



Institute of Social Sciences

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MARMARA UNIVERSITY

SOCIAL SCIENCES INSTITUTE

CULTURAL STUDIES DEPARTMENT

SOUND SYMBOLISM ASSOCIATIONS OF TURKISH SPEAKERS

Master's Thesis

GAMZE GÜMÜŞ

ISTANBUL, 2021

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Thesis Supervisor: PROF. DR. FERHAT KENTEL

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ÖZET

TÜRKÇE KONUŞANLARDA SES SEMBOLİZMİ ÇAĞRIŞIMLARI

Ses ve anlam arasındaki ilişki uzun zaman boyunca insanlığın merakını celbetmiştir. 20. yüzyıl başlarında Ferdinand de Saussure'ün ses-anlam ilişkisinin keyfi olduğunu öne sürüşünden bu yana, bu güçlü fikrin yerini alacak bir teori öne sürülemedi. Ses sembolizmi fikri Plato'nun söylemlerine kadar uzansa da, bu alanı destekleyen çalışmalar özellikle son 20 yılda yoğunlaşmış ve meseleyi ses sembolizmi var mıdır yok mudur noktasından ne ölçüde vardır noktasına getirmişlerdir. Kelimelerdeki belli seslerin belli anlamlara karşılık geldiği sadece belli diller çerçevesinde değil diller-arası bir düzeyde ispatlanmıştır. Türkçe konuşanların ses sembolik çağrışımlarını inceleyen ilk çalışma olması sebebiyle, kavramların çeşitliliği hedeflenmiş ve 8 anlam kategorisinin (ebat, şekil, güç, hız, cinsiyet, kötülük, komiklik, parlaklık) her birinde zıt anlamlı çiftler oluşturacak şekilde çeşitli uydurulmuş kelimelere karşı verilen reaksiyonlar test edilmiştir. Elde edilen sonuçlara göre, Türkçe konuşanların belli sesleri belli anlamlarla eşleştirmeye meğilli oldukları ve anlamdaki güç açısından seslerin etkisinin kelime uzunluğunun etkisinden daha fazla olduğu görülmüştür. Bu gibi çağrışımlardaki farklar ve benzerlikler, kültürel farklar temelinde açıklanmış ve ses sembolik çağrışımlar *phone* (ses) ve *index* (işaret etmek) kelimeleri harmanlanarak *phondexicality* (sesin anlamı işaret edebilirliği) olarak tanımlanmıştır. Kelimelerin uzlaşımsal olmaları yönüyle keyfi, fakat her zaman nedensel oldukları öne sürülmüştür.

Anahtar Kelimeler: Ses Sembolizmi, İkoniklik, Nedensellik, Keyfiyet, Türkçenin Sesbilimi, Fonosemantik, Psikodilbilim, Bilişsel Dilbilim, Kültürel Antropoloji

ABSTRACT

SOUND SYMBOLISM ASSOCIATIONS of TURKISH SPEAKERS

The relationship between speech sounds and meaning has long been a matter of interest. Since the beginning of the 20th century when Ferdinand de Saussure suggested that the link between speech sounds and meaning is arbitrary, there hasn't been an entrenched theory replacing it. However, although the idea of sound symbolism is as old as Platonean discourse, particularly studies in the last two decades have been able to go further to shift the question from whether non-arbitrariness exists to what the scale of its existence is. It has been proved that there are words whose sounds correspond to certain meanings which hold not only language specifically but also cross-linguistically. Being the first study which investigates Turkish speakers' sound symbolic associations, an extensive semantic range was targeted and 8 semantic categories (size, shape, strength, speed, gender, villainness, funniness, brightness) with nonce words within each category in forms of binary pairs were tested. The results revealed that Turkish speakers tend to associate certain sounds with certain meanings and that the effect of speech sounds surpass the effect of word length with respect to strength. The differences and similarities of such associations were explained by cultural variances. A neologism was proposed to describe sound symbolic associations as; *phondexicality* – a blend word embracing *phone* and *index*. Words are propounded to be arbitrary with respect to their conventionality, but they are always motivated.

Keywords: Sound Symbolism, Iconicity, Motivatedness, Arbitrariness, Turkish Phonology, Phonosemantics, Psycholinguistics, Cognitive Linguistics, Cultural Anthropology

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Gamze GÜMÜŞ

İstanbul, 2021

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INTRODUCTION

“Hayy Allah... Konuşuyor kumrular yine penceresimin önünde, bulgur tanelerini dökmeme bekliyorlar. Guk guk! guk guk! Camı açmamla beraber kendilerini garantiye aldıkları zeytin ağacının dallarına uçup konuyorlar bir çırpıda. Yanı başındaki küçük limon ağacı özeniyor zeytinin kadim misafirlerine.

Bir farkımız yok limoncuk... Sen de, ben de, misafiriz hepimiz yeryüzünde, birbirimizin yerinde...”

“Oh God... The doves are talking again outside my window, waiting for me to pour the grains of bulgur. Coo coo! coo coo! The moment I open the window, they immediately fly and perch on the branches of the olive tree where they feel the guaranteed safety. The lemon tree right beside emulates the olive’s regulars.

We are not different from each other lemonette... Not only you, me, and all of us are guests on this earthland, on each others’ land...”

The two piles of symbols above embrace the “challenge” of telling the same story. It is a challenge because it is a very long and a very hard journey; the perception and conveyance of what is intended deep in the soul and the mind. This perceiving what is happening around us, spiritually and mentally digesting it in us, and producing an outcome with these limited symbols and releasing them out is the language faculty which makes human kind the hyper-kind on the planet.

Language is a faculty, like an academic faculty comprising several departments without which it wouldn’t be reified. Like the general division of departments as quantitative and qualitative, language and thought are the two indispensable facets of humanness. It is quite salient that apes, dolphins, bees and many other creatures have ways of communication. For example, bees’ waggle dance enables them to perfectly communicate the location of a nectar by certain movements of signaling, but the type of information they can communicate is quite limited. However, it is human kind which could express limitless things with limited systems which then entails that brutes and humans have different ways of using signs. In Peircean terms, signs are divided into three categories as iconic, indexical and symbolic. To illustrate, the dance of the bees are iconic due to its similarity to the object, the smoke away is indexical due to its factual relationship with fire, and letters are symbolic as their links arise from convention (Peirce 1955: 102). In order to understand the signs and react accordingly, we constantly interpret them. While interpreting, we think and while we think, we think by language. Thus, thought could be regarded as silent language which entails the question then how do we think if it is thought words that makes our kind different from the other kinds? Animals

see, feel, sense, perceive, learn with their memory. Obviously, they have perceptions and to a certain extent intellect; yet, it is *knowing, reasoning* that creates the chasm between us and them. Through reasoning we not only sense but we “make” sense out of the world around us. While doing that, we make associations, we evaluate resemblances and differences, we make generalizations, and we produce generic ideas. Animals, on the other hand, could just react to single entities. Reasoning is to make things knowable which requires *naming of a thing* (Müller 1862/2010: 317).

Once we name a thing, it becomes. For example, approximately 50 years ago there wasn't a word as “depression”. Perhaps it has been there since the existence of humanity but once it was embodied in words, it started forming its own environment; that is, the patient, the doctor, pharmaceutical companies, treatment centers, media and the field all with its sub and side divisions. Before its emergence, it was sensed, experienced but not explicitly named. Thus, its effects, its reasons, all the sub and side categories were not gathered under that name.

Given that naming is the keystone of knowing and reasoning, how do we reason and thus know a thing and name it accordingly? In order to provide this accordance with the name and the thing, how do we organize the speech sounds and form a unity to correspond to a thing? As humanity, we have not yet been able to give a precise answer to this question. Even ideas pertaining to when this faculty may have started operating diverge to such a range between millions of years to some hundred thousands. However, theological accounts' common revelation is that it is as old as the first human being. While the issue was retaining its mystery, there emerged various theories on the first namings; that is, the origin of language. The theories range considerably with interesting names such as, ding-dong theory (nativistic), bow-wow theory (echoic), wah-wah theory (contact), uh-oh theory (gene mutation) and many others comprising 17 theories altogether. They could form a more compact classification according to their sources as; divine source, natural sound source, social interaction source, physical adaptation source, tool-making source and the genetic source (Karaman 2017: 22). Since it was almost impossible to prove these theories due to the fact that the history of writing (and thus recording) dates back only about 5400 years, in 1886 it was announced by The Linguistic Society of Paris that they would not publish scholarly works on this topic pertaining to the origin of language. Probably with the inherent and perpetual thirst of making things knowable, the studies and ideas about this mystery haven't ceased, even at the time of the declaration. It was during those decades that Ferdinand de Saussure, as a structural linguist, confined those discussions on the origin of language within theory of arbitrariness. The theory suggests that there is not a natural, motivated relationship between speech sounds and meanings, and thus the linguistic sign is arbitrary just established by convention, by collective behaviour (Saussure 1966: 67). The fact that all languages articulate

different combinations of sounds while referring to objects and concepts sufficed to prove the theory of arbitrariness. For this line of thought, even the quasi-natural sound reflections, called onomatopoeic words differ in languages. For example, while Turks say hav-hav for the sound of a dog whereas English speakers say bow-wow. Arbitrariness was defended by successive scholars, philosophers, semiologists and linguists (Levi-Strauss 1963; Hockett 1964; Barthes 1964; Benveniste 1973; Pinker 1994; Duan 2012); however, it was observed they brought with them new perspectives to the notion of arbitrariness. The rigid understanding of the concept turned gradually into grey colors revealing the existence of certain sound combinations to “somehow” match with certain meanings. Although this idea of natural link between speech sounds and meanings were as old as Platonean discourse dating back to 5th century B.C., the theoretical grounds and a few examples though with cross-linguistic references which were sparsely scattered through time, constituted an insufficient layer in the literature until 20th century when linguists like Jespersen, Sapir, Whorf, Newman and psychologists like Köhler and later in the present century with Ramachandran and Hubbard, the deeply rooted but silent presence of sound symbolism was rekindled through more extensive exemplifications and empirical endeavors. The “somehowness” of sounds like gl- connoting light as in *glimmer*, *glisten*, *glamour* have started to be encircled and scaffolded by the empirical evidences with respect to the individual sounds such as *a* is bigger than *i*, and *t*, *k* are more angular than *m*, *l*. Such early semantic categories inspired other studies and a proliferation in quantity and quality emerged. For example, studies on other meanings such as strength, funniness, brightness, motion, gender, color and others were built on size and shape. The awareness reached to such an extent that the effect of sound symbolism was proved in brand-naming and thus became a professional function of marketing strategies (Batı, Ünal 2010; Crupa McCune 2011; Ögel, Bayraktaroğlu 2019; Zulfugarova, Yüksel 2019) built on and supporting the expressive values of fictitious characters (Rausch 2014; Kawahara et. al 2018; Godoy 2020; Miyakoda & Oshita 2019). This extensive conglomeration of research required a typological approach which contributed to the field in terms of explaining sound symbolic associations based on the findings of the studies so far and the new findings on the cross-linguistic comparisons of natural lexicons focusing on primary semantic attributes shedding light on possible motivations of proto-languages (Ciccotosto 1991; Johansson 2013; Sidhu, Pexman 2017).

