg', 'KI', 'rály', 'PAUSE', 's', 'HÁ', 'rom', 'szép', 'LE', 'ány', 'a', 'STOP'); P=P1;

**Table 1**

	LEFT	N	Generator	RIGHT	
1	#	2	STOP	volt	
2	STOP	1	volt	EDY	
3	volt	1	EDY	szer	
4	EDY	1	szer	egy	
5	szer	1	egy	Ö	
6	egy	1	Ö	reg	
7	Ö	1	reg	KI	
8	reg	1	KI	rály	
9	KI	1	rály	PAUSE	

10	rály	1	PAUSE	s	
11	PAUSE	1	s	HÁ	
12	s	1	HÁ	rom	
13	HÁ	1	rom	szép	
14	rom	1	szép	LE	
15	szép	1	LE	ány	
16	LE	1	ány	a	
17	ány	1	a	STOP	

The numbers in the third column are occurrences.

The table has no double entries. STOP and PAUSE are ignored.

## Step 2

P2 = char( 'az', 'Ö', 'reg', 'KI', 'rály', 'SZE', 'ret', 'te', 'VOL', 'na', 'mind', 'a', 'HÁ', 'rom', 'LE', 'ány', 'át', 'FÉRJ', 'hez', 'AD', 'ni', 'STOP'); P = strvcat (P1, P2);

**Table 2**

	LEFT		G	RIGHT					
1	a	3	STOP	az	15	rom, szép	2	LE	2-ány
2	STOP	1	volt	EDY	16	2-LE	2	ány	a, át
3	volt	1	EDY	szer	17	mind, ány	2	a	HÁ, STOP
4	EDY	1	szer	egy	18	STOP	1	az	Ö
5	szer	1	egy	Ö	19	rály	1	SZE	ret
6	az, egy	2	Ö	2-reg	20	SZE	1	ret	te
7	2-Ö	2	reg	2-KI	21	ret	1	te	VOL
8	2-reg	2	KI	2-rály	22	te	1	VOL	na
9	2-KI	2	rály	PAUSE, SZE	23	VOL	1	na	mind
10	rály	1	PAUSE	s	24	na	1	mind	a
11	PAUSE	1	s	HÁ	25	ány	1	át	FÉRJ
12	a, s	2	HÁ	2-rom	26	át	1	FÉRJ	hez
13	2-HÁ	2	rom	LE, szép	27	FÉRJ	1	hez	AD
14	rom	1	szép	LE	28	hez	1	AD	ni
					29	AD	1	ni	STOP

After **Step 2** we see multiple (double, to be exact) entries of some generators into the **Table**. Two “chemical” processes are, therefore, possible:

### 1. Class acquisition

Class (= category, pattern) *W* requires two or more different neighbors (A, B, C...) on one side of generator *X*.

NOTE: Letter *W* is chosen because it is not in Hungarian alphabet, except for foreign words.

No.	A, B, C	3	X	...
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No.	...	3	X	A, B, C
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$$\{A, B, C\}-X \Rightarrow W-X$$

$$\{A, B, C\} \Leftrightarrow W$$

$$X-\{A, B, C\} \Rightarrow W-X$$

$$\{A, B, C\} \Leftrightarrow W$$

## 2. Bond A-X acquisition

**Bond A-X requires two or more occurrences of the same neighbor A of X.**

No	...	2	X	2-A
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No	2-A	2	X	...
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$$\{X, A\} \Leftrightarrow X-A$$

$$\{A, X\} \Leftrightarrow A-X$$

**Step 2** produces new classes from the following lines of the Table 2

(\*\*\* stands for non-participating generators) :

6	az, egy	2	Ö	***
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15	rom, szép	2	LE	2-ány
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12	a, s	2	HÁ	
----	------	---	----	--

16	***	2	ány	a, át
----	-----	---	-----	-------

13	***	2	rom	LE, szép
----	-----	---	-----	----------

17	mind, ány	2	a	***
----	-----------	---	---	-----

$$W1 \{az, egy\}-\ddot{O}$$

$$W2 \{a,s\}-H\acute{A}$$

$$W3 \text{rom}-\{LE, \text{sz}\acute{e}p\}$$

$$W4 \text{ány}-\{a, \text{át}\}$$

$$W5 \{\text{mind}, \text{ány}\}-a$$

**Step 2** produces new bonds from the following lines of Table 2:

6	***	2	Ö	2-reg
7	2-Ö	2	reg	2-KI
8	2-reg	2	KI	2-rály
9	2-KI	2	rály	***

15	rom, szép	2	LE	2-ány
16	2-LE	2	ány	a, át



$\{\ddot{O}, \text{reg}\} \Leftrightarrow \ddot{O}\text{-reg}$  ;  $\{\text{reg}, \text{KI}\} \Leftrightarrow \text{reg-KI}$  ;  $\{\text{KI} + \text{raly}\} \Leftrightarrow \text{KI-raly}$ ;  
 $\{\ddot{O}, \text{reg}, \text{KI}, \text{raly}\} \Leftrightarrow \ddot{O}\text{-reg-KI-raly}$ ;  $\{\text{LE}, \text{ány}\} \Leftrightarrow \text{LE-ány}$ ;

Since LE and ány belong to classes W3 and W5 other equilibriums are possible :

$\{\text{LE}, \text{ány}\} \Leftrightarrow \text{LE-ány}$ ;

W6 rom- $\{\text{LE}, \text{szép}\} \Rightarrow \text{rom-}\{\text{LE-ány}, \text{szep}\}$

W7  $\{\text{mind}, \text{ány}\}\text{-a} \Rightarrow \{\text{mind}, \text{LE-ány}\}\text{-a}$

The further fate of newly formed bonds and classes depends on the function of memory: bonds, as well as classes will fade away unless strengthened by repetitions. The extremely limited and repetitive infant-addressed speech is essential for language acquisition. The limited environment of the infant (**the blessing of the poverty of stimulus**) satisfies this condition.

The folk tale like *Salt* is suitable for language expansion but not acquisition by infants. The child-addressed speech has been a subject of detailed investigation in many languages and its properties—almost no syntax, short phrases, pauses, and repetitions—make me think that if there is anything innate in language acquisition it is the Motherese, which sounds very much as Nean. For an introductory but rich in detail review, see [5]. Some Russian tales for children are very simple and repetitive, for example *Kolobok* (“Round Bun”) [6], which is one of the very first tales read to children in Russia.

It is easy to see that if the steps of processing *Salt* are continued, the content of the acquiring mind will soon become complicated. Its complexity does not exceed, however, that of grammar, which is easily manageable by a young mind. It is important to understand that such complex equilibriums are typical for chemical systems. They would completely paralyze all practical chemistry, as well as biochemistry of life, if not for one circumstance: **most of them are absolutely negligible** because either an equilibrium is

shifted practically toward one end or either the establishing of most equilibriums takes a very long, sometimes astronomical, time. In chemical reality, the content of the flask or living cell is processed before the equilibrium establishes, so that only a few fast-forming products are present. Life and industrial chemistry never come to equilibrium. Even in wine-making, achieving equilibrium during the maturation of the wine is just a costly dream.

I would dogmatize the principles of kinetics in human sciences in the following way:

**We say what can be said faster.**

**We understand what can be understood faster.**

**We do what can be done faster.**

Examples: we say stupid things, fear mathematics, and marry a wrong person.

The next question is how we can compute such systems where **kinetics and not thermodynamics** rules. They are not the same as what is understood by **dynamical systems**. As I believe, this is where the key to understanding the mind can be found.

I suspect that computational chemistry has made some progress in this area, which is outside my expertise, but I am not familiar with the literature at this point. I leave this question open, adding only that I believe that Ulf Grenander's GOLEM [3] is the right starting point because of its chemical properties. The only idea I would add is the kinetics.

It is not so difficult to program the succession of steps, but it is more difficult to include the kinetics because of problems with the structure of transition state. It is possibly complicated, but not hopeless. I am not prepared, however, at this stage to approach the entire problem of computation. The molecules compute the state of the system quite effectively, I can see how they do it, but without a new parallel hardware it would take astronomical time to simulate it on PC. In computational chemistry this type of problems is represented by **protein folding**.

The information about the state of the system, kinetic or not, can be fully represented by the **Q** and **A** matrix of Ulf Grenander [2,3]. Honestly, I am afraid that the

computation can only obscure the simplicity of basic ideas. In order to better illustrate them **incrementally**, I am adding the next step.

