

# The Logic of Turkish

Prof. Dr. Eşref ADALI

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# Development of Languages

## Lintor

Primitive languages are useless in explaining the origin of language. Because the language spoken by primitive societies is much more complex in terms of grammar than the language spoken by today's societies.

## Bickerton

We can say that language did not develop gradually from a primitive language, but that syntax and grammar emerged suddenly and in one piece.

## Bates et al

The language is very structured and complex. Such an advanced structure can only be given by the Creator.

## Chomsky

Human language is directly related to the human mind. There is no scientific basis to draw similarities between animals and humans in terms of language structure and to claim that language developed gradually.

# What is Said about Language

## Confucius

If I were to take over the administration of a country, the first thing I would do undoubtedly be to review its language. Because:

- If language is flawed, words cannot express thought well.
- If the thought cannot be expressed well, tasks and services cannot be performed properly.
- In places where duties and services cannot be performed properly, customs, rules and culture are disrupted.
- If customs, rules and culture are broken, justice will go astray.
- If justice goes astray, the confused people do not know what to do or where the situation will lead.

That's why nothing is as important as language!

# What is Said about Turkish - I

Prof. Dr.  
David Cuthell\*

Turkish is such a language that it is as if a hundred higher mathematics professors came together and created Turkish. Many words are produced from one root. The meaning changes depending on sound harmony. Turkish is such a language that it is a language of emotion, thought, logic and philosophy in itself.

Turkish is such a language that it is a language of emotion, thought, logic and philosophy in itself.

While other languages are based on learning the static meanings of words, Turkish is based on finding and extracting these meanings, that is, on dynamic meaning. In Turkish, it is necessary to learn dynamic rules instead of memorizing static words. In Turkish, the meanings are determined by the position of the words in the sentence, not the definitions in the dictionary.

Turkish is more than based on mathematics, it is almost mathematics in disguise.

Learning how to conjugate any verb in Turkish and how to pluralize words means knowing how to conjugate verbs that do not even exist yet, which will enter Turkish five years later, and what the plurals of words that were forgotten 300 years ago are.



# What is Said about Turkish - II

Prof. Dr.  
Johan Vandewalle\*

I believe that a native speaker of Turkish thinks in short sentences and creates complex structures by connecting these short sentences together in various ways while speaking. This 'tendency to link sentences' may be weak in some speakers, and strong enough to be almost a disease in others. The linguistic structures that emerge in this last situation reflect the superior possibilities of the human mind in the most beautiful way.

Although I have studied many languages belonging to different language groups, I can say that I have never come across a structure in any language that fascinates me as much as the complex sentence structures in Turkish.

\* Linguist, Ghent Univ. Belgium: Speaks 35 languages

# What is Said about Turkish - III

F. Max Müller\*

Even if you have no desire to use Turkish grammar, reading Turkish grammar is truly a great pleasure. The ingenious manner in which countless grammatical forms are revealed, the dexterous structure of the tenses, the conformity of all inflections to the rules, the transparency and comprehensibility evident in all the productions, must astonish anyone who has felt the wonderful power of human intelligence that shines in language.

People have worked hard to express their wishes, feelings and thoughts. In this context, deriving imperative, subjunctive moods, present and future tense verbs from verb roots; They tried to produce uniform, consistent, harmonious expressions. However, this does not mean that successful results were obtained from these studies. The results appear as solid structures.

On the contrary, the grammar of Turkic languages has a transparent structure and an order in which we can examine its inner workings as if we were watching the construction of cells in a crystal beehive. A well-known orientalist said, "**We can imagine that Turkish is the result of deliberations by some distinguished group of scholars**"; but such a society could not have conceived what the human mind had produced, left to itself in the Tartar steppes, and created, guided only by its innate laws or by an instinctive power as wonderful as any in the realm of nature.

\* German philosopher: Made the Language family cluster of Turan .

# Features of Turkish and Questions- I

What kind of qualities does vowel and consonant harmony bring to Turkish?

Can logical rules be written to describe phonetic properties?

Can a new root word be derived in Turkish? Can artificial word be made?

What is the syllable structure of Turkish and what kind of contributions does it make to the language?

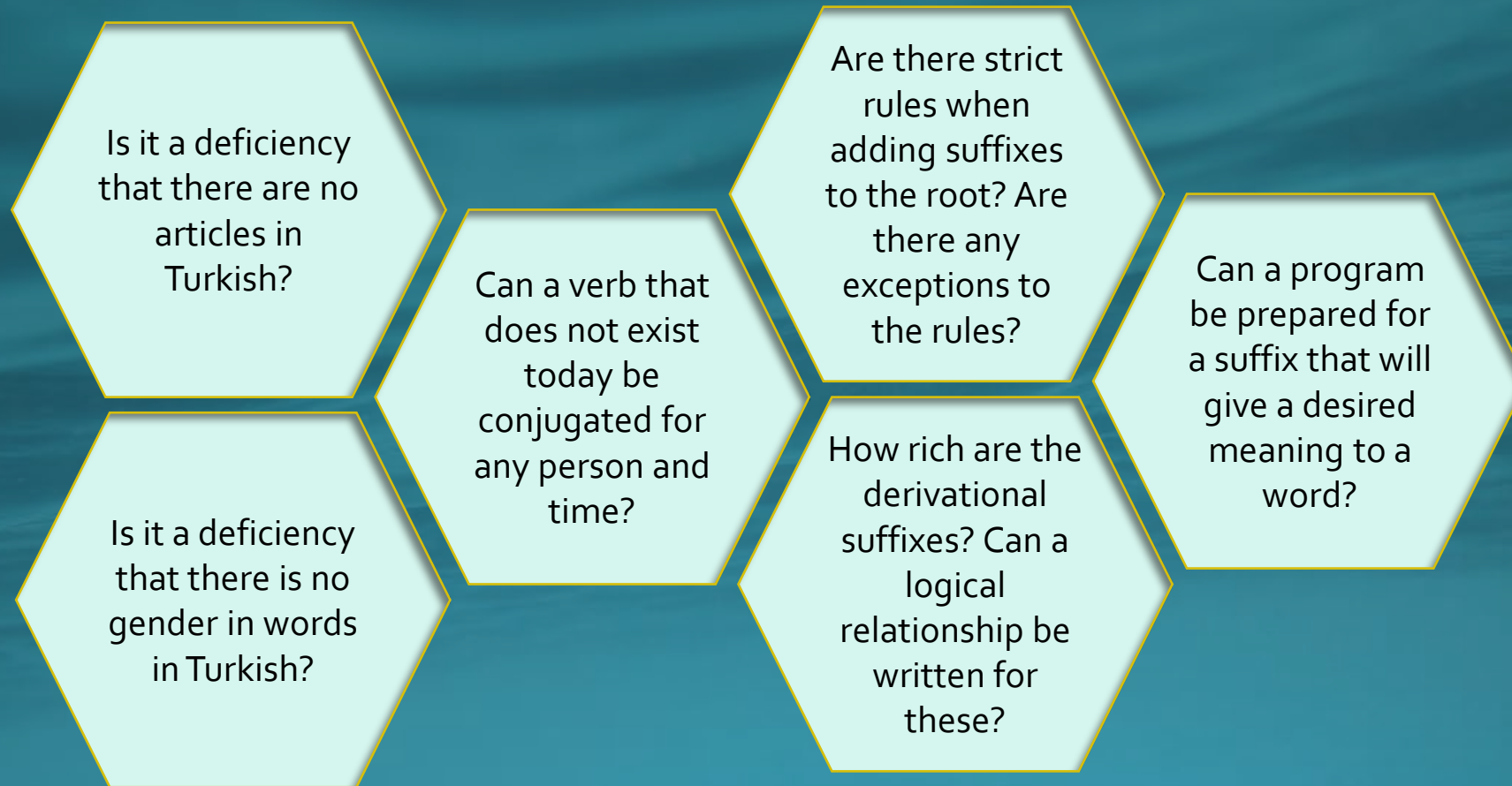
Can logical relations be written to define the rules of inflectional suffixes?

Can it be said that the phonetic features of Turkish increase the understandability of the language?

Can a program be written that provides conjugate rules of verb?

What kind of advantage do case suffixes give to Turkish?

# Features of Turkish and Questions- II





# Features of Turkish and Questions- III

Is the syntax of Turkish an indicator of the regularity and transparency of the language?

Does it cause a change in meaning when words are changed position?

Can rules be created to define the subject?

Is the free syntax of Turkish considered a superior class compared to languages with fix sentence structure?

Can rules be created to define the complement?

Can logical rules be written for nouns and adjective phrases?

Can a Turkish sentence be created with a program by giving only root words?



# Purposes and Arguments

## Purposes

- To reveal the phonology, morphology and syntax rules of Turkish,
- Writing logical relations about rules,
- Creating flow charts related to rules,
- Writing programs to verify rules and
- Testing the rules for all possibilities.

## Arguments

- If the logical relation of a grammar rule can be written and there are no exceptions in the written logical relation, **this result is proof that the language has a proper logical structure.**
- To verify logical relations, programs based on the relevant relation have been written and the accuracy of the relation has been tested by performing many experiments. **Test results have shown that Turkish is truly a logic language.**

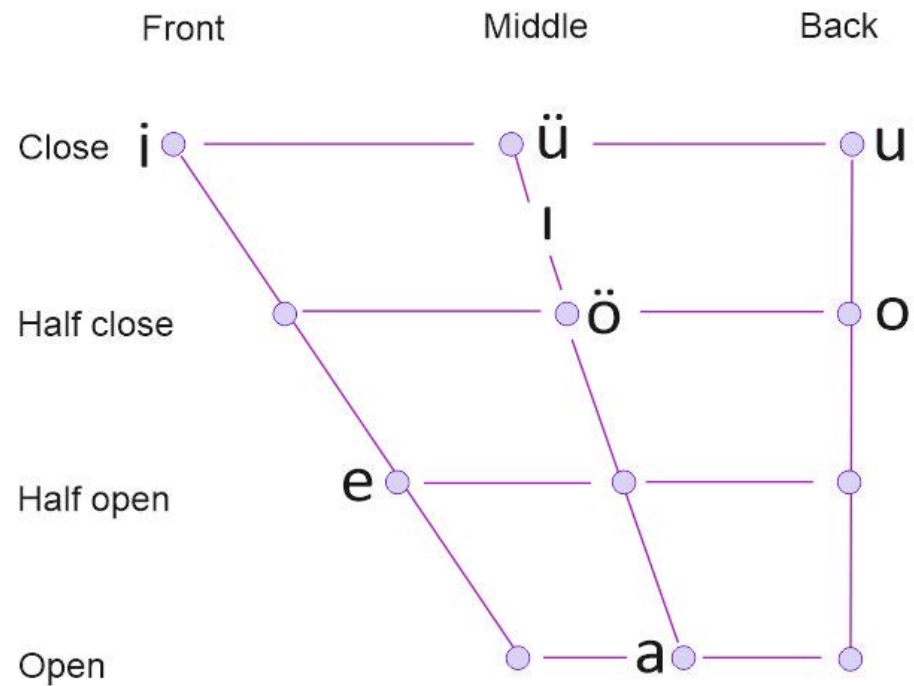
## Restrictions

- Our arguments apply to prescriptive linguistics.
- It does not include loanwords,
- The argument that languages have no logic and that there are many irregularities in languages is not valid for Turkish.

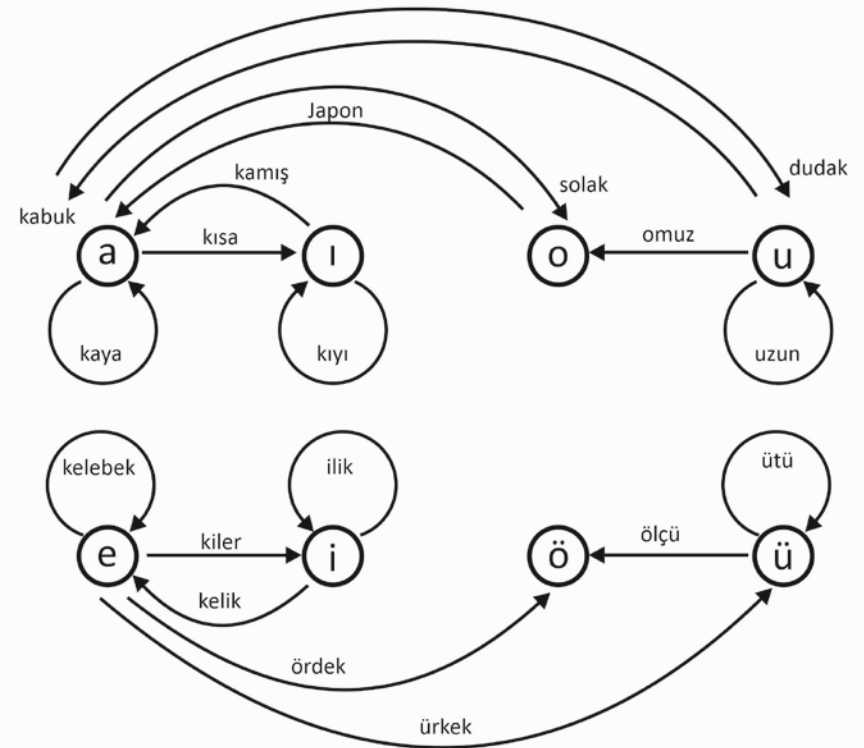
# Phonetics Features of Turkish

# Vowels

## Vowels of Turkish



## Vowel Harmony of Turkish

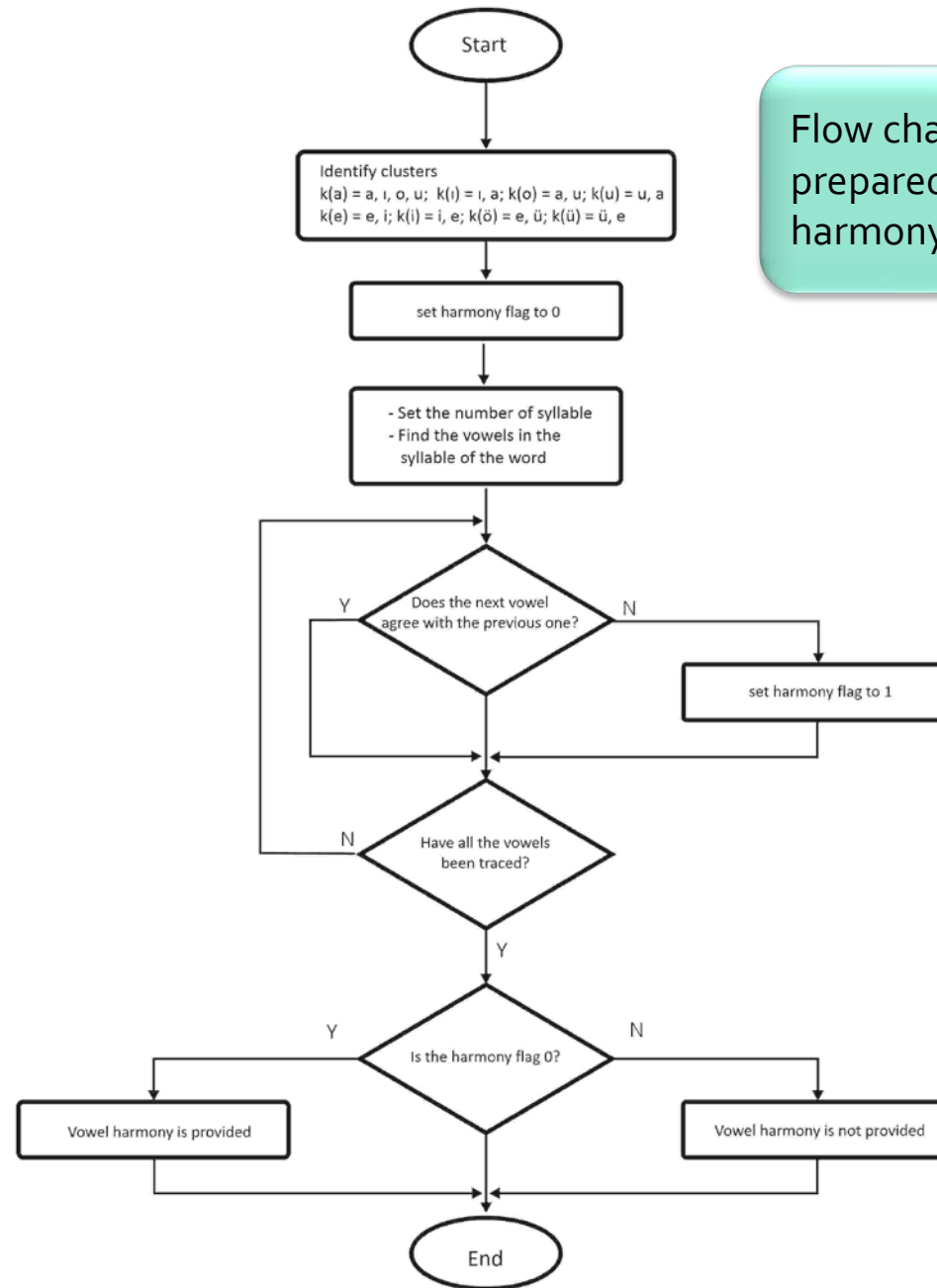


# Vowel Harmony

It is clear what the vowel will be before and after a vowel in a word. This is called the **Binding Vowel Rule**.

$$BA\check{G} = \left\{ \begin{array}{l} a \cup \iota \Rightarrow \iota \\ e \cup i \Rightarrow i \\ o \cup u \Rightarrow u \\ \ddot{o} \cup \ddot{u} \Rightarrow \ddot{u} \end{array} \right\}$$

Flow chart of the algorithm prepared to test vowel harmony in Turkish.



# Consonant Harmony

## Clusters of consonants

There are also sound harmony rules for consonants, although they are not as precise as the rules for vowels.

|                                  |                        |
|----------------------------------|------------------------|
| Voiceless (hard)                 | ç, f, h, k, p, s, ş, t |
| Voiced (with a hard equivalent ) | b, c, d, g, ğ, j, v, z |
| Voiced (constantly flowing)      | l, m, n, r, y          |

- The probability of a hard consonant coming after a hard consonant is higher than the probability of a soft consonant coming.
- The probability of a hard consonant being followed by a consonant without a hard equivalent seems to be higher than consonants with a hard consonant equivalent.
- The probability of a hard consonant being followed by a soft consonant with a hard counterpart is third.
- After a soft consonant that does not have a hard equivalent, a soft consonant that does not have a hard equivalent comes first.
- After a soft consonant that does not have a hard equivalent, a hard consonant may come in the second place and a soft consonant with a hard equivalent may come in the third place. First comes a consonant that has no hard equivalent.
- Consonants within a word are generally chosen from the same cluster.
- After the dental consonants, it is most likely that one of the palatal and then one of the labial consonants may come.
- After the palate consonants, a dental consonant may most likely come, followed by a labial consonant.



# Softening of Discontinuous Hard Consonants - I

## Basic rules

- When a suffix starting with a vowel is added to words ending with a discontinuous hard consonant (**p, ç, t, k**), the hard consonants soften and turn into (**b, c, d, g**).
- If the consonant **k** falls between two vowels, it becomes **ğ**.

## Rules for words consisting of more than one syllable

- The last letter of words ending in **-it** does not change.
- The last letter **t** of words ending in **-ut** does not change, but angut is an exception.
- Some words consisting of more than one syllable do not comply with the above rule.
- The last letter **t** of the words ending in **-çüt** does not change, but the last letter of the words **öğüt** and **söğüt** turns into **d**. The constancy in the criterion word is determined by the three penultimate hard consonants. **Ölçüt** is a single example.
- Only one word **kelkit** ending in **-it** has been found. This word is used colloquially. Therefore, it would not be right to take it as general rules.

## Other cases where the last letter does not change

- If there is voice and voice suffix at the end of the word, the last letter of the word does not change even if the suffix starts with a vowel.
- Words taken from foreign languages adapt to the phonatic characteristics of Turkish over time, but some do not.

# Softening of Discontinuous Hard Consonants - II

## Rules for one-syllable words containing two or three letters

- The rule that letters **ç, k, p, t** do not change between two vowels is a general rule applied to single vowels with two or three letters.
- Six nouns and five verbs do not follow the general rules:  
uç ⇒ ucu, but ⇒ budu, tat ⇒ tadı, gök ⇒ göğü, dip ⇒ dibi, kap ⇒ kabı  
tat-, et-, dit-, git- gü-

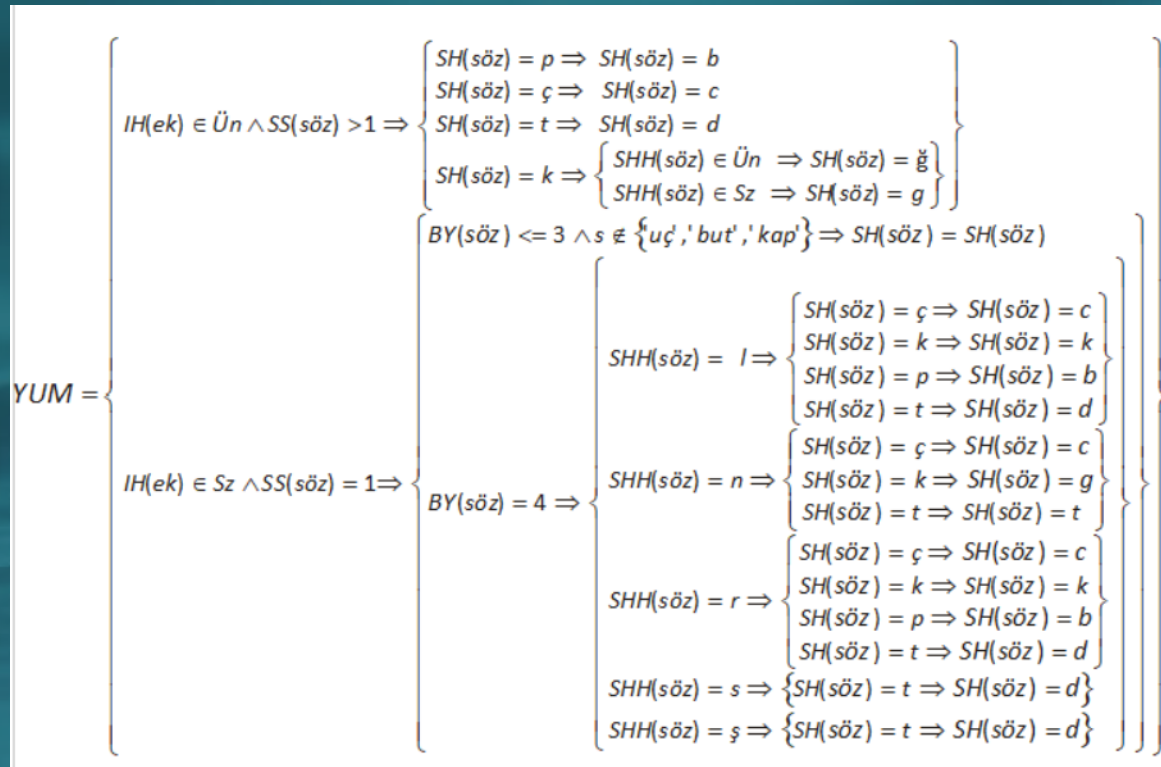
## Softening rules for syllables containing four letters

- The softening rules for syllables containing four letters are as follows:  
Two consonants can appear consecutively in the same syllable, but these consonants obey the following rule:  
The leading consonants must be **l, n, r, s** or **ş**; **ç, k, p** or **t** after **l**; **ç, k, t** after **n**; **ç, k, p, s** or **t** after **r**; **t** may come after **s** and **ş**.
- In single syllables with four letters, the last letter is softened by complying with these prerequisites, but it is not softened if the last two letters are **rk** and **nt**.

Some rules regarding the softening of hard consonants were revealed for the first time in this study.