It is time for a short-way retrospection of the two texts of two languages which opened the gates of this study. They are in fact the two thought systems when examined by a magnifying glass. At first sight, we could say that the majority of combinations are quite different and there are several words which resemble each other or totally the same. In Chomskyan terms, “in their essential properties and even down to fine detail, languages are cast to the same mold. The Martian scientist might reasonably conclude that there is a single human language, with differences only at the margins”

(Chomsky 2000: 7). Although the similarity of grammatical structures were more focused in the metaphor of the visit from Mars, it is salient that speech sounds also resemble each other within the framework of that universal mold of languages; however, most of the time “different” members of them gather to correspond to the “same” thing. The issue is quite complex that English and Turkish (and any other two languages) are like two different houses designed by two exterior architects comprised of various rooms designed by multiple interior architects; yet, they can be succinctly illustrated. The word *bulgur* is the same in both languages because English shares the appellation of Turkish as English culture does not have that grain, and Turkish seems to have borrowed the word *guarantee* and adapt it as *garanti* due to cultural causes again as Turks might have not regarded anything as “guaranteed”, the root *lemon* has a longer journey as it is trailed to have its origins in Austronesian lands (*limaw*) then to Arabian territories (*laimun*), seems to have left its imprints on Anatolia (*limon*) and reaches at Provençal (*lymon*) which then finds another home in Britain (*lemon*), *coo coo* and *guk guk* resemble each other as they are imitations of a specific bird though the bird’s varieties in diverse geographies may differ in their sounds. What about *olive* and *zeytin*? *I* and *Ben*? The verbs *uç – fly*, *konuş – talk*? And many more... They appear not to have been borrowed from each other, what is the underlying factor(s) that they are comprised of different sounds but mean the same things? (the question to be asked first should have been; are they really the same things for both English and Turkish cultures, or are the cultures that they borrowed these words the same or not?) For example, *olive* comes from the Greek *elaia* which gives a sense of the liquid, slimy structure of the substance with the sound /l/ whereas the word *zeytin* coming from Aramaic *zayt* sounds like the abrupt slippery nature of the substance with the sounds *z*, *y*, and *t*. It also resembles English grease with an emphasis on *z*. Since the people naming this plant are not alive today, we will never learn the ‘motive’ but this study claims that there should be a motive in calling the plant not *crapoqa* (by my coinage) but some other fitting sounds. Why are the first person singular pronouns *I* and *Ben* not long words? Maybe the bird flew abruptly in Turkish territories when seen first, and the ones in British skies were up in the air soaring in flocks, ending in *ç* sound for Turkish and *l*, *y* sounds in English. *Konuş-* comes from the verb *kon-* which means to perch, perhaps two people perching on each others’ minds and souls while talking was meant in Turkish as the suffix *-ş* causes reciprocity while *talk* comes from tale, story telling.

All those possible “motivations” of naming might be thought as forced correspondences of today. However, “the first natural and instinctive utterances, if sifted differently by different clans, would fully account both for the first origin and for the first divergence of human speech” (Müller 1862/2010: 327). As this is the case, to analyze the sound patterns of the raw words of recent appellations lead us a shorter and clearer way of the “motivations” of naming processes. With the

emphasis on the word motivation, I believe that every naming process is motivated this way or the other. And our most basic motivation in using words is the fact that “words serve to make our thoughts understood, to do this with ease and to provide a way into the knowledge of things. [However,] we fail in the first respect when we have no steady, determinate ideas for our words, or none that are accepted and understood by others” (Leibniz 1765/2012: 173). Therefore, if the grain *bulgur* was naturally existent in Britain, perhaps it would have been called by the motivation of another perspective, such as its way of ploughing, its color or its taste. But, it would certainly have a motivation, a reason to be called as such.

Due to inevitable constraints in reaching at the root words in natural languages, the sources of motivation are researched in constructed words of later appellations of recent epochs which enable tracing. They could be regarded as less processed and thus comprehensible, if not non-processed. Thus, by mediating constructed words, I conducted this study so as to contribute to the field with regards to portraying a picture of how Turkish speakers show tendencies (if any) on sound symbolic associations. To the best of my knowledge, it constitutes a preliminary place as it is the first empirical study on sound symbolism focusing on Turkish speakers’ reflections on invented lexical units. Based on previous studies, 8 semantic macro categories as SIZE, SHAPE, FUNNINESS, VILLAINNESS, STRENGTH, SPEED, BRIGHTNESS, GENDER (in binaries of 16 semantic attributes as; small-large, round-angular, funny-serious, good-bad, strong-weak, fast-slow, bright-dark, feminine-masculine) and 20 oppositional pairs of constructed words unevenly distributed to each category, the extent of the tendencies which native Turkish speakers demonstrate was tested. The pairs included distinct individual phonemes or shared phonemic features when compared within the pair. This design of questioning and the experimentation on Turkish speakers’ preferences of sound symbolic associations were applied to reply questions that follow as:

- 1) Will Turkish speakers show inclinations to associate certain sounds with certain meanings like the speakers of other languages? Or will there be non-significant results as to their selections of semantic attributes and corresponding phonemic distributions?
- 2) If they show any tendencies, what are their directions? Cross-linguistically thinking, will they be diverging from or in parallel with the findings of previous studies in the field?
- 3) If they demonstrate unexpected preferences, what may be the underlying causes?

With the intention of providing answers to such questions, this empirical method based on quantitative evaluation was adopted. With respect to the content and the trail of the study, initially the theoretical framework was drawn. Before proceeding to the philosophical account of the subject,

various definitions and related terminology were primarily explained. Due to a conspicuous cleavage between the supporting and opposing ideas, first the theory of arbitrariness was delineated as the counter argument to the idea of sound symbolism. Subsequently, non-arbitrariness was scrutinized by dissecting it into two categories as theoretical studies and empirical studies. The philosophy of non-arbitrariness and the experiments conducted on the subject was examined with explicit references to the distinctions as language-specific and cross-linguistic foci.

After the conveyance of theoretical background, the details of the methodological path followed in this study was presented. In order to depict a clear picture of the experiment, the bases of each survey question were elaborately explained in the stimuli section. The features of the participant group and the information about the procedure followed the explanations about the survey questions.

In the analysis and results chapter, the findings of the applied survey were demonstrated. The statistical results of each binary pair were presented. Whether the semantic attributes and the designated phoneme distributions were in line with the expectations were stated under each table of results.

The discussion chapter includes a focused discourse of the unexpected results and their cross-categorical relations. Some potential methodological considerations compared to previous studies were mentioned. Causal relationships were constructed based on philosophies presented in the literature review.

Lastly, findings taking previous studies into account, an overall inferences and implications were elucidated. The final chapter also features limitations of the present study and suggestions for future researchers in order to lead to an enhancement of contribution which this study endeavors.

THEORETICAL AND EMPIRICAL FRAMEWORK

What Is Sound Symbolism?

Sound symbolism may evoke various cross-modalities upon encountering the phrase for the first time. The associations may well range from the bell sound of the breaktime reminding school years, to the coo sound of a dove which might carry the hearer away to the regular village visits of summer holidays during childhood. One of the other immediate visualisations could naturally be the musical notes which symbolise the individual units of melodies.

Within the framework of the present study, these recalls constitute a subsidiary status (though absolutely interrelated in a broader sense of iconicity). Linguistically speaking, in its most basic definition; the term implies *the correspondence of speech sounds to meaning*. As a matter of fact, by the ‘sound’ speech sounds, and by ‘symbolism’ meaning is intended as the referent. To concretize, the words *shine, shimmer* in English; *ışık (light), ıslıl ıslıl (sparkling, gleaming), şıkır şıkır (glittery), şık (elegant), şaşaa (splendour); shavk* (light – also used in Turkish particularly for the light of the moon), *shams* in Arabic; *shanyao* (shine) in Chinese have all the sound sh [ʃ] and the denotations are related to ‘light’ in common. Does that specific sound add anything to those words about their brightness? These occurrences leading to raising the question whether individual speech sounds have any inherent meaning is the scope of ‘sound symbolism’.

Since the subject itself belongs to the endeavor of pursuing meaning, as preliminary steps to take in the name of clarifying the meaning of ‘sound symbolism’, various definitions of the term will be presented. Subsequently, related terms will be expounded with a view to rendering familiarization. It was not until the 20th century that the term has started to appear in the literature as it is. Previously, it was stated as arbitrary and/or non-arbitrary relations between sound and meaning. Even before that the bond had been questioned though without the existence of “distinct” terminology. Therefore, although the topic is quite ancient, the definitions below comprise 20th and 21st centuries as the birth and growth periods of the linguistic term ‘sound symbolism’.