### Step 3

P3 = char ('ez', 'nem', 'is', 'lett', '**VOL**', 'na', '**NE**', 'héz', 'mert', '**HÁ**', 'rom', '**OR**', 'szág', 'a', 'volt', '**PAUSE**', 'mind', 'a', '**HÁ**', 'rom', '**LE**', 'ány', 'á', 'ra', '**JUT**', 'ott', '**EDY**', 'egy', '**OR**', 'szág', '**STOP**'); P = strvcat (P1, P2, P3);

**Table 3**

1	a, ni	4	STOP	az, ez
2	STOP, a	2	volt	EDY, PAUSE
3	ott, volt	2	EDY	egy, szer
4	EDY	1	szer	egy
5	EDY, szer	2	egy	OR, Ö
6	az, egy	2	Ö	2-reg
7	2-Ö	2	reg	2-KI
8	2-reg	2	KI	2-rály
9	2-KI	2	rály	PAUSE, SZE
10	rály, volt	2	PAUSE	mind, s
11	PAUSE	1	s	HÁ
12	2-a, mert, s	4	HÁ	4-rom
13	4-HÁ	4	rom	2-LE, OR, szép
14	rom	1	szép	LE
15	2-rom, szép	3	LE	3-ány
16	3-LE	3	ány	a, á, át
17	2-mind, szág, ány	4	a	2-HÁ, STOP, volt
18	STOP	1	az	Ö
19	rály	1	SZE	ret

20	SZE	1	ret	te
21	ret	1	te	VOL
22	lett, te	2	VOL	2-na
23	2-VOL	2	na	NE, mind
24	PAUSE, na	2	mind	2-a
25	ány	1	át	FÉRJ
26	át	1	FÉRJ	hez
27	FÉRJ	1	hez	AD
28	hez	1	AD	ni
29	AD	1	ni	STOP
30	STOP	1	ez	nem
31	ez	1	nem	is
32	nem	1	is	lett
33	is	1	lett	VOL
34	na	1	NE	héz
35	NE	1	héz	mert
36	héz	1	mert	HÁ
37	egy, rom	2	OR	2-szág
38	2-OR	2	szág	STOP, a
39	ány	1	á	ra
40	á	1	ra	JUT
41	ra	1	JUT	ott
42	JUT	1	ott	EDY

We have to add to **Table 3** the bonds and classes generated in the previous step:

W1	{az, egy}- <b>Ö</b>	W2	{a,s}-HÁ
W3	rom-{LE, szép}	W4	ány-{ a, át }
W5	{mind, ány}-a		
W6	rom-{ <b>LE</b> , szép} ⇒ rom-{ <b>LE-ány</b> , szép}		
W7	{mind, <b>ány</b> }-a ⇒ {mind, <b>LE-ány</b> }-a		
<p>{<b>Ö</b>, reg } ⇔ <b>Ö</b>-reg ; {reg, KI} ⇔ reg-KI ; {KI + raly} ⇔ KI-raly;          { <b>Ö</b>, reg, KI, raly } ⇔ <b>Ö</b>-reg-KI-raly; {LE , ány } ⇔ LE-ány;</p>			

The new material in **Table 3** is highlighted yellow. New bonds and classes can be extracted from the following lines, which can be characterized as **relevant novelty**:

6	az, egy	2	<b>Ö</b>	2-reg
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12	2-a, mert, s	4	HÁ	4-rom
13	4-HÁ	4	rom	2-LE, OR, szép

17	2-mind, szág, ány	4	a	2-HÁ, STOP, volt
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22	lett, te	2	VOL	2-na
23	2-VOL	2	na	NE, mind

37	egy, rom	2	OR	2-szág
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### New bonds:

{VOL-na} ⇔ VOL-na

{OR, szág } ⇔ OR-szág

### Expansion of old classes:

- W1 {a, mert, s }-HÁ  
 W3 rom-{LE, szép, OR}  
 W5 {mind, ány, szág}-a

### New classes:

- W8 {az, egy}-Ö  
 W9 a-{ HÁ, volt}  
 W10 {lett, te}-VOL  
 W11 na-{NE, mind}

### Some of new equilibriums:

- {mind}  $\Leftrightarrow$  mind-a-HÁ-rom-LE-ány (“all three girls”)  
 { HÁ }  $\Leftrightarrow$  HÁ-rom-OR-szág  
 {KI-rály}  $\Leftrightarrow$  az-Ö-reg-KI-rály

I intentionally do not interpret the classes, but a linguist even very superficially familiar with Hungarian will note that **egy** and **az** in W8 make up for two out of three Hungarian forms of the article (**egy**, **a**, and **az**) . In the subsequent text, **KI-rály** will bind all articles in a class and, therefore, all nouns and adjectives will be bound in class by the articles. This creeping and crawling process of triangulation, which in the eyes of a chemist is nothing but catalysis, seems to be the essence of language acquisition and growth in general. I would compare it with a group of mountain climbers who help and safeguard each other.

I will illustrate the main idea of the “chemical” approach to language acquisition from a slightly different angle, with relation to [7]. I repeat **Table 2** with additional columns that indicate only bonds and classes of syllables. Thus, generator **Ö**, (1) forms a bond with **-reg** on the right and (2) denotes a class including **az** and **egy** on the left. Generator **ány** (1) forms a bond with **LE** on the left and (2) denotes a class including **a** and **s** on the right. Since we are in the very beginning of acquisition, the three last columns do not contain any new information, but with next steps the new and more general classes, for example, what we call Article of Noun, can be added.

**Table 2A**

	LEFT		G	RIGHT	BOND	Class UP	Class DOWN
1	a	3	STOP	az			
2	STOP	1	volt	EDY			
3	volt	1	EDY	szer			
4	EDY	1	szer	egy			
5	szer	1	egy	<b>Ö</b>			
6	az, egy	2	<b>Ö</b>	<b>2-reg</b>	<b>-reg</b>	{az-, egy-}	
7	<b>2-Ö</b>	2	<b>reg</b>	2-KI			
8	2-reg	2	<b>KI</b>	<b>2-rály</b>	<b>-rály</b>		
9	<b>2-KI</b>	2	<b>rály</b>	PAUSE, SZE	<b>KI-</b>		
10	rály	1	PAUSE	s			
11	PAUSE	1	s	HÁ			
12	a, s	2	<b>HÁ</b>	<b>2-rom</b>	<b>-rom</b>	{a-, s-}	
13	<b>2-HÁ</b>	2	<b>rom</b>	LE, szép	<b>HÁ-</b>		{-LE, -szép}
14	rom	1	szép	LE			
15	rom, szép	2	<b>LE</b>	<b>2-ány</b>		{rom-, szép-}	
16	<b>2-LE</b>	2	<b>ány</b>	a, át			{-a, -át}
17	mind, ány	2	a	HÁ, STOP		{mind-, ány-}	
18	STOP	1	az	Ö			
19	rály	1	SZE	ret			
20	SZE	1	ret	te			
21	ret	1	te	VOL			
22	te	1	VOL	na			
23	VOL	1	na	mind			
24	na	1	mind	a			
25	ány	1	át	FÉRJ			
26	át	1	FÉRJ	hez			
27	FÉRJ	1	hez	AD			

28	hez	1	AD	ni			
29	AD	1	ni	STOP			

Let us consider all possible arrangements of three generators: **a**, **HÁ**, and rom.

1. **a-HÁ-rom**
2. a-rom-HÁ
3. **HÁ-rom-a**
4. **HÁ-rom-a**
5. rom-a-HÁ
6. rom-HÁ-a

Only triplet **a-HÁ-rom** contains **both** regular bond **HÁ-rom** and the regular class **a-HÁ**. Therefore, the transition state from thought to utterance that contains this triplet has the lowest energy among six triplets and the utterance that includes it has the highest chance to be generated at normal conditions.

Along the same principles, it follows from **Table 2A** (but not from the final state of language knowledge) that **Fragment 1** below has better chances than **Fragment 2**. In both fragments, **HÁ-rom** (“three”) and **LE-ány** (“girl”) are considered relatively stable generators.

**Fragment 1:** [a]—[HÁ-rom]—[LE-ány]. **Fragment 2:** [LE-ány]—[a]—[HÁ-rom].

I balk at the next steps of acquisition before the process becomes too cumbersome, but here is the table for the next step:

## Step 4

P4 = char ( 'HA', 'nem', 'A', 'hogy', 'an', 'nincs', 'HÁ', 'rom', 'EDY', 'for', 'ma', 'AL', 'ma', 'PAUSE', 'úgy', 'a', 'HÁ', 'rom', 'OR', 'szág', 'sem', 'volt', 'EDY', 'for', 'ma', 'STOP');

P=strvcat (P2, P3, P4, P5);

Table 4

1	a, ni, szág	5	STOP	HA, az, ez
2	STOP, a, sem	3	volt	2-EDY, PAUSE
3	ott, rom, 2-volt	4	EDY	egy, 2-for, szer
4	EDY	1	szer	egy
5	EDY, szer	2	egy	OR, Ö
6	az, egy	2	Ö	2-reg
7	2-Ö	2	reg	2-KI
8	2-reg	2	KI	2-rály