# Softening of Discontinuous Hard Consonants - III

Logic relation and flow chart regarding the softening of consonants



YUM: Softening

IH: First letter

SH: Last letter

SHH: Letter before last

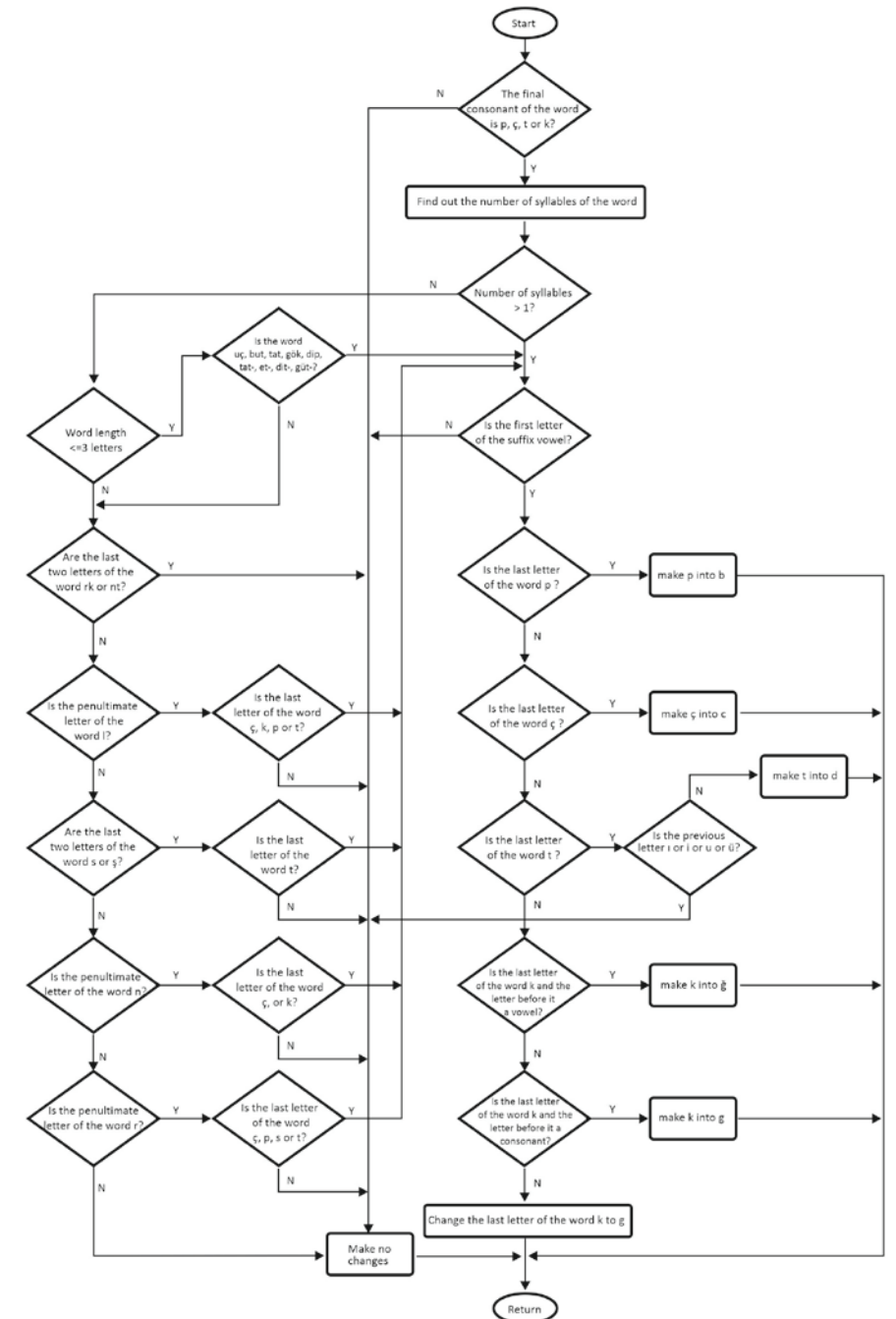
BY: Size of word

söz: word

$\ddot{U}n$ : vowel

Sz: Consonant

SS: Number of syllable



# Syllable and Spelling

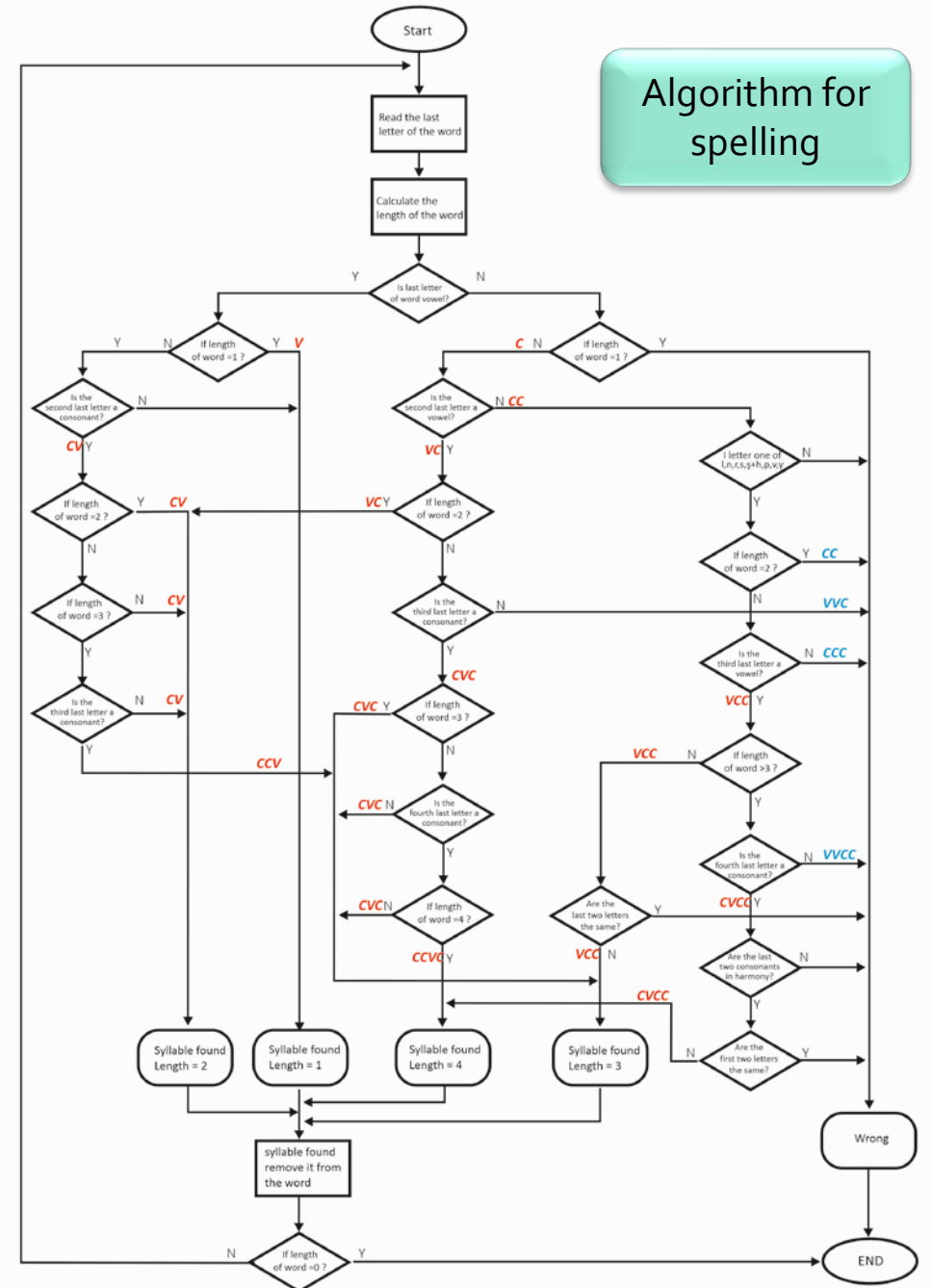
The syllable structure of Turkish is regular.

|             |     |          |      |              |       |           |      |              |       |           |        |
|-------------|-----|----------|------|--------------|-------|-----------|------|--------------|-------|-----------|--------|
| [V]         | (o) | [VC]     | (at) | [VCC]        | (üst) | [CV]      | (su) | [CVC]        | (tam) | [KVCC]    | (Türk) |
| [V + CV]    |     | (aba)    |      | [V + CVC]    |       | (ocak)    |      | [V + CVCC]   |       | (avurt)   |        |
| [VC + CV]   |     | (ayna)   |      | [VC + CVC]   |       | (aşkın)   |      | [VC + CVCC]  |       | (aldanç)  |        |
| [CV + CV]   |     | (baba)   |      | [CV + CVC]   |       | (tabak)   |      | [CV + CVCC]  |       | (kazanç)  |        |
| [CVC + CV]  |     | (bohça)  |      | [CVC + CVC]  |       | (bostan)  |      | [CVC + CVCC] |       | (başkurt) |        |
| [CVCC + CV] |     | (Türkçü) |      | [CVCC + CVC] |       | (Türklük) |      |              |       |           |        |

Number of words that can be derived from Turkish by taking into account syllable and phonetic rules

| monosyllabic words |              | two-syllable words |                |            |                  |           |                  |
|--------------------|--------------|--------------------|----------------|------------|------------------|-----------|------------------|
| form               | number       | form               | number         | Form       | number           | form      | number           |
| V                  | 8            | V + CV             | 320            | CV + CV    | 6.080            |           |                  |
| VC                 | 128          | V + CVC            | 4.882          | CV + CVC   | 92.758           |           |                  |
| VCC                | 112          | V + CVCC           | 4.256          | CV + CVCC  | 80.864           |           |                  |
| CV                 | 152          | VC + CV            | 5.696          | CVC + CV   | 113.928          | CVCC + CV | 72.352           |
| CVC                | 2312         | VC + CVC           | 86.614         | CVC + CVC  | 1.732.438        | CVCC + CV | 1.094.324        |
| CVCC               | 2128         | VC + CVCC          | 75.488         | CVC + CVCC | 1.509.900        |           |                  |
| <b>Total</b>       | <b>4.840</b> |                    | <b>177.256</b> |            | <b>3.545.968</b> |           | <b>1.166.676</b> |

Algorithm for spelling





# Programs Prepared for Spelling and Softening

Seslemlere Ayırma : Hazırlayan E. Adalı

**Bir sözcüğü seslemlerine ayırabilirsiniz**

Bir sözcük yazınız

1. Seslem : ke  
2. Seslem : le  
3. Seslem : bek  
4. Seslem : le  
5. Seslem : ri  
6. Seslem : mi  
7. Seslem : zin

Giriş Başarılı...

Sözcük ünlü uyumuna uygun.....

Devam

Sözcüğün son harfini yumuşatma : Hazırlayan E. Adalı

**Sözcüğün son harfini eke göre yumuşatabilir, eki uyumlu yapabilirsiniz**

Bir sözcük yazınız

Bir ek yazınız

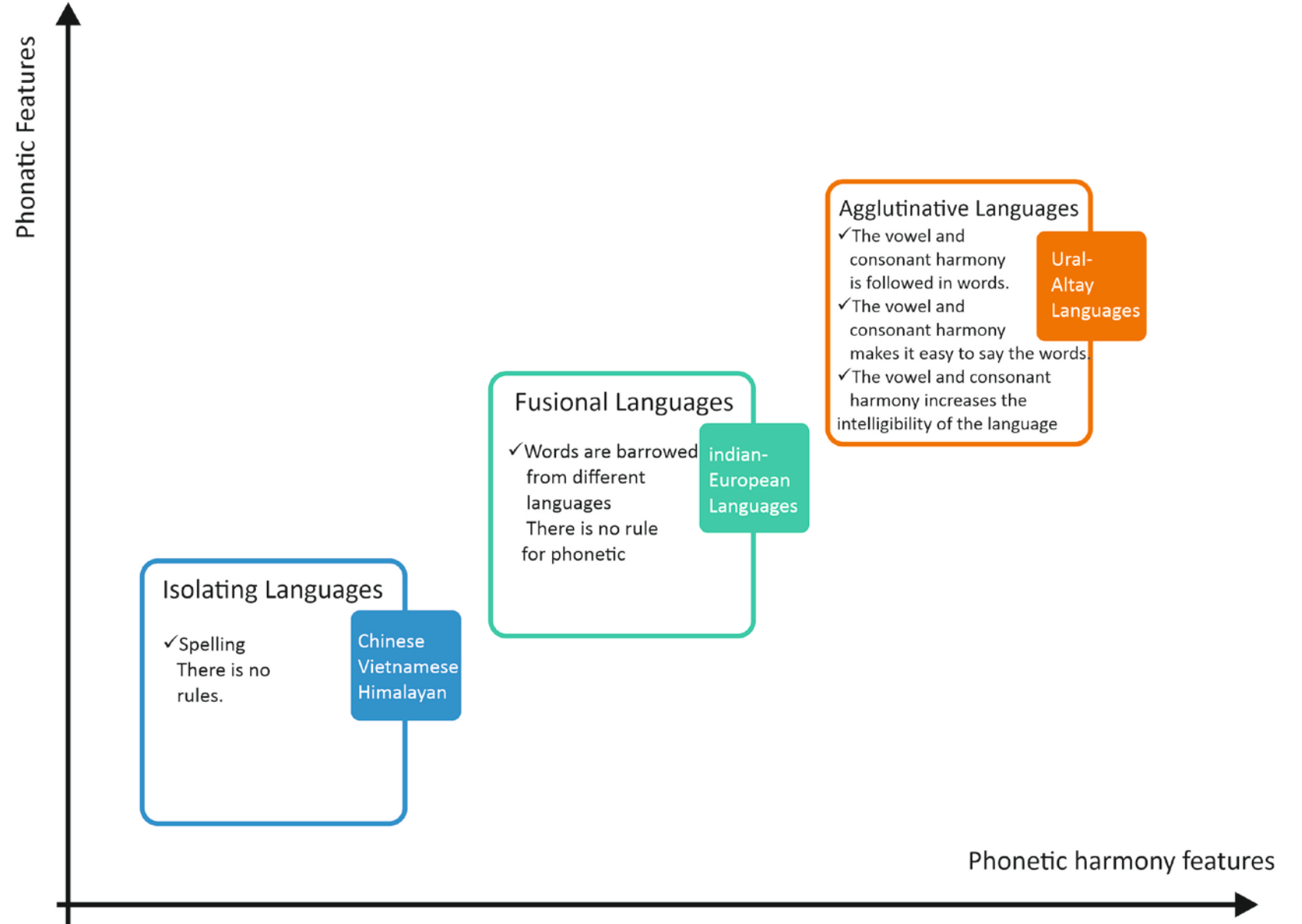
Yumuşatılmış sözcük : kelebeğimiz

Giriş Başarılı...

Devam



# Comparing Languages in Terms of Phonology



# Morphological Features of Turkish

# Formation of Agglutinative Structure

It is thought that people first form verb words and then noun words.

It is known that the first verb words derived from Turkish were monosyllabic.

In Turkish, approximately one-third of the approximately 800 root verbs are monosyllabic, and the rest are bisyllabic.

Languages that developed with monosyllabic words began to produce polysyllabic words over time. They achieved this by adding suffixes to root words in different ways, thus creating agglutinative languages.

# Using Words Side by Side

People tried to express their feelings and thoughts by putting words together. For example, they tried to explain that they went home by using the words "**I home**" and "**go**" side by side.

Over time, they added negations and interrogation to their narratives.

In the next step, they understood that it was necessary to create a link between words and they achieved this.

People have developed their languages over time to make them more understandable. For example, they described **a girl with blue eyes** as follows:

Ben git ev & ben var git ev  
**I go home & I do go home**

Ben git me ev & ben yok git ev  
**I no go home & I do not go home**

Ben git ev+e & ben var git doğru ev  
**I go to home & I do go to home**

Mavi göz+lü kız & mavi göz kız  
**Blue eye+d girl & blue eye girl**

Today, languages with words at the syllable level are still used. For example, Chinese. English can be given as an example for languages that use polysyllabic words but do not establish bonds between words. The following examples reflect this situation:

***I do go home, I don't go home***

***Blue eyed girl***

Languages such as Turkish have managed to establish connections between words:

Ben ev+e gidiyorum      ***I am going to home***

Mavi göz+lü kız      ***Girl with blue eyes***

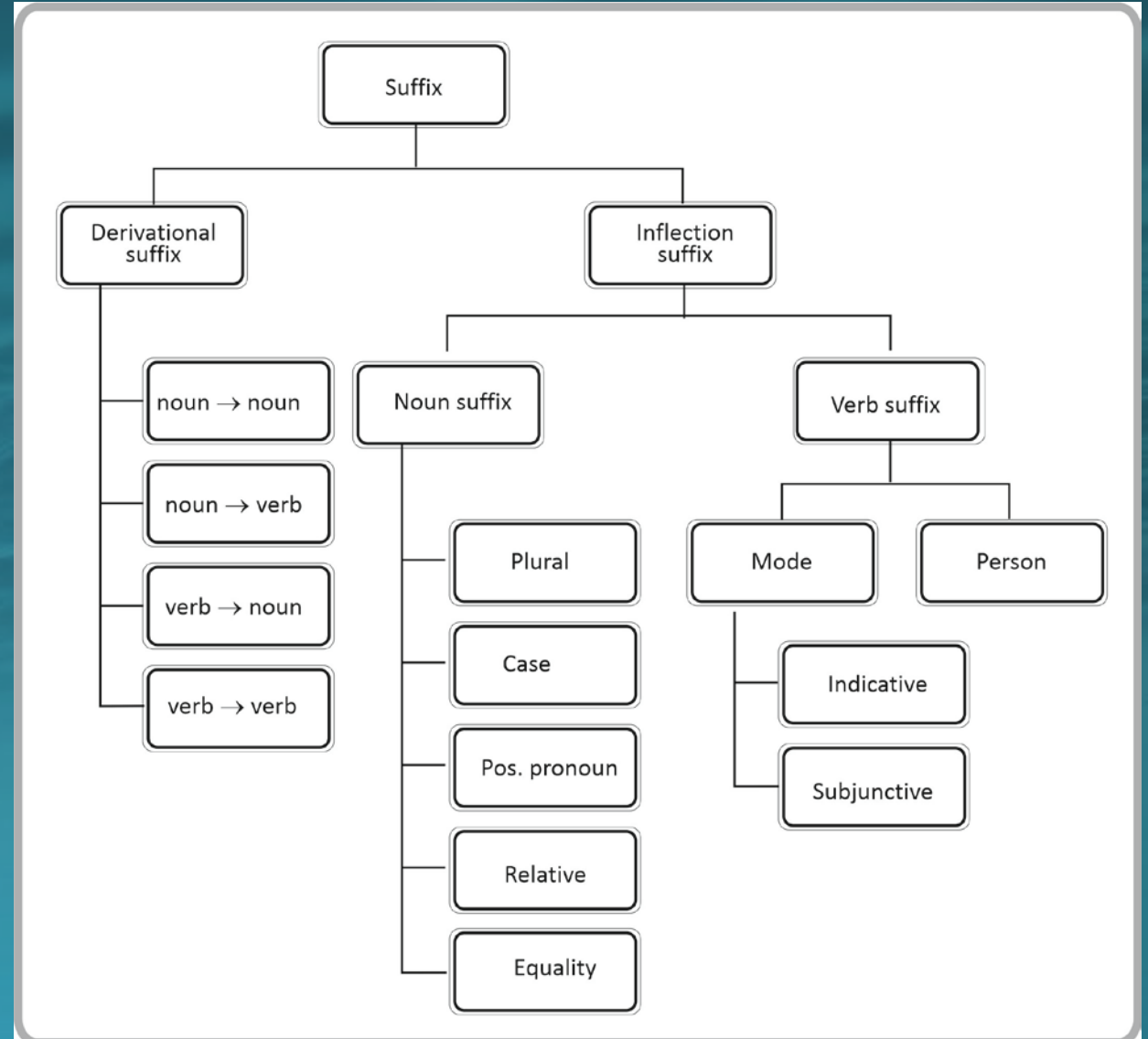
# Derivational and Inflection Suffix - I

- Turkish is an agglutinative language and derivational and inflectional suffixes are added to the end of the root word.
  - Inflectional suffixes create bonds between words and make a significant contribution to the understandability of the language.
  - Derivational suffixes enable the derivation of new words.
  - Case suffixes included in inflectional suffixes make an important contribution **to showing the direction of the action**.
  - The inflection of nouns clearly defines the connections between words by giving plural, possessive and genitive suffixes to nominal words.
  - Inflectional suffixes added to verbs show who, when and in what situations an action was performed.
- 
- Derivational suffixes give new meanings to root or stem words. **Thus, new words can be derived. Since the root does not change in newly coined words, the meaning of the derived word is understood by the speaker.**
  - Suffix can follow each other and there is no limit on their number. Research shows that all words in Turkish have approximately 0,94 suffixes; It shows that words with suffixes receive 1,85 suffixes.
- 
- It is known that there are about 170 derivational suffixes in Turkish and about 70 of them are frequently used.



# Derivational and Inflection Suffix - II

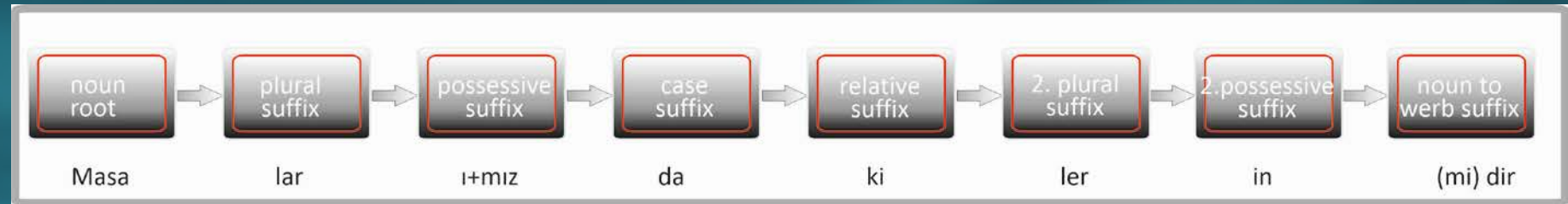
- Derivational suffixes can be added to noun and verb words. At the end of the additions, a noun-based word can turn into a noun-based word or a verb-based word.
- Similar transformation applies to verbs. A verb can turn into a new verb or a noun word by adding a suffix.



# Noun Conjugation

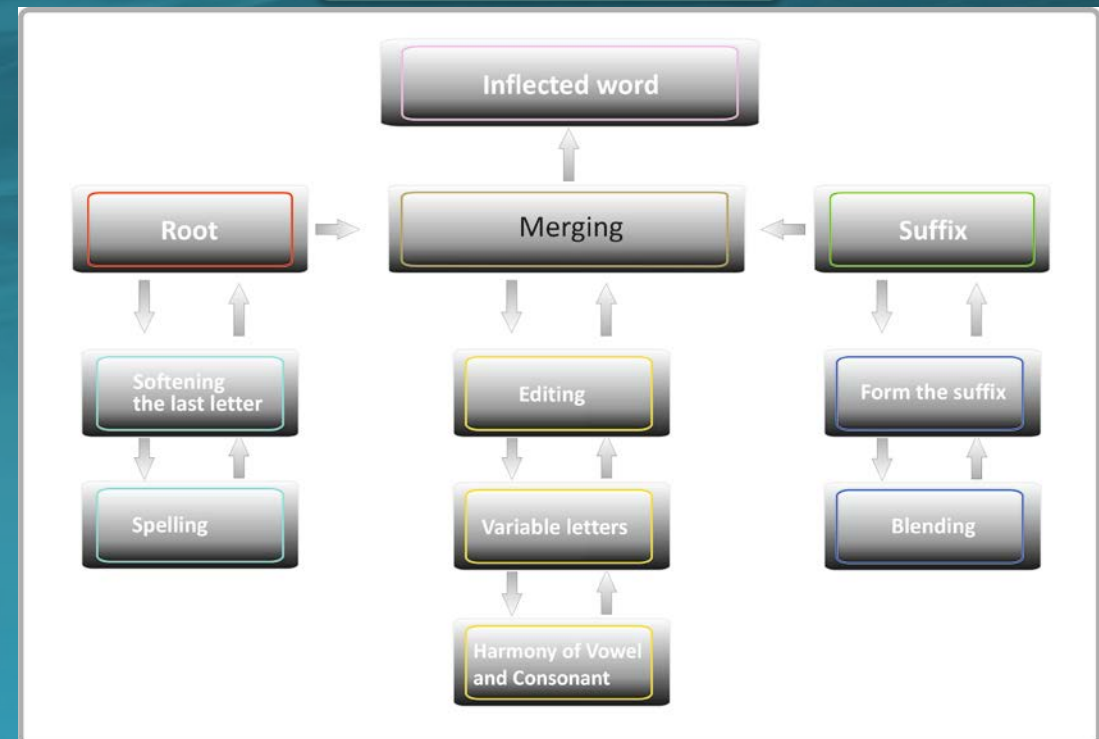
# Noun Suffix - I

The order in which inflectional suffixes are added to nominal words



- In order for a joint to add the next joint, some adaptations must be made in accordance with the phonetics characteristics of Turkish.
- In this stage, which we call the merging process,
  - vowel consonant harmonies,
  - adding fusing letters,
  - softening of hard consonants and
  - binding vowel harmony rules apply.