“... a natural correspondence between sound and sense, ... words acquire their contents and value through a certain sound symbolism” (Jespersen, 1922/1954)

“Sound symbolism is the direct linkage between sound and meaning.” (Hinton, Nichols, Ohala 1994:1)

“(Synesthetic) sound symbolism is the process whereby certain vowels, consonants, and suprasegmentals are chosen to consistently represent visual, tactile, or proprioceptive properties of objects, such as size or shape” (Hinton, Nichols, Ohala 1994: 4)

“The term sound symbolism is used when a sound unit such as a phoneme, syllable, feature, or tone is said to go beyond its linguistic function as a contrastive, non-meaning-bearing unit, to directly express some kind of meaning” (Nuckolls 1999: 228)

“a “natural” connection, the more contemporary version of which we may frame in terms of *iconicity* or *motivation*, between form and meaning” (Perniss, Thompson, Vigliocco 2010: 2)

“sound symbolism, [is] the phenomenon in which speakers link phonetic features with meanings in a non-arbitrary fashion” (D’onofrio 2013: 367)

“The concept of sound symbolism is that of a natural relation between sound and meaning, that sounds may invoke a corresponding idea beside the purely conventional meaning of a word” (Rausch 2014:1)

“sound symbolism, the potential for words to ‘naturally’ denote their meanings” (Cuskley et. al. 2017)

“Sound symbolism refers to cases in which particular images are associated with certain sounds” (Shinohara, Kawahara 2016: 396)

“Sound (or phonetic) symbolism refers to the non-arbitrary mappings that exist between phonetic properties of labels and perceptual properties of their referents” (Knoeferle et. al 2017)

“Languages... exhibit symbolism, where form corresponds to meaning or function: such symbolism flouts the assumption of arbitrariness” (Shih et. al. 2018: 1)

“... defining the sound-meaning associations that belong to the core of sound symbolism, i. e. the most fundamental and language-independent associations and their accompanying semantic and phonetic features, is a way of looking into the most basic meanings in language and elucidating how lexical fields are related to each other and develop over time” (Johansson et. al. 2020: 2)

As it might be observed in the definitive clauses above, various perspectives have led to various ways of defining and describing the phenomenon of sound symbolism. Stemming from this fact, there emerged an assortment of several other terms before and after ‘sound symbolism’ as; *phonetic symbolism, phonoaesthesia, motivatedness, iconicity, and non-arbitrariness*. They have at times been used interchangeably or complementarily as supporting terminology. So as to shed more light on these expressions, the following part is a spared sphere.

Related Terminology

Even though the first and foremost term to peruse ought to be non-arbitrariness, and subsequently arbitrariness, I deliberately leave them to the end of this part with the intention of providing a smooth transition to the figures, namely the theoreticians and researchers in the field. Along with similar terms to ‘sound symbolism’, there will be other affiliated terms explained about the subject.

Phonetic Symbolism: The word ‘phonetic’ is derived from the root ‘phone’ which denotes ‘voice, sound’. Therefore, phonetic symbolism is the closest phrase to sound symbolism. In the same manner, it is the idea that ‘phonemes’ carry intrinsic meanings. (As an etymological flavor; the word telephone comprises the same root ‘phone’ with an additional ‘far’ (tele-) meaning)

Phoneme: A phoneme is the smallest contrastive unit in the sound system of a language. Each language consists of a phonemic inventory. They are shown in slashes. For example; the words *zip* and *lip* have two distinct phonemes as /z/ and /l/, the environment of the word is the same except for one unit and that changes the meaning serving a contrastive function. Dictionaries provide phonemic transcriptions (broad transcription) which users may benefit for correct pronunciation.

Example: pay /peɪ/

There is also phonetic transcription (narrow transcription) which is demonstrated in brackets. It shows finer details about pronunciation such as, devoicing, aspiration, glottalisation, nasalisation and so on.

Example: pay [p^heɪ]

Each language has its specific phonemic inventory. For instance, whereas English has 44-46 phonemes depending on the dialect (see Figure 1), the users of Turkish language articulate 31

phonemes while speaking (Eker:186). There are even languages which only have 11 phonemes as in the indigenous language of Piraha (spoken in Brazil, Amazons), and there are languages which can raise the bar up to 141 phonemes as in Ju (spoken in Namibia, Botswana, Angola). Enabling the representation of all phonemes in all languages, there is an institution called International Phonetic Association (IPA – also stands for International Phonetic Alphabet) which was founded in 19th century with the intent of supporting the school children for reading foreign languages better. The birth of the idea owes to Otto Jespersen, who is a renowned Danish linguist of English language (1860-1943). He will be mentioned later as well since he is a prominent figure when sound symbolism is taken into consideration.

Consonants				Vowels and diphthongs			
1	p	pen	/pen/	1	i:	see	/si:/
2	b	bad	/bæd/	2	i	happy	/'hæpi/
3	t	tea	/ti:/	3	ɪ	sit	/sɪt/
4	d	did	/dɪd/	4	e	bed	/bed/
5	k	cat	/kæt/	5	æ	cat	/kæt/
6	g	get	/get/	6	ɑ:	father	/'fɑ:ðə(r)/
7	tʃ	chain	/tʃeɪn/	7	ɒ	got	/gɒt/ (British English)
8	dʒ	jam	/dʒæm/	8	ɔ:	saw	/sɔ:/
9	f	fall	/fɔ:l/	9	ʊ	put	/pʊt/
10	v	van	/væn/	10	u	actual	/'æktʃuəl/
11	θ	thin	/θɪn/	11	u:	too	/tu:/
12	ð	this	/ðɪs/	12	ʌ	cup	/kʌp/
13	s	see	/si:/	13	ɜ:	fur	/fɜ:(r)/
14	z	zoo	/zu:/	14	ə	about	/ə'baʊt/
15	ʃ	shoe	/ʃu:/	15	eɪ	say	/seɪ/
16	ʒ	vision	/'vɪʒn/	16	əʊ	go	/gəʊ/
17	h	hat	/hæt/	17	aɪ	my	/maɪ/
18	m	man	/mæn/	18	ɔɪ	boy	/bɔɪ/
19	n	now	/naʊ/	19	aʊ	now	/naʊ/
20	ŋ	sing	/sɪŋ/	20	ɪə	near	/nɪə(r)/ (British English)
21	l	leg	/leg/	21	eə	hair	/heə(r)/ (British English)
22	r	red	/red/	22	ʊə	pure	/pjʊə(r)/ (British English)
23	j	yes	/jes/				
24	w	wet	/wet/				

Figure 1: The phonemes in English (Source: Oxford Learner's Dictionaries – online version)

Phonemes are classified into two essential groups as consonants and vowels, and they both have various parameters within themselves (See Figures 2 & 3 for sound features of English) Consonants are divided into three main categories as;

- 1) Place of articulation determines the location of the phoneme as bilabial, labiodental, dental, alveolar, palatoalveolar, palatal, glottal, and velar
- 2) Manner of articulation determines how speech organs are arranged as obstruents (stops, fricatives, affricates), sonorants (nasals [approximants {liquids, glides}])
- 3) Voicing determines whether the vocal cords vibrate or not as voiced / voiceless

		Place of Articulation															
		Bilabial		Labio-dental		Inter-dental		Alveolar		Post-Alveolar		Palatal		Velar		Glottal	
Manner of Articulation	Stop	p	b					t	d					k	g	ʔ	
	Fricative			f	v	θ	ð	s	z	ʃ	ʒ					h	
	Affricate									tʃ	dʒ						
	Flap								r								
	Nasal		m						n						ŋ		
	Lateral Liquid								l								
	Retroflex Liquid								ɭ								
	Glide	w	w ³										j				

State of the Glottis Voiceless Voiced

Figure 2: Place, manner and voicing parameters of English consonants
(Dawson, Phalen 2016: 115)

Vowels are mostly voiced sounds and the air flows freely while producing them. There occurs no obstruction of air. Their parameters are:

- 1) Height & Backness: position of the tongue as high / mid / low and front / central / back
- 2) Lip rounding: manner of the lips as rounded / unrounded
- 3) Tenseness: the muscular effort as tense / lax

As Figure 3 shows, there are 10 simple vowels in English (they are called simple because there are diphthongs and glides which are at times regarded as vowel category). However, all vowels in all languages are above 30, and since Turkish vowels are of concern in this study, it will be functional to incorporate the vowel chart of Turkish (See Figure 4), particularly for the experimental sections.

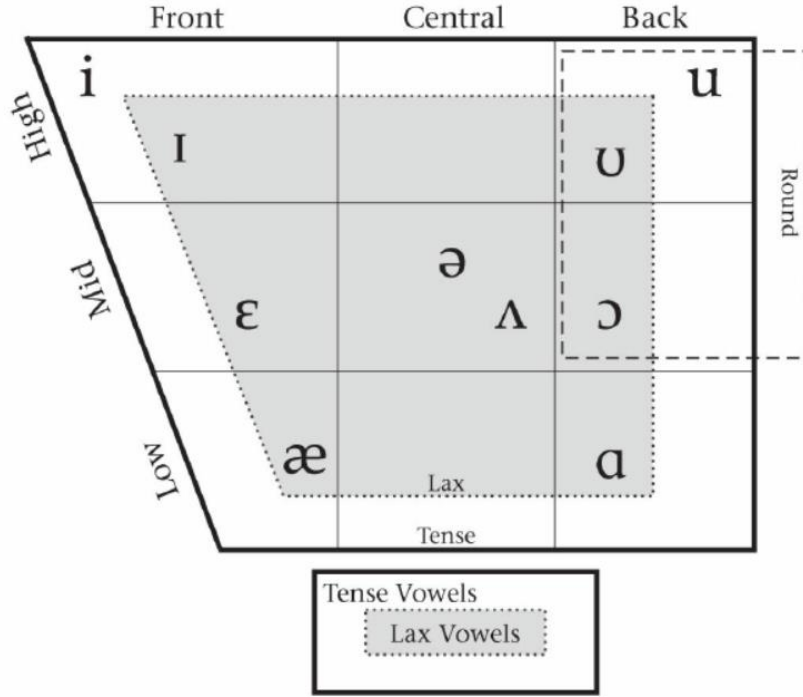


Figure 3: English vowel features in terms of height & backness, rounding, tenseness (Dawson, Phalen 2016: 117)

Backness →	Front		Back	
Height ↓	Unrounded	Rounded	Unrounded	Rounded
High	i	y	ɯ	u
Low	ε	œ	ɑ	ɔ

Figure 4: Turkish vowel features in terms of height, backness, rounding (Kilic et. al. 2006: 676)

So as to grasp how the Turkish vowels are articulated, an illustration of Turkish vowel sounds with sample words and their phonetic transcriptions are as in the following:

[i] → iyilik [ijilik] [y] → ütü [yty] [ɯ] → ılık [ɯfɯk] [u] → ulus [ulus]
 [ɛ] → eski [ɛski] [œ] → önem [œnem] [ɑ] → ana [ana] [ɔ] → omuz [ɔmuz]

In the present study, the group of sounds will be addressed quite frequently because sounds sharing close features are sometimes expected to behave similarly with respect to sound meaning mappings. While mentioning about sound-meaning correlations in previous studies and in this study, there will be shifting foci. For example, some semantic categories will be experimented by applying voiced stops which will mean [b, d, g] sounds, while some other concentrations will allude to [i, u] by stating high vowels.