9	2-KI	2	rály	PAUSE, SZE
10	ma, rály, volt	3	PAUSE	mind, s, úgy
11	PAUSE	1	s	HÁ
12	3-a, mert, nincs, s	6	HÁ	6-rom
13	6-HÁ	6	rom	EDY, 2-LE, 2-OR, szép
14	rom	1	szép	LE
15	2-rom, szép	3	LE	3-ány
16	3-LE	3	ány	a, á, át
17	2-mind, szág, ány, úgy	5	a	3-HÁ, STOP, volt
18	STOP	1	az	Ö
19	rály	1	SZE	ret
20	SZE	1	ret	te
21	ret	1	te	VOL
22	lett, te	2	VOL	2-na
23	2-VOL	2	na	NE, mind
24	PAUSE, na	2	mind	2-a
25	ány	1	át	FÉRJ
26	át	1	FÉRJ	hez
27	FÉRJ	1	hez	AD
28	hez	1	AD	ni
29	AD	1	ni	STOP
30	STOP	1	ez	nem
31	HA, ez	2	nem	A, is
32	nem	1	is	lett
33	is	1	lett	VOL
34	na	1	NE	héz
35	NE	1	héz	mert
36	héz	1	mert	HÁ
37	egy, 2-rom	3	OR	3-szág
38	3-OR	3	szág	STOP, a, sem
39	ány	1	á	ra
40	á	1	ra	JUT
41	ra	1	JUT	ott
42	JUT	1	ott	EDY
43	STOP	1	HA	nem
44	nem	1	A	hogy
45	A	1	hogy	an
46	hogy	1	an	nincs
47	an	1	nincs	HÁ
48	2-EDY	2	for	2-ma
49	AL, 2-for	3	ma	AL, PAUSE, STOP
50	ma	1	AL	ma
51	PAUSE	1	úgy	a
52	a	1	sem	volt

We can use a bigger or even complete text if we unrealistically assume that it all can be kept in the focus of attention (called **window** in psycholinguistics). This is impossible with real children but possible with robot-child. One practical implementation of language chemistry can be the actual simulation of robot-child and its learning. Like the wheel, it may be unnatural, but practical.



**I emphasize that the entire concept is no more than a hypothesis** and it needs a lot of further confirmations of its validity, which could be my next task.

The essence is, in very general terms, that the child creates its own grammar which is constantly and significantly updated by the input in an incremental manner. In other words, grammar is a kind of a biological species, very primitive in the beginning, which evolves in the environment of input and an exchange with environment into its final complex form which remains individual. The mechanism of this evolution consists of simplistic and somewhat mechanical rules. In this sense, the child possesses a real Language Acquisition **Device**, as Chomsky prophetically called it, which works until the active learning takes off. The LAD quite mechanically (i.e., “chemically”) generates hypotheses about the grammar (i.e., regularity of PT) for further tests.

Thus, at the initial stage, if the entire input is nothing but a single tale about salt, the child-robot, probably, knows that **HÁ-rom** (“three”) is a separate word because it occurs in different environments, but perceives **Ö-reg-KI-raly** (“old king”) as a single word because there is no evidence to the contrary.

The complete text [4], translation, and its complete **Table 4** are given in the **APPENDIX** for those who would like to see for themselves how much grammar can be extracted from the triplets. Obviously, not all of it, but quite a lot, which will be enough for telling simple tales in a simple language.

Next I will select some lines from **Table 4** and expand them, as before, with columns **Bond (B)**, **Class UP (CUP)**, **Class Down (CDN)**, and **New G(NG)**, filled out manually in order to provide more illustrations. This time I will give some translations.

	<b>LEFT</b>		<b>G</b>	<b>RIGHT</b>	<b>Bond</b>	<b>CUP</b>	<b>CDN</b>	<b>NG</b>
<b>2</b>	STOP, a, ez, kos, lan, len, meg, nem, sem, szép	10	volt	AZ, 2-EDY, KÜ, PAUSE, STOP, TER, a, csak, mind	volt- EGY			

**Line 2.** Since **volt-EGY** occurs more than once, formally, there is a bond between them. This is a hypothesis the child-robot’s LAD has to make.

	LEFT		G	RIGHT	Bond	CUP	CDN	NG
3	STOP, ig, még, ott, rom, ta, 2-volt	8	EDY	egy, et, 2-for, ma, 3-szer	EDY-for-ma, EDY-szer			
49	AL, EDY, Még, 2-for	5	ma	AL, PAUSE, STOP, gá, is	forma			

**Line 3.** Since there is a hypothetical bond **EGY-szer** (“once”) , **Lines 2 and 3** imply a block **volt-EGY-szer**. This hypothesis could be further rejected, but in the context of the tale it is justified: “there was once...” is a standard beginning of a folk tale.

Similarly, **Lines 3 and 49** imply **EDY-for-ma** (“equal,” “same”) ,as a block, and this hypothesis is correct. Other examples of **bond** formation can be seen in **Table 4**. **No** in **Line 223** is an interjection, naturally, between two pauses.

	LEFT		G	RIGHT	Bond	Class Up	Class Down	NG
53	2-PAUSE, STOP, szer, 2-én	6	azt	FEL, HAL, 3-MOND, ROS	aztMONDta			
54	3-PAUSE, STOP, 3-azt	7	MOND	jad, 5-ta, tam	MONDta			
55	HAGY, JÁR, 5-MOND, TISZ, TUD, ad, dol, fog, 2-lát, nál, tol, áz	17	ta	BÚZ, EDY, MA, MEG, SZOM, 7-a, az, hogy, lak, már, szó		V-ta (V= verb)		
80	Azt, 3-PAUSE, ged, nem	6	KÉR	6-dez	KÉRdez			
81	6-KÉR	6	dez	lek, 4-te, tem	KÉRdezte			
86	a, két	2	GA	2-lamb	GAlamb			
180	2-MEG	2	lát	2-ta	MEGlátta			
223	3-STOP	3	No	3-PAUSE	PAUSE-No-PAUSE			

Some of the bonds will survive, other will not. The grammar that the child-robot builds looks like a kind of a living evolving ecosystem rather than an artificial zoo of species.

	LEFT		G	RIGHT	Bond	Class Up	Class Down	NG
17	STOP, 2-ban, de, 2-dult, 2-ek, 2-em, ett, i, ik, ja, járt, jött, lamb, ment, 2-mind, mint, nak, rá, 2-rály, rályt, szer, szett, szág, sírt, 7-ta, 6-te, ták, ték, volt, 3-ány, úgy	50	a	2-FI, GA, 3-HÁ, KAN, KEZ, 12-KI, KÖ Z, 6-LE, 4-LEG, 2-PA, PE, PIL, RU, 2-STOP, SZEL, TISZ, TÖB, VA, i, 6-sót, volt	a-XYZ...		-XYZ	
21	TET, 4-dez, el, 2-et, get, hát, ret, szélsz	12	te	MIND, 2-PAUSE, STOP, TOL, VOL, 6-a	KÉRdezte-a...	...xyz-te		

**Line 17.** Hungarian **a /az** is the definite article. It is, as the mathematicians say, “degenerated” by having too many possible neighbors. Its function seems vague. But while most of the neighbors on the right are stressed (capitalized) syllables, i.e., beginnings of words, those on the left are, remarkably, all unstressed.

NOTE: **sót** is the objective case of **só**, “salt.” I did not capitalized it because of the inconsistency of my hyphenation rules, but it is a noun.

The hypothesis is that there is a bond between article **a** and any stressed syllable denoted as XYZ. It also follows that the definite article forms a Class Down, i.e., a class of all words that follow it. A linguist would call it the class of nouns, but the child does not know linguistics. In the beginning of acquisition, morpheme **i** and verb **volt** (“was”) seems to be included in the class erroneously. This is because morpheme **a** is not only an article but also a multi-functional marker for verbs and nouns. The vocabulary of the tale is not sufficient to make some correct grammatical assignments. Other examples with **XYZ** or unstressed **xyz** can also be found in the **Table**.

Line	LEFT		G	RIGHT	Bond	Class Up	Class Down	New G
<b>18</b>	PAUSE, STOP, ban, csak, el, en, 2-hogy, ki, mert, mint, még, ra, rály, sót, ta, ve, ílt, írt, ült	20	az	AJ, AP, AR, ASZ, EB, 3-EM, OR, UD, ÉD, ÉT, 8-Ö	az-XYZ... X=vowel; azÖreg...		-XYZ	

<b>60</b>	PAUSE, 4-a, rály	6	LEG	i, job, 2-kis, nagy, szebb	a LEG kis?			
<b>117</b>	5-kis	5	asz	4-szony, szonyt				-t
<b>220</b>	et, het, tet	3	ték	EGY, PAUSE, a		xyz-t-ték		-t
<b>95</b>	az, 3-es	4	AP	2-ád, 2-ám	APád, APám		AP- {ád, ám}	
<b>96</b>	2-AP, BÁTŸ	3	ám	2-PAUSE, UR		XYZ-ám		

**Line 18.** Definite article **a** takes the form **az** before vowels. Due to the limitation of the current vocabulary, a hypotheses about the block **az-Ö-reg-KI-rály** (“the old king”) is formed, which is true only within the context of this tale, together with the correct bond **az-XYZ...** , where **X** = vowel.

At the same time, the article **a/az** creates a large class of syllables belonging to what we call nouns, numerals, and adjectives, so that the acquisition device rather early marks the category of nouns and adjectives.

**Line 60.** **LEG** (Superlative morpheme) forms bonds with **kis** (“little, small”), which, in turn, can be extended to either **asz** (**assz**) , bonded further with **szony** or **ebb**.