## Merging process



# Plural and Interrogative Suffix

Adding plural suffix

+lAr

$$A = (e \vee i \vee \ddot{o} \vee \ddot{u}) \wedge (a \vee e)$$

Logical equation of plural suffix

$$s\ddot{o}z + \begin{cases} S(a \vee i \vee o \vee u) \Rightarrow +lar \\ S(e \vee i \vee \ddot{o} \vee \ddot{u}) \Rightarrow +ler \end{cases}$$

Adding interrogative suffix

+mH

$$H = (a \vee i) \wedge (i \vee i \vee u \vee \ddot{u}) = i$$

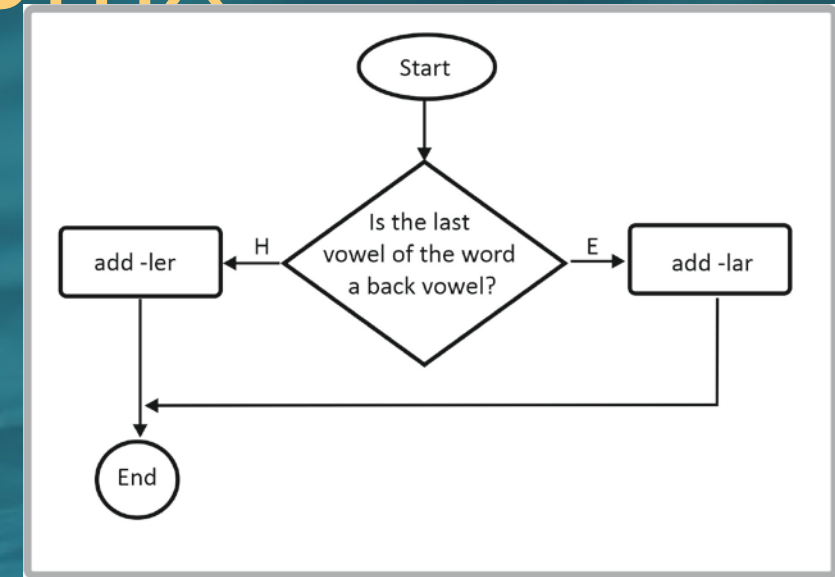
$$H = (o \vee u) \wedge (i \vee i \vee u \vee \ddot{u}) = u$$

$$H = (e \vee i) \wedge (i \vee i \vee u \vee \ddot{u}) = i$$

$$H = (\ddot{o} \vee \ddot{u}) \wedge (i \vee i \vee u \vee \ddot{u}) = \ddot{u}$$

Logical equation of interrogative suffix

$$s\ddot{o}z + \begin{cases} S(a \vee i) \Rightarrow 'm\ddot{u}?' \\ S(e \vee i) \Rightarrow 'm\ddot{u}?' \\ S(o \vee u) \Rightarrow 'm\ddot{u}?' \\ S(\ddot{o} \vee \ddot{u}) \Rightarrow 'm\ddot{u}?' \end{cases}$$

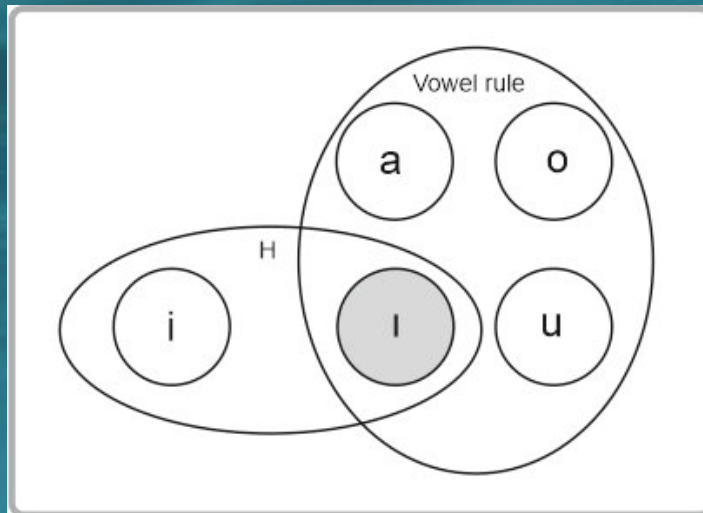




# Possessive Suffix -I

kaş+(H)m

$$H = (a \vee i \vee o \vee u) \wedge (i \vee i) = i$$



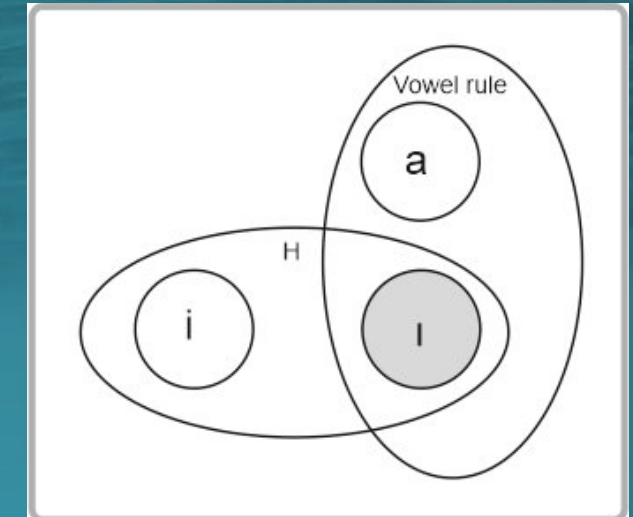
kaşım

| Suffix  | Explanation   | Sample          |
|---------|---------------|-----------------|
| +(H)m   | 1 st singular | kuş <u>um</u>   |
| +(H)n   | 2 rd singular | kuş <u>un</u>   |
| +(s)H   | 3 rd singular | kuş <u>u</u>    |
| +(H)mHz | 1 st plural   | kuş <u>umuz</u> |
| +(H)nHz | 2 rd plural   | kuş <u>unuz</u> |
| +lArH   | 3 rd plural   | kuş <u>ları</u> |

kır+(H)m

$$H = (i \vee a) \wedge (i \vee i) = i$$

kırım





# Possessive Suffix -II

The value H will take

$$H = \begin{cases} S \rightarrow H = \phi & S: \text{ünlü} \\ Z \rightarrow H = (H) & Z: \text{ünsüz} \end{cases}$$

S = vowel  
Z = consonant

The vowel in a suffix must agree with the last vowel of the word to which it is attached. These rules actually show the value the **binding** letter will receive. For this reason, connecting vowels are called the harmony rule.

$$BA\check{G} = \begin{cases} a \vee i \Rightarrow i \\ e \vee i \Rightarrow i \\ o \vee u \Rightarrow u \\ \ddot{o} \vee \ddot{u} \Rightarrow \ddot{u} \end{cases} \quad ya \ da \ BA\check{G}(s)$$

söz = word  
ek = singular  
çoğ = plural

If the last letter of the word is a discontinuous hard vowel (p, ç, t, k), this consonant is softened before adding the possessive suffix. This process is abbreviated as YUM.

$$\left\{ \begin{array}{l} S(a \vee i \vee o \vee u) \Rightarrow a \\ S(e \vee i \vee \ddot{o} \vee \ddot{u}) \Rightarrow e \end{array} \right\} = \left\{ \begin{array}{l} S(söz) \in Ka \Rightarrow a \\ S(söz) \in In \Rightarrow e \end{array} \right\}$$

Ka = back vowel  
In = front vowel

Logical relation containing all cases of possessive suffixes

$$söz = \left\{ \begin{array}{l} BR\ 1.tek \Rightarrow YUM(söz) \left\{ \begin{array}{l} SH(söz) = \ddot{U}n \Rightarrow + "" \\ SH(söz) = Sz \Rightarrow + BA\check{G}(söz) \end{array} \right\} + m \\ BR\ 2.tek \Rightarrow YUM(söz) \left\{ \begin{array}{l} SH(söz) = \ddot{U}n \Rightarrow "" \\ SH(söz) = Sz \Rightarrow + BA\check{G}(söz) \end{array} \right\} + n \\ BR\ 3.tek \Rightarrow YUM(söz) \left\{ \begin{array}{l} SH(söz) = \ddot{U}n \Rightarrow + s \\ SH(söz) = Sz \Rightarrow + "" \end{array} \right\} + BA\check{G}(söz) \\ BR\ 1.çoğ \Rightarrow YUM(söz) \left\{ \begin{array}{l} SH(söz) = \ddot{U}n \Rightarrow + "" \\ SH(söz) = Sz \Rightarrow + BA\check{G}(söz) \end{array} \right\} + m + BA\check{G}(söz) + z \\ BR\ 2.çoğ \Rightarrow YUM(söz) \left\{ \begin{array}{l} SH(söz) = \ddot{U}n \Rightarrow + "" \\ SH(söz) = Sz \Rightarrow + BA\check{G}(söz) \end{array} \right\} + n + BA\check{G}(söz) + z \\ BR\ 3.çoğ \Rightarrow I + \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow a \\ S(söz) = In \Rightarrow e \end{array} \right\} + r + BA\check{G}(söz) \end{array} \right.$$

SH = last letter  
Ün = vowel  
Sz = Consonant  
BR = Person  
BAĖ = Binding

# Case Suffix

## Nominative

+(y)H (i case: accusative case)

+(y)A (e case: dative case)

+DA (de case: locative)

+DAn (den case: ablative)

+(n)Hn (in case: genitive)

ev masa

evi masay

eve masaya

evde masada

evden masadan

evin masanın

+DAki (relative suffix)

+(y)IA (instrumental)

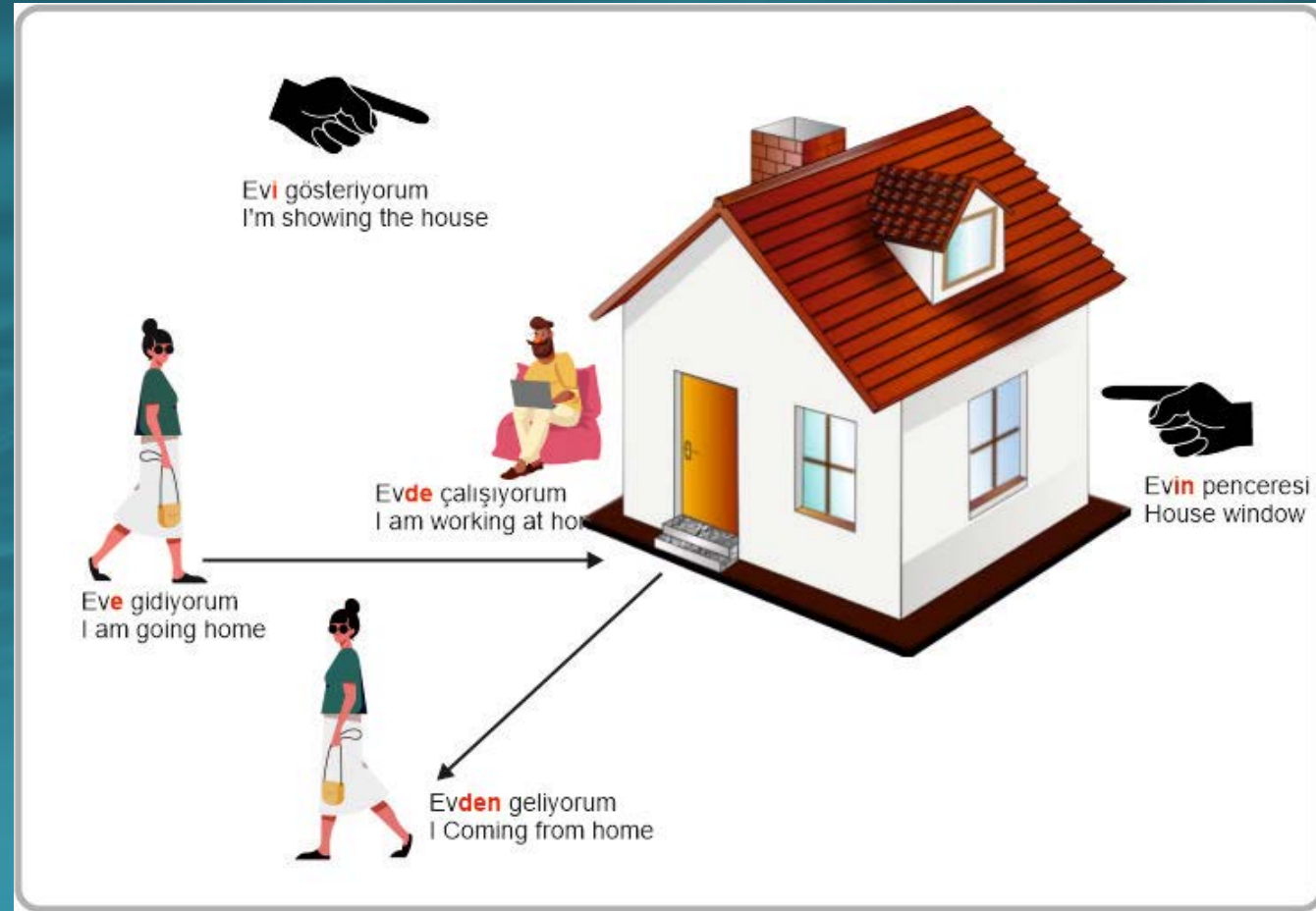
+CA (equality)

kapı kapıdaki

uçak uçakla

ben bence

- When adding case suffixes to names, the phonetic harmony rules of Turkish are followed.
- Common nouns ending in a consonant receive case suffixes according to vowel harmony and consonant similarity.
- Additionally, softening rules are applied for consonants at the end of words.



# Accusative Case

at+(y)H

$$H = (a \vee i \vee o \vee u) \wedge (i \vee i \vee u \vee \ddot{u}) = i$$

$$y = \begin{cases} S \rightarrow (y) = \phi \\ Z \rightarrow (y) = y \end{cases}$$

Result : **atı**

kapı+(y)H

Result : **kapıyı**

ev+(y)H

$$H = (e \vee i) \wedge (i \vee i \vee u \vee \ddot{u}) = i$$

$$y = \begin{cases} S \rightarrow (y) = \phi \\ Z \rightarrow (y) = y \end{cases}$$

Result : **evİ**

kedi+(y)H

Result : **kediyİ**

top+(y)H

$$H = (a \vee u) \wedge (i \vee i \vee u \vee \ddot{u}) = u$$

$$y = \begin{cases} S \rightarrow (y) = \phi \\ Z \rightarrow (y) = y \end{cases}$$

Result : **topu**

oto+(y)H

Result : **otoyu**

su+(y)H

Sonuç : **suyu**

süt+(y)H

$$H = (\ddot{u} \vee e) \wedge (i \vee i \vee u \vee \ddot{u}) = \ddot{u}$$

$$y = \begin{cases} S \rightarrow (y) = \phi \\ Z \rightarrow (y) = y \end{cases}$$

Result : **sütü**

kötü+(y)H

Result : **kötüyü**



# Logical Equation for Case Suffixes

- Hard (St): hard consonants (ç, f, h, k, p, s, ş, t)
- Soft (Yu): soft consonants (b, c, d, g, ğ, j, v, z, l, m, n, r, y)

Yalın: nominative  
Belirtme: accusative  
Yönelme: dative  
Bulunma: locative  
Ayrılma: ablative  
Tamlayan: genitive)

İlgi: locatif+accusative  
Araç: instrumentality  
Eşitlik: equative

$$\begin{aligned}
 & \text{Yalın ise } +'''' \\
 & \text{Belirtme ise } \left\{ \begin{array}{l} SH(söz) = Ün \Rightarrow +y \\ SH(söz) = Sz \Rightarrow +'''' \end{array} \right\} + BAĞ(söz) \\
 & \text{Yönelme ise } \left\{ \begin{array}{l} SH(söz) = Ün \Rightarrow +y \\ SH(söz) = Sz + '''' \end{array} \right\} + \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \\
 & \text{Bulunma ise } \left\{ \begin{array}{l} SH(söz) = St \Rightarrow t \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \\ SH(söz) = Yu \Rightarrow d \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \end{array} \right\} \\
 & \text{Ayrılma ise } \left\{ \begin{array}{l} SH(söz) = St \Rightarrow t \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \\ SH(söz) = Yu \Rightarrow d \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \end{array} \right\} + n \\
 & \text{Tamlayan ise } \left\{ \begin{array}{l} SH(söz) = Ün \Rightarrow +n \\ SH(söz) = Sz \Rightarrow +'''' \end{array} \right\} + BAĞ(söz) + n \\
 & \text{İlgi ise } \left\{ \begin{array}{l} SH(söz) = St \Rightarrow t \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \\ SH(söz) = Yu \Rightarrow d \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \end{array} \right\} ki \\
 & \text{Araç ise } \left\{ \begin{array}{l} SH(söz) = Ün \Rightarrow +y \\ SH(söz) = Sz \Rightarrow +'''' \end{array} \right\} + l \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\} \\
 & \text{Eşitlik ise } c \left\{ \begin{array}{l} S(söz) = Ka \Rightarrow +a \\ S(söz) = İn \Rightarrow +e \end{array} \right\}
 \end{aligned}$$

# Program for Noun Conjugation

## Phases

1

Create suffix

$$Ek = \begin{cases} SH(kök) = Ün \Rightarrow +kh + yek \\ SH(kök) = Sz \Rightarrow +yek \end{cases}$$

2

Softening

YUM

3

Editing variable letters within a suffix

$$DEH = \begin{cases} A \Rightarrow \begin{cases} S(kök) = Ka \Rightarrow A \rightarrow a \\ S(kök) = İn \Rightarrow A \rightarrow e \end{cases} \\ C \Rightarrow \begin{cases} SH(kök) = St \Rightarrow C \rightarrow ç \\ SH(kök) = Yu \Rightarrow C \rightarrow c \end{cases} \\ D \Rightarrow \begin{cases} SH(kök) = St \Rightarrow D \rightarrow t \\ SH(kök) = St \Rightarrow D \rightarrow d \end{cases} \\ I \Rightarrow BAĞ(kök) \\ H \Rightarrow BAĞ(kök) \end{cases}$$

4

Adding suffix to root

For example

- if the root word is **su** and the first form of the suffix is  $+(y)HmHz$ , the suffix is formed as follows:  $+yHmHz$  and
- if the root word is **taş** and the first form of the suffix is  $+(y)HmHz$  the suffix is formed as follows:  $+HmHz$

Kök: *su* ve ek:  $+yHmHz \Rightarrow suyHmHz$

Kök: *taş* ve ek:  $+HmHz \Rightarrow taşHmHz$

Kh: fusion letter, Yek: nominatif part of the suffix

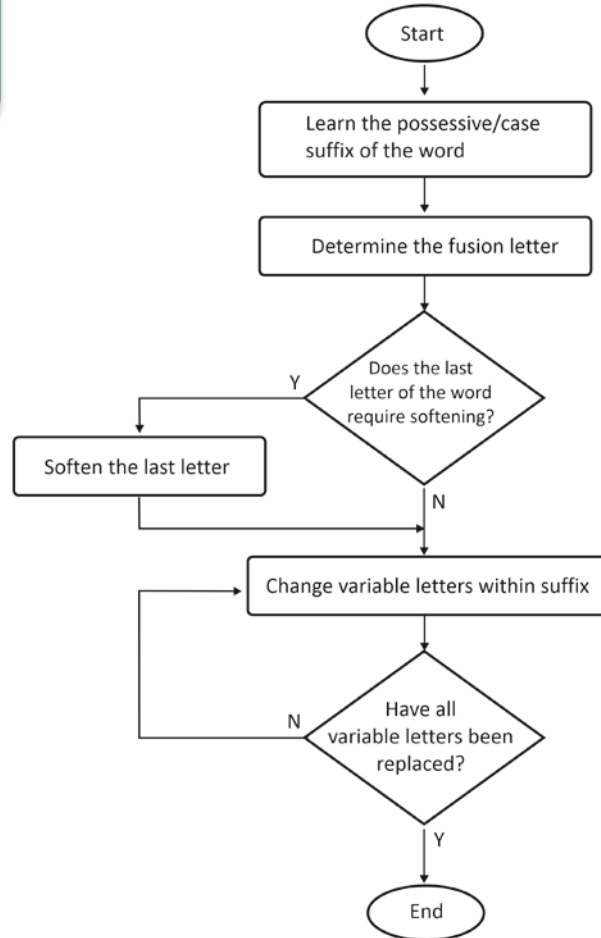
Kök: *su* ve ek:  $su+yumuz \Rightarrow suyumuz$

Kök: *taş* ve ek:  $taş+ımız \Rightarrow taşımız$

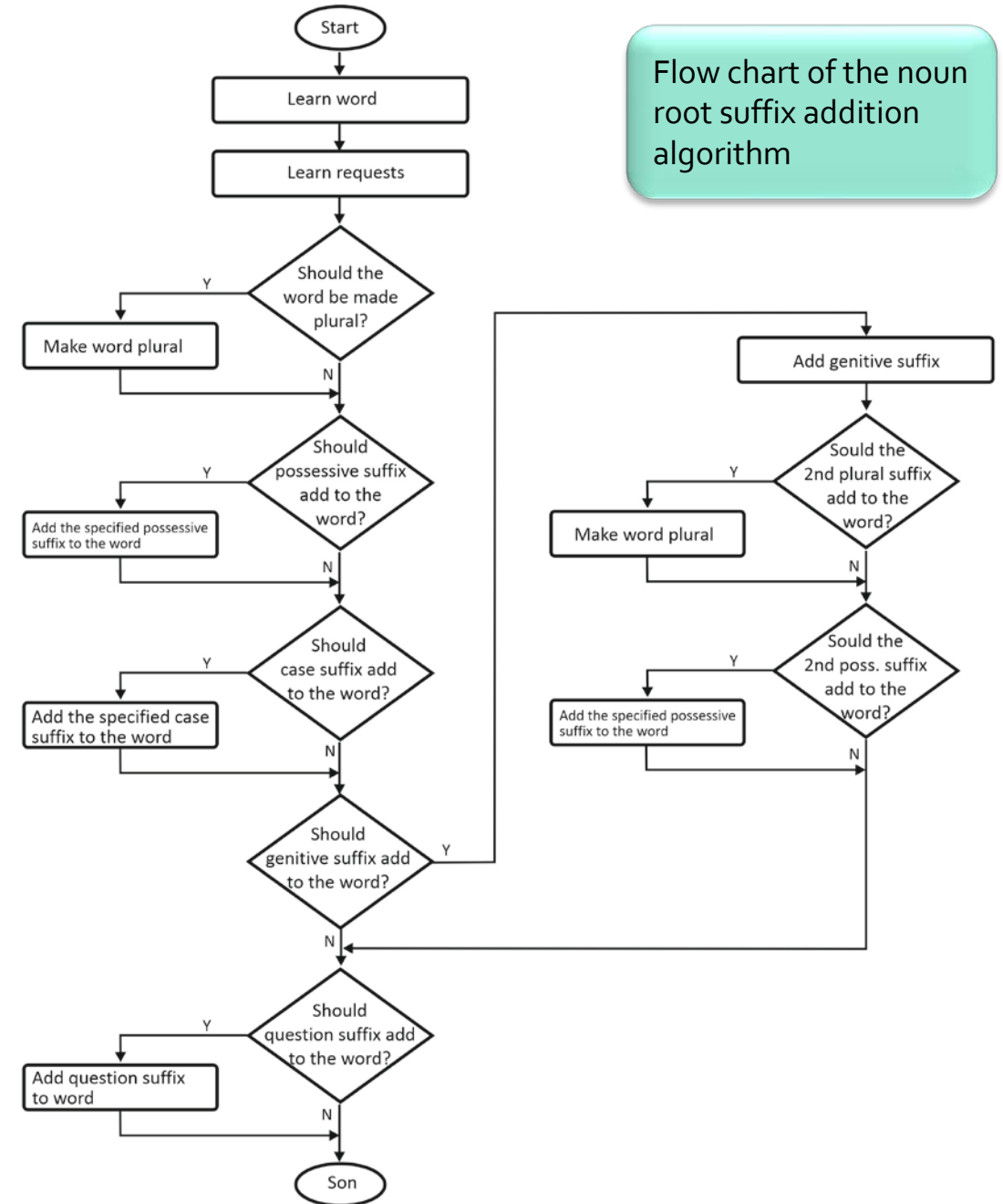


# Flowcharts of Noun Conjugation

Flow chart for adding possessive or case suffixes to the root word



Flow chart of the noun root suffix addition algorithm



# Program of Noun Conjugation

Ad genel çekimi : Hazırlayan E. Adalı

**Bir adı tüm olasılara göre çekebilirsiniz**

Bir ad yazınız

evet hayır

Çoğul yapılsın mı? ☒ ☐

İyelik eki eklensin mi? ☒ ☐ Evet ise kaçınıcı iye?  1, 2, 3, 4, 5, 6

Durum eki eklensin mi? ☒ ☐ Hangi Durum eki? yal bel yön bul ayr tam ilg arç eş  
☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐ ☐

evet hayır

İlgi eki eklensin mi? ☒ ☐ İlgi eki eklendiyse 2. çoğul yapılsın mı? ☒ ☐

İlgi eki eklendiyse 2. İyelik eki eklensin mi? ☒ ☐

2. iyelik eklenecek ise

Ad soru yapılsın mı? ☐ ☒ kaçınıcı iye?  1, 2, 3, 4, 5, 6

Ad eyleme dönüştürülsün mü? ☐ ☒

{Çoğul : } masalar

{İyelik : } masalarımız

{Durum : } masalarımızda

{İlgi : } masalarımızdaki

{2. Çoğul : } masalarımızdakiler

{2. İyelik : } masalarımızdakileri

Giriş Başarılı...