Ideophone: It is a type of a word which evoke an idea by speech sounds. The ideas formed in the mind are like vivid impressions of any of the sensations. They could represent sounds, colors, actions, movements or shapes. When such words represent sounds, the phenomenon is called *onomatopoeia*.

Examples:	English		Turkish	
	Hip-hop	noun	Kırısklık (wrinkles)	noun
	Shilly-shally	verb	Zonklamak (pulsate)	verb
	Wishy-washy	adjective	fos (nothing in it)	adjective
	Hugger-mugger	adverb	fısır fısır (whispering)	adverb
	Boom, coo, meow	onomatopoeia	Ciklemek (tweet)	onomatopoeia

As the examples illustrate, ideophones are like ‘sound pictures’ (Westermann 1927) in its perfect simile. Mark Dingemanse, who is a contemporary Dutch linguist, has spared a comprehensive website dedicated to ideophones (<http://ideophone.org>). Especially, in order to fully comprehend what is and what is not an ideophone or to shatter misconceptions about this special word class, it is a satisfactory platform to resort.

Phonaestheme (phonestheme – American Eenglish): Coined by J. R. Firth in 1930, it is a speech sound or a combination of speech sounds which bear a specific meaning. Thus, by that condition the existence of it affirms the non-arbitrary feature of languages. For example, it could be simply noticed that the English words *flee*, *flicker*, *fly*, *flourish*, *flout* all start with the phonestheme FL- and they share a meaning of some kind of movement. Leonardi (2015) compiles 22 phonesthemes of Latin language which has its reflections on several European languages. They range from AC- (meaning peak) as in

acus (pin), *acumen* (top), *acer* (sharp) to TR- (meaning tremble) as in *tremescere* (shake), *trepidare* (tremble, worry), *tritus* (rubbing) (pp. 67, 69). As for Turkish, since its phonology does not typically allow consonant clusters it turns out to be a phenomenon which is not as frequent. However, when onomatopoeic words are concerned, the presence of phonesthemes are felt to a certain extent; such as RT- in the words *pirt*, *virt*, *kirt*, *hart* - all of which carry a meaning of abruptness (Akyıldız A. 2017: 22-23).

Grapheme: A grapheme is a written symbol that represents a sound (phoneme). A letter is a segmental symbol of a phonemic writing system. Therefore, although there are as many as 44 phonemes in English, the number of the letters are 26. When different letters combine, they form distinct individual phonemes to articulate. Letters are just symbols.

Example: ch is a grapheme of the phoneme [tʃ] as in the word chain

However, ch grapheme consists of two letters as c and h

As an umbrella term incorporating graphemes, letters and more; orthography, stands for all the conventions for writing a language, such as spelling, hyphenation, capitalization and so on.

Phonetics: It is the study of speech sounds. There are three sub-branches of phonetics as; articulatory (which studies how human vocal apparatus produce phones), acoustic (which studies the sound waves produced by human vocal organs), and auditory (which studies how the brain, nerves and the ear perceive phones).

Phonology: It is the study of the way the phones in a language are organised and used. The scope of phonology comprises phonetics; however, not vice versa. While phonetics deal with all speech sounds universally, phonology focuses on language-specific phonemic inventories and the interactions within. According to the hierarchy of fields in linguistics, its place is between the study of sounds (phonetics) and words (morphology). Below is the whole scale:

Phonetics → Phonology → Morphology → Syntax → Semantics → Pragmatics

Phonosemantics: It is the study of the relationship between sound and meaning, and used as the field for *sound symbolism*, *phonaesthesia*, *non-arbitrariness*, *iconicity*, and *motivatedness*. In fact, there are thin layers of nuance among these terms. Sound symbolism affirms the symbolic value of the sounds while phonosemantics suggests the relation and does not explicitly state whether it exists or not. Phonoaesthesia focuses on the synesthetic link between speech sounds and senses. The last but not the

least is non-arbitrariness which constitute a headliner status with its oldest age. Within the framework of linguistics, it suggests that speech sounds, their combinations and bonds between their meanings are all motivated and/or iconic. What is *motivatedness* and *iconicity* then?

I leave the extensive answer to this fundamental question scattered in this chapter and in the conclusion on purpose. The more the subject deepens, the clearer the waters of sound symbolism will seem. Although motivatedness and iconicity could be defined as ‘the form and the referent linked on grounds’, the gems of this quite extensive treasured phenomenon not only belongs to the study of linguistics but also philosophy, anthropology, theology, logic, psychology, sociology, cognitive science and many other fields.

Arbitrariness, Unmotivatedness and Conventionality

The questions pertaining to language and its evolution have long been asked by the one and only living species using the language tool for the main purpose of interaction. Unfortunately, it is impossible to date the inauguration time when human kind has started using language. Since there is not a written record of how any type of homos began to speak, the first utterances in history retain its mystery. Owing to the fact that it is quite appealing to decipher this blurred picture, there have been many assumptions, comments, hypotheses and theories regarding how mankind might have started naming the world around them. What could have been the motive? Was it something innate and all a ready package which the first human started using with a professional aptitude or was it such a challenge which the users have overcome and built upon in thousands of years to make it ripen as much as this day?

Regarding the origin of language, once the theological account that it has been existent since the very first day of human life with all its faculties (namely with a satisfying lexical inventory and a complex-enough grammar) is spared aside (Torah, Genesis 2/19; Gospel of John 1/1; Surah Baqarah 2/31), the gradual evolution theories are mainly categorized into two essential thoughts as; arbitrary and non-arbitrary factors. Although the theory of arbitrariness emerged on the stage later, it will be expounded initially due to its still surviving strength and its linguistically neutral expression as if non-arbitrariness must have emerged subsequently.

The theory of *arbitrariness* suggests that the form of a word does not have a natural relationship with its meaning. To instantiate, it claims that the sounds of the word snake as /s/, /n/, /eɪ/, an /k/ do not add any snakesness to the meaning of the word. According to this notion, the naming process is believed to have been realised in an arbitrary fashion. That is, all the constituents of a word have come together according to one’s will, and that ‘one’ may well be ‘one group’, and the others

agreed upon that which is referred to as *convention*. Therefore, language is believed to be formed and developed by convention. It is said to be as such by the father of structural linguistics Ferdinand de Saussure (1857-1913) with the explicit theory of arbitrariness through the terms signifier, signified and the sign, which would serve as the basis for both semantic approaches in linguistics and more broadly for the semiological studies.

The lines about the issue are in the very first chapter of *The Nature of The Linguistic Sign*, which appears in the compiled book *Le Cours de Linguistique Générale* (The Course in General Linguistics) published posthumously by Saussure's devoted students in the beginning of the 20th century (Saussure 1966: 65-70). First and foremost, what he meant by *linguistic sign* should be contoured clearly. The source of the linguistic sign is not only the form of the word as predicted, it is not the letters nor the phonemes, but the *sound-image* (in Saussurean terms) which emerges in the mind. He underlines the fact that although we do not move our lips or tongue at times, we speak to ourselves with the words to its full capacity. Hence, for the existence of a sound-image, articulation is not a required act. Furthermore, this *sound-image – the signifier*, is in reciprocal interaction with the *concept – the signified*. By concept, he means the object and its multi-relational meanings. To concretize, he gives the example of the word 'arbor'. When one thinks about this sound-image, it is not solely that specific type of the tree that the mind brings with it, but also the idea that it belongs to the category of trees is carried simultaneously and indispensably. Thus, there is an implication of the whole with one single representation here. The signifier, the sound-image of the arbor, and the signified arboriness with all its extended meanings make up the *linguistic sign*. Although the sound-image, due to misconceptions, might be regarded as the sign itself; in fact, the whole act of signing is targeted while referring to sign. So, by linguistic sign, *signification* as a whole with its constituents the signifier and the signified is meant.

While propounding the features of the linguistic sign, he begins by its arbitrary nature as a primordial property of language. By saying that "the bond between the signifier and the signified is arbitrary" (Saussure 1966: 67), he ignited a spark which still sheds light on the discussions pertaining to the origin of language and meaning. He evidenced this theory so soundly that it was as if erecting a column in the field standing out from every angle when the endeavors whether for and against are concerned. The fact that all languages combine different sounds to indicate the same concept is the proof of arbitrariness. For example, 'love' means *dashuri* in Albanian, *hob* in Arabic, *ser* in Armenian, *ljubav* in Bosnian, *ai* in Japanese, *kærlighed* in Danish, *rakkaus* in Finnish, *amore* in Italian, *eshq* in Persian, *mivoshch* in Polish, *tinj yeu* in Vietnamese, and *ashk* in Turkish. All these counterparts of the word 'love' embody quite different speech sounds. Consequently, this fact leads to the idea that if

there was a natural relation between sound and meaning, all languages should have used same sounds to correspond to the same concept. The immediate counterargument that how to explain then the existence of onomatopoeic words is refuted by regarding such words as inorganic elements of language systems. He even considers the linguistic sound representations like *tweet*, *baa*, *ouch*, *oops* as arbitrarily formed because, as an illustration, their correspondences in Turkish do have different sounds like *cik* /dʒick/, *mee* /mɛ:/, *ah* / ah/, *ay* / aj/ respectively. All in all, according to Saussure, while naming a concept, an image, an object or even a sound, collective behaviour which is in parallel with the one's and/or group's will is in effect, no other natural, intrinsic factor is effective; that is, the sign is *unmotivated* depending solely on the language user's preference (p. 69).