Therefore, **kis** can be a component of either block **LEG-kis-ebb** , “the youngest” or block **KI-rály-kis-asz-szony** , “princess” (literally, king-little-lady). How can the child-robot decide which? It depends on what other components are there in the focus. In the tale, the choice is unambiguous because **ebb** and **asszony** are not encountered between two stops.

**Line 95.** **AP-ád** , (“your father”) an **AP-ám** (“my father”) create a class **-{ -ád, -ám}** , which itself creates class **XYZ-{-ád, -ám}** if more **XYZ** with **ád** and/or **ám** are encountered. This nouns and possessive endings are thereby bonded as two classes.

**Line 117.** The fact that **asszony** (“woman, lady”) and **asszonyt** (Object Case) differ in a sound implies that **t** can be a generator, although it is not a syllable. And in fact, **t** is an important multifunctional marker in Hungarian. See also **Line 220** .

Those are some of many bits of grammar that the robot-child can acquire from the *Tale of Salt*.

As I hinted in previous e-papers [1], the language acquisition is just one case of the entire class of processes of growth. Knowledge acquisition, for example, by scientific means, is another one. The child-robot works by building and updating hypotheses, as the scientist does. Biological mutations are hypotheses of a kind, too. Both biological and language-acquisition mutations do not involve any mind.

I assume that the pattern model of the mind can be built **incrementally**, along the principles of **simplicity** [1], in the same way a child acquires language or builds a Lego palace, i.e., with almost no thinking involved. When some intermediate construct seems unstable (contradictive or counterproductive, i.e. working against homeostasis), an improvement is made by trial and error. Whatever I have presented regarding language, however, does not take to account homeostasis. The actual building of the model of the mind will naturally include it.

In general, three general ideas, none of them new, seem to emit guiding light:

1. Language acquisition is a counterpart of biological evolution of species and natural evolution of knowledge.
2. Language acquisition device (LAD) is really a device, which, like any device, works as a mechanism, even though somewhat lax and wobbly.
3. Language acquisition is like packing a parachute: if some sections do not go first, and other last, it will not open. This is the essence of bootstrapping.

### Further work with *Salt* and other objects

It is obvious that my manual analysis of triplet tables is subjective and cumbersome. A computer code for incremental simplistic learning from syllabic input is needed. Can the code itself be simple? How far can we go with simplicity? Do we need forgetting in order

to learn? Etc. Ultimately, can we construct an interface between thought and speech, working on principles of kinetics? A next step in my program is to explore the transition state. The question is: how can a semantic configuration be squashed into the line with the help of a triplet grammar? As a chemist, I clearly see the whole mechanism, but to present it to non-chemists as a model is a challenge.

**Questions, suggestions and shattering criticism are welcome at:**

**EMAIL: <http://spirospero.net/email.html>**

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See also <http://spirospero.net/complexity.htm>

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## APPENDIX

The approximate pronunciation of some consonants is: **gy = d** in “due”, **j** and **ly = y** in “you,” **s = sh**, **sz = s**, and **cs = ch**. The short vowels are: **a, e, i, o, u, ö, and ü**; they all sound, approximately, as in German. The long vowels are **Á á, É é, Í í, Ó ó, Ú ú,** and **Ő ő**. The latter, **Ő ő**, which is not rendered by MATLAB, will be alternatively denoted **Õ õ**. The stress and the length of the vowels are independent, which gives the Hungarian language its characteristic syncopated melody. The stress is on the first syllable, but what is a syllable? I don't hear it as carved in stone.

### A SÓ

The transcription of the folktale by Elek Benedek [5].

Volt egyszer egy öreg király s három szép leánya. Az öreg király szerette volna mind a három leányát férjhez adni. Ez nem is lett volna nehéz, mert három országa volt, mind a három leányára jutott egy-egy ország. Hanem ahogyan nincs három egyforma alma, úgy a három ország sem volt egyforma.

Azt mondta egyszer a király a leányainak, hogyannak adja a legszebb országát, amelyik őt legjobban szereti.

- Felelj nekem, édes leányom, hogy szeretsz engem? - kérdezte a legidősebbiket.

- Mint a galamb a tiszta búzát - mondta a leány.

- Hát te, édes leányom? - kérdezte a középsőt.

- Én úgy, édesapám, mint forró nyárban a szellőt.

- No, most téged kérdezlek - fordult a legkisebbikhez -, mondjad, hogy szeretsz?

- Úgy, édesapám, ahogy az emberek a sót! - felelte a kicsi királykisasszony.

- Mit beszélsz, te! - förmedt rá a király. – Ki az udvaromból, de még az országomból is!

Ne is lássalak, ha csak ennyire szeretsz!

Hiába sírt a királykisasszony, hiába magyarázta, hogy az emberek szeretik a sót: világgá kellett hogy menjen.

Elindult a kicsi királykisasszony sírva, s beért egy nagy erdőbe. Onnan nem is ment tovább, ott éltegy darabig egymagában.

Egyszer, mikor már egy esztendő is eltelt, arra járta szomszéd királyfi, s meglátta a királykisasszonyt.

Megtetszett a királyfinak a királykisasszony, mert akármilyen piszkos volt a ruhája, szép volt, különösen az arca. Szépen megfogta a kezét, hazavezette a palotájába, s két hetet sem várt, de még egyet sem, de talán még egy órát sem, és megesküdték.

A fiatal pár békésen élt, úgy szerették egymást, mint két galamb. Egyszer azt mondta a király:

- No, feleség, amikor először megláttalak, nem kérdeztem, miért kergetett el az apád.

Mondd meg nekem a valóságot!

- Azt kérdezte tőlem, hogy szeretem őt, s én azt feleltem: mint az emberek a sót.

- Jól van, majd csinálok én valamit, tudom, megszeret újra az édesapád - mondta a király.

S azzal levelet írt az öreg királynak, s abban meghívta ebédre. El is ment a levél másnap, s harmadnap jött a király. Fölvezette a fiatal király az öreg királyt a palotába. Ott már meg volt terítve az asztal két személyre s leültek. No, ez volt csak az ebéd! Megkóstolta az öreg király a levest, de le is tette mindjárt a kanalat, nem tudta megenni, olyan sóatlan volt. Gondolta magában az öreg király: ebből bizony kifelejtették a sót, de a többi ételben majd csak lesz. De nem volt azokban sem. Hordták a pecsenyéket, de vissza is vihették, mert az öreg király bele sem harapott, olyan sóatlan, ízetlen volt mind. De ezt már nem hagyta szó nélkül:

- Hallod-e, öcsém, hát milyen szakácsod van neked, hogy só nélkül süt-főz? - kérdezte.

- Sóval süt-főz ez máskor mindig, de én azt hallottam, hogy bátyámuram nem szereti a sót, azt mondtam hát neki, hogy ne tegyen sót az ételekbe.

- No, azt rosszul tetted, mert én nagyon szeretem a sót. Kitől hallottad, hogy nem szeretem?

- A leányától - mondta a fiatal király. Abban a pillanatban kinyílt az ajtó, és belépett a királyné, az öreg király legkisebb leánya. Hej, istenem, örült az öreg király! Mert sajnálta már nagyon, hogy elkergette a leányát. Most neki adta a legnagyobb országát.

Még ma is élnek, ha meg nem haltak.



## Translation:

### Salt

Once upon a time there lived an old king with his three beautiful daughters. The old king wanted all three his daughters to get married. It would not be difficult because he had three lands, one for each daughter. But as there are no three apples alike, so there are no three lands alike. And so the king told his daughters that he will give the best kingdom to the daughter who loves him most.

“Tell me, my dear daughter, how do you love me?” he asked the oldest.

“As a dove loves pure grain,” answered the eldest.

“And you, dear daughter?” He asked the middle one.

“And I love you as much as a breeze in hot summer.”

“Now I am asking you, he turned to the youngest, tell me how do you love me?”

“As much, dear father, as people love salt,” answered the little princess.

“What are you saying!” The king shouted. “Off my court, and get out of my land. I don’t want to see you if you love me that much.”

In vain the princess cried, in vain explained how people like salt: she had to go. The little princess left in tears and came to a big forest. She did not go any further, she lived there completely on her own.

Once , when already a year had passed, a neighboring prince came there and saw the little princess. The prince was struck by the princess because however shabby her dress was, she was beautiful, especially, her face. He gently took her hand and brought her to his palace, and not in two weeks, not even one, maybe not even in an hour they got married.

The young couple lived in love like two doves.

One day the king said, “Well, my wife, when I first saw you, I did not ask why your father banished you. Tell me the truth!”

“He had asked me how I loved him and I answered: as people love salt.”

“Good, then I know how to do something so that you father will love you again,” said the king. And he wrote a letter, inviting the old king for dinner. Next day the letter went out and after another day the king arrived. The young king invited the old king into his palace. There already was a table set for two and they sat down. But what a dinner it was! The old king tried the soup but had to put down the spoon at once and could not eat because it was without salt. The old king thought for himself: here certainly the salt was forgotten, but probably not in other food. But there was no salt either. The roast was brought in but taken back because the old king could not take a bite, so saltless and tasteless everything was. But he already lost his patience.