Devam

# Verb Conjugation

# Auxiliary Verb Conjugation

## Steps

1

Creating the negative of the root

2

Creating of suffix

3

Softing

4

Editing variable letters within a suffix

5

Creating the verb

In Turkish, auxiliaries verbs allow noun words to be used as predicates. Suffixes are formatted according to tense and are defined for four tenses:

| Tenses                | Time suffixes | Personel suffixes                          | Examples      |
|-----------------------|---------------|--|---------------|
| Past tense indefinite | $+(y)mHş$     | $+Hm, +sHn, +''', +Hz, +sHnHz, +lAr$       | öğrenciymişim |
| Past tense            | $+(y)DH$      | $+m, +n, +'', +k, +nHz, +lA$               | öğrenciydim   |
| Present and future    | $+'''$        | $+(y)Hm, +sHn, +DHr, +(y)Hz, +sHnHz, +lAr$ | öğrenciyim    |
| Optative - condition  | $+(y)s(A)$    | $+m, +n, +''', +k, +nHz, +lAr$             | öğrenciysem   |

| Tenses            | Time suffixes | Personel suffixes | Examples         |
|-------------------|---------------|-------------------|------------------|
| suffix $+ken$     | $+'''$        | $+(y)ken$         | öğrenciyken      |
| suffix $+mışçası$ | $+'''$        | $+(y)mHşcAsHnA$   | öğrencimişçesine |



# Program for Auxiliaries Verb Conjugation

Ek Eylem genel çekimi : Hazırlayan E. Adalı

**Bir ek eylemi ve eylemsileri tüm olasılara göre çekebilirsiniz.**

Bir ad kök yazınız

evet hayır

Eylem olumlu mu? ☒ ☐

Eylem soru mu? ☐ ☒

Kişi sıra bilgisini ne?  1, 2, 3, 4, 5, 6,

Kipler

- Şimdiki ve geniş zaman
- Belirsiz geçmiş zaman
- Belirli geçmiş zaman
- Şimdiki ve geniş zaman
- Dilek koşul
- +ken eki
- +mışcasına

Devam

Çekilmiş eylem: öğrenciyim



# Verb Conjugation

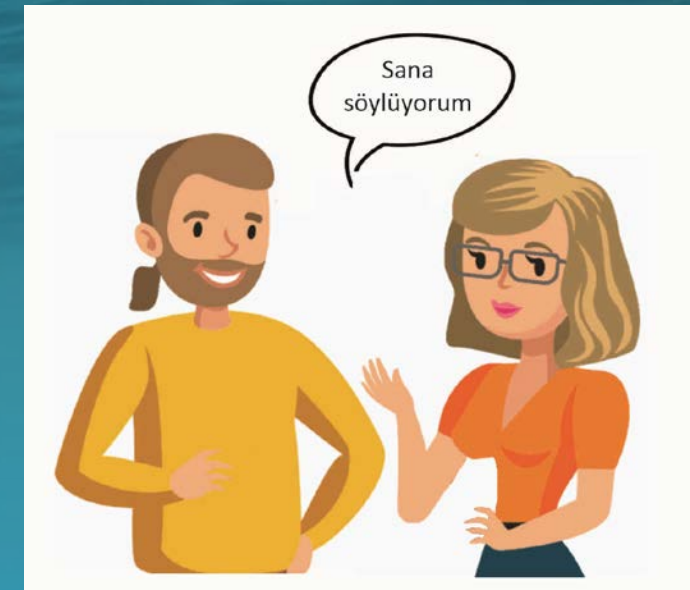
Conjugation of Turkish verbs is regular and **there are no examples of exceptions to the rule**. On the other hand, in English and French, the conjugations of verbs that are used frequently and number more than a hundred are irregular. Conjugation of irregular verbs can only be used by memorization. The fact that verb conjugations are regular in Turkish allows it to be conjugated in accordance with the rules when a new verb enters the language.

Turkish verbs have the feature of **indicating direction and are logical**.

Eren Bartu'**ya** söylüyor  
Bartu Eren'**i** dinliyor

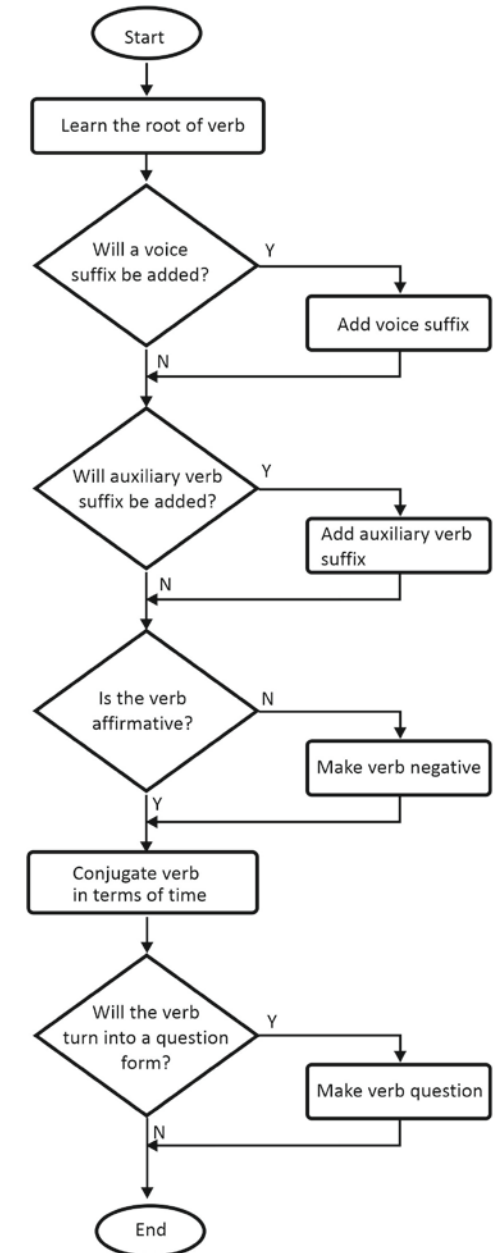
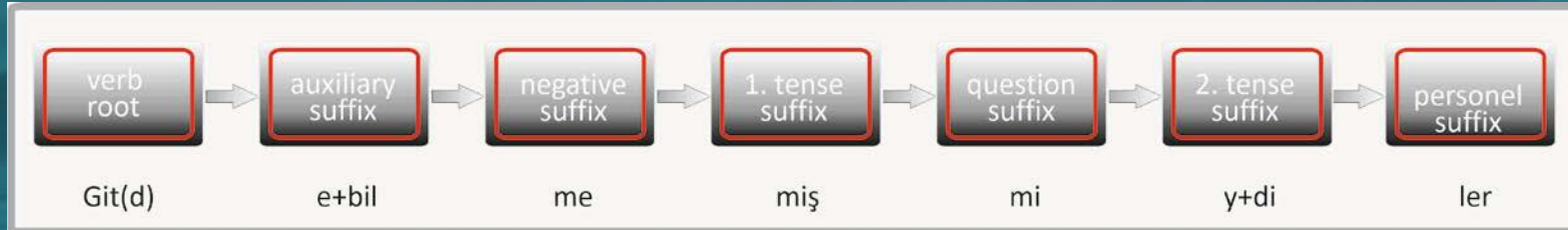
You are listening **to** Istanbul radio  
You are saying something **to** Eren

Vous écoutez la radio **d'**Istanbul  
Tu dis quelque chose **à** Eren

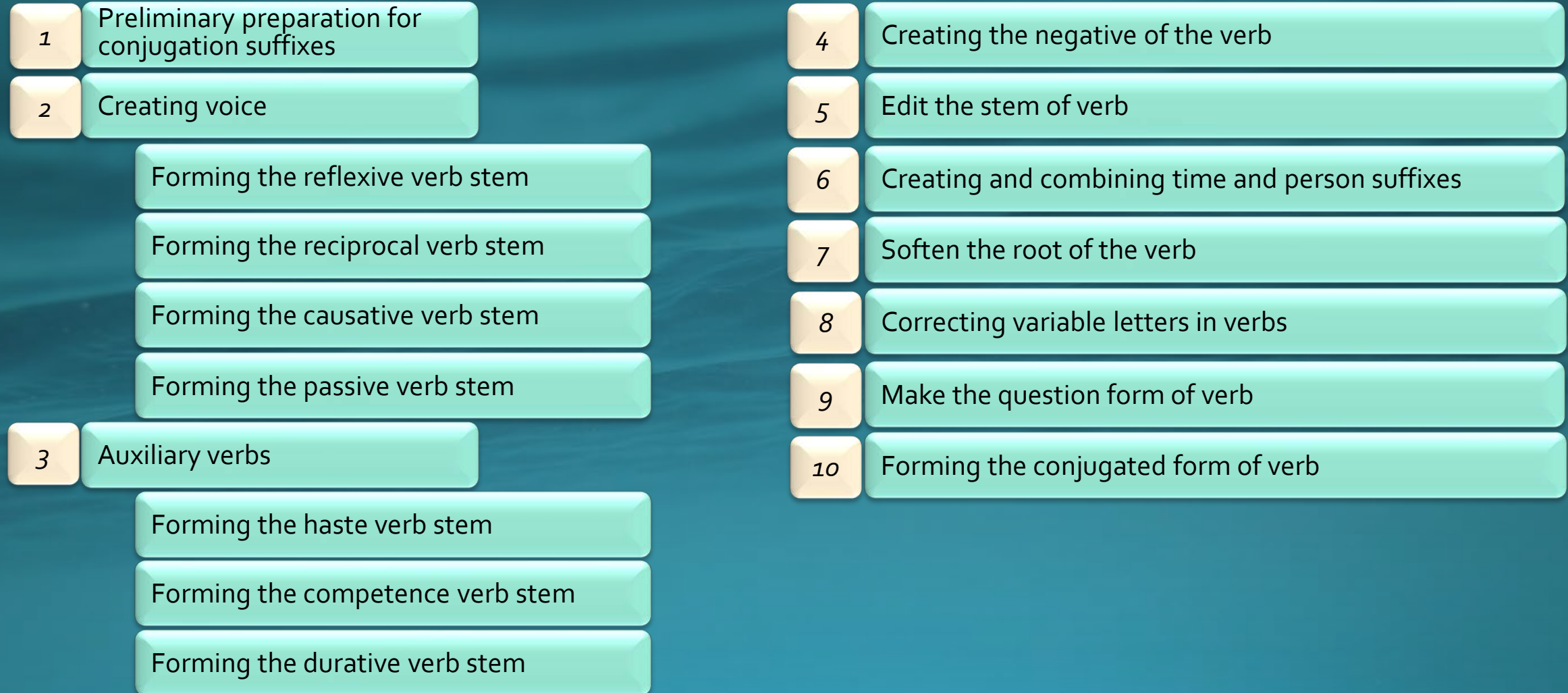


# Verb Conjugation

The main flow chart of verb conjugation



# Verb Conjugation Program Preparations





# Indicative Moods

Indicative Moods:  
Tense and Person Inflectional Suffixes

| Tenses                            | Time suffix        | Personel suffixes                            | Examples            |
|-----------------------------------|--------------------|--|---------------------|
| Past tense, indefinite            | <i>+mHş</i>        | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>sevmişim</b>     |
| Past tense                        | <i>+D</i>          | <i>+Hm, +Hn, +H, +Hk, +Hniz, +HIAr</i>       | <b>sevdim</b>       |
| Present simple tense              | <i>+(H)yor</i>     | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>seviyorum</b>    |
| Future tense                      | <i>+(y)AcAk</i>    | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>seveceğim</b>    |
| Aorist                            | <i>+(A/H)r</i> *   | <i>+Hm, +sHn, +""', +(y)Hz, +sHnHz, +IAr</i> | <b>severim</b>      |
| Past perfect tense indefinite     | <i>+mHşD</i>       | <i>+Hm, +Hn, +H, +Hk, +HnHz, +HIAr</i>       | <b>sevmiştim</b>    |
| Past perfect tense                | <i>+DHyD</i>       | <i>+Hm, +Hn, +H, +Hk, +HnHz, +HIAr</i>       | <b>sevdiydin</b>    |
| Present past tense                | <i>+(H)yorD</i>    | <i>+Hm, +Hn, +H, +Hk, +HnHz, +HIAr</i>       | <b>seviyordum</b>   |
| Future past time                  | <i>+(y)AcAkD</i>   | <i>+Hm, +Hn, +H, +Hk, +HnHz, +HIAr</i>       | <b>sevecektim</b>   |
| Aorist perfect tense              | <i>+(A/H)rD</i> *  | <i>+Hm, +Hn, +H, +Hk, +HnHz, +HIAr</i>       | <b>severdim</b>     |
| Past indefinite Inferential       | <i>+mHşmHş</i>     | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>sevmişmişim</b>  |
| Present Inferential               | <i>+(H)yormHş</i>  | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>seviyormuşum</b> |
| Future Inferential                | <i>(y)AcAkmHş</i>  | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>sevecekmişim</b> |
| Aorist Inferential                | <i>(A/H)rmHş</i> * | <i>+Hm, +sHn, +""', +Hz, +sHnHz, +IAr</i>    | <b>severmişim</b>   |
| Past ind. Inferential conditional | <i>+mHşsA</i>      | <i>+m, +n, +""', +k, +nHz, +IAr</i>          | <b>sevmişsem</b>    |
| Past ind. Inferential conditional | <i>+DHysA</i>      | <i>+m, +n, +""', +k, +nHz, +IAr</i>          | <b>sevdiysem</b>    |
| Present conditional               | <i>+(H)yorsA</i>   | <i>+m, +n, +""', +k, +nHz, +IAr</i>          | <b>seviyorsan</b>   |
| Future conditional                | <i>+(y)AcAksA</i>  | <i>+m, +n, +""', +k, +nHz, +IAr</i>          | <b>seveceksem</b>   |
| Aorist conditional                | <i>+(A/H)rsA</i> * | <i>+m, +n, +""', +k, +nHz, +IAr</i>          | <b>seversem</b>     |

# Subjunctive Moods

Subjunctive Modals:  
Tense and Individual  
Inflectional Suffixes

| Moodes                          | Time suffix | Personel suffixes                      | Examples      |
|---------------------------------|-------------|--|---------------|
| Wish - Conditional              | +sA         | +m, +n, +""', +k, +nHz, +lAr           | sevsem        |
| Optative                        | +A          | +yHm +sHn, +""', +lHm, +sHnHz, +lAr    | seveyim       |
| Obligational                    | +mAIlH      | +yHm, +sHn, +""', +yHz, +sHnHz, +lAr   | sevmeliyim    |
| Imperative mood                 | +""'        | +""', +""', +sHn, +""', +HnHz, +sHnlAr | sev (2.tek)   |
| Perfect of wish - conditional   | +sAyD       | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | sevseydim     |
| Perfect of optative             | +AyD        | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | seveydim      |
| Perfect of obligational         | +mAIlHyD    | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | sevmeliydim   |
| Inferential of wish-conditional | +sAymHş     | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | sevseymişim   |
| Inferential of optative         | +AymHş      | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | seveymişim    |
| Inferential of obligation       | +mAIlHymHş  | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | sevmeliymişim |
| Conditional of obligation       | +mAIlHysA   | +m, +n, +""', +k, +nHz, +lAr           | sevmeliysem   |



# Verb Voices

Reflexive  
Dönüşlü

$dönüşlü\ eylem = etken\ eylem \begin{cases} SH(eylem) \text{ ünlü ise} + (I \vee n \vee \text{ş}) \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + (I \vee n \vee \text{ş}) \end{cases}$

Reciprocal  
İşteş

$işteş\ eylem = etken\ eylem \begin{cases} SH(eylem) \text{ ünlü ise} + \text{ş} \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + \text{ş} \end{cases}$

Causative  
Ettirgen

1  $\begin{matrix} Ettirgenlik - dir\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + tt + BAĞ(eylem) + r \\ SH(eylem) \text{ ünsüz ise} & \begin{cases} SH(eylem) \text{ sert ise} + t \\ SH(eylem) \text{ yumuşak ise} + d \end{cases} + BAĞ(eylem) + r \end{cases} \\ Ettirgenlik - r\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + r \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + r \end{cases} \\ Ettirgenlik - t\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + t \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + t \end{cases} \end{matrix}$

3  $\begin{matrix} Ettirgenlik - dir\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + tt + BAĞ(eylem) + rtt + BAĞ(eylem) + r \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + rtt + BAĞ(eylem) + r \end{cases} \\ Ettirgenlik - r\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + rtt + BAĞ(eylem) + r \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + rtt + BAĞ(eylem) + r \end{cases} \\ Ettirgenlik - t\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + tt + BAĞ(eylem) + rt \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + tt + BAĞ(eylem) + rt \end{cases} \end{matrix}$

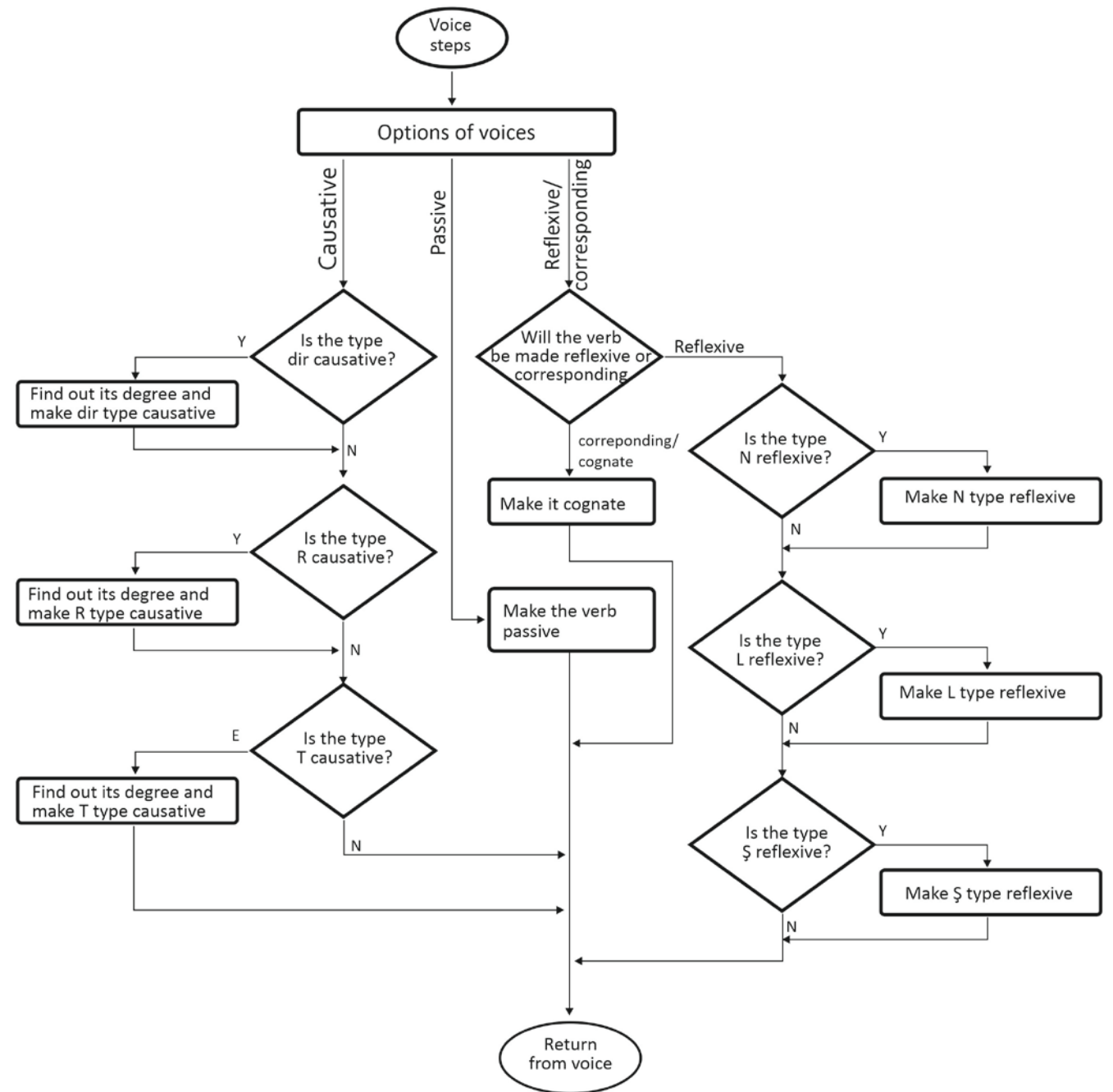
2

$\begin{matrix} Ettirgenlik - dir\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + tt + BAĞ(eylem) + rt \\ SH(eylem) \text{ ünsüz ise} & \begin{cases} SH(eylem) \text{ sert ise} + t \\ SH(eylem) \text{ yumuşak ise} + d \end{cases} + BAĞ(eylem) + rt \end{cases} \\ Ettirgenlik - r\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + rt \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + rt \end{cases} \\ Ettirgenlik - t\ ise\ eylem & \begin{cases} SH(eylem) \text{ ünlü ise} + tt + BAĞ(eylem) + r \\ SH(eylem) \text{ ünsüz ise} + BAĞ(eylem) + tt + BAĞ(eylem) + r \end{cases} \end{matrix}$

Passive  
Edilgen

$edilgen\ eylem = etken\ eylem \begin{cases} SH((eylem) \vee SHH(eylem)) I\ ise + BAĞ(eylem) + n \\ SH(eylem) \text{ ünlü ise} + n \\ diğer\ durumlarda + BAĞ(eylem) + I \end{cases}$

# Forming of Voices



# Compound Verbs

Haste / **Tezlik**

tezlik = etken eylem

|             |                                   |                         |
|-------------|-----------------------------------|-------------------------|
| olumlu ise  | SH(kök) ünlü ise + <b>y</b>       | + BAĞ(kök) + <b>ver</b> |
|             | SH(kök) ünsüz + ""                |                         |
| olumsuz ise | S(kök) ince ise + <b>meyiver</b>  |                         |
|             | S(kök) kalın ise + <b>mayiver</b> |                         |

Competence / **Yeterlik**

yeterlik = etken eylem

|           |             |                             |                                    |
|-----------|-------------|-----------------------------|------------------------------------|
| güç ise   | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>ebil</b>      |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>abil</b>     |
|           | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>em</b>        |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>am</b>       |
| olası ise | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>ebil</b>      |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>abil</b>     |
|           | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>emeyebil</b>  |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>amayabil</b> |
| istek ise | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>ebil</b>      |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>abil</b>     |
|           | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>emeyebil</b>  |
|           |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>amayabil</b> |