Before Saussure, as one of the most influential thinkers of the enlightenment period, John Locke wrote an essay called *An Essay on Human Understanding* (1689). There he expounds the relationship between speech sound and ideas. Although he uses the word 'arbitrary' not as a linguistic term of connoting unmotivatedness, but meaning 'free will of choosing', what he asserts in his lines is in parallel with the notions of arbitrariness:

Thus we may conceive how words, which were by nature so well adapted to that purpose, came to be made use of by men as the signs of their ideas; not by any natural connexion that there is between particular articulate sounds and certain ideas, for then there would be but one language amongst all men; but by a voluntary imposition, whereby such a word is made arbitrarily the mark of such an idea. The use, then, of words, is to be sensible marks of ideas; and the ideas they stand for are their proper and immediate signification. (Locke 1689/1999: 390)

After a renowned philosopher, the account of a linguist who does not have a Eurocentric approach will be covered. Compared to Saussure, relatively more comprehensive analyses with his account of a wider array of language varieties is provided by the American structural linguist Leonard Bloomfield (1887-1949). With respect to the theory of arbitrariness, he adduces the idea by the lack and impossibility of full scientific knowledge of every concrete and abstract entity and the existence of diverse subjective mind sets of language users and its reflections on word selections. For example, he states that while explaining the meaning of the material *salt*, it is sufficient to say that it is *sodiumchloride* in scientific terms. However, as for the concepts like love and hate, it turns out to be unattainable to define them as precisely, and such words comprise the majority of language compared to the ones enabling scientific and absolute denotations. Thus, although the measurements and correspondences of a color spectrum are identically defined by physicists universally, they are differently named among languages implying a different spot of hue on the spectrum, and this

selection of meaning and speech-sounds is quite arbitrary (Bloomfield 1973: 140). For example, while French has violet only, English offers violet and purple designated for that color, which indicates that English people are more sensitive to the shades of chromatic scale (Underhill 2009: 134). By his terms laconically then, “one set of sounds is as unreasonable as any other” (Bloomfield 1973: 145). His approach to the presence of onomatopoeia and exclamations is the same as Saussure by stating that they are spared because of diverging from ordinary statements. He goes beyond and state the existence of some ‘symbolic forms’ in language. By mentioning about this phenomenon, he half-opens the door of sound symbolism. To concretize, he feels a common point of meaning among the words with common initials or finals such as, [sn-] ‘meaning creep’ *snake, snail, sneak, snoop* and [-æʃ] ‘meaning violent movement’ *clash, crash, smash, mash, dash*. For him, this type of words ‘somehow illustrate the meaning’ but it is ‘a matter of grammatical structure’ like the pronominal structures starting with the same consonant as in *no (not), never, neither, nor, none* (pp. 244, 245). By this approach, he seems to grasp the issue from one edge; and even, as if he is not holding it upright. This results from the fact that he finds out the trail to phonesthemes, yet describe them from a grammatical perspective. In fact, there is a difference between these groups; the word *never* is a blend of *not+ever* or *none* is the combination of *no+one*. Nevertheless, when the word *snake* is decomposed as *sn-* and *-ake*, it is obvious that *-ake* is left as a word without a meaning.

Preserving a Saussurean discourse of arbitrariness, and influenced by Bloomfield, Charles Francis Hockett (1916-2000) illustrated some metaphors while drawing lines between *iconicity* and *unmotivatedness*. For him, iconicity versus arbitrariness has resemblances to the superiority of the digital computer over analog computer, or a picture writing system over a genuine writing system. Both the analog computer and the picture writing system have considerable functions but to a limited extent. The waggle dance of the bee can communicate the location of the nectar perfectly through iconic representations; however, it cannot go beyond the information of distance and location, whereas through language thanks to its feature being not dependent on iconicity, countless types of synchronic and diachronic information may be passed on to the collocutor (Hockett 1964: 577,578). Like Saussure, he mentions about the existence of onomatopoeia and interjectional structures along with their arbitrariness, less obvious though. The languages come close to each other with respect to the verbal representations of those structures; however, they carry a certain extent of arbitrariness by still differing in their sounds (p. 578).

As this linguistic matter of signification and its features have links to the field of semiology, the semioticians like Roland Barthes (1915-1980) annexed the linguistic sign to other more broad issues of signification in his work *Elements of Semiology* (1964). He supports the idea that the

linguistic sign is said to be *necessary, rather than arbitrary*. This necessity idea is resolutely shared by Benveniste in his *Problems in General Linguistics* (1973). He describes the link between the form and the concept as a symbiotic relationship. One without each other can not survive, and that they inevitably evoke one another once imprinted in the mind. Since humans do not think by empty forms, a concept is like the soul of a word. In other words, the word is the reification of a concept. If there is not a correspondence between a word and a meaning, then that word is unidentifiable and thereby regarded as foreign. Benveniste resorts to Saussure's metaphor of a sheet of paper two sides of which are associated with language and thought. Once it is cut, both sides are affected by it. (Benveniste 1973: 45-47). The fact that nobody is able to change the use of a word once it is founded actually points out to its non-arbitrariness. As it can be inferred, here Barthes interprets arbitrariness as the extent of freedom to modify language. Thus, he suggests to use the term 'unmotivated' instead of arbitrary (Barthes 1986: 50-54).

By following Levi-Strauss, who asserts that *language is arbitrary a priori, but non-arbitrary a posteriori* (1963: 90), Barthes approaches arbitrariness in a diachronic manner which in fact is not the attitude of Saussure as he does not cover etymological processes where arbitrariness is out of effect and thereby focuses on synchronic evaluations. Arbitrary a priori suggests that once an agreement is realised pertaining to the meaning of a word, the agreeing phase is an arbitrary act; however, after the association is established and inured, the non-arbitrary phase inaugurates. For example, in Turkish there is the word 'göz' (eye). Once it was established arbitrarily to denote our organ responsible for vision by the speech sounds /g/, /œ/, and /z/, no one can change this correspondence. From that time on, we cannot call 'göz' as 'pöz' for instance, or any other far-flung combination of speech sounds, and the immediate reaction of the mind to the words 'gözlük' (glasses), 'gözlem' (observation) brings the notion of 'vision' with them non-arbitrarily. However, we also observe that the very same word is open to gain new meanings in time; such as 'çekmece gözü' (the eye of the drawer; meaning **drawer**), göz göz olmak (to be eye-eye; to describe **bubbles** forming on a liquid), and 'iki gözlü ev' (a house with two eyes; meaning a house with two **rooms**). Similar to that of Strauss's terms that *language is arbitrary a priori, but non-arbitrary a posteriori*, Benveniste prefers describing the case as the *mutability and immutability* feature of language for such occurrences (Benveniste 1973: 47). What he suggests by that distinction is, since the signification is arbitrary it is mutable and open to modifications (as illustrated in the derived word 'gözlük' (glasses) where the word 'göz' was open to change, once that device was invented, the naming process for it occurred in Turkish directly linked to vision, whereas in English the 'material' (glass) seems to have surpassed the 'sense' during appellation), and by the very same token of arbitrariness it is immutable in the sense that no rational norm can challenge it (the expression 'iki gözlü ev' (a house with two rooms) cannot be questioned as

to why it has not been ‘iki kollu ev’ ‘a house with two arms’, and if somehow such questions were to be asked to a teacher of the language, a typical answer would most probably be ‘please memorise them, they are irregulars’.

A 21st century reflection of this idea framing the mutability/immutability of language, Duan reminds Saussure’s variability/invariability relation of arbitrariness, the umbrella theory which is strenuously defended. According to this feature of sign pertaining to variation, language is arbitrarily formed and cannot be discussed about its reasons, because for a thing to be discussed there must be some reason to it. Moreover, it is such an adaptable system that by historical and social factors, it is open to modification based only on its set of rules (Duan 2012: 57). For example, in English in an idiomatic expression ‘eggs is eggs’ could be perfectly uttered and somehow as established and accepted as the literal grammatical usage ‘the eggs are here’. Thus, the ungrammatical usage of ‘eggs’ had been the outcome of being open to change, but within the “boundaries” of the general principle that idioms could be syntactically anomalous.

Referring back to a priori / a posteriori scale of arbitrariness towards non-arbitrariness in the sense of transition from unconstraint to rigid restrictions, Duan portrays a reversed fashion of evolution towards arbitrariness. As an answer back to the claims of the proof of non-arbitrariness based on the presence of words imitating nature and interjections, he asserts that the diverging speech sound representations of onomatopoeic words and exclamations in languages scaffolds unmotivatedness contrary to the expectations. Furthermore, by depending Saussure’s idea that these words are exposed to phonological and morphological evolutions, Duan comes to the point of a priori/a posteriori division of a reversed scale which starts with non-arbitrary appellations towards arbitrary systems by the inference that “with the development of language, a word of onomatopoeic origin may gradually become unmotivated” (Duan 2012: 56).

Another recent epoch linguist contends that “words have stable meanings, linked to them by arbitrary convention” (Pinker 1994: 237). With the insight provided by the intersection of a cognitive psychology and linguistics background, Steven Pinker highlights the *Language Instinct* (1994). Diverging from Noam Chomsky, regarded as the father of modern linguistics and known as the UG – Universal Grammar theoretician, although Pinker is a proponent of the innateness facet of language like Chomsky, he has an evolutionary approach in which they differ. And Pinker touches upon the matter of arbitrariness, whereas Chomsky does not deal with it. Chomsky’s focus is on sentences rather than the relationship between speech sounds and meaning. Pinker acutely affirms that phonemes have discontinuous patterns, which suggests that an intermediary phoneme between any distinctive sounds of a minimal pair does not necessarily mean something between the meanings of the words

with that minimal pair. As an illustration, he states that there is not a meaning between the words *bat* and *pat* resulting from an acoustic sound halfway between /b/ and /p/ (Pinker 1994: 237). There is a clear imbalance when the limited number of speech sounds and the unlimited linguistic forms and meanings are compared. According to Pinker, this paves the way for an absence of relationship between the speech sounds and their referents.

The number of thinkers following this arbitrary line of thought seem to be not more than the fingers of the hand. However, the opponents of arbitrariness seem to outnumber the proponents of it. This majority should not mislead to any thought of weakness about the theory. On the contrary, due to the soundness of the theory, less is more. Therefore, there is a proliferation of miscellaneous studies holding from various edges of the non-arbitrariness phenomenon with the aim of proving its existence or co-occurrence with the theories of conventionality. A contemporary and comprehensive work solely on *Saussure and His Interpreters* underlines that, along with other issues of linguistics, what Saussure left us is such a landmark that in order to identify a theoretical position, it would suffice to know how, why and to what extent one agrees or disagrees with him. The editor cites the classification by J. R. Firth, who categorized the linguists in his time as; Saussureans, anti-Saussureans, post-Saussureans and non-Saussureans (Harris 2002: 189). By this token, even a far-flung hypothesis seems to find its meaning with the ultimate binary opposition of what Saussure has **signed**.