“Listen, young man, what kind of cook do you have that cooks without salt?” He asked.

“He always cooks with salt in other times but I heard that you, sir, do not like salt, so I said to him not to salt food.”

“Well, this is very bad that you did so because I like salt very much. From whom did you hear that I do not like it?”

“From your daughter,” said the young king.

At this moment, the door opened and the queen, the youngest daughter of the old king, entered. Good Lord, how the old king rejoiced! Now he regretted very much having chased the girl away. Now he gave her the largest land.

They are still living, if have not died.

## Input string for MATLAB

```
P=char ('STOP', 'volt', 'EDY', 'szer', 'egy', 'Ö', 'reg', 'KI', 'rály', 'PAUSE', 's', 'HÁ', ...
'rom', 'szép', 'LE', 'ány', 'a', 'STOP', 'az', 'Ö', 'reg', 'KI', 'rály', ...
'SZE', 'ret', 'te', 'VOL', 'na', 'mind', 'a', 'HÁ', 'rom', 'LE', 'ány', 'át', 'FÉRJ', 'hez', ...
'AD', 'ni', 'STOP', 'ez', 'nem', 'is', 'lett', 'VOL', 'na', 'NE', 'héz', 'mert', 'HÁ', ...
'rom', 'OR', 'szág', 'a', 'volt', 'PAUSE', 'mind', 'a', 'HÁ', 'rom', 'LE', ...
'ány', 'á', 'ra', 'JUT', 'ott', 'EDY', 'egy', 'OR', 'szág', 'STOP', 'HA', 'nem', 'A', ...
'hogy', 'an', 'nincs', 'HÁ', 'rom', 'EDY', 'for', 'ma', 'AL', 'ma', 'PAUSE', 'úgy', 'a', ...
'HÁ', 'rom', 'OR', 'szág', 'sem', 'volt', 'EDY', 'for', 'ma', 'STOP', ...
'azt', 'MOND', 'ta', 'EDY', 'szer', 'a', 'KI', 'rály', 'a', 'LE', 'ány', 'a', 'i', 'nak', ...
'hogy', 'AN', 'nak', 'AD', 'ja', 'a', 'LEG', 'szebb', 'OR', 'szág', 'át', 'PAUSE', 'A', ...
'mely', 'ik', 'öt', 'PAUSE', 'LEG', 'job', 'ban', 'SZER', 'e', 'ti', 'STOP', 'FEL', 'elj', ...
```

'NEK', 'em', 'PAUSE', 'ÉD', 'es', 'LE', 'ány', 'om', 'PAUSE', 'hogy', 'SZER', 'etsz', ...  
 'EN', 'gem', 'PAUSE', 'KÉR', 'dez', 'te', 'a', 'LEG', 'i', 'dő', 'sebb', 'ik', 'et', ...  
 'STOP', 'mint', 'a', 'GA', 'lamb', 'a', 'TISZ', 'ta', 'BÚZ', 'át', 'PAUSE', 'MOND', ...  
 'ta', 'a', 'LE', 'ány', 'STOP', 'hát', 'te', 'PAUSE', 'ÉD', 'es', 'LE', 'ány', 'om', 'PAUSE', ...  
 'KÉR', 'dez', 'te', 'a', 'KÖZ', 'ép', 'sőt', 'STOP', 'én', 'ügy', 'ÉD', 'es', 'AP', ...  
 'ám', 'PAUSE', 'mint', 'FOR', 'ró', 'NYÁR', 'ban', 'a', 'SZEL', 'lőt', 'STOP', 'no', ...  
 'most', 'TÉ', 'ged', 'KÉR', 'dez', 'lek', 'PAUSE', 'FOR', 'dult', 'a', 'LEG', 'kis', 'ebb', ...  
 'ik', 'hez', 'STOP', 'MOND', 'jad', 'hogy', 'SZER', 'etsz', 'STOP', 'ügy', 'ÉD', ...  
 'es', 'AP', 'ám', 'PAUSE', 'A', 'hogy', 'az', 'EM', 'ber', 'ek', 'a', 'sót', 'PAUSE', 'FEL', ...  
 'el', 'te', 'a', 'KI', 'csi', 'KI', 'rály', 'kis', 'asz', 'szony', 'STOP', 'mit', 'BE', ...  
 'szélsz', 'te', 'PAUSE', 'FÖR', 'medt', 'rá', 'a', 'KI', 'rály', 'STOP', 'ki', 'az', ...  
 'UD', 'var', 'om', 'ból', 'de', 'még', 'az', 'OR', 'szág', 'om', 'ból', 'is', 'PAUSE', ...  
 'STOP', 'ne', 'IS', 'lás', 'sa', 'lak', 'PAUSE', 'ha', 'csak', 'EN', 'nyi', 're', 'SZER', ...  
 'etsz', 'STOP', 'HI', 'á', 'ba', 'sirt', 'a', 'KI', 'rály', 'kis', 'asz', 'szony', 'PAUSE', ...  
 'HI', 'á', 'ba', 'MA', 'gyar', 'áz', 'ta', 'hogy', 'az', 'EM', 'ber', 'ek', 'SZER', ...  
 'et', 'ik', 'a', 'sót', 'PAUSE', 'VI', 'lág', 'gá', 'KEL', 'lett', 'hogy', 'MENJ', 'en', ...  
 'STOP', 'EL', 'in', 'dult', 'a', 'KI', 'csi', 'KI', 'rály', 'kis', 'asz', 'szony', 'SÍR', ...  
 'va', 'PAUSE', 's', 'BE', 'ért', 'egy', 'nagy', 'ER', 'dő', 'be', 'STOP', 'ON', ...  
 'nan', 'nem', 'is', 'ment', 'TO', 'vább', 'PAUSE', 'ott', 'élt', 'egy', 'DA', 'rab', 'ig', ...  
 'EDY', 'ma', 'gá', 'ban', 'STOP', 'EDY', 'szer', 'MI', 'kor', 'már', 'egy', ...  
 'ESZT', 'en', 'dő', 'is', 'el', 'telt', 'PAUSE', 'ar', 'ra', 'JÁR', 'ta', 'SZOM', 'széd', ...  
 'KI', 'rály', 'fi', 'PAUSE', 's', 'MEG', 'lát', 'ta', 'a', 'KI', 'rály', 'kis', 'asz', 'szonyt', ...  
 'STOP', 'MEG', 'tet', 'szett', 'a', 'KI', 'rály', 'fi', 'nak', 'a', 'KI', 'rály', ...  
 'kis', 'asz', 'szony', 'PAUSE', 'mert', 'A', 'kár', 'mi', 'lyen', 'PISZ', 'kos', ...  
 'volt', 'a', 'RU', 'há', 'ja', 'PAUSE', 'szép', 'volt', 'KÜ', 'lön', 'ös', 'en', 'az', 'AR', ...  
 'ca', 'STOP', 'SZÉP', 'en', 'MEG', 'fog', 'ta', 'a', 'KEZ', 'ét', 'PAUSE', ...  
 'HA', 'za', 'vez', 'et', 'te', 'a', 'PA', 'lot', 'á', 'já', 'ba', 'PAUSE', 's', 'két', 'HET', ...  
 'et', 'sem', 'várt', 'PAUSE', 'de', 'még', 'EDY', 'et', 'sem', 'de', 'TAL', ...  
 'án', 'még', 'egy', 'ÓR', 'át', 'sem', 'PAUSE', 'és', 'MEG', 'es', 'küd', 'tek', 'STOP', ...  
 'A', 'FI', 'at', 'al', 'pár', 'BÉ', 'kés', 'en', 'élt', 'PAUSE', 'ügy', 'SZER', 'et', 'ték', ...  
 'EGY', 'mást', 'PAUSE', 'mint', 'két', 'GA', 'lamb', 'STOP', 'EGY', 'szer', 'azt', 'MOND', ...  
 'ta', 'a', 'KI', 'rály', 'STOP', 'No', 'PAUSE', 'FE', 'le', 'ség', 'PAUSE', 'A', 'mi', 'kor', 'EL', ...  
 'o', 'ször', 'MEG', 'lát', 'ta', 'lak', 'PAUSE', 'nem', 'KÉR', 'dez', 'tem', 'PAUSE', 'MI', ...  
 'ért', 'KER', 'get', 'ett', 'el', 'az', 'AP', 'ád', 'STOP', 'MONDD', 'meg', 'NEK', 'em', 'a', 'VA', ...  
 'lő', 'ság', 'ot', 'STOP', 'Azt', 'KÉR', 'dez', 'te', 'TOL', 'em', 'PAUSE', 'hogy', 'SZER', ...  
 'et', 'em', 'ot', 'PAUSE', 's', 'én', 'azt', 'FEL', 'el', 'tem', 'PAUSE', 'mint', 'az', 'EM', 'ber', ...  
 'ek', 'a', 'sót', 'STOP', 'Jól', 'van', 'PAUSE', 'majd', 'CSI', 'nál', 'ok', 'én', 'VA', 'la', 'mit', ...  
 'PAUSE', 'TUD', 'om', 'PAUSE', 'MEG', 'szeret', 'ÚJ', 'ra', 'az', 'ÉD', 'es', 'AP', 'ád', ...  
 'PAUSE', 'MOND', 'ta', 'a', 'KI', 'rály', 'STOP', 's', 'AZ', 'zal', 'LE', 'vel', 'et', 'írt', 'az', ...  
 'Ö', 'reg', 'KI', 'rály', 'nak', 'PAUSE', 's', 'AB', 'ban', 'MEG', 'hívta', 'EB', 'éd', 're', ...  
 'STOP', 'EI', 'is', 'ment', 'a', 'LE', 'vél', 'MÁS', 'nap', 'PAUSE', 's', 'HAR', 'mad', 'nap', ...  
 'jött', 'a', 'KI', 'rály', 'STOP', 'FÖL', 'vez', 'et', 'te', 'a', 'FI', 'at', 'al', 'KI', 'rály', 'az', 'Ö', ...  
 'reg', 'KI', 'rályt', 'a', 'PA', 'lo', 'tá', 'ba', 'STOP', 'Ott', 'már', 'meg', 'volt', 'TER', 'ft', 've', ...  
 'az', 'ASZ', 'tal', 'két', 'SZEM', 'ély', 're', 's', 'LE', 'ül', 'tek', 'STOP', 'No', 'PAUSE', 'ez', ...  
 'volt', 'csak', 'az', 'EB', 'éd', 'STOP', 'MEG', 'kós', 'tol', 'ta', 'az', 'Ö', 'reg', 'KI', 'rály', 'a', ...  
 'LE', 'vest', 'PAUSE', 'de', 'le', 'is', 'TET', 'te', 'MIND', 'járt', 'a', 'KAN', 'al', 'at', 'PAUSE', ...  
 'nem', 'TUD', 'ta', 'MEG', 'en', 'ni', 'PAUSE', 'OLY', 'an', 'SÓT', 'lan', 'volt', 'STOP', ...  
 'GON', 'dol', 'ta', 'MA', 'gá', 'ban', 'az', 'Ö', 'reg', 'KI', 'rály', 'STOP', 'EB', 'bol', 'BI', ...  
 'zony', 'KI', 'fel', 'ej', 'tet', 'ték', 'a', 'sót', 'PAUSE', 'de', 'a', 'TÖB', 'bi', 'ÉT', 'el', 'ben', ...  
 'majd', 'csak', 'lesz', 'STOP', 'De', 'nem', 'volt', 'AZ', 'ok', 'ban', 'sem', 'STOP', 'HORD', ...  
 'ták', 'a', 'PE', 'cseny', 'ék', 'et', 'PAUSE', 'de', 'VIS', 'sza', 'is', 'VI', 'het', 'ték', ...  
 'PAUSE', 'mert', 'az', 'Ö', 'reg', 'KI', 'rály', 'BE', 'le', 'sem', 'HA', 'rap', 'ott', 'PAUSE', ...  
 'OLY', 'an', 'SÓT', 'lan', 'PAUSE', 'ÍZ', 'et', 'len', 'volt', 'mind', 'STOP', 'De', 'ezt', 'már', ...  
 'nem', 'HAGY', 'ta', 'szó', 'NÉL', 'kül', 'STOP', 'HAL', 'lod', 'e', 'PAUSE', 'ÖCS', 'ém', ...  
 'PAUSE', 'hát', 'MILY', 'en', 'SZA', 'kács', 'od', 'van', 'NEK', 'ed', 'PAUSE', 'hogy', 'só', ...  
 'NÉL', 'kül', 'SÜT', 'foz', 'PAUSE', 'KÉR', 'dez', 'te', 'STOP', 'SÓ', 'val', 'SÜT', 'foz', ...