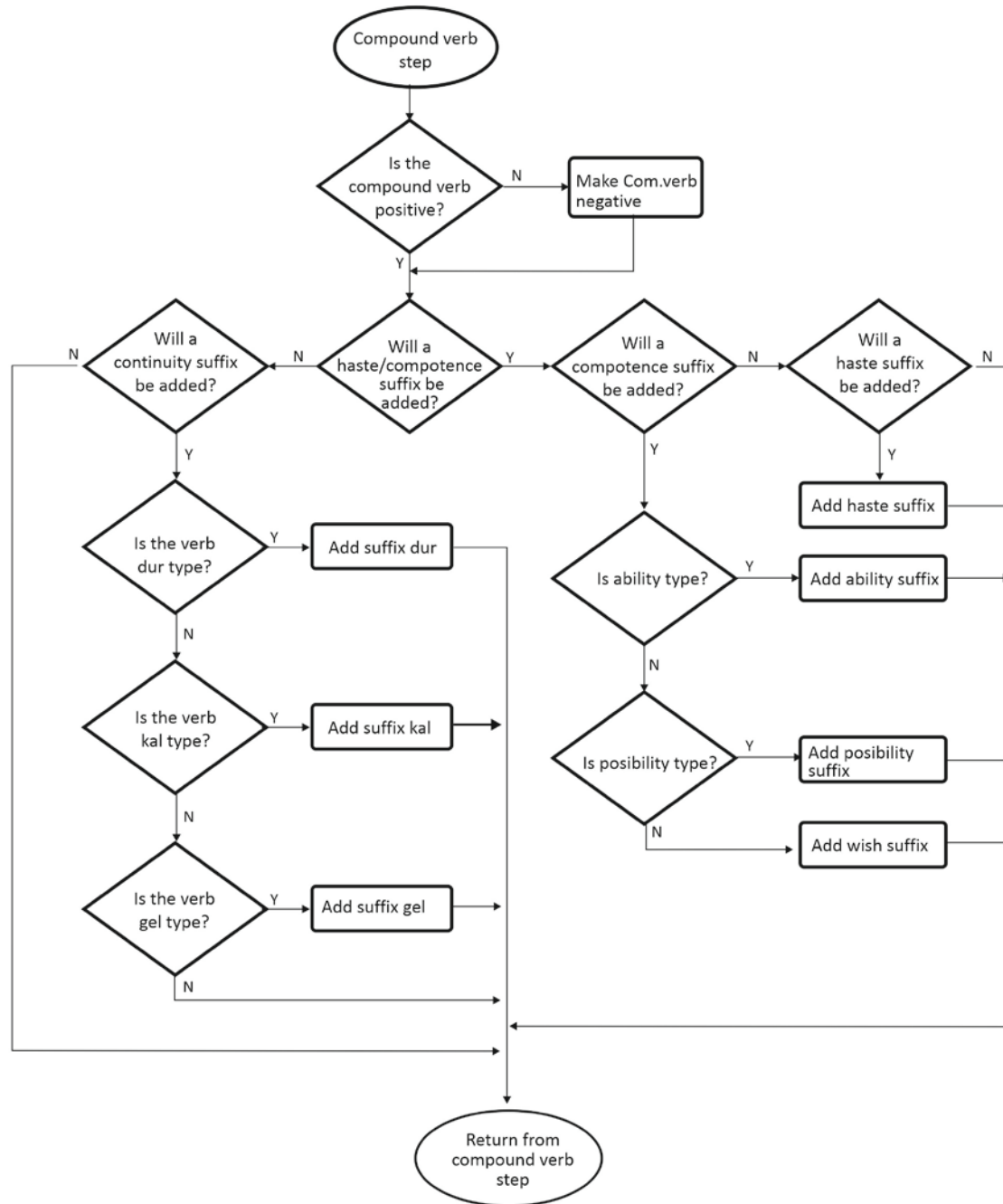
Durative / **Sürerlik**

sürerlik = etken eylem

|          |             |                             |                                    |
|----------|-------------|-----------------------------|------------------------------------|
| -dur ise | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>edur</b>      |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>adur</b>     |
|          | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>edurma</b>    |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>adurma</b>   |
| -kal ise | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>ekal</b>      |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>akal</b>     |
|          | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>ekalma</b>    |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>akalma</b>   |
| -gel ise | olumlu ise  | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>egel</b>      |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>agel</b>     |
|          | olumsuz ise | SH(kök) ünlü ise + <b>y</b> | S(kök) ince ise + <b>egelmane</b>  |
|          |             | SH(kök) ünsüz + ""          | S(kök) kalın ise + <b>agelmane</b> |



# Forming of Compound Verbs





# Negative of Verb

General

$OLZ(\text{eylem}) = \text{etken eylem} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{me} \\ S(\text{kök}) \text{ kalın ise} + \text{ma} \end{cases}$

Present tense

$OLZ(\text{eylem tümŞİZ}) = \text{etken eylem} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{m} + \text{BAĞ}(\text{kök}) \\ S(\text{kök}) \text{ kalın ise} + \text{m} + \text{BAĞ}(\text{kök}) \end{cases}$

Aorist

$OLZ(\text{eylem tümGNZ}) = \text{etken eylem} \begin{cases} \text{tüm kipler için} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{mez} \\ S(\text{kök}) \text{ kalın ise} + \text{maz} \end{cases} \\ \text{GNZ 1. tek} \vee \text{1.çoğ ise} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{me} \\ S(\text{kök}) \text{ kalın ise} + \text{ma} \end{cases} \end{cases}$

Competence

$OLZ(\text{yeterlik}) = \text{etken eylem} \begin{cases} \text{güç ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{em} \\ S(\text{kök}) \text{ kalın ise} + \text{am} \end{cases} \\ \text{olası ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{emeyebil} \\ S(\text{kök}) \text{ kalın ise} + \text{amayabil} \end{cases} \\ \text{istek ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{emeyebil} \\ S(\text{kök}) \text{ kalın ise} + \text{amayabil} \end{cases} \end{cases}$

Haste

$OLZ(\text{tezlik}) = \text{etken eylem} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{meyiver} \\ S(\text{kök}) \text{ kalın ise} + \text{mayiver} \end{cases}$

Durative

$OLZ(\text{sürerlik}) = \text{etken eylem} \begin{cases} \text{-dur ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{edurma} \\ S(\text{kök}) \text{ kalın ise} + \text{adurma} \end{cases} \\ \text{-kal ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{ekalma} \\ S(\text{kök}) \text{ kalın ise} + \text{akalma} \end{cases} \\ \text{-gel ise} \begin{cases} SH(\text{kök}) \text{ ünlü ise} + \text{y} \\ SH(\text{kök}) \text{ ünsüz} + "" \end{cases} \begin{cases} S(\text{kök}) \text{ ince ise} + \text{egelme} \\ S(\text{kök}) \text{ kalın ise} + \text{agelme} \end{cases} \end{cases}$

Eylem: verb

Kök: root

İnce: front vowel

Kalın: Back vowel

OLZ: Negative

Tüm: all

# Change on Verb Root

When determining the present tense suffix, the last letter of the root verb is changed. The rule for this change is as follows:

- In the first stage, whether the **last letter of the root** is **a** or **e** is examined. If the last letter is **a**, it is changed to **i** and if it is **e**, it is changed to **i**.
- In the second stage, **if the last letter of the root is a consonant**, the last vowel is checked. If the last vowel is **a** or **i**, **i** is added to the root, if **e** or **i**, **i** is added, if **o** or **u**, **o**, if **ö** or **ü**, **ü** is added. In a sense, the binding vowel rule applies.

$$\left\{ \begin{array}{l} SH(kök) a \text{ ise } a \rightarrow i \\ SH(kök) e \text{ ise } e \rightarrow i \\ SHH(kök) a \vee i \text{ ise } kök + i \\ SHH(kök) e \vee i \text{ ise } kök + i \\ SHH(kök) o \vee u \text{ ise } kök + u \\ SHH(kök) ö \vee ü \text{ ise } kök + ü \end{array} \right\} = \left\{ \begin{array}{l} SH(kök) a \text{ ise } a \rightarrow i \\ SH(kök) e \text{ ise } e \rightarrow i \\ kök + BAĞ(kök) \end{array} \right\} = DÜZ(kök)$$

SH: last letter

SHH: letter before the last one

DÜZ: change

Among the Turkish verb roots, it was necessary to change the last letter of the four verb roots ending in t (**dit**, **et**, **git**, **güt**, **tat**). The last letters of these verbs in the modes ŞİZ, ŞİZH, ŞİZR, ŞİZK, GEZ, GEZH, GEZR, GEZK, GNZ, GNZH, GNZR and GNZK have been changed to t  $\Rightarrow$  d. This is because the first letter of the tense suffix begins with a vowel.

$$Eylem \left\{ \begin{array}{l} dit \vee et \vee \\ git \vee güt \vee \\ tat \end{array} \right\} \wedge zaman \left\{ \begin{array}{l} ŞİZ \vee ŞİZH \vee ŞİZR \vee ŞİZK \vee \\ GEZ \vee GEZH \vee GEZR \vee GEZK \vee \\ GNZ \vee GNZH \vee GNZR \vee GNZK \vee \end{array} \right\} \text{ ise } \{ SH(kök) t \text{ ise } t \rightarrow d \} = DÜZ(kök)$$

Zaman: time

ŞİZ: present

GEZ: future

GNZ: aorist

-H: imperfect

-R: narration

-K: conditional

# Time and Person Suffixes - I

In the first stage, time suffix is added to the root, then person suffix is added.

The tense suffix may contain variable letters, fusion letters and constant letters.

For example, DHyD, (y)AcAk, mHş. At this stage, the solution of variable and fusion letters is done by going through the following steps:

- 1 If the last letter of the verb is a vowel and there is the letter H or X in parentheses, the parenthesized part of the tense suffix is deleted. For example, if the root = **oku** and the tense suffix is +(H)yorD, the tense suffix = +yorD
- 2 If the last letter of the verb is a consonant and there is an H in parentheses, the letter in parentheses is added before the tense suffix. For example, if the root = **sev** and the tense suffix is +(H)yorD, the tense suffix = +HyorD
- 3 If the last letter of the verb is a consonant and there is an X in parentheses, the following conclusion is reached by looking at the number of syllables in the verb: If the number of syllable is 1, the letter A is added to the beginning of the suffix, and if the number of syllable is more than 1, the letter H is added. For example, if root = **sev** and tense suffix +(A/H)r, tense suffix = +AyorD, if root = **düşün** and tense suffix +(A/H)r, tense suffix = +HyorD.
- 4 If the last letter of the verb is a vowel and there is a y in parentheses, the letter in parentheses is added before the tense suffix. For example, if the root = **oku** and the tense suffix is +(y)AcAk, the tense suffix = +yAcAk.
- 5 If the last letter of the verb is a consonant and there is a y in parentheses, the parentheses are deleted. For example, if the root = **sev** and the tense suffix is +(y)AcAk, the tense suffix = +AcAk



# Time and Person Suffixes - II

Negatives of present tense suffixes have a special situation and the situation is resolved as follows:

- 1 At the end of the evaluation of the letter in parentheses, the first letter of the time suffix created is deleted. Before the correction, if the root = *sevmez* and the time suffix is +(A/H)r, the tense suffix = +Ar, so the verb becomes **sevmezer**. When the tense suffix is deleted, the tense body of the verb becomes **sevmez**.
- 2 For first singular and first plural person suffixes, the last letter of the verb tense body is deleted. Thus the result is **sevme**.

When these stages are completed, the time suffix part of the action is created and added to the action root. The resulting part is called the **time body**. Next is the creation of the person suffix. Person suffixes may have a fusion letter at the beginning and variable letters inside. Therefore, all that needs to be done is to evaluate the fusion letter in parentheses at the beginning of the person suffix. For this, the following steps must be completed:

- 1 If the last letter of the tense stem is vowel, y is added to the beginning of the person suffix. For example: if time body = **okud** and person +(H)m, time suffix = +ym
- 2 If the last letter of the verb is a consonant and there is a y in parentheses, the letter in parentheses is added before the tense suffix. For example: if the root = **sevme** and the person suffix is +(y)Hz, then the tense suffix = +yHz
- 3 If the last letter of the verb is a vowel and there is a y in parentheses, the letter in parentheses is deleted. For example: if the root = **sever** and the person suffix is +(y)Hz, then the tense suffix = +Hz.



# Softening in the Verb Root Changing Variable Letters

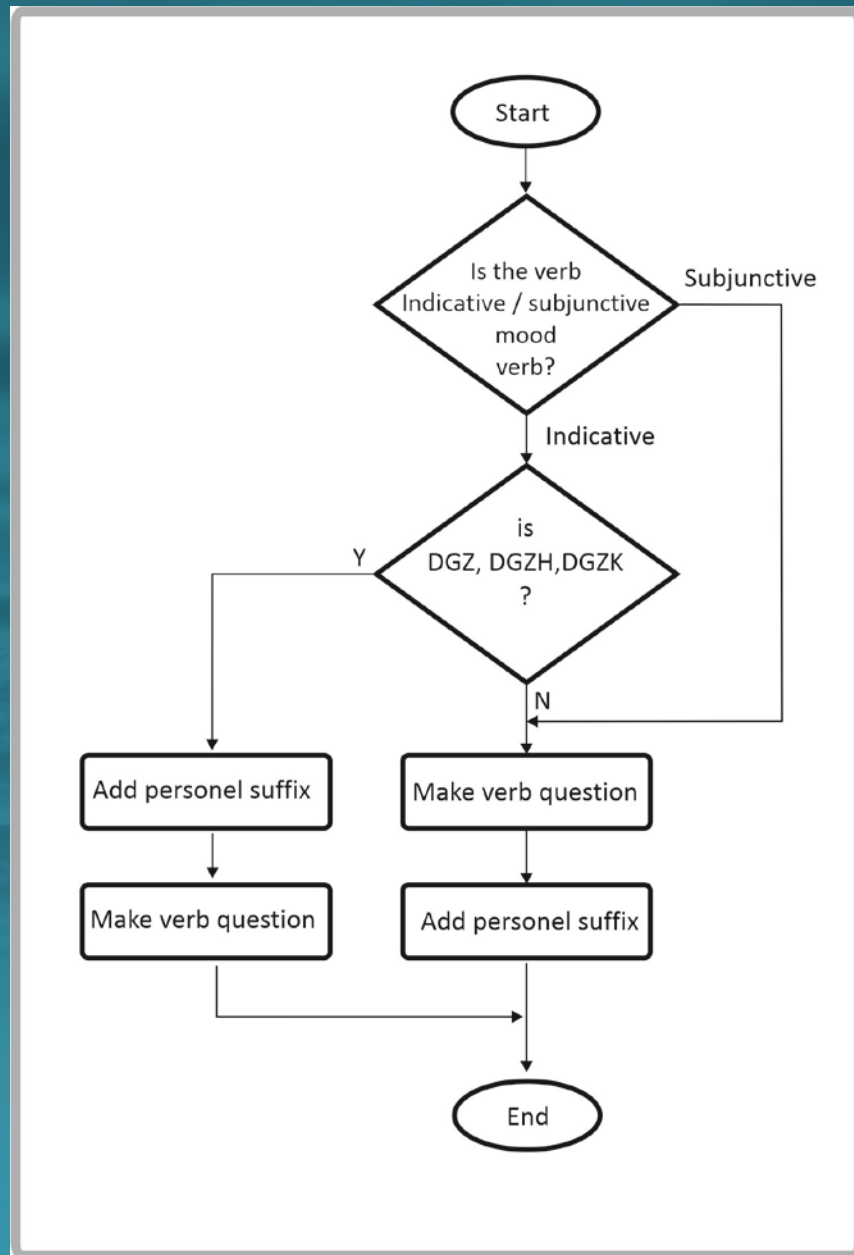
For smoothing, YUM operation is sufficient.

$$YUM = \left\{ \begin{array}{l} IH(ek) \in \ddot{U}n \wedge SS(söz) > 1 \Rightarrow \left\{ \begin{array}{l} SH(söz) = p \Rightarrow SH(söz) = b \\ SH(söz) = ç \Rightarrow SH(söz) = c \\ SH(söz) = t \Rightarrow SH(söz) = d \\ SH(söz) = k \Rightarrow \left\{ \begin{array}{l} SHH(söz) \in \ddot{U}n \Rightarrow SH(söz) = ğ \\ SHH(söz) \in Sz \Rightarrow SH(söz) = g \end{array} \right\} \end{array} \right. \\ \\ IH(ek) \in Sz \wedge SS(söz) = 1 \Rightarrow \left\{ \begin{array}{l} BY(söz) \leq 3 \wedge s \notin \{ 'uç', 'but', 'kap' \} \Rightarrow SH(söz) = SH(söz) \\ \\ BY(söz) = 4 \Rightarrow \left\{ \begin{array}{l} SHH(söz) = l \Rightarrow \left\{ \begin{array}{l} SH(söz) = ç \Rightarrow SH(söz) = c \\ SH(söz) = k \Rightarrow SH(söz) = k \\ SH(söz) = p \Rightarrow SH(söz) = b \\ SH(söz) = t \Rightarrow SH(söz) = d \end{array} \right\} \\ \\ SHH(söz) = n \Rightarrow \left\{ \begin{array}{l} SH(söz) = ç \Rightarrow SH(söz) = c \\ SH(söz) = k \Rightarrow SH(söz) = g \\ SH(söz) = t \Rightarrow SH(söz) = t \end{array} \right\} \\ \\ SHH(söz) = r \Rightarrow \left\{ \begin{array}{l} SH(söz) = ç \Rightarrow SH(söz) = c \\ SH(söz) = k \Rightarrow SH(söz) = k \\ SH(söz) = p \Rightarrow SH(söz) = b \\ SH(söz) = t \Rightarrow SH(söz) = d \end{array} \right\} \\ \\ SHH(söz) = s \Rightarrow \{ SH(söz) = t \Rightarrow SH(söz) = d \} \\ SHH(söz) = ş \Rightarrow \{ SH(söz) = t \Rightarrow SH(söz) = d \} \end{array} \right. \end{array} \right. \end{array} \right\}$$

DEĞ operation is applied for variable letters.

$$\left\{ \begin{array}{l} S(\ddot{o}nce) a \vee i \text{ ise } H \rightarrow i \\ S(\ddot{o}nce) e \vee i \text{ ise } H \rightarrow i \\ S(\ddot{o}nce) o \vee u \text{ ise } H \rightarrow u \\ S(\ddot{o}nce) \ddot{o} \vee \ddot{u} \text{ ise } H \rightarrow \ddot{u} \end{array} \right\}$$

# Question Form of the Verb



# Verb Creation

## Positive form of verb

$$GNZ(zaman) = \left\{ \begin{array}{l} SH(kök) \text{ ünlü ise } + "" \\ \left\{ \begin{array}{l} SH(kök) (I \vee r) \\ Kurallı \end{array} \right\} \text{ ise } \left\{ \begin{array}{l} \text{tek seslem ise } \left\{ \begin{array}{l} S(kök) \text{ kalın ise } + \mathbf{a} \\ S(kök) \text{ ince ise } + \mathbf{e} \end{array} \right\} \\ \text{çok seslem ise } + BAĞ(kök) \end{array} \right\} \\ \left\{ \begin{array}{l} SH(kök) (I \vee r) \\ Özel \end{array} \right\} \text{ ise } \left\{ \begin{array}{l} kök 2 \text{ harfli ise} \\ kök 3 \text{ harfli ve ilk harf} \\ b, d, g, k \text{ veya } v \end{array} \right\} \text{ ise } + BAĞ(kök) \\ \left\{ SH(kök) \text{ diğer ünsüzler} \right\} \text{ ise } \left\{ \begin{array}{l} \text{tek seslem ise } \left\{ \begin{array}{l} S(kök) \text{ kalın ise } + \mathbf{a} \\ S(kök) \text{ ince ise } + \mathbf{e} \end{array} \right\} \\ \text{çok seslem ise } + BAĞ(kök) \end{array} \right\} \end{array} \right\} + r$$

## Negative form of verb

$$OLZ(kök) \left\{ \begin{array}{l} BR(1) \vee BR(4) \text{ ise } + "" \\ BR(2 \vee 3 \vee 5 \vee 6) \text{ ise } + \mathbf{z} \end{array} \right\}$$

## Present tense positive form of the verb

$$GNZ(zaman) + r \left\{ \begin{array}{l} 3. \text{ çoğ için } "" \\ \text{diğerleri için } + \mathbf{m} + BAĞ \end{array} \right\}$$

## Present negative form of the verb

$$OLZ(kök) + \mathbf{z} + \mathbf{m} + BAĞ(kök)$$

# Program for Verb Conjugation

Eylem genel çekimi : Hazırlayan E. Adalı

**Bir eylemi tüm olasılıklara göre çekebilirsiniz.**

Bir eylem kökü yazınız

Çatı eki seçenekleri evet hayır

Dönüşlü / İsteş mi? ☐ ☒ İsteş ☐

Eylem ettirgen mi? ☒ ☐ Dönüşlü ☒ ise >> L (ile) ☐ N (ile) ☐ Ş (ile) ☐

Eylem edilgen mi? ☐ ☒ Ettirgen ise türü ne? DİR (ile) ☒ R (ile) ☐ T (ile) ☐

Birleşik eylem seçenekleri ☒ ☐ Ettirgenlik derecesi ne?  1, 2, 3

Eylem olumlu mu? ☒ ☐ Birleşik eylem türü Tezlik ☐

Eylem soru mu? ☐ ☒ Yeterlik ☐ ise >> Güç ☐ Olası ☐ İstek ☐

Kipler ☐ Sürerlik ☒ ise >> -dur ☒ -kal ☐ -gel ☐

Kişi sıra bilgisini ne?  1, 2, 3, 4, 5, 6,

Giriş Başarılı...