Non-Arbitrariness, Motivatedness, Phonaesthesia and Iconicity

Within the discourse of arbitrary viewpoint, some previous representative discourses reflect that the term ‘non-arbitrariness’ was used as the opposite of arbitrary in the sense which suggests the lack of freedom to modify the language faculties with the adoption of a diachronic approach. Nevertheless, the term non-arbitrariness is to be evaluated on the same temporal level where the ‘arbitrary’ functions take place. Then the meaning of the term emerges on the surface as it is referring to a motivation in the process of appellation, rather than the immutability feature of language.

To this point, the theoretical background of arbitrariness was succinctly portrayed. The nature of the theory does not require any further empirical proof apart from few examples from diverse languages illustrating the dissimilar phoneme representations of similar meanings. However, proving non-arbitrariness entails tremendous experimental work to refute what has been previously adduced by unequivocal claims as applied for all strong and established theories. Therefore, although it is not common to encounter a conglomeration of empirical data about arbitrariness, the opposite holds for non-arbitrariness. As a consequence, the studies are primarily classified as theoretical and empirical

which then could be divided into works on natural and constructed languages. Both of the subtitles natural and constructed are further categorized as language-specific and cross-linguistic studies.

Non-arbitrariness As a Premise

As mentioned previously, when compared to arbitrariness, the history of non-arbitrariness travels further back in time. With the written records at hand, it is assumed that the discussion is at least as old as 5th century B.C. when Plato's *Cratylus* dialogues oscillate between the conventional and naturalist perspective regarding the origin of words. Hermogenes says that their friend Cratylus, suggests that the names are natural and do not have a portion of the human voice "which men agree to utter" (Plato 1875: 203). However, as he thinks about their acts pertaining to changing the names of the slaves as they wish and call them from then on with that name, he is not convinced about this assertion and resorts to Socrates. He, who believes in making others think rather than teaching, asks questions to Hermogenes and Cratylus that the issue deepens down to the essence of things and truth. Their way of intellectual travelling stops at the nature of appellations. Initially, Socrates wants to confirm the idea of convention by a vivid example. If a horse is called a man, and man a horse then they would have been called as such perfectly as they are now. As a next step, they start analysing names given in Greek mythology and literature, and arrive at the conclusion that etymology does not lead them to an ultimate result as the primary names of all those words cannot be known. Further, Socrates suggests to dissect words into their components to delve into their realms like a painter who uses individual colors to form a whole picture. At that point, the phonemic and phonesthemic correspondences are discussed. 2500 years ago very similar discussions of contemporary magnitude, shape, motion, luminosity, tactile semantic associations with speech sounds could be found to have been conspicuously mentioned. For example, /r/ and /i/ represent motion, as in the words *tromos* (trembling), *trachus* (rugged), *krouein* (strike), *thrauein* (crush), *thruptein* (break), *rumbein* (whirl); sounds like /ph/, /ps/, /s/ needs breath and have their reflections on the words *psuchron* (shivering), *xeon* (seething), *seiesthai* (to be shaken), *seismos* (shock), *phusodes* (windy); /l/ has a liquid movement of the tongue slipping which gives a smooth sense as in *oliothanein* (to slip), *liparon* (sleek), *kollodes* (glue); /o/ signifies roundness as in the word *goggulon* (round). And there are further comments on phonemes like /g/ detains the tongue and is a heavy, clammy sound; /n/ sounds like within, inward; /t, d/ are said to be binding and thus rest in a place, stable (which will be called 'stops' with the emergence of structural linguistics); and ultimately /a/ expresses size. "Thus did the legislator, reducing all things into letters and syllables, and impressing on them names and signs, and out of them by imitation compounding other signs. That is my view, Hermogenes, of the truth of names" ends this part of the discussion and seems to have perfectly satisfied Cratylus and Hermogenes.

Greek philosophers stand out in history of thought pertaining to their depth and diverse matters; however, the topic of the relationship between ideas and letters surely attracted not only that part of the world, but also a wide range from the Upanishads of Indians to Old Chinese texts, from Celtic *Book of Taliesin* to Arabic Abjad.

During the enlightenment period in 17th century, Gottfried Wilhem Leibniz published the work *New Essays on Human Understanding* as a reply to John Locke's essay. It comprises criticisms of Locke's views in intricate details. About the points regarding the connection between linguistic form and meaning, he says:

We cannot claim that there is a perfect correspondence between words and things. But signification is not completely arbitrary either. There must be a reason for having assigned this word to that thing. Languages do have a natural origin in the harmony between the sounds and the effect impressed on the soul by the spectacle of things. I tend to think that this origin can be seen not only in the first language, but in the languages that came about later, in part from the first one, and in part from the new usages acquired by man over time and scattered over the surface of the earth. (Leibniz 1765/2012: 137)

The idea that the purer structure of the root words of basic concepts in primary languages and their subsequent varieties upon complex cultural interactions and proliferations and thereby open to an indispensable outcome of losing sound symbolic features alongwith other faculties of language is adopted by the early 19th century philosopher, linguist, and diplomat Wilhelm von Humboldt. The reality of sound symbolism was manifestly elucidated in his words as:

Since *words* always correspond to *concepts*, it is natural for *related concepts* to be designated by *related sounds*. If the pedigree of concepts is more or less clearly perceived in the mind, a pedigree in the sounds must correspond to it, so that conceptual and sound affinities coincide. (Humboldt 1836/1988: 71)

It is actually the extent of this “clear perception” of concepts in the minds which led Humboldt to discuss the impacts of cultural diversity and worldview reflected upon languages. Leaving the question of whether the clear perceptions of concepts is attainable to philosophy, that they are not always fixed leads to the conclusion that motivatedness (if it is an inherent feature in any language) surrenders to unmotivatedness which occurs as an outcome of cultural interactions and word borrowings. For example; the word *trenchcoat* is borrowed from English and has been used in Turkish as *trençkot* /trəntʃkɔt/ common to most native Turkish speakers. What is uncommon is that if it was asked to any native speaker of Turkish about the word's meaning, they would say ‘yağmurluk’ (raincoat), or mevsimlik ince palto (seasonal fine coat – ‘palto’ from French ‘paletot’ which is originally from Old English ‘paltoc’) or pardesü (overcoat – ‘pardessus’ from French). However, none of them corresponds to the meaning as it does in English. If a one-to-one translation of the word

trenchcoat was made, then the outcome should have been ‘hendekpaltosu’ or even more Turkish as ‘arkgömleği’, since the word ‘hendek’ is also from Arabic origin. ‘Gömlek’ comes from gönül, alongwith its other connotations means the ‘chest’, forming the meaning ‘the cloth that is worn covering the chest’. When this translation was again asked to a native speaker of Turkish, the reaction would naturally be empty looks initially. The reason of this void is that the semantic gap results from the fact that the word ‘trenchcoat’ has its roots in British history because it was first recorded in 1916, as a type of coat worn by British officers in the trenches during World War I. This historical background, which have its reflections on language and fashion as constituents of culture, does not belong to Turkish past, and so as the correspondence of the speech sounds ‘trençkot’ to its meaning. In the same manner, the loanword ‘dolman’ in English owes its presence in a previous domain to the days of the English Levant Company merchants’ commerce in Istanbul in 16th century, when also the words ‘coffee’ and ‘caviar’ were also borrowed and became new English words of Turkish origin (Aksoy 2020: 421). As for ‘dolman’, a similar incorrespondence applies to that of ‘trençkot’. That specific type of dress belongs to Turkish culture, and the original word is ‘dolama’, which means ‘wrapping’, stemming from the style of the cloth on the body. Very similarly, the word ‘dolman’ will not tell about this act of the cloth, namely its original meaning, to most native English speakers at the time of uttering this word. Bülent Aksoy, who is the author of the recently published comprehensive book on the etymology of the English Language, construes this outcome as:

...words in a foreign language create no such image, one can learn their general or most frequently used meanings by consulting a dictionary. Even the words borrowed from a foreign language but which have been used in the native tongue throughout several centuries are not as vivid-looking as those whose bases are of native origin... Every word we use has a history, and this history sometimes reveals remarkable facts in the past of a nation and of a language, and in the striking interaction between two or more languages. (Aksoy 2020: 18,19)

The *history* of words is a literally *high-story* to reach. Hence, this fact leads to the inaccessibility of the primary words in world languages and how they were formed, whether in a motivated or unmotivated manner, or a coalescence of the two. This subject matter belongs to the realm of the origin of languages, which seems to remain a mystery of all times. Given that, are we to ask the question: Isn’t there a way to conceive and comprehend how humans name things?

Since languages are proved to be constantly changing, the naming process should also act in parallel with this mutability in order to make the new world around us more meaningful. Yet, the answer to the critical question does not lie in the expansion of lexicons through new lexical units emerging, for instance, due to the advancements in technology. In this manner, the word ‘selfie’ or

‘bilgisayar’ (computer in Turkish) could suffice in explaining the individual speech sounds’ cause of being selected because those words have semantic connections to the already existing roots. By inventing new words, it should be a literal invention, which is called neologism or coinage. To be able to track an instantiation of this kind, the prerequisite is the presence of historical record, namely when, how and by whom the word was invented. The precise answers to these consecutive questions could be replied through a poem called “Jabberwocky”. It was written in 1855 by Charles Lutwidge Dodgson, who is in fact known as the author of the classic *Alice’s Adventures in Wonderland* but by the pen name Lewis Carroll. His mastery of playing with the words paved the way for the expansion of English lexicon through “non-sense words”. The poem belonging to the fantasy genre, embodies many odd words corresponding to some fictitious characters, animals and even features and acts;

’Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the **mome** raths outgrabe.

“Beware the Jabberwock, my son!
The jaws that bite, the claws that catch!
Beware the **Jubjub** bird, and shun
The frumious Bandersnatch!”

He took his **vorpal** sword in hand;
Long time the manxome foe he sought—
So rested he by the Tumtum tree
And stood awhile in thought.

It originally comprises 7 stanzas, but for the sake of the words “jubjub”, “vorpal”, and “mome” I extracted the first 3 stanzas. Among the other abundance of invented words, I selected these with a view to their representative features of not belonging to the blended word category and appearing as an entry in Oxford English Dictionary, which is in fact a proclamation of their official membership in the language. About their meanings, “jubjub” is both a ferocious and charitable bird, “vorpal” is deadly and keen, and “mome” is solemn or grave. Carroll invented these words to demonstrate some meanings, it was his decision to combine those sounds by his will which seems to be quite arbitrary, and then they were adopted, accepted and thereby publicised. However, would it make the same vivid impression and expressiveness to the extent that they were adopted commonly if the sword and ferocious bird were described by *mome*, and the raths (the grand and slow turtles) by *jubjub*?