'ez', 'MÁS', 'kor', 'MIND', 'ig', 'PAUSE', 'de', 'én', 'azt', 'HAL', 'lot', 'tam', 'PAUSE', ...  
 'hogy', 'BÁTY', 'ám', 'UR', 'am', 'nem', 'SZER', 'et', 'i', 'a', 'sót', 'PAUSE', 'azt', 'MOND', ...  
 'tam', 'hát', 'NEK', 'i', 'PAUSE', 'hogy', 'ne', 'TEGY', 'en', 'sót', 'az', 'ÉT', 'el', 'ek', 'be', ...  
 'STOP', 'No', 'PAUSE', 'azt', 'ROS', 'szul', 'TET', 'ted', 'PAUSE', 'mert', 'én', 'NAGY', ...  
 'on', 'SZER', 'et', 'em', 'a', 'sót', 'STOP', 'KI', 'tol', 'HAL', 'lot', 'tad', 'PAUSE', 'hogy', ...  
 'nem', 'SZER', 'et', 'em', 'STOP', 'a', 'LE', 'ány', 'á', 'tól', 'PAUSE', 'MOND', 'ta', 'a', 'FI', ...  
 'at', 'al', 'KI', 'rály', 'STOP', 'AB', 'ban', 'a', 'PIL', 'la', 'nat', 'ban', 'KINY', 'ilt', 'az', 'AJ', ...  
 'tó', 'PAUSE', 'és', 'BE', 'lép', 'ett', 'a', 'KI', 'rály', 'né', 'PAUSE', 'az', 'Ö', 'reg', 'KI', 'rály', ...  
 'LEG', 'kis', 'ebb', 'LE', 'ány', 'a', 'STOP', 'Hej', 'PAUSE', 'IS', 'ten', 'em', 'PAUSE', ...  
 'ÖR', 'ült', 'az', 'Ö', 'reg', 'KI', 'rály', 'STOP', 'Mert', 'SAJ', 'nál', 'ta', 'már', 'NAGY', 'on', ...  
 'PAUSE', 'hogy', 'EL', 'ker', 'get', 'te', 'a', 'LE', 'ány', 'át', 'STOP', 'Most', 'NEK', 'i', ...  
 'ad', 'ta', 'a', 'LEG', 'nagy', 'obb', 'OR', 'szág', 'át', 'STOP', 'Még', 'ma', 'is', 'ÉL', 'nek', ...  
 'PAUSE', 'ha', 'meg', 'nem', 'HAL', 'tak', 'STOP');

Table 4: SALT complete

size (P) 1069 6 (number and length of syllables)

size (words) 1 366

No.	LEFT		G	RIGHT
1	PAUSE, STOP, 2-a, ba, ban, 2-be, ca, em, en, et, 2-etsz, hez, kül, lamb, lesz, löt, ma, mind, ni, ot, re, 7-rály, sem, szony, szonyt, szág, 2-sót, söt, te, 2-tek, ti, volt, ád, ány, 2-át, éd	50	STOP	A, AB, Azt, 2-De, EB, EDY, EGY, EL, EI, FEL, FÖL, GON, HA, HAL, HI, HORD, Hej, Jól, KI, 2-MEG, MOND, MONDD, Mert, Most, Még, 3-No, ON, Ott, STOP, SZÉP, SÓ, a, az, azt, ez, hát, ki, mint, mit, ne, no, s, én, úgy
2	STOP, a, ez, kos, lan, len, meg, nem, sem, szép	10	volt	AZ, 2-EDY, KÜ, PAUSE, STOP, TER, a, csak, mind
3	STOP, ig, még, ott, rom, ta, 2-volt	8	EDY	egy, et, 2-for, ma, 3-szer
4	3-EDY, EGY	4	szer	MI, a, azt, egy
5	EDY, már, még, szer, élt, ért	6	egy	DA, ESZT, OR, nagy, ÓR, Ö
6	8-az, egy	9	Ö	9-reg
7	9-Ö	9	reg	9-KI
8	STOP, 12-a, 2-al, 2-csi, 9-reg, széd, zony	28	KI	2-csi, fel, 23-rály, rályt, tol
9	23-KI	23	rály	BE, LEG, PAUSE, 7-STOP, SZE, 2-a, az, 2-fí, 5-kis, nak, né
10	Hej, 3-No, at, ba, e, ed, 3-em, et, fi, foz, gem, i, ig, is, ja, 2-lak, lan, lek, ma, mit, mást, nak, nap, nek, ni, né, 3-om, on, ot, ott, rály, sem, 2-szony, ség, 4-sót, tad, tam, 2-te, ted, telt, 2-tem, ték, tó, tól, va, van, vest, volt, vább, várt, ád, 2-ám, 2-át, élt, ém, ét, öt	72	PAUSE	3-A, FE, FEL, FOR, FÖR, HA, HI, IS, 3-KÉR, LEG, MEG, MI, 3-MOND, 2-OLY, STOP, TUD, VI, ar, az, 2-azt, 5-de, ez, 2-ha, 7-hogy, hát, majd, 3-mert, mind, 3-mint, 2-nem, ott, 7-s, szép, 2-ÉD, ÍZ, ÖCS, ÓR, 2-és, 2-úgy
1	7-PAUSE, STOP, re	9	s	AB, AZ, BE, HAR, HÁ, LE, MEG, két, én
2	3-a, mert, nincs, s	6	HÁ	6-rom
3	6-HÁ	6	rom	EDY, 2-LE, 2-OR, szép