Ettirgen eylem: sevdirecektir

Birleşik eylem: sevdirecektir

Çekilmiş eylem: sevdirecektir



# Derivational Suffixes

# Derivational Suffixes

noun + suffix  $\Rightarrow$  noun

noun + suffix  $\Rightarrow$  verb

noun + suffix  $\Rightarrow$  adjective

noun + suffix  $\Rightarrow$  adverb

verb + suffix  $\Rightarrow$  verb

verb + suffix  $\Rightarrow$  noun

verb + suffix  $\Rightarrow$  adjective

verb + suffix  $\Rightarrow$  adverb

- Sources show that the number of root verbs in Turkish is **758**, the number of main verbs is approximately **6523**, and the number of basic noun words is approximately **15,468**.
- There are those who, with a cursory comment without evaluating the structure of Turkish, say that the vocabulary of Turkish is weak. Those who think this way say that many words in foreign languages do not have equivalents in Turkish.
- The majority of those who defend this claim are those who do not favor the Language Revolution.
- In Turkish, which is an agglutinative language, many new words can be derived from one root, and the first person who hears each new word can deduce its meaning.

| Type of suffix | Number |
|----------------|--------|
| Inflectional   | 22     |
| Noun to noun   | 58     |
| Noun to verb   | 20     |
| Verb to noun   | 67     |

| Turkish            | English     | Class     | Turkish            | English                | Class     |
|--------------------|-------------|-----------|--------------------|------------------------|-----------|
| <b>Göz</b>         | Eye         | Noun      | <b>Gözlemci</b>    | Observer               | Adjective |
| <b>Gözlük</b>      | Eyeglasses  | Noun      | <b>Gözlemcilik</b> | Observation            | Noun      |
| <b>Gözlükçü</b>    | Optician    | Adjective | <b>Gözde</b>       | Favourite              | Adjective |
| <b>Gözlükçülük</b> | Opticians   | Noun      | <b>Gözü</b>        | Mirror                 | Noun      |
| <b>Gözcü</b>       | Watchman    | Adjective | <b>Gözünlük</b>    | Mirror stand           | Noun      |
| <b>Gözcülük</b>    | Opthamolgy  | Noun      | <b>Gözücü</b>      | Mirror maker           | Adjective |
| <b>Gözlem</b>      | Observation | Noun      | <b>Gözücülük</b>   | Mirror makers business | Noun      |
| <b>Gözlemlemek</b> | To observe  | Verb      | <b>Gözü</b>        | Who have eyes          | Adjective |

# Meanings Gained by Derivational Suffixes

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>Place name</b> <ul style="list-style-type: none"> <li>• Position regarding action</li> <li>• Passing place</li> <li>• Place, region suitable for action</li> <li>• Place name reminiscent of its qualification</li> <li>• Cute settlement</li> <li>• Relatively small settlement</li> <li>• Name given due to the feature it contains</li> <li>• Place name that reminds the living people</li> <li>• Place name related to the intended use</li> <li>• Place name suitable for the purpose of use</li> <li>• Specified location</li> </ul> </li> <li>• <b>Hand tool name</b> <ul style="list-style-type: none"> <li>• Hand tool that contributes to the action</li> <li>• Hand tool that helps action</li> <li>• Hand tool used in action</li> <li>• Hand tool used to implement the action</li> <li>• Object related hand tool</li> </ul> </li> <li>• <b>Tool name</b> <ul style="list-style-type: none"> <li>• Tool used in action</li> </ul> </li> <li>• <b>Device name</b> <ul style="list-style-type: none"> <li>• Action related device</li> </ul> </li> <li>• <b>Name of profession or career stage</b> <ul style="list-style-type: none"> <li>• Profession name</li> <li>• Career stage</li> <li>• Community of colleagues</li> <li>• The work done by the professional</li> <li>• Professional name related to the job he does</li> <li>• Profession name at the degree of specialization</li> </ul> </li> <li>• <b>Adopting a movement of thought</b> <ul style="list-style-type: none"> <li>• Adopting an idea</li> <li>• Opinion based on thought</li> <li>• Those who think the same way</li> </ul> </li> <li>• <b>Togetherness</b> <ul style="list-style-type: none"> <li>• Being together</li> <li>• Cluster of similar things</li> </ul> </li> <li>• <b>Equality, partnership, affiliation</b> <ul style="list-style-type: none"> <li>• Carrying common features</li> <li>• A community of people with common character</li> <li>• Having common qualities</li> <li>• Coming from the same place, root or lineage</li> <li>• Resembling an object</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Similarity</b> <ul style="list-style-type: none"> <li>• Resemblance</li> <li>• Similar quality</li> <li>• Similar behavior</li> <li>• Reminiscent behavior</li> </ul> </li> <li>• <b>Illness</b> <ul style="list-style-type: none"> <li>• Disease name</li> </ul> </li> <li>• <b>Herb</b> <ul style="list-style-type: none"> <li>• Plant name</li> </ul> </li> <li>• <b>Organ</b> <ul style="list-style-type: none"> <li>• Organ name</li> </ul> </li> <li>• <b>Equal distribution</b> <ul style="list-style-type: none"> <li>• Delivery numbers</li> </ul> </li> <li>• <b>Sorting</b> <ul style="list-style-type: none"> <li>• Ordinal numbers</li> <li>• Do the action in order</li> <li>• Doing two actions together</li> </ul> </li> <li>• <b>Time</b> <ul style="list-style-type: none"> <li>• A certain moment</li> <li>• In a certain period</li> <li>• Within a certain period of time</li> <li>• A certain time</li> <li>• At a certain moment</li> <li>• While in a certain situation</li> <li>• Always</li> <li>• When it happened</li> <li>• Time period</li> </ul> </li> <li>• <b>Action that states not to do</b> <ul style="list-style-type: none"> <li>• The act of doing indicated by the noun</li> <li>• The act of doing that is indicated by the verb</li> <li>• The act of doing indicated by the verb</li> <li>• The act of doing indicated by the reflexive noun</li> <li>• The act of doing that the adjective indicates</li> </ul> </li> <li>• <b>Verb make from verb</b> <ul style="list-style-type: none"> <li>• Action of making from reflexive verb</li> </ul> </li> <li>• <b>Verb indicating being</b> <ul style="list-style-type: none"> <li>• The act of becoming what the noun indicates</li> </ul> </li> <li>• <b>Person doing the action</b> <ul style="list-style-type: none"> <li>• The person or object doing the action</li> <li>• A person who does the action without caring</li> <li>• A person who performs an action without thinking</li> <li>• The person who performs the action</li> </ul> </li> </ul> |
|---|--|

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• <b>Parentage status</b> <ul style="list-style-type: none"> <li>• Parentage status</li> </ul> </li> <li>• <b>Temperament, behavior, habit</b> <ul style="list-style-type: none"> <li>• Temperament, behavior, habitual quality</li> <li>• Maintaining temperament and behavior as a habit</li> <li>• Action-related outcome behavior</li> <li>• Action-related temperament, behavior</li> </ul> </li> <li>• <b>Contempt, pity, love</b> <ul style="list-style-type: none"> <li>• Contempt</li> <li>• Disdain</li> <li>• Pity and love</li> <li>• Relatively weak</li> <li>• Humiliation</li> <li>• Relatively small</li> </ul> </li> <li>• <b>Language and dialect</b> <ul style="list-style-type: none"> <li>• Language and dialect</li> </ul> </li> <li>• <b>Ongoing</b> <ul style="list-style-type: none"> <li>• Noun that describes the result of an ongoing action</li> </ul> </li> <li>• <b>Known situation</b> <ul style="list-style-type: none"> <li>• Known situation</li> </ul> </li> <li>• <b>Prayer and wish</b> <ul style="list-style-type: none"> <li>• Prayer and wish</li> </ul> </li> <li>• <b>Food name</b> <ul style="list-style-type: none"> <li>• The name of the food given by those who eat its name.</li> <li>• A dish named after its cooking method.</li> </ul> </li> <li>• <b>Direction</b> <ul style="list-style-type: none"> <li>• Direction</li> </ul> </li> <li>• <b>Seven, Düşkün</b> <ul style="list-style-type: none"> <li>• Seven, yakınlık gösteren, düşkün</li> </ul> </li> <li>• <b>Hosting a feature</b> <ul style="list-style-type: none"> <li>• Qualifying adjective related to a noun</li> <li>• Possessing the qualities indicated by the noun</li> <li>• The property of resembling something</li> <li>• Being related to the subject indicated by the noun</li> <li>• Qualifying adjective related to noun</li> <li>• Being related to the organ or object indicated by the noun</li> <li>• Approaching the quality indicated by the adjective</li> <li>• Qualifying the outcome of the action</li> <li>• Explaining the result of the action</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Person who performs work as a duty</li> <li>• <b>Occasional</b> <ul style="list-style-type: none"> <li>• Occasional action</li> </ul> </li> <li>• <b>Resulting from action</b> <ul style="list-style-type: none"> <li>• The place, environment created as a result of the action</li> <li>• The tool created as a result of the action</li> <li>• Desire resulting from action</li> <li>• Passive subject of action</li> <li>• Document or opportunity created as a result of an action</li> <li>• Action-like function</li> <li>• Abstract concept related to action</li> <li>• Action related concept</li> <li>• Tool used in action</li> <li>• Result concept that evokes action</li> <li>• The resultant product resulting from the action</li> <li>• Technical terms that remind of action</li> <li>• Subject performing the action</li> <li>• The unit or part that emerges with the realization of the action</li> </ul> </li> <li>• <b>The object that emerges when the action takes place</b> <ul style="list-style-type: none"> <li>• The relevant process for the action to be carried out</li> <li>• The situation that occurs when the action occurs</li> <li>• How to do the work related to the action</li> <li>• The act of doing action-related work</li> <li>• Place where the action is performed</li> <li>• The object resulting from the action</li> <li>• The structure, product formed as a result of the action</li> <li>• Reflexive event that confuses the action</li> <li>• Event that evokes action</li> <li>• Result related to action</li> <li>• Structure, subject that evokes action</li> <li>• Reflexive situation that confuses the action</li> </ul> </li> <li>• <b>Having some qualities</b> <ul style="list-style-type: none"> <li>• Having some qualities</li> <li>• Noun that resembles the appearance of an object or person</li> </ul> </li> <li>• <b>Structure</b> <ul style="list-style-type: none"> <li>• Structure</li> </ul> </li> </ul> |
|---|---|



# Add Derivational Suffixes

## Phases

1

Preparation phase: Is the word Turkish?; The meaning to be attributed; class of the root

2

Suffix creation phase: Sound harmony rules; fusion letter

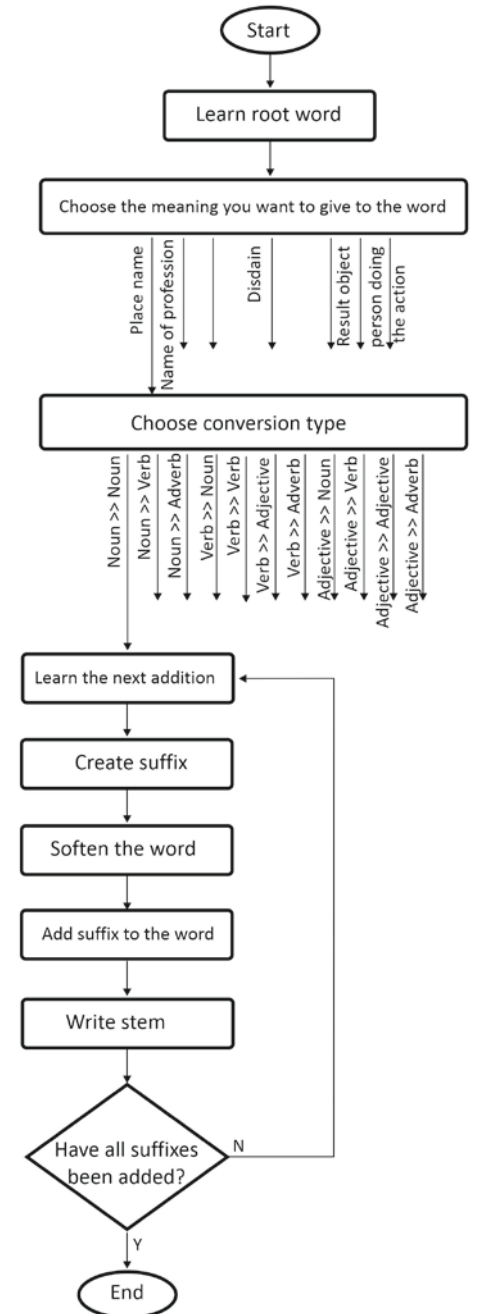
3

Softening phase

4

Adding the suffix to the root

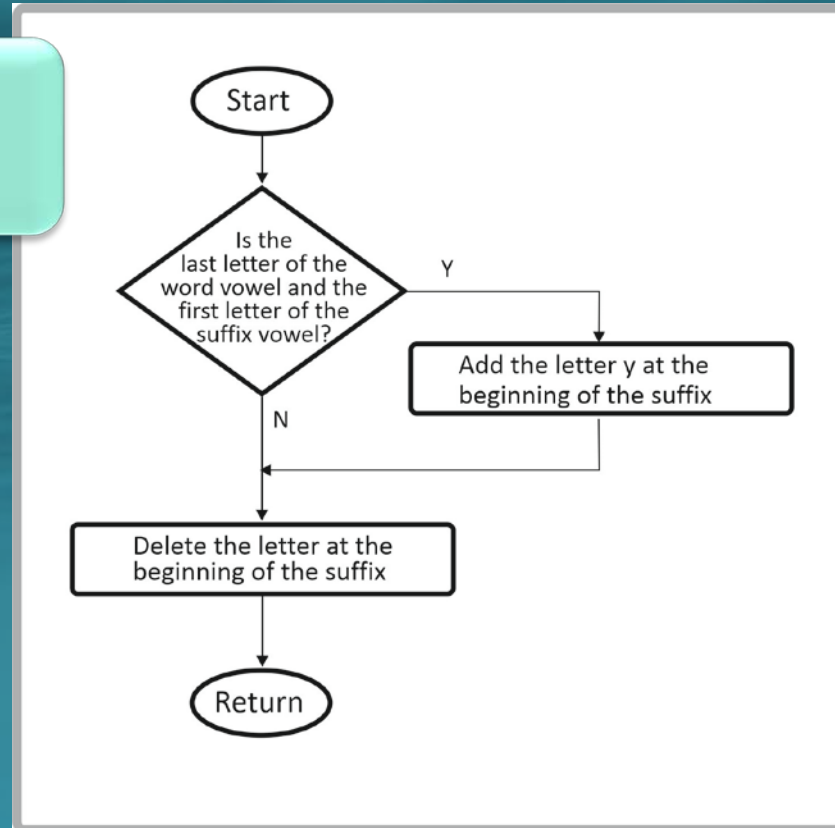
Framework for  
adding a derivational  
suffix to a word



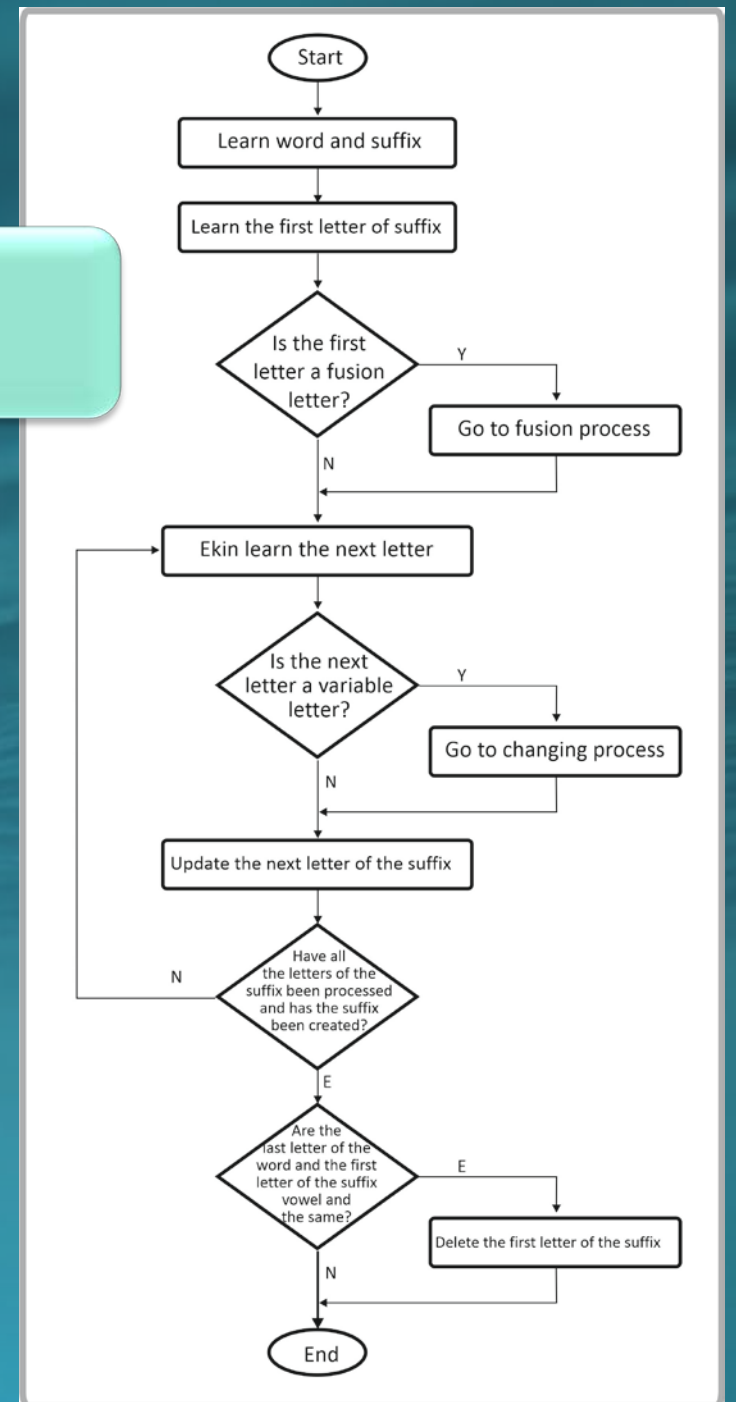


# Steps for Derivational Suffixes

Flow chart for adding fusing letters

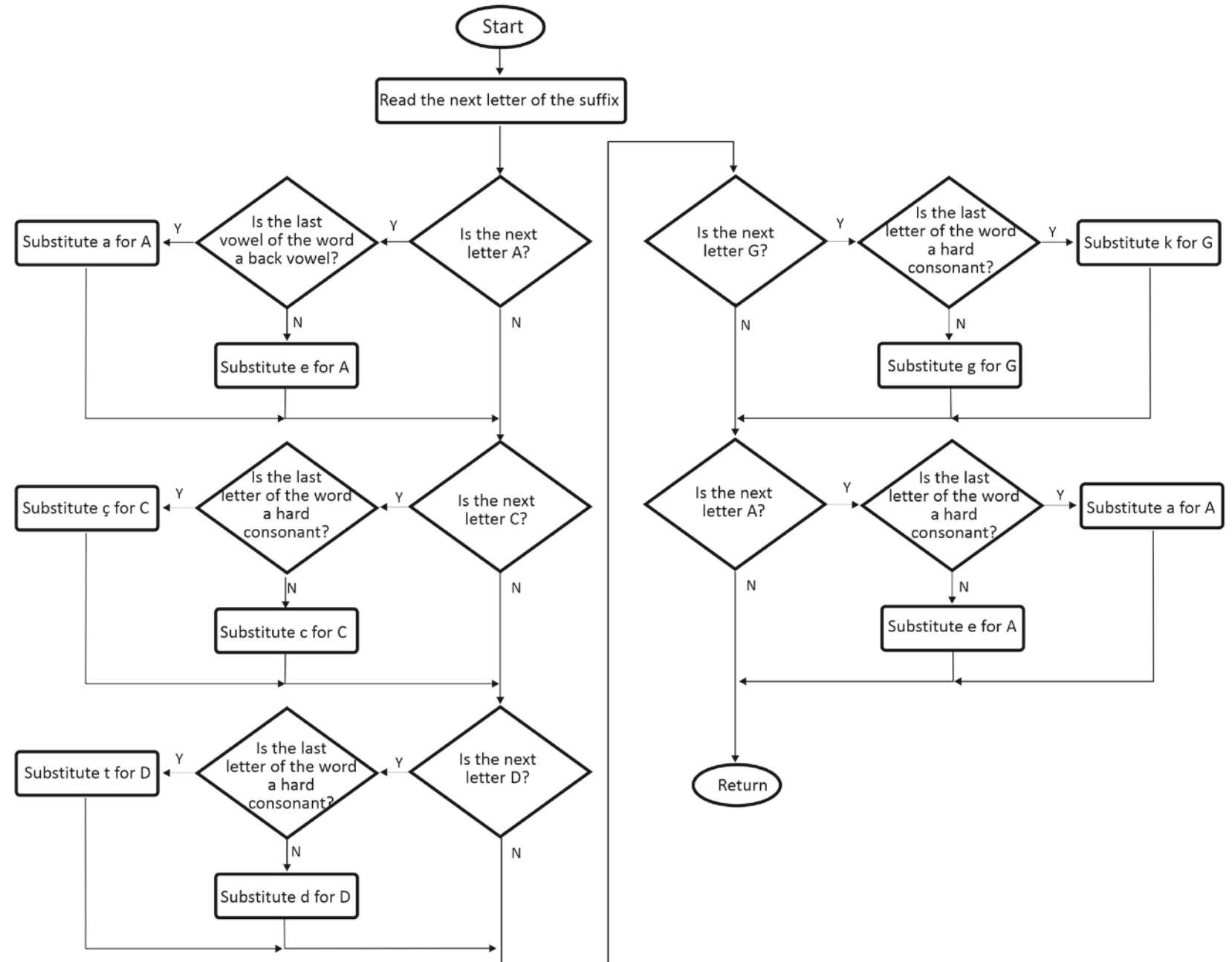


Flowchart for creating an attachment



# Steps for Derivational Suffixes

Flowchart of the process of changing variable letters within the suffix



# Suffixes Deriving Place Name

## Root formation phase

- Root: arpa;
- First letter of the suffix: l, not variable. Instant suffix: l
- The second letter of the suffix is H: variable; The suffix is monosyllable, so the new value of the letter H is found as ı by using the following logical relation.

Instant suffix: lı

$$\text{Seslem\_sayısı}(ek) = 1 \text{ ise } \left\{ \begin{array}{l} S(Kök) (a \vee i) \text{ ise } H \rightarrow ı \\ S(Kök) (e \vee i) \text{ ise } H \rightarrow i \\ S(Kök) (o \vee u) \text{ ise } H \rightarrow u \\ S(Kök) (\ddot{o} \vee \ddot{u}) \text{ ise } H \rightarrow \ddot{u} \end{array} \right\}$$

- Last letter of the suffix: k, not variable. Instant suffix: lık

## Softening phase

- Root: arpa; The first letter of the suffix is a consonant. Accordingly, the following logical relation is used.

$$SS(kök) > 1 \wedge IH(ek) \text{ ünsüz ise } \left\{ \begin{array}{l} SHH(kök) r \text{ ise } \wedge SH(kök) k \text{ ise } SH(kök) \rightarrow k \\ \text{diğer durumlarda kök yumuşamaz} \end{array} \right\}$$

- No softening of the root is required.

| Meaning   | Suffix | Transform | Examples  |
|---|--------|-----------|---|
| Position regarding action   | -A     | verb name | doğa, evre, öte, sapa   |
| Passing placer  | -AmAk  | verb name | basamak, geçemek  |
| Name of place or region suitable for action                           | -Ak    | verb name | batak, barınak, bucak, çatak, durak, kavşak, konak, sığınak, tapınak  |
| Place name that reminds of its quality                                | +CA    | adj. name | Çamlıca, Çatalca, Çukurca, Derince, Düzce, Gökçe, Ilıca, Kaplıca, Kozluca, Kumluca, Sapanca, Sütlüce, Tuzluca, Yarımcı, Yenice  |
| Cute settlement   | +cAk   | name name | Göynücek, Kuyucak, Sorguncak  |
| Relatively small settlement   | +cHk   | name name | Ayvacı, Çınarcık, Germencik, Gölcük, Harmancık, Kuzguncuk, Ovacık, Pazarcık, Yakacık  |
| The place named because of the feature it contains                    | +IH    | name name | Erikli, Kozlu, Topuzlu, Turgutlu  |
| The name of a settlement that reminds the inhabitants                 | +IAr   | name name | Çifteler, Hocalar, Sağmalcılar, Sütçüler, Toroslar  |
| In relation to the purpose of use or the inhabitants given place name | +IHk   | name name | ağaçlık, arpalık, Arnavutluk, Ayvalık, bademlik, çalılık, çamlık, çimenlik, çöplük, dutluk, Etlik, Gemlik, kumluk, odunluk, ormanlık, samanlık, sazlık, Susurluk, söğütlük, taşlık, zeytinlik |
| Place suitable for intended use                                       | +IAk   | name name | avlak, güzlek, kışlak, otlak, sulak, yaylak, yazlak   |
| Specified location  | +rA    | name name | bura, içre, ora, taşra, nere  |

## Add suffix

As a result, the stem:  
arpa+lık → **arpalık**

# Suffixes Deriving Place Name

## Root formation phase

- Root: badem;
- First letter of the suffix: l, not variable. Instant suffix: l
- The second letter of the suffix is H: variable; The suffix is monosyllable, so the new value of the letter H is found as i by using the following logical relation. It becomes instant suffix: li.

$$\text{Seslem\_sayısı}(ek) = 1 \text{ ise } \left\{ \begin{array}{l} S(Kök) (a \vee i) \text{ ise } H \rightarrow i \\ S(Kök) (e \vee i) \text{ ise } H \rightarrow i \\ S(Kök) (o \vee u) \text{ ise } H \rightarrow u \\ S(Kök) (\ddot{o} \vee \ddot{u}) \text{ ise } H \rightarrow \ddot{u} \end{array} \right\}$$

- Last letter of the suffix: k, not variable. Instant suffix: **lik**;

## Softening phase

- Root: badem; The first letter of the suffix is a consonant. Accordingly, the following logical relation is used.

$$SS(kök) > 1 \wedge IH(ek) \text{ ünsüz ise } \left\{ \begin{array}{l} SHH(kök) r \text{ ise } \wedge SH(kök) k \text{ ise } SH(kök) \rightarrow k \\ \text{diğer durumlarda kök yumuşamaz} \end{array} \right\}$$

- No softening of the root is required. **bademlik**

## Root formation phase

- Root: dut;
- First letter of the suffix: l, not variable. Instant suffix: l
- The second letter of the suffix is H: variable; The suffix is monosyllable, so the new value of the letter H is found as u by using the following logical relation. Instant suffix: lu.

$$\text{Seslem\_sayısı}(ek) = 1 \text{ ise } \left\{ \begin{array}{l} S(Kök) (a \vee i) \text{ ise } H \rightarrow i \\ S(Kök) (e \vee i) \text{ ise } H \rightarrow i \\ S(Kök) (o \vee u) \text{ ise } H \rightarrow u \\ S(Kök) (\ddot{o} \vee \ddot{u}) \text{ ise } H \rightarrow \ddot{u} \end{array} \right\}$$

- Last letter of the suffix: k, not variable. Instant suffix: **luk**

## Softening phase

- Root: dut; The first letter of the suffix is a consonant. Accordingly, the following logical relation is used.

$$SS(kök) > 1 \wedge IH(ek) \text{ ünsüz ise } \left\{ \begin{array}{l} SHH(kök) r \text{ ise } \wedge SH(kök) k \text{ ise } SH(kök) \rightarrow k \\ \text{diğer durumlarda kök yumuşamaz} \end{array} \right\}$$

- No softening of the root is required. **dutluk**



# Ordering Suffixes

Suffixes can follow each other and there is no limit on their number.