So as to intensify the point of the question another instantiation awaits. To illustrate fictitious names and appellations of contemporary works, what if *Gandalf*, the old master wizard of *The Lord of*

the Rings were called *Gimli*, the dwarf, and vice versa? Tolkien, who even invented a totally new language of Elvish within the framework of this masterpiece, must have thought about the expressive values of these characters. With a retrospective look, it could be observed that not only for literary purposes but also for practical reasons as facilitating communication within a multi-national society, languages were invented. Bâleybelen, regarded as the first artificial language devised by Muhyî-i Gülşenî (1528-1604), has a lexicon of 10000 words among which there exist sound symbolic constituents such as; *nechem* (to peel), *binhav* (nightmare), *Beslece* (God) (Koç 2006). Likewise, while building pictures with his words, would Jonathan Swift make the same impact today if he chose the words for the land of the giants as *Lilliput*, and the tiny race as *Brobdingnag*, which in fact is reverse? Perhaps it would amaze Gulliver even further as we are astounded when we meet someone called Haydar in person and encounter a weak, skinny and short figure. The opposite may also happen in a way that sometimes we may visualize a woman called Pelin with a naive, slender figure; but we might come across bulky Pelins which might in turn not match with the image produced by some minds. Cartoon characters and their fitness to their names is also a matter of this debate. For example, the popular Turkish cartoon “Kare takımı” has four characters which are named Enda, Aypa, Kutu, Rupi. Their physical properties (from left to right respectively) could be seen in Figure 5. Figure 6 depicts another popular production called İbi (the name of the slim girl). What if the names of the team were mixed and İbi were called Obo?



Figure 5: The characters of the cartoon *Kare Takımı*



Figure 6: The cartoon girl *İbi*

The naming processes are not limited to fictitious characters and real proper names of persons, we also name products; that is, there is also brand-naming. Perhaps it is already obvious to a discerning eye that the last /s/ sound seems to have been a matter of preference by the manufacturers of chips, such as *Ruffles*, *Doritos*, *Lays*. Sometimes we might feel that the name of the product does not match with its thing. For example, although the quality is good, whether the Turkish brand *Züher*

for healthy, dietary bars reflect its aim of healthiness and slimness is a question mark. However, the chocolate *Canga* with peanuts unevenly distributed on top of the wafer layer and together with the motto in the commercial as “for the ones who love mess” is said to evoke the meaning of the product by most people. There is a considerable amount of growing awareness with a view to benefiting from sound symbolism as a marketing strategy reflected upon brand-naming process (Bati, Ünal 2010; Crupa McCune 2011; Ögel, Bayraktaroğlu 2019; Zulfugarova, Yüksel 2019). Even the sounds of the numerals in the price is found to affect discount perceptions and thus consumer preferences (Coulter & Coulter 2010). For instance, when the sale prices reflect a discount rate as 28.4 % with the before and after sale prices as \$11.00 - \$7.88, the discount is found to be perceived as greater than a 29.9 % discount of \$10.00 - \$7.01 prices.

Whether the speech sounds in the above naming processes has sound symbolic motivations or not might be thought to depend on individual and cultural backgrounds of different types. However, by constructing totally new names specific for the experimentation of this matter could reflect statistical outcomes. With a view to this aim, the following part will summarize some of the salient studies in the field.

Non-Arbitrariness in Empirical Studies

It was not more than two decades after the publication of Saussure’s linguistic principles that another structural linguist Edward Sapir experimented the effect of vowels on size perception (1929). His constructed words *mal-mil* were asked to the participants in order to find out their preferences about which matches to which as a small table or a big table. Most of the participants selected big one as *mal*, and the small one as *mil*. This pioneering study about size was so effective that it was like a small snowball which later on would turn into an avalanche.

The secondary, small but effective attempt occurred the same year by the psychologist Wolfgang Köhler, who carried and placed the issue to a different level by proposing the effect of visuals on speech sounds by the famous *takete-baluma* binaries and the “iconic” angular and round shapes of today’s clearer discussion of sound symbolism (See Figure 8 and further information in shape section of methodology chapter). Later, in 1947, Köhler renamed the *baluma* constructed word as *maluma*, which had the similar effect. Newman added a new semantic category as “brightness”, along with size, both testing vowels and consonants (1933), and he explicitly called his endeavors as *Further Experiments in Phonetic Symbolism*.

Empirical studies revived especially in the beginning of the new century. By resurrecting the shape and sound relationship through the constructed words *kiki* and *bouba*, Ramachandran and

Hubbard's (2001) rekindled the preoccupation with regards to sound symbolism. A comparison by Sidhu and Pexman reveals that the number of publications about non-arbitrariness was 28 in 2001 escalating up to 193 when it was 2016 (2018: 1620). With the advent of 21st century, the semantic attributes which were tested have been varied considerably. Apart from **size** (Kawahara et. al. 2018; Godoy et. al. 2020) and **shape** (Nielsen and Rendall 2013; D'onofrio 2013; Cuskley et. al. 2017), various other semantic categories have been experimented with respect to sound symbolism; such as, **motion** to test perceptions of speed (Cuskley 2013), and **tactile** feelings to test whether the nonsense words are matched to smooth or rough fabrics (Lo et. al. 2017). There are also studies which examine several semantic attributes together (size and strength combined) and in which the data comes from proper names of *Pokemon* character names (on Japanese: Kawahara et. al 2018; on Portuguese: Godoy 2020), or more comprehensively Japanese character names from various productions which examines **villainness** attribute (Miyakoda & Oshita 2019) or even a totally constructed language like that of *Elvish*, which is spoken by the elves in the renowned world of *The Lord of the Rings* (Rausch 2014). The semantic attributes in this study range from magnitude, **luminosity** to **color**, **temperature** and other intricate symbolisms like **closed-set symbolism** (mama-papa /m, p/). The common point of these studies is that they have language-specific features, in the manner that they work on with either the proper names of one nation's language or participants speaking that specific language which is most of the time English.

However, there are also cross-linguistic studies involving more than one or various languages spoken by the participants in the experiments. Again, the words are constructed nonce words, and the approaches to the topic are diverse. For example, while Uno et. al (2020) analyse Japanese *Pokemon* names and English Disney characters in order to find out which phonemes are common for villainness and cuteness, Shih et. al. focus on Japanese and English *Pokemon* names with respect to their relationship with size and strength in line with their evolutions (2018). What drives them to study this evolutionary aspect is that the evolved characters have longer names and more power which in turn reflect on their linguistic representations (Shih et. al 2018: 6). Size and shape mappings conducted on bilingual English speakers were analyzed with a concentration on acoustic cues (Knoeferle et. al. 2017). With a colorful participation of Hungarian, Cantonese, Albanian, Italian, Spanish, Arabic, Greek, English, Mandarin, Turkish and German speakers, it was further found that if size and shape perceptions are experimented alongwith action, namely the hand movements while drawing, they will reveal some neurobiological connections which may well be the cause of "human's ability to acquire language and interlink abstract symbols with abstract meanings" (Margiotoudi, Pulvermüller 2020: 11). In Shinohara and Kawahara's study (2016), Japanese, Korean, Chinese and English participants were tested to rate constructed words with vowels, voiced and voiceless obstruent consonants with

respect to size. While all participants showed similar tendencies, Japanese speakers rated low vowels to be smaller than mid vowels (p. 400). This was an unexpected outcome when also compared to a previous study solely on Japanese speakers (Kawahara 2005), and this led them to invite future researchers to scrutinize the lexicon of each language with respect to sound symbolic associations. The general tendencies of this experiment revealed that articulatory gestures and their acoustic consequences are projected to the sensation of image (p. 407).

Although it requires tremendous effort to analyze natural languages in terms of sound symbolic associations of sound and meaning, the challenges of these tasks have also been traded in exchange of shedding more light on the linguistic journey whose destination back is very much unknown.

Being one of the oldest and most esteemed scripts, Qoranic verse has been analysed for its linguistic features for centuries. With a view to its eloquence, its distinctness from other texts of Arabic language, it has attracted tremendous interest. As an illustration of the prevalence of sound-meaning relationship, the very last surahs Falaq (113) and Nas (114) could be stated (Hasan 2008, as cited in Aydin 2019: 72). In the former, the meanings of the ayahs are as follows:

Say, 'O Prophet,' "I seek refuge in the Lord of the daybreak
from the evil of whatever He has created
and from the evil of the night when it grows dark,
and from the evil of those 'witches casting spells by' blowing onto knots,
and from the evil of an envier when they envy."

the Arabic words at the end of each ayah ends with a voiced stop which requires vigor to articulate as in; فلق /fɛlaʔ/, خلق /χalaʔ/, وقب /wɛʔab/, عقد /ʊʔad/, حسد /ħased/. To recall, voiced stop sounds were regarded as linked to darkness (Newman 1933) and badness, strength (Godoy 2020), villainnes (Miyakoda & Oshita 2019; Uno et. al. 2020) as semantic attributes. The prevailing meaning in this surah is the evil entities and acts, and the omnipotence of the Almighty. As for the last surah Nas (114), there is the repetition of س /s/ sound this time at the end of the ayahs, which creates alliteration in its entirety. And when the prevailing meaning in the surah is taken into account, it could be seen that it includes warnings about the *sneaky, sly, insidious whispers* of the satan. These whispers have their counterparts in Arabic as *vesvese* وسواس, and in Turkish as *fısıltı*. The insidious is *خناس* /ħannas/ in Arabic, and *sinsi* in Turkish. It is obvious that all these meanings and speech sounds meet at common grounds.