4	PAUSE, rom	2	szép	LE, volt
5	6-a, ebb, 2-es, 2-rom, s, szép, zal	14	LE	vel, vest, vél, 10-ány, ül
6	10-LE	10	ány	STOP, 3-a, 2-om, 2-á, 2-át
7	STOP, 2-ban, de, 2-dult, 2-ek, 2-em, ett, i, ik, ja, járt, jött, lamb, ment, 2-mind, mint, nak, rá, 2-rály, rályt, szer, szett, szág, sirt, 7-ta, 6-te, ták, ték, volt, 3-ány, úgy	50	a	2-FI, GA, 3-HÁ, KAN, KEZ, 12-KI, KÖZ, 6-LE, 4-LEG, 2-PA, PE, PIL, RU, 2-STOP, SZEL, TISZ, TÖB, VA, i, 6-sót, volt
8	PAUSE, STOP, ban, csak, el, en, 2-hogy, ki, mert, mint, még, ra, rály, sót, ta, ve, ílt, irt, ült	20	az	AJ, AP, AR, ASZ, EB, 3-EM, OR, UD, ÉD, ÉT, 8-Ő
9	rály	1	SZE	ret
20	SZE	1	ret	te
1	TET, 4-dez, el, 2-et, get, hát, ret, szélsz	12	te	MIND, 2-PAUSE, STOP, TOL, VOL, 6-a
2	lett, te	2	VOL	2-na
3	2-VOL	2	na	NE, mind
4	PAUSE, na, volt	3	mind	STOP, 2-a
5	BÚZ, 2-szág, ÓR, 2-ány	6	át	FÉRJ, 2-PAUSE, 2-STOP, sem
6	át	1	FÉRJ	hez
7	FÉRJ, ik	2	hez	AD, STOP
8	hez, nak	2	AD	ja, ni
9	AD, en	2	ni	PAUSE, STOP
30	PAUSE, STOP, foz	3	ez	MÁS, nem, volt
1	De, HA, 2-PAUSE, am, ez, hogy, meg, már, nan	10	nem	A, HAGY, HAL, KÉR, 2-SZER, TUD, 2-is, volt
2	El, ból, dő, le, ma, 2-nem, sza	8	is	PAUSE, TET, VI, el, lett, 2-ment, ÉL
3	KEL, is	2	lett	VOL, hogy
4	na	1	NE	héz
5	NE	1	héz	mert
6	3-PAUSE, héz	4	mert	A, HÁ, az, én
7	az, egy, obb, 2-rom, szebb	6	OR	6-szág
8	6-OR	6	szág	STOP, a, om, sem, 2-át
9	2-HI, lot, 2-ány	5	á	2-ba, já, ra, tól
40	ar, ÚJ, á	3	ra	JUT, JÁR, az
1	ra	1	JUT	ott
2	JUT, PAUSE, rap	3	ott	EDY, PAUSE, élt
3	PAUSE, STOP, sem	3	HA	nem, rap, za
4	3-PAUSE, STOP, mert, nem	6	A	FI, 2-hogy, kár, mely, mi
5	2-A, 7-PAUSE, jad, lett, nak, ta	13	hogy	AN, BÁTÝ, EL, MENJ, 3-SZER, an, 2-az, ne, nem, só
6	2-OLY, hogy	3	an	2-SÓT, nincs
7	an	1	nincs	HÁ
8	2-EDY	2	for	2-ma
9	AL, EDY, Még, 2-for	5	ma	AL, PAUSE, STOP, gá, is
50	ma	1	AL	ma
1	2-PAUSE, STOP, én	4	úgy	SZER, a, 2-ÉD
2	ban, 2-et, le, szág, át	6	sem	HA, PAUSE, STOP, de, volt, várt
3	2-PAUSE, STOP, szer, 2-én	6	azt	FEL, HAL, 3-MOND, ROS
4	3-PAUSE, STOP, 3-azt	7	MOND	jad, 5-ta, tam
5	HAGY, JÁR, 5-MOND, TISZ, TUD, ad, dol, fog, 2-lát, nál, tol, áz	17	ta	BÚZ, EDY, MA, MEG, SZOM, 7-a, az, hogy, lak, már, szó
6	LEG, 2-NEK, a, et	5	i	PAUSE, a, ad, dő, nak

7	AN, fi, i, rály	4	nak	AD, PAUSE, a, hogy
8	hogy	1	AN	nak
9	AD, há	2	ja	PAUSE, a
60	PAUSE, 4-a, rály	6	LEG	i, job, 2-kis, nagy, szebb
1	LEG	1	szebb	OR
2	A	1	mely	ik
3	ebb, et, mely, sebb	4	ik	a, et, hez, őt
4	ik	1	őt	PAUSE
5	LEG	1	job	ban
6	2-AB, NYÁR, 2-gá, job, nat, ok	8	ban	KINY, MEG, STOP, SZER, 2-a, az, sem
7	ban, ek, 3-hogy, 2-nem, on, re, úgy	10	SZER	e, 6-et, 3-etsz
8	SZER, lod	2	e	PAUSE, ti
9	e	1	ti	STOP
70	PAUSE, STOP, azt	3	FEL	2-el, elj
1	FEL	1	elj	NEK
2	Most, elj, hát, meg, van	5	NEK	ed, 2-em, 2-i
3	2-NEK, TOL, 3-et, ten	7	em	3-PAUSE, STOP, 2-a, ot
4	2-PAUSE, az, 2-úgy	5	ÉD	5-es
5	MEG, 5-ÉD	6	es	3-AP, 2-LE, küd
6	TUD, szág, var, 2-ány	5	om	3-PAUSE, 2-ból
7	3-SZER	3	etsz	EN, 2-STOP
8	csak, etsz	2	EN	gem, nyi
9	EN	1	gem	PAUSE
80	Azt, 3-PAUSE, ged, nem	6	KÉR	6-dez
1	6-KÉR	6	dez	lek, 4-te, tem
2	ER, en, i	3	dő	be, is, sebb
3	dő	1	sebb	ik
4	EDY, HET, 6-SZER, ik, vel, 2-vez, ÍZ, ék	14	et	PAUSE, STOP, 3-em, i, ik, len, 2-sem, 2-te, ték, írt
5	3-PAUSE, STOP	4	mint	FOR, a, az, két
6	a, két	2	GA	2-lamb
7	2-GA	2	lamb	STOP, a
8	a	1	TISZ	ta
9	ta	1	BÚZ	át
90	PAUSE, STOP, tam	3	hát	MILY, NEK, te
1	a	1	KÖZ	ép
2	KÖZ	1	ép	sőt
3	ép	1	sőt	STOP
4	STOP, de, mert, ok, s	5	én	NAGY, VA, 2-azt, úgy
5	az, 3-es	4	AP	2-ád, 2-ám
6	2-AP, BÁT	3	ám	2-PAUSE, UR
7	PAUSE, mint	2	FOR	dult, ró
8	FOR	1	ró	NYÁR
9	ró	1	NYÁR	ban
100	a	1	SZEL	lőt
1	SZEL	1	lőt	STOP
2	STOP	1	no	most
3	no	1	most	TÉ
4	most	1	TÉ	ged
5	TÉ	1	ged	KÉR
6	dez	1	lek	PAUSE
7	FOR, in	2	dult	2-a
8	2-LEG, 5-rály	7	kis	5-asz, 2-ebb

9	2-kis	2	ebb	LE, ik
110	MOND	1	jad	hogy
1	3-az	3	EM	3-ber
2	3-EM	3	ber	3-ek
3	3-ber, el	4	ek	SZER, 2-a, be
4	6-a, en	7	sót	4-PAUSE, 2-STOP, az
5	2-FEL, ett, is, 2-ÉT	6	el	az, ben, ek, te, telt, tem
6	2-KI	2	csi	2-KI
7	5-kis	5	asz	4-szony, szonyt
8	4-asz	4	szony	2-PAUSE, STOP, SÍR
9	STOP, la	2	mit	BE, PAUSE
120	mit, rály, s, és	4	BE	le, lép, szélsz, ért
1	BE	1	szélsz	te
2	PAUSE	1	FÖR	medt
3	FÖR	1	medt	rá
4	medt	1	rá	a
5	STOP	1	ki	az
6	az	1	UD	var
7	UD	1	var	om
8	2-om	2	ból	de, is
9	5-PAUSE, ból, sem	7	de	TAL, VIS, a, le, 2-még, én
130	2-de, án	3	még	EDY, az, egy
1	STOP, hogy	2	ne	IS, TEGY
2	PAUSE, ne	2	IS	lás, ten
3	IS	1	lás	sa
4	lás	1	sa	lak
5	sa, ta	2	lak	2-PAUSE
6	2-PAUSE	2	ha	csak, meg
7	ha, majd, volt	3	csak	EN, az, lesz
8	EN	1	nyi	re
9	nyi, éd, ély	3	re	STOP, SZER, s
140	PAUSE, STOP	2	HI	2-á
1	já, tá, 2-á	4	ba	MA, PAUSE, STOP, sírt
2	ba	1	sírt	a
3	ba, ta	2	MA	gyar, gá
4	MA	1	gyar	áz
5	gyar	1	áz	ta
6	PAUSE, is	2	VI	het, lág
7	VI	1	lág	gá
8	MA, lág, ma	3	gá	KEL, 2-ban
9	gá	1	KEL	lett
150	hogy	1	MENJ	en
1	ESZT, MEG, MENJ, MILY, SZÉP, TEGY, kés, ös	8	en	MEG, STOP, SZA, az, dő, ni, sőt, élt
2	STOP, hogy, kor	3	EL	in, ker, o
3	EL	1	in	dult
4	szony	1	SÍR	va
5	SÍR	1	va	PAUSE
6	BE, MI	2	ért	KER, egy
7	LEG, egy	2	nagy	ER, obb
8	nagy	1	ER	dő
9	dő, ek	2	be	2-STOP
160	STOP	1	ON	nan
1	ON	1	nan	nem