All words in Turkish have approximately 0.94 suffixes; It has been shown that words with suffixes receive 1.85 suffixes.

The shortest suffix consists of 1 letter and the longest suffix consists of 7 letters; It is stated that the average attachment length is 2.44.

Average word length = (Average root length + Average number of affixes) x Average affix length

# Rules for Ordering Suffixes

Noun and verb roots are different from each other in terms of their qualities and functions. For this reason, a root with the same sound structure cannot be both a noun and a verb root. Priority goes to the verb root, the nominal root must be produced later.

Derivational suffixes are added to noun or verb roots. In Turkish, suffixes added to nouns are not added to verbs, and suffixes added to verbs are not added to nouns. It can be seen that some suffixes that look the same are added to noun and verb roots, but the functions of these suffixes are different.

Derivative suffixes can be added consecutively in a word, but there is a rule for this. Suffixes that make a noun a noun can come one after the other; However, suffixes that act as nouns cannot be added consecutively. Similarly, while suffixes that derive verb from verb can occur consecutively; Suffixes that derive nouns from verbs cannot appear consecutively.

The primary suffix changes the meaning of the root word and turns the root into a stem. Suffixes added after the first suffix change the meaning of the body to suit the purpose. The suffix added later changes the meaning of the text even further. The order of the suffixes is +cH → +lHk. The root word *Göz* is a noun root with a concrete meaning.

# Program that Adds Meaningful Suffixes

Bir sözcüğe yapım eki ekleme : Hazırlayan E. Adalı

**Bir sözcüğe uygun bir yapım eki ekleyebilirsiniz.**

Bir sözcük kökü yazınız

Kaynak sözcük türü: ad ☒ Eylem ☐ Önad ☐ Hedef sözcük türü: ad ☒ Eylem ☐ Önad ☐ Belirteç ☐

| Ek    | Gövde     |
|-------|-----------|
| CH    | masacı    |
| CHlHk | masacılık |
| lAr   | masalar   |
| lHk   | masalık   |

Kazandırılacak anlam

- Meslek veya meslek aşamasının adı
- Yer adı
- Aygıt ve araç adı
- Gereç adı
- Meslek veya meslek aşamasının adı
- Bir düşünce akımını benimseme, taraftarı olma
- Birliktelik
- Eşitlik, ortaklık
- Üyelik durumu
- Huy, davranış, alışkanlık nitelime adı
- Küçültme, acıma, aşağılama, şefkat belirtme
- Dil ve lehçe adı
- Benzerlik
- Hastalık, bitki, organ, hayvan adı
- Sıralama ve üleştirme önadı
- Zaman kavramı
- Yapma bildiren eylem adı
- Olma bildiren eylem kavramı
- Eylemi yapan kişi veya nesne adı

Devam

# Morphological Features of Turkish – (noun)

**In Turkish, case suffixes show the direction of the action clearly and precisely.** On the other hand, it is necessary to know which preposition to use for which action in English.

While Turkish noun inflectional suffixes are added to a root or stem noun, some corrections need to be made in the last letter of the name and in the suffix due to sound characteristics. The rules for making these changes are clear.

In Turkish, auxiliary verbs allow noun words to be used as predicates. They are shaped according to the auxiliary tense and are defined for four tenses. The structure of auxiliary verbs is regular and there are no irregularities.

In Turkish, auxiliary verbs allow noun words to be used as predicates. They are shaped according to the auxiliary tense and are defined for four tenses. **The structure of auxiliary verbs is regular and there are no irregularities.**



# Morphological Features of Turkish – (verb)

A regular structure

Rules that are never broken (no exceptions)

Showing person and time information transparently

Question and negative structure transparent

It has certain rules for deriving passive verbs

Having certain rules for performing causative verb

Having certain rules for performing reciprocal verb

Having certain rules for performing reflexive verb

The ability to competence, haste, durative verb

Speakers of Indo-European languages must first learn irregular verbs. The number of frequently used irregular verbs in English is approximately 280, in French there are 570, in German there are more than 200. Today, we can conjugate a verb that does not exist in Turkish today for all moods and individuals.

Some abilities seen in Turkish verbs are not found in Indo-European languages. For example

- An action can be made causative in multiple ways.
- An action can be done reciprocal.
- An action can be done reflexive.

An important feature of Turkish verbs is that they indicate the direction of the action. For example, the action of **inmek** indicates the action performed downwards, while the action of **tirmanmak** indicates the action performed upwards. There is no need to add the particles "up" to mean up or "down" to the verb as in English.

# Comparing Turkish with Other Languages in Terms of Morphology

## Isolating Languages

Isolating languages do not take suffixes, so their morphological properties cannot be mentioned.

## Fusional Languages

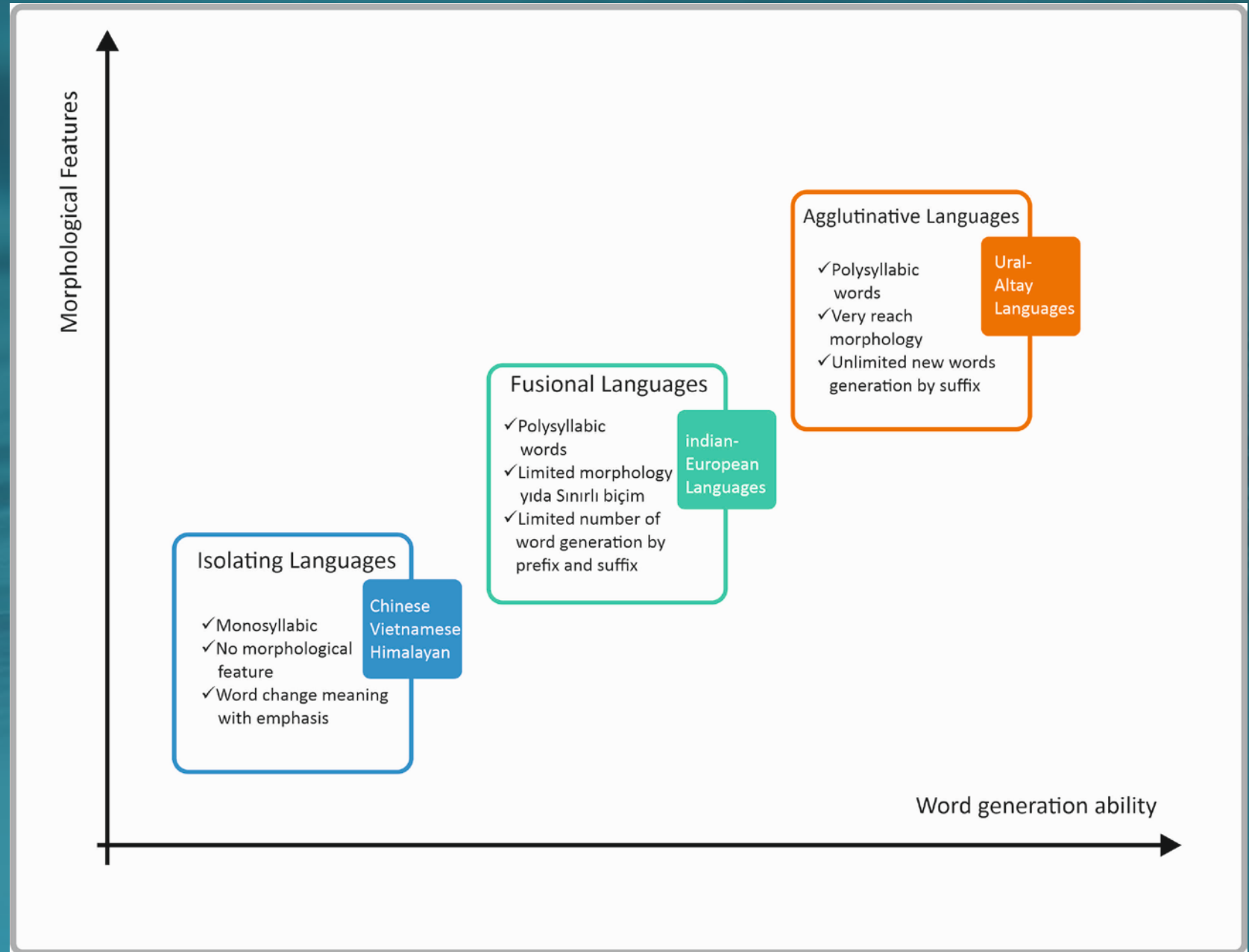
Indo-European languages, which are among the inflected languages, can have prefixes and suffixes, but their number does not exceed one. In Hami-Semitic languages, words can be derived by adding so-called vowel letters to a meaningless **vezin**, for example: Common features of Indo-European languages include gender and definite article of nouns.

**We Turks cannot understand the purpose of word gender, which even the speakers of these languages cannot understand.**

## Agglutinative Languages

The most important example language among agglutinative languages is Turkish. All features of Turkish are explained in this section. It is known that noun and verb inflection suffixes are regular, regular, transparent and understandable. In agglutinative languages, the basis of the word is the root and it has meaning. Many new words can be derived by adding derivational suffixes to the root. The meaning of the derived word can be deduced by looking at the root word. There is no limit to the number of suffixes to be added to the root. The limit is the intelligence of the individual.

# Comparing Turkish with Other Languages in Terms of Morphology



# Syntax Features of Turkish



# Words and Syntax - I

It is known that the vocabulary in a language is limited. In addition, the sentence structure and rules of each language are clear. Based on these facts, it can be said that the sentences that can be written in a language can be artificially derived and their number will be limited. However, human ability shows that an infinite number of sentences can be produced in accordance with the rules of the language. Because those who produce sentences are individuals, and it is seen that individuals can produce different types of sentences. Each new sentence produced has a meaning and the listeners understand it. It is accepted that this ability arises from human creativity.

Linguists Wilhelm von Humboldt and Noam Chomsky also say that the number of sentences in a language is infinite. The human ability to produce new sentences and understand new sentences was called Language Acquisition Device (LAD), later Universal Grammar.

The LAD approach assumes that every individual innately knows the principles and variables that determine the structure of the language he speaks. Principles are abstract and do not change from language to language. Every language has a structure and rules, so **words cannot be ordered randomly in a sentence constructed to express something**. In other words, words are arranged in a certain order to create a sentence to express something. Because people know these rules, they can understand what is said.

# Words and Syntax - II

It is thought that Chomsky did not sufficiently examine Turkish when proposing the LAD theory. **Because in Turkish, especially the syntax is flexible. In other words, the sentences are not in formulaic form. The ability of a flexibly constructed sentence not to lose its meaning is an ability that Turkish case suffixes have brought to Turkish.**

Arabayı sabunla yıka.  
Arabayı yıka sabunla.  
Sabunla arabayı yıka.  
Sabunla yıka arabayı.  
Yıka arabayı sabunla.  
Yıka sabunla arabayı.

In this example, the subject is **araba** (car), the object is **sabun** (soap), and the verb is **yıka** (wash). The English equivalent of this sentence is in one form and is as follows: "**wash the car with soap**". According to the LAD theory, the action in question can only be said like this. The fact that the sentences written in six different ways correspond to the same action are the case suffixes that connect the words.

While a bond is established between **modifiers** and **modified** words in Turkish, this bond is not established in English.

Turkish morphological and syntactic features enable a close bond to be established between the words in the sentence. The bond established is clearly visible. The establishment of the bond and the elements that establish the bond are clear and are added to the words in accordance with certain rules. **These features provide Turkish with the flexibility to change the place of words within the sentence, but without disrupting the meaning of the sentence.**

|                        |              |
|------------------------|--------------|
| uçak pilot <u>u</u>    | plane pilot  |
| araba sürücü <u>sü</u> | car driver   |
| gemi kaptanı           | ship captain |

|   |                            |
|---|----------------------------|
| sarışın kız <u>ın</u> hasır şapka <u>sı</u>   | blonde girl's straw hat    |
| aile <u>nin</u> yakışıklı delikanlı <u>sı</u> | handsome boy of the family |

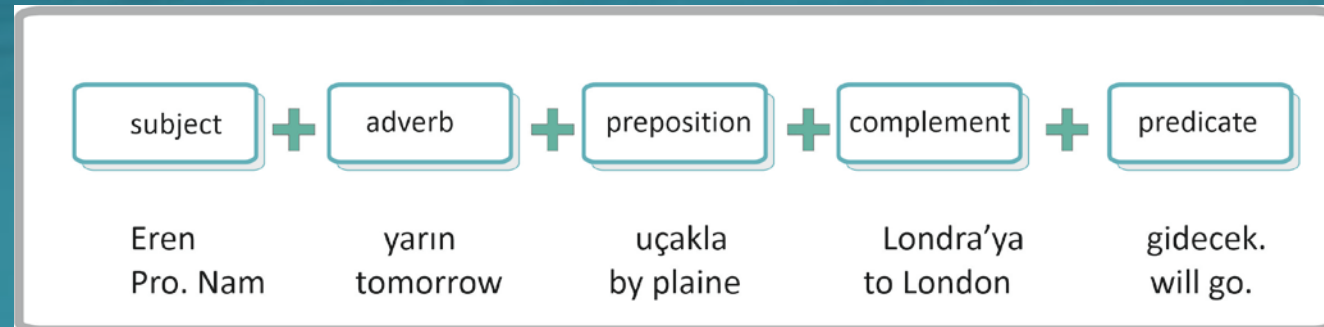
# Turkish Sentence Structures

Depending on the type of predicate, a verb sentence or a noun sentence can be formed.

Sentences written in accordance with the rules of grammar are considered correct sentences.

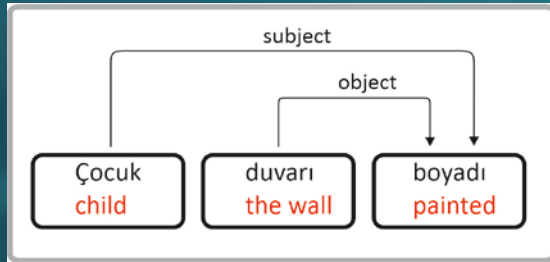
Elements of Turkish sentences can be change position. In this case, there is no significant change in the main meaning of the sentence. Due to this feature, Turkish is considered a language with flexible syntax.

In Turkish, compound sentences consisting of more than one sentence can be formed. In the sentence, the complement clause is first followed by the complemented clause. The connection between sentences is established with prepositions, common sentence elements, common person or meaning relations.

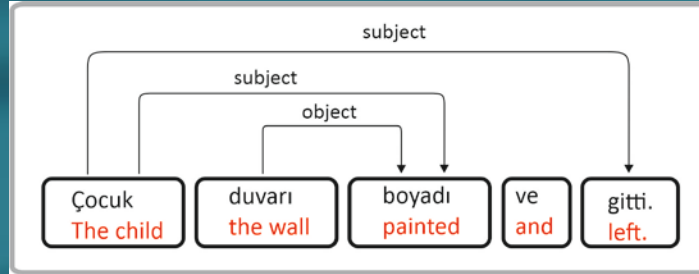


# Turkish Sentence Formats

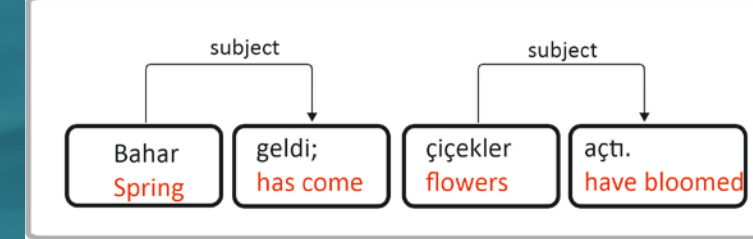
## Simple sentence



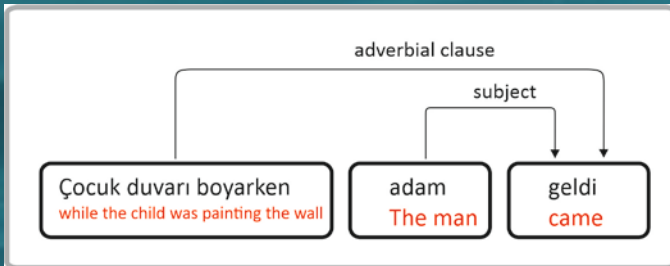
## Dependent sentence with common subject



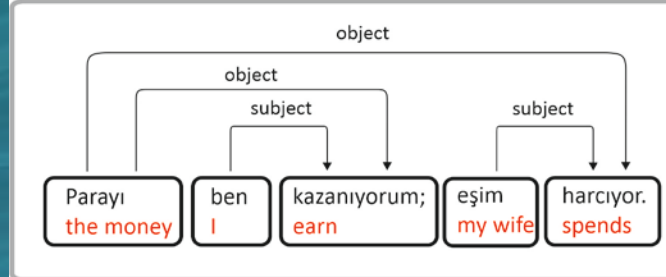
## Independent ordered sentence



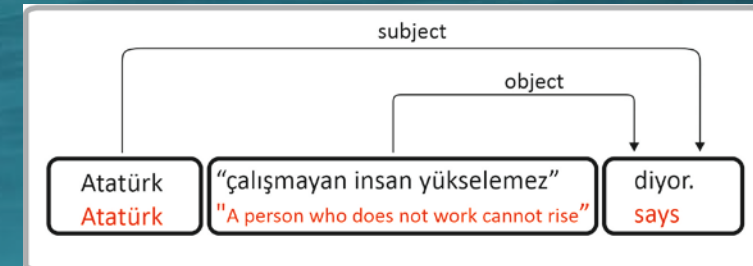
## Compound sentence without common element



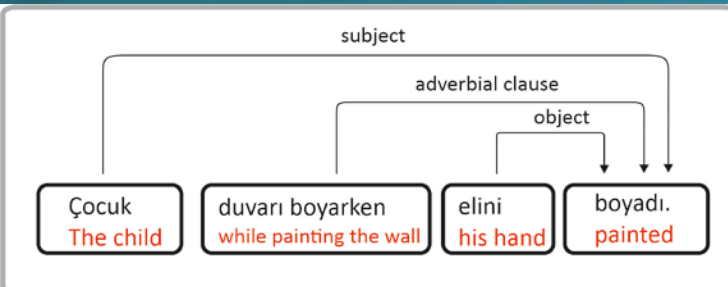
## Dependent sentence with common object



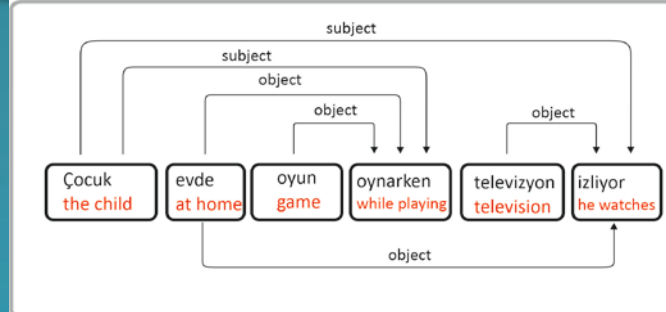
## Introductory sentence



## Compound sentence with common element



## Dependent sentence with common element





# Comparing Turkish with Other Languages in Terms of Syntax

## Isolating

In isolating languages, words are in the form of a single syllable, they do not have morphological features, therefore they do not take suffixes, and as a result, no connection is established between the words in the sentence.

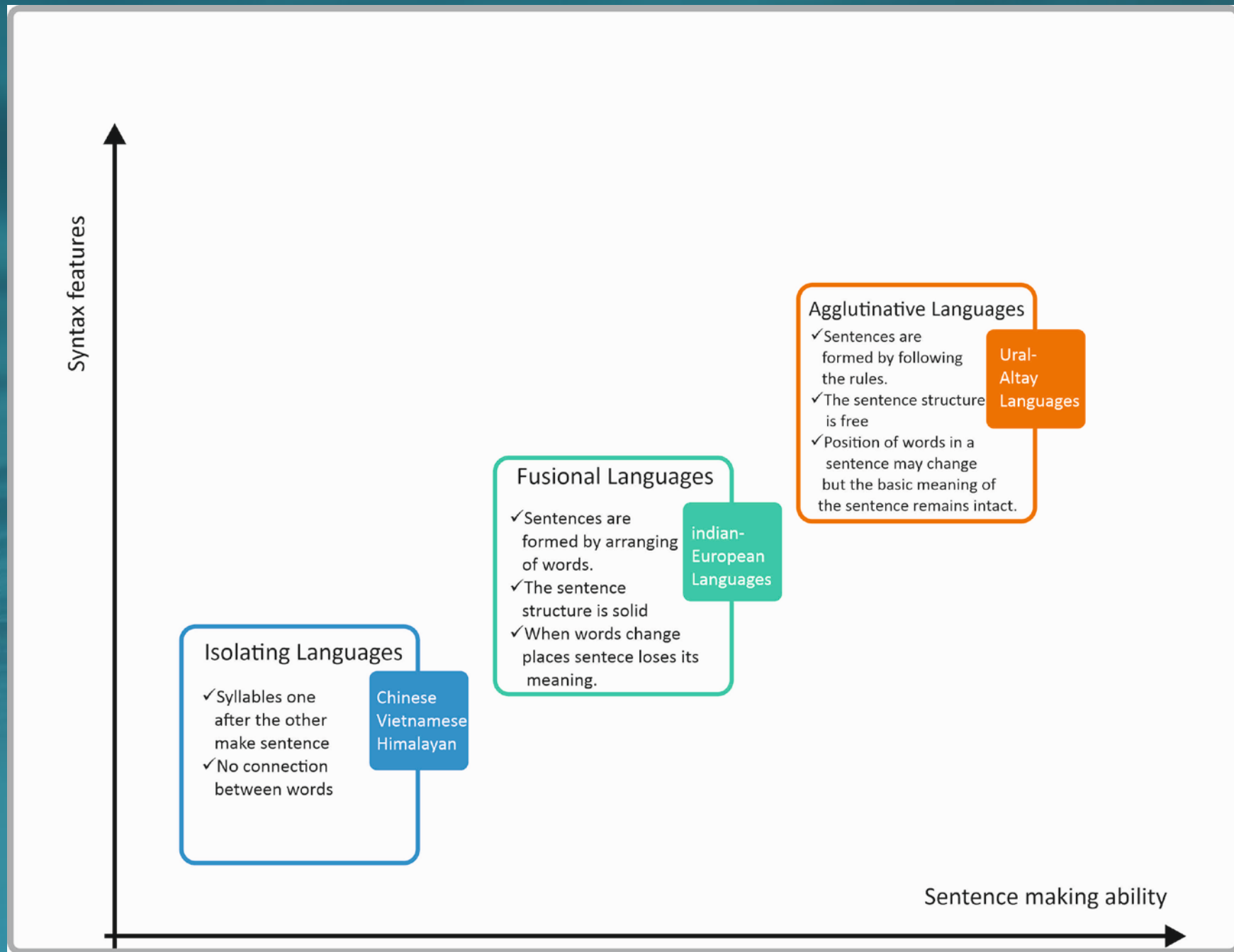
## Fusional

- In inflected languages, the syntax is in the Subject-Verb-Complement order and its structure is rigid. For this reason, they are described as syntactically rigid or formulaic languages. When the places of the words in the sentence are changed, the sentence loses its meaning.
- A sentence can be formed by adding more than one clause. The link between clauses is done by ***ne, kim, kimin, neresi, nerede, ne zaman*** (English: ***what, who, whose, where, when***; French: ***quoi, qui, dont, où, quand***; Persian: ***pi, ki, ki, kebe***)

## Agglutinative

In Turkish, the sentence structure is free, words can change places within the sentence, but the meaning of the sentence does not change. Case suffixes provide this ability to Turkish.