2	2-is	2	ment	TO, a
3	ment	1	TO	vább
4	TO	1	vább	PAUSE
5	en, ott	2	élt	PAUSE, egy
6	egy	1	DA	rab
7	DA	1	rab	ig
8	MIND, rab	2	ig	EDY, PAUSE
9	PAUSE, szer	2	MI	kor, ért
170	MI, MÁS, mi	3	kor	EL, MIND, már
1	Ott, ezt, kor, ta	4	már	NAGY, egy, meg, nem
2	egy	1	ESZT	en
3	el	1	telt	PAUSE
4	PAUSE	1	ar	ra
5	ra	1	JÁR	ta
6	ta	1	SZOM	széd
7	SZOM	1	széd	KI
8	2-rály	2	fi	PAUSE, nak
9	PAUSE, 2-STOP, ban, en, s, ször, ta, és	9	MEG	en, es, fog, hívta, kós, 2-lát, szeret, tet
180	2-MEG	2	lát	2-ta
1	asz	1	szonyt	STOP
2	MEG, ej	2	tet	szett, ték
3	tet	1	szett	a
4	A	1	kár	mi
5	A, kár	2	mi	kor, lyen
6	mi	1	lyen	PISZ
7	lyen	1	PISZ	kos
8	PISZ	1	kos	volt
9	a	1	RU	há
190	RU	1	há	ja
1	volt	1	KÜ	lön
2	KÜ	1	lön	ös
3	lön	1	ös	en
4	az	1	AR	ca
5	AR	1	ca	STOP
6	STOP	1	SZÉP	en
7	MEG	1	fog	ta
8	a	1	KEZ	ét
9	KEZ	1	ét	PAUSE
200	HA	1	za	vez
1	FÖL, za	2	vez	2-et
2	2-a	2	PA	lo, lot
3	2-HAL, PA	3	lot	tad, tam, á
4	á	1	já	ba
5	mint, s, tal	3	két	GA, HET, SZEM
6	két	1	HET	et
7	sem	1	várt	PAUSE
8	de	1	TAL	án
9	TAL	1	án	még
210	egy	1	ÓR	át
1	2-PAUSE	2	és	BE, MEG
2	es	1	küd	tek
3	küd, ül	2	tek	2-STOP
4	A, 2-a	3	FI	3-at



5	3-FI, al	4	at	PAUSE, 3-al
6	KAN, 3-at	4	al	2-KI, at, pár
7	al	1	pár	BÉ
8	pár	1	BÉ	kés
9	BÉ	1	kés	en
220	et, het, tet	3	ték	EGY, PAUSE, a
1	STOP, ték	2	EGY	mást, szer
2	EGY	1	mást	PAUSE
3	3-STOP	3	No	3-PAUSE
4	PAUSE	1	FE	le
5	BE, FE, de	3	le	is, sem, ség
6	le	1	ség	PAUSE
7	EL	1	o	ször
8	o	1	ször	MEG
9	dez, el	2	tem	2-PAUSE
230	ért	1	KER	get
1	KER, ker	2	get	ett, te
2	get, lép	2	ett	a, el
3	2-AP	2	ád	PAUSE, STOP
4	STOP	1	MONDD	meg
5	MONDD, ha, már	3	meg	NEK, nem, volt
6	a, én	2	VA	la, ló
7	VA	1	ló	ság
8	ló	1	ság	ot
9	em, ság	2	ot	PAUSE, STOP
240	STOP	1	Azt	KÉR
1	te	1	TOL	em
2	STOP	1	Jól	van
3	Jól, od	2	van	NEK, PAUSE
4	PAUSE, ben	2	majd	CSI, csak
5	majd	1	CSI	nál
6	CSI, SAJ	2	nál	ok, ta
7	AZ, nál	2	ok	ban, én
8	PIL, VA	2	la	mit, nat
9	PAUSE, nem	2	TUD	om, ta
250	MEG	1	szeret	ÚJ
1	szeret	1	ÚJ	ra
2	s, volt	2	AZ	ok, zal
3	AZ	1	zal	LE
4	LE	1	vel	et
5	et	1	írt	az
6	STOP, s	2	AB	2-ban
7	MEG	1	hívta	EB
8	STOP, az, hívta	3	EB	bol, 2-éd
9	2-EB	2	éd	STOP, re
260	STOP	1	El	is
1	LE	1	vél	MÁS
2	ez, vél	2	MÁS	kor, nap
3	MÁS, mad	2	nap	PAUSE, jött
4	s	1	HAR	mad
5	HAR	1	mad	nap
6	nap	1	jött	a
7	STOP	1	FÖL	vez

8	KI	1	rályt	a
9	PA	1	lo	tá
270	lo	1	tá	ba
1	STOP	1	Ott	már
2	volt	1	TER	ít
3	TER	1	ít	ve
4	ít	1	ve	az
5	az	1	ASZ	tal
6	ASZ	1	tal	két
7	két	1	SZEM	ély
8	SZEM	1	ély	re
9	LE	1	ül	tek
280	MEG	1	kós	tol
1	KI, kós	2	tol	HAL, ta
2	LE	1	vest	PAUSE
3	is, szul	2	TET	te, ted
4	kor, te	2	MIND	ig, járt
5	MIND	1	járt	a
6	a	1	KAN	al
7	2-PAUSE	2	OLY	2-an
8	2-an	2	SÓT	2-lan
9	2-SÓT	2	lan	PAUSE, volt
290	STOP	1	GON	dol
1	GON	1	dol	ta
2	EB	1	bol	BI
3	bol	1	BI	zony
4	BI	1	zony	KI
5	KI	1	fel	ej
6	fel	1	ej	tet
7	a	1	TÖB	bi
8	TÖB	1	bi	ÉT
9	az, bi	2	ÉT	2-el
300	el	1	ben	majd
1	csak	1	lesz	STOP
2	2-STOP	2	De	ezt, nem
3	STOP	1	HORD	ták
4	HORD	1	ták	a
5	a	1	PE	cseny
6	PE	1	cseny	ék
7	cseny	1	ék	et
8	de	1	VIS	sza
9	VIS	1	sza	is
310	VI	1	het	ték
1	HA	1	rap	ott
2	PAUSE	1	ÍZ	et
3	et	1	len	volt
4	De	1	ezt	már
5	nem	1	HAGY	ta
6	ta	1	szó	NÉL
7	szó, só	2	NÉL	2-kül
8	2-NÉL	2	kül	STOP, SÛT
9	STOP, azt, nem, tol	4	HAL	lod, 2-lot, tak
320	HAL	1	lod	e

1	PAUSE	1	ÖCS	ém
2	ÖCS	1	ém	PAUSE
3	hát	1	MILY	en
4	en	1	SZA	kács
5	SZA	1	kács	od
6	kács	1	od	van
7	NEK	1	ed	PAUSE
8	hogy	1	só	NÉL
9	kül, val	2	SÜT	2-foz
330	2-SÜT	2	foz	PAUSE, ez
1	STOP	1	SÓ	val
2	SÓ	1	val	SÜT
3	MOND, lot	2	tam	PAUSE, hát
4	hogy	1	BÁTY	ám
5	ám	1	UR	am
6	UR	1	am	nem
7	ne	1	TEGY	en
8	azt	1	ROS	szul
9	ROS	1	szul	TET
340	TET	1	ted	PAUSE
1	már, én	2	NAGY	2-on
2	2-NAGY	2	on	PAUSE, SZER
3	lot	1	tad	PAUSE
4	á	1	tól	PAUSE
5	a	1	PIL	la
6	la	1	nat	ban
7	ban	1	KINY	ílt
8	KINY	1	ílt	az
9	az	1	AJ	tó
350	AJ	1	tó	PAUSE
1	BE	1	lép	ett
2	rály	1	né	PAUSE
3	STOP	1	Hej	PAUSE
4	IS	1	ten	em
5	PAUSE	1	ÖR	ült
6	ÖR	1	ült	az
7	STOP	1	Mert	SAJ
8	Mert	1	SAJ	nál
9	EL	1	ker	get
360	STOP	1	Most	NEK
1	i	1	ad	ta
2	nagy	1	obb	OR
3	STOP	1	Még	ma
4	is	1	ÉL	nek
5	ÉL	1	nek	PAUSE
6	HAL	1	tak	STOP