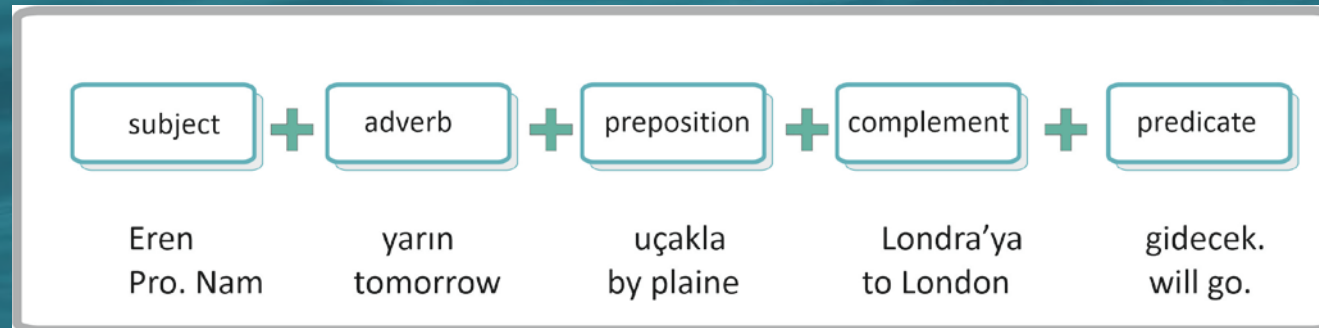
# Comparing Turkish with Other Languages in Terms of Syntax



# Creating a Turkish Sentence

# Creating a Turkish Sentence

In order to create a sentence, it is necessary to create the elements of the sentence using the grammatical rules of Turkish. These reasons require knowing the characteristics of each element.





# Subject - I

- The subject can be a living or inanimate entity, a concrete or abstract object.
- The subject can be a single word or a phrase.
- The subject can be the person doing the job specified by the verb, or it can be the job done.
- The subject is attached to the verb without taking any inflectional suffixes other than plural, possessive and genitive suffixes.
- There can be more than one subject in a sentence.
- One of the subjects in a sentence may undertake the task of explaining the other.
- The subject may not appear in some sentences. The subject can be specified with the person suffix of the predicate.
- There is no subject in sentences formed with intransitive passive predicates. Predicates are in the third person.
- Address elements are considered non-sentence elements because they are connected to the predicate.
- This element does not have to agree with the subject in terms of meaning.
- It can be the common subject of consecutive sentences.
- Nominal words can form subject phrases together.
- When the subject is plural, the predicate does not have to be plural as well. If "non-intelligent" beings and objects become subjects, the predicate will be in singular form, even if these subjects exist in plural form.
- If the subject is plural and human, the predicate can be singular or plural.
- If the subject is singular, the predicate is also singular. If the subject is human and there is more than one (prefixed with any number prefix), the verb is still singular.
- The indefinite pronoun and word used instead of a collective noun are also used with the singular form of the predicate:
- Compatibility is sought between the subject and the predicate in terms of person.

# Subject - II

- Phrases that display subject characteristics act as a single word within the sentence.
- The order of the words in the phrase is regular. In nominal and nominal phrases, the active word is placed at the end of the phrase, so the auxiliary words are placed before it.
- A word phrase can be connected to another phrase by taking a case suffix.
- There may also be phrases that complement each other within the phrase that forms the subject.

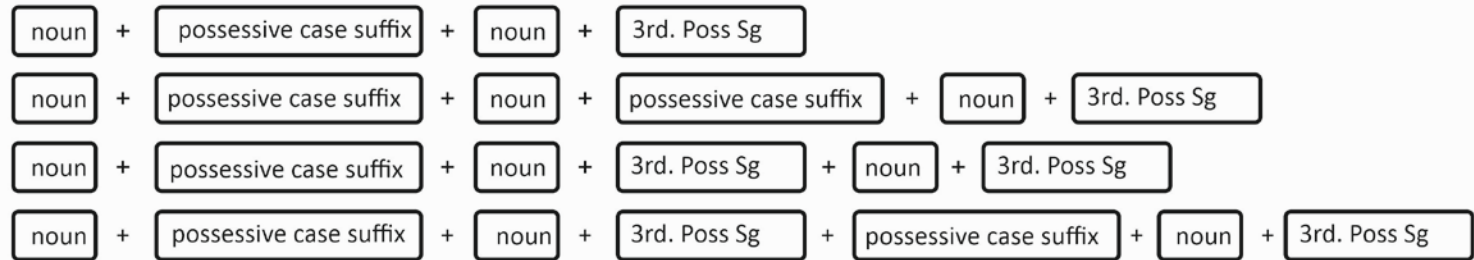
The phrase that forms the subject can be formed as a noun phrase or a noun phrase.

# Subject – III (Noun Compound)

There are three types of noun phrases in Turkish:

- Definite noun phrase
- Indefinite noun phrase
- Chained noun phrase

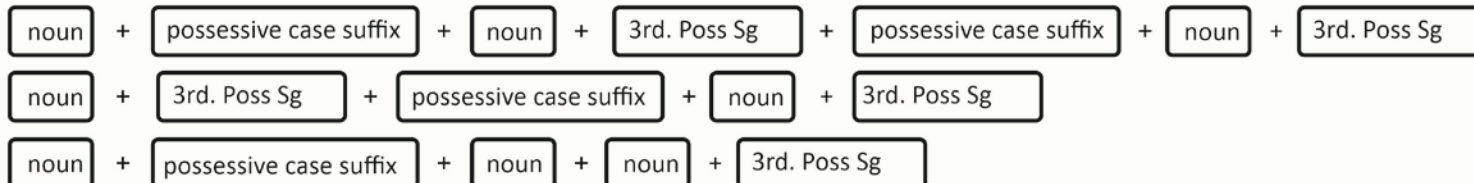
## Definite noun phrase



## Indefinite noun phrase



## Chain noun phrase



# Subject – IV (Adjective Compound)

adjective phrase

adjective + noun

adjective phrase

adjective + adjective +... adjective + noun

adjective phrase

adjective phrase + adjective phrase + adjective phrase + noun

adjective phrase

adjective + noun phrase



# Creating the Subject

| Input                                    | Output  |
|--|---|
| A[Ali Ayşe çocuk]                        | Ali Ayşe çocuk                                |
| A[Ali Ayşe çocuk] OY[güzel sarışın kız]  | Ali Ayşe çocuk güzel sarışın kız              |
| A[Ali çocuk] OT[Alpay güzel kız]         | Ali çocuk Alpay'ın güzel kızı                 |
| AY[okul yolu]                            | okul yolu                                     |
| AT[kapı kolu]                            | okulun yolu                                   |
| OT[Alpay güzel kız -] ATD[kedi gözü]     | Alpay'ın güzel kızının kedisinin gözü         |
| ZA[han kapı kolu]                        | han kapı kolu                                 |
| ZB[han kapı kolu]                        | han kapısının kolu                            |
| ZC[han kapı kolu]                        | hanın kapısının kolu                          |
| OT[Alpay güzel kız -] ZBD[han kapı kolu] | Alpay'ın güzel kızının han kapısının kolu     |
| OT[Alpay güzel kız -] ZBC[han kapı kolu] | Alpay'ın güzel kızının hanının kapısının kolu |

- **A:** Simple noun, proper noun, object name or pronouns
- **OY:** Prefix phrase
- **OT:** Subjective pronoun phrase: If this phrase qualifies a noun phrase that comes after it, the last element is "-".
- **AY:** Indefinite noun phrase
- **AT:** Definite noun phrase
- **ATD:** Definite noun phrase qualified by the adjective phrase
- **ZA:** Indefinite chained noun phrase
- **ZB:** Chained noun phrase with the last two elements indicated
- **ZC:** Chained noun phrase with all elements indicated.
- **ZBD:** Chained noun phrase with the last two elements qualified by the adjective phrase.
- **ZCD:** Chained noun phrase with all elements qualified by the adjective phrase.

A[Ali Ayşe çocuk] OY[güzel sarışın kız] OT[Alpay çirkin kız -] AY[kapı kolu] AT[kapı kolu] ZCD[han kapı kolu]

# Complement

There are four types of complements in Turkish:

- Direct complement (Object)
- Indirect complement
- Prepositional phrase
- Adverbial phrase

Subject

Complements

object

+

ind. complement

+

adverbial phrase

+

prepos. phrase

Predicate

# Creating the Complement

| Giriş                    | Çıkış                 |
|--------------------------|-----------------------|
| NY[kedi köpek]           | kedi köpek            |
| NYA[ağustos böcek]       | ağustos böceği        |
| NYO[minik kuş]           | minik kuş             |
| NT[kitap dergi]          | kitabı dergiyi        |
| NTA[kapı kol]            | kapının kolunu        |
| NTO[yakışıklı delikanlı] | yakışıklı delikanlıyı |
| DTY[Konya Ankara]        | Konya'ya Ankara'ya    |
| DTD[Konya Ankara]        | Konya'da Ankara'da    |
| DTA[Konya Ankara]        | Konya'dan Ankara'dan  |
| DTAY[Ankara gar]         | Ankara garına         |
| DTAB[Ankara gar]         | Ankara garında        |
| DTAA[Ankara gar]         | Ankara garından       |
| DTOY[pembe konak]        | Pembe konağa          |
| DTOB[pembe konak]        | Pembe konakta         |
| DTOA[pembe konak]        | Pembe konaktan        |
| BT[hızlı hızlı]          | hızlı hızlı           |
| BTA[akşam yedi]          | akam yedide           |
| BTO[dün söylemeden]      | dün söylemeden        |
| IT[uçak ile]             | uçak ile              |

NY[kedi köpek] NYA[ağustos böcek] NYO[güzel kuş] NT[kitap dergi] NTA[kapı kol] NTO[yakışıklı delikanlı]  
DTB[Konya Ankara] DTAB[Ankara gar] DTOB[kokulu gül]

# Predicate -I

## Indicative Moods: Tense and person Inflectional Suffixes

- Creating voice suffixes
  - Make a reciprocal
  - Make a reflexive
  - Make causative
  - Make passive
- Compound verbs operations
  - Haste
  - Competence
  - Durative
- Creating the negative of the verb
- Modal operations
- Adding time and person suffixes
- Create the question form

| Tenses                            | Time suffix | Personel suffixes                     | Examples     |
|-----------------------------------|-------------|---------------------------------------|--------------|
| Past tense, indefinite            | +mHş        | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | sevmişim     |
| Past tense                        | +D          | +Hm, +Hn, +H, +Hk, +Hniz, +HIAr       | sevdim       |
| Present simple tense              | +(H)yor     | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | seviyorum    |
| Future tense                      | +(y)AcAk    | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | seveceğim    |
| Aorist                            | +(A/H)r *   | +Hm, +sHn, +""', +(y)Hz, +sHnHz, +IAr | severim      |
| Past perfect tense indefinite     | +mHşD       | +Hm, +Hn, +H, +Hk, +HnHz, +HIAr       | sevmiştim    |
| Past perfect tense                | +DHşD       | +Hm, +Hn, +H, +Hk, +HnHz, +HIAr       | sevdiydım    |
| Present past tense                | +(H)yorD    | +Hm, +Hn, +H, +Hk, +HnHz, +HIAr       | seviyordum   |
| Future past time                  | +(y)AcAkD   | +Hm, +Hn, +H, +Hk, +HnHz, +HIAr       | sevecektim   |
| Aorist perfect tense              | +(A/H)rD *  | +Hm, +Hn, +H, +Hk, +HnHz, +HIAr       | severdim     |
| Past indefinite Inferential       | +mHşmHş     | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | sevmişmişim  |
| Present Inferential               | +(H)yormHş  | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | seviyormuşum |
| Future Inferential                | (y)AcAkmHş  | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | sevecekmişim |
| Aorist Inferential                | (A/H)rmHş * | +Hm, +sHn, +""', +Hz, +sHnHz, +IAr    | severmişim   |
| Past ind. Inferential conditional | +mHşsA      | +m, +n, +""', +k, +nHz, +IAr          | sevmişsem    |
| Past ind. Inferential conditional | +DHşsA      | +m, +n, +""', +k, +nHz, +IAr          | sevdiysem    |
| Present conditional               | +(H)yorsA   | +m, +n, +""', +k, +nHz, +IAr          | seviyorsan   |
| Future conditional                | +(y)AcAksA  | +m, +n, +""', +k, +nHz, +IAr          | seveceksem   |
| Aorist conditional                | +(A/H)rsA * | +m, +n, +""', +k, +nHz, +IAr          | seversem     |



# Predicate -II

## Subjunctive Moods: Tense and person inflectional suffixes

Mode operations are performed by following the following steps:

- Edit in verb root
- Creating and combining time and person suffixes
- Softening at the root of verb
- Editing variable letters in verb

| Moodes                          | Time suffix | Personel suffixes                      | Examples      |
|---------------------------------|-------------|--|---------------|
| Wish - Conditional              | +sA         | +m, +n, +""', +k, +nHz, +lAr           | sevsem        |
| Optative                        | +A          | +yHm +sHn, +""', +lHm, +sHnHz, +lAr    | seveyim       |
| Obligational                    | +mAIH       | +yHm, +sHn, +""', +yHz, +sHnHz, +lAr   | sevmeliyim    |
| Imperative mood                 | +""'        | +""', +""', +sHn, +""', +HnHz, +sHnlAr | sev (2.tek)   |
| Perfect of wish - conditional   | +sAyD       | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | sevseydim     |
| Perfect of optative             | +AyD        | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | seveydim      |
| Perfect of obligational         | +mAiHyD     | +Hm, +Hn, +H, +Hk, +HnHz, +HlAr        | sevmeliydim   |
| Inferential of wish-conditional | +sAymHş     | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | sevseymişim   |
| Inferential of optative         | +AymHş      | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | seveymişim    |
| Inferential of obligation       | +mAiHymHş   | +Hm, +sHn, +""', +Hz, +sHnHz, +lAr     | sevmeliymişim |
| Conditional of obligation       | +mAiHysA    | +m, +n, +""', +k, +nHz, +lAr           | sevmeliysem   |

# Sentence Creation Program - I

## Organizer

In this environment, the elements that should be included in the subject and complement are defined. In addition, it is possible to choose the framework and compound action operations related to the verb root and verb. Naturally, the time, person, positive and negative situations of the action are determined.

In addition to ensuring that definitions and selections can be entered into the program, the editor also checks whether the entries comply with the spelling and logic rules. In this context, it carries out the following inspections.

- Whether or not the fields to be defined and selected have been entered,
- Whether or not there is any character other than the alphabet in the entered words,
- Whether the words entered are Turkish or not,
- Formal control of the spelling of definitions,
- Whether the operators are written correctly and used appropriately,
- Whether all definitions within the subject are made correctly or not,
- Whether all the definitions in the complement are made correctly or not,
- Whether the predicate is Turkish or not,
- Suitability of the options selected for voice operations,
- Suitability of options selected for combined verb,
- Whether the verb mode has been chosen and the appropriateness of the individual's choice for this mode

# Sentence Creation Program - II

## Interpreter

After entering the necessary information regarding sentence formation, the interpretation phase begins. At this stage, first the definitions entered in the subject and complement fields are analyzed. Within the scope of the analysis process, the definitions entered in the relevant fields are divided into tokens.

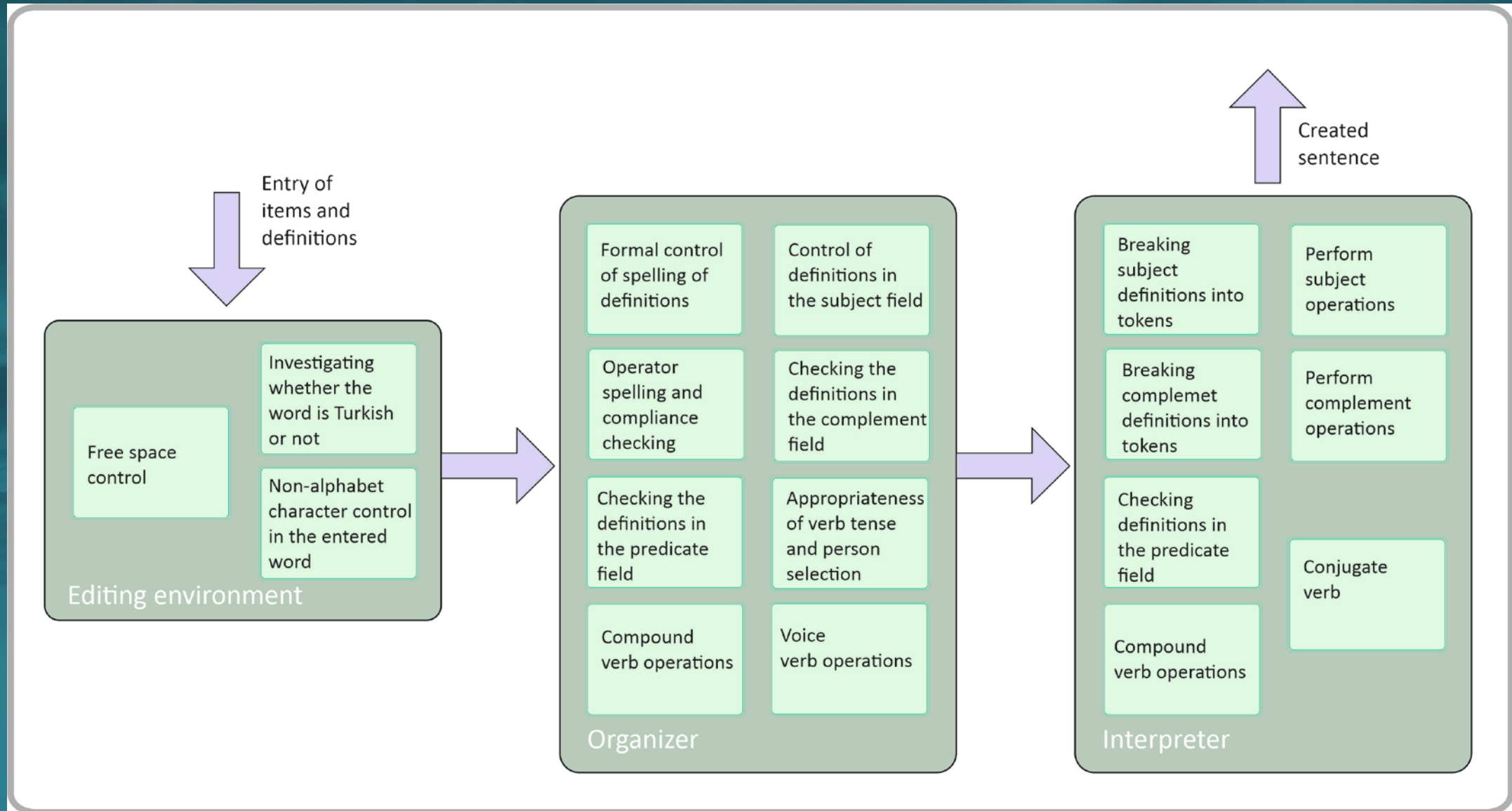
A[Eren kedi ben] OY[sarışın kız] OY[güzel kedi] AY[okul yol] OT[Alpay güzel kız] OT[Alpay güzel kız -] ATD[kedi göz] OT[biz büyük ev -] ATD[geniş kapı] ZA[han kapı kol] ZB[han kapı kol]

Definition: A[Eren kedi ben]  
Operator: A; action : name class subject  
Elemets: Eren, kedi, ben  
Prop. Nam.: Eren  
Pron : ben  
Definition : OY[sarışın kız]  
Operator : OY; action: adjective phrase  
Elemets : sarışın, kız  
Definition : OY[güzel kedi]  
Operator : OY; action: adjective phrase  
Elemets : güzel, kedi  
Definition : AY[okul yol]  
Operator : AY; action : indefinite phrase  
Elemets : okul, yol  
Definition : OT[Alpay güzel kız]  
Operator : OT; action: adjective phrase with subject  
Subject: Alpay  
Elemets : güzel, kız

Definition : OT[Alpay güzel kız -]  
Operator : OT; action : qualify adjective phrase with subject  
Subject: Alpay  
Elemets : güzel, kız  
Definition : ATD[kedi göz]  
Operator : ATD; action : qualify adjective phrase  
Elemets : kedi, göz  
Definition : OT[biz büyük ev -]  
Operator : OT; action: qualify adjective phrase with subject  
Pron: biz  
Elemets : büyük, ev, -  
Definition : ATD[geniş kapı]  
Operator : ATD; action : qualify adjective phrase  
Elemets : geniş kapı

Definition : ATD[geniş kapı]  
Operator : ATD; action : qualify adjective phrase  
Elemets : geniş kapı  
Definition : ZA[han kapı kol]  
Operator : ZA; action : qualify indefinite phrase  
Elemets : han, kapı, kol  
Definition : ZB[han kapı kol]  
Operator : ZB; action : qualify chain phrase with the last two element are defined  
Elemets : han, kapı, kol  
Definition : ZC[han kapı kol]  
Operator : ZC; action: qualify chain phrase with all element are defined  
Elemets : han, kapı, kol

# Structure of the Sentence Generation Program





# Sentence Generator Program

Türkçe tümce oluşturma : Hazırlayan E. Adalı

## Türkçe Tümce Oluşturma

Öznenin öğelerini yazınız A[Eren Irmak çocuk kedi ] OY[güzel sarışın kız] OT[Alpay güzel kız -] ATD[kedi kafesi]

Tümleçleri yazınız DTY[Ankara] BTA[yarın akşam yedi] IT[uçak ile]

Bir eylem kökü yazınız git

Çatı eki seçenekleri evet hayır

Dönüşlü / İşteş mi? ☐ evet ☒ hayır İşteş ☐ evet ☒ hayır

Eylem ettirgen mi? ☐ evet ☒ hayır Ettirgen ise türü ne? DİR (ile) ☐ R (ile) ☐ T (ile) ☐ Ş (ile) ☐ N (ile) ☐ L (ile) ☒ ise >>

Eylem edilgen mi? ☐ evet ☒ hayır Ettirgenlik derecesi ne? 1, 2, 3

Birleşik eylem seçenekleri ☒ evet ☐ hayır

Eylem olumlu mu? ☒ evet ☐ hayır Birleşik eylem türü Tezlik ☐ Yeterlik ☒ Güç ☒ Olası ☐ İstek ☐ Sürelik ☐ ise >> -dur ☐ -kal ☐ -gel ☐ ise >>

Eylem soru mu? ☒ evet ☐ hayır

Kipler Gelecek

Kişi sıra bilgisini ne? 6 1, 2, 3, 4, 5, 6,

Yanlışlar -----

Kısaltmalar

--- ÖZNE Kümesi ---

--- ÖZNE Kümesi ---

A: Ad, özel ad, nesne adı, adıl

OY: Önad tamlaması

OT: Özneli Önad tamlaması

AY: Belirtisiz ad tamlaması

AT: Belirtili ad tamlaması

ATD: Önad tamlamasının nitelediği AT

ZA: Belirtisiz zincirleme ad tamlaması

ZB: Son iki ögesi belirtili zincirleme AT

ZBD: Y'nin nitelediği son iki ögesi belirtili ZB

ZCD: OY'nin nitelediği tüm öğeleri belirtili ZB

--- TÜMLEÇ Kümesi ---

NY: Belirtisiz nesne

NYA: Ad tamlamalı belirtisiz nesne

NYO: Önad tamlamalı belirtisiz nesne

NT: Belirtili nesne

NTA: Ad tamlamalı belirtili nesne

NTO: Önad tamlamalı belirtili nesne

DTY: Dolaylı tümleş yönelme

DTB: Dolaylı tümleş bulunma

DTA: Dolaylı tümleş ayrılma

DTAY: Dolaylı AT tümleş yönelme

DTAB: Dolaylı AT tümleş bulunma

Giriş Başarılı...

Devam

Özne Eren Irmak çocuk kedi güzel sarışın kız Alpay'ın güzel kızının kedisinin kafesi

Tümleş Ankara'ya yarın akşam yedide uçak ile

Yüklem gidebilecekler mi?