Ibn Jinni (c. 932-1002), who was a specialist on philosophy of language and Arabic grammar, touched upon the relationship between sound and meaning and called it *iştikak-ı ekber* (major

derivation) based on the fact that the Arabic words are derived through infix roots. The multiplication of lexical units are all bound to this system. For instance, out of a root like /k-t-b/ (write) words from various parts of speech could be reproduced; such as, /katib/ (one who writes), /mekteb/ (school), /kitab/ (the written text – book), and verb conjugations like /jaktub/ (he is writing) or /katab/ (he wrote) (Bloomfield 1973: 243-244). This linguistic rule is called as *iştikak-ı sağır* (minor derivation). However, our concern is the major one, which even goes beyond deriving words as in this example; جلف, جرف, جنف these words all have the sounds /dʒ/ at the beginning and /f/ as the last phoneme. The mid phonemes alter as /l/, /r/ and /n/, and the common point about these sounds is their place of articulation, namely, they are all alveolar consonants. The fact that they have a common place of articulation causes their meanings to be similar as well. From right to left they connote; to peel, to pluck a part of the camel, and to lean, all of which have the meanings of replacement (Ibni Jinni 2003, as cited in Asutay 2012: 312). As a consequence, here in *iştikak-ı ekber*, not the vowels but the consonants change, namely the root words change; however, if they have close places of articulation they tend to have close meanings, which is an instantiation of sound symbolism.

Even the phonemes in isolation have deep meanings in Quranic verse; that is, even not bound to any environment like a morpheme or a syntactic structure. At the beginning of some surahs, there appear some letters on their own, which are like divine codes. They are neither sentences, nor words, but they are still ayahs which are by many scholars thought to convey a meaning although they are open to interpretation due to their symbolic values. These letters are called ‘*alhuruf al-muqatta / detached letters*’. To illustrate, the second surah Al-Baqara starts with *الم*. And these letters are recited with their names as Alif-Lam-Mim (like that of Greek alphabet’s alpha /a/, beta /b/, epsilon /e/, lambda /l/, some Arabic letters have names). According to Ibn-i Abbas, who is regarded as a great mufasssir (interpreter) of Quran and the cousin of the Prophet Mohammad, interprets these phonemes as Alif symbolising Allah (God), Lam symbolising Al-Lateef (The Subtle One, The Most Gentle) and Mim symbolising Al-Malik (The King and Owner of Dominion) and Al-Majeed (The Glorious, The Most Honorable) (Zerkeşi 2004, as cited in Akgül 2006: 55). Such emphasis and evaluation of phonemes demonstrate that they are not likely to have lack of meaning both on their own and in combination with others.

Investigations on natural languages from a perspective of a specific semantic attribute as funniness were conducted through analyzing approximately 5000 words of English (Westbury, Hollis 2019) which was a previously compiled corpus by Engelthaler and Hills (2018). The amplified version of experimenting natural words in terms of funniness and analysing their phoneme distributions was conducted by studying on 70,000 English words (Dingemanse and Thompson 2020). They found out that the playful and the poetic tastes of the words are likely to arise from their *structural markedness*;

despite having a wide range of scope which for this study suggests the unexpected speech sound combinations or violations of the prevalent phonological rules in a given language.

Japanese language has also been decomposed and examined in terms of sound symbolic associations. It is observed that it is very rich in terms of ideophones (the mimetic words). This preponderance even led the linguists to categorize them into three subtitles as *giseigo*, *giongo* and *gitaigo*. Sharlin (2009) points out that *giseigo* and *giongo* are common types in most languages; however, *gitaigo* is what makes Japanese distinct in terms of the frequency of sound symbolic use. As illustrations of more *gitaigo* words, she lists out of the abundance as such; *muka-muka* describes nausea, *zuki-zuki* and *hiri-hiri* describe throbbing and burning pain respectively, *waku-waku* describes nervous excitement (p. 13).

The Sound Symbolic System of Japanese			
Classification	definition	example	definition of example
<i>Giseigo</i>	the sounds of animals	<i>nya-nya</i>	the sound a cat makes
<i>Giongo</i>	the sounds of objects	<i>pota-pota</i>	the sound of dripping water
<i>Gitaigo</i>	the sounds of physical and emotional states	<i>fura-fura</i>	the sound of being dizzy

Figure 7: The categories of ideophones in Japanese and their examples (Sharlin 2009: 13)

There are contrastive and repetitive sounds in parallel with their meanings as well. For example; /i/ versus /u/ is depicted as such; *buyo-buyo* = flabby, *iso-iso* = lively; the phoneme /chi/ expresses quickness and smallness, a small amount as in *chibi-chibi* = a little at a time, *chobo-chobo* = sparsely scattered; the phoneme /no/ stands for slowness like that of *noso-noso* = moving slowly, clumsily, lumbering, *nobi-nobi* = leisurely, easily, relaxed, *noro-noro* = moving slowly, sluggishly (Fukuda 2003, as cited in Sharlin 2009: 16-17).

Hamano goes beyond this brevilouquent account of Japanese sound symbolism in his dissertation which has divisions of monosyllabic and bisyllabic mimetic words alongwith information about reduplicatives and non-reduplicatives.

a. Teeburu-kurosu o piN to hiOpaO-te hosi-ta.

I carefully pulled the table cloth into shape and hung it on a line.

b. Teeburu-kurosu o piN piN to hiQpaQ-te hosi-ta.

I carefully pulled the table cloth into shape several times and hung it on a line.

This linguistic phenomenon as representative in /pin-pin/ and /pin/ points at two kinds of sound symbolism. The first is the distinctive fact that if an adverb is reduplicated it represents the reiteration or continuity of the action whereas the one occurring only once suggests that the action is performed only once (Hamano 1986: 78,79). The other facet is related to the symbolic value of /pin/ in isolation as Hamano states “the semantics of the voiceless bilabial stop in monosyllabic mimetic adverbs is broken down to 'abrupt movement, stretched-out surface or line, light/small/fine' corresponding to its phonological features of 'explosive, bilabial, voiceless.’” (Hamano 1986: vii).

This type of language-specific studies on natural languages reflect satisfying considerations; however, more is required to mention about any universals on sound symbolism. And that more suggests cross-linguistic analyses on natural languages. The challenge was welcomed by researchers like Niklas Johansson, who endeavored to draw a big picture of the phenomenon by analyzing 75 natural languages on 56 oppositional semantic concepts (2013). The results conveyed that out of 56 concepts 41 of them showed significant results according to their sound features. Moreover, 13 of them as MOTHER, I, FATHER, WIDE/BROAD, ABOVE, MAN, THIS, NARROW, SMALL, ROUGH, SHORT, BLACK, FLAT were found to have common phonemic distributions in terms of features like sound frequency (pitch), sonority (resonance), general phonetic features like voicing and so on (pp. 72,73). For instance, among these 75 genetically and areally distributed languages, there is an overrepresentation of (100 %) nasal sounds /m,n, ŋ/ in the words MOTHER, whereas the words FATHER have voiceless labials /f, p/ (p. 47).

Nick Ciccotosto’s dissertation published in 1991 opens another wide window-blind to have a clearer picture of language universals within the framework of sound symbolism. The data of this study comprises lexical samples from 50 languages out of 229 languages which represent 10 of the 17 human language phyla. 16 primitive concepts as NECK, TOOTH, MOUTH, NOSE, COUGH, EAT, DRINK, VOMIT, BREAST, SUCK, DOG, SWALLOW, SPIT, FOOD, WATER, and CHEW were trailed in order to arrive at generalizations which are supposed to reflect information about proto-languages of our ancestors (p. Vii). It was found that those languages share common phonemic features for common concepts to a considerable extent. Such revelations also signals the ways how human mind started and continued parsing events and their semantic correspondences accordingly (p. 199).

It is high time that we commemorated Otto Jespersen (1860-1943), the Danish linguist mastering in English language and to whom we owe all those international phonetic transcriptions which prevailingly function in present study as well. His scholarly interest in phonemes surely impacted his belief in the existence of the notion of sound symbolism. In his comprehensive work named *Language: Its Nature, Development, and Origin* (1922), he prudently conveys that:

There is no denying, however, that there are words which we feel instinctively to be adequate to express the ideas they stand for, and others the sounds of which are felt to be more or less incongruous with their signification. Future linguists will have to find out in detail what domains of human thought admit, and what domains do not admit, of congruous expression through speech sounds, and further what sounds are suitable to express such and such a notion... It would be an interesting task to examine in detail and systematically what ideas lend themselves to symbolic presentation and what sounds are chosen for them in different languages. (Jespersen 1922/1954: 398)

With the intention of contributing to the realm of this phenomenon, I will portray how native Turkish speakers perceive words in terms of their sound symbolic values. It could be followed that among the ideas generated in linguistics, semiology, psychology and anthropology, there seems to occur a transition from a dark hue of arbitrariness towards a blended one and subsequently a bright color of sound symbolism, at times with hues of arbitrariness in it depending on the artist of the realm of signs. What kind of an amalgamation this study will offer are in the following chapters.

METHODOLOGY

The path of this experiment was designed to test the reactions of Turkish speakers to artificial sets of words. That is, words which do not naturally exist in Turkish lexicon were coined in order to find the gaps of their intellect in terms of vocabulary familiarity.

Natural words in an exotic language could have been tested as well; however, the combinations of phonemes would be not this much to the point. While coining a word, the inventor has the freedom of uniting sounds as wished. Moreover, the question type would be either too open-ended as;

“What do you think could be the meaning of this word?”

or too constrained as;

“Which of the following meanings do you think the specified word corresponds to?”

Hence, it would be hard to analyze and group the tendencies regarding the open-ended answers as they would have diverse options. As for the second type, there would be two options to choose from, such as big or small, bright or dark. Then the following question would repeat the semantic attribute which may force the participant to select the unselected choice. If some sounds were shifted to give a sense of a new question, then the duration of the survey would be longer.

Another type of natural lexicon question could have been as follows;

“Which of the two meanings below do you think corresponds to the word ‘hay’?”

- A) Big tree
- B) Small tree

If that specific language does not have the binary opposition meaning (eg. *hay* as big tree and *hiy* as small tree) having the same sounds except for one sound, then it would be unclear which sounds caused that specific perception of correspondence.

Since in this study, not the single entities (eg. water, carpet, apple) but dichotomies are in question, specific semantic categories (adjectives; attributes of things) were chosen. Among many other meanings; size, shape, strength, speed, gender, funniness, villainness and brightness were tested.

As a technique, the lexicon of Turkish language could have been scrutinized in terms of one of those categories or any other one. For example, the words denoting largeness and the words denoting smallness could be listed and analyzed in terms of the sounds they consist of. Nevertheless, since no language is pure and given that it is impossible to fully define the origin of languages, these analyses of the vocabulary inventories would be like commenting on the raw ingredients and their ways of growth having a dish cooked at hand. Since languages are organic and in constant change, to approach any natural language individually with the aim of sound symbolic deductions is to take all impacts and modifications for granted. Rather than a language-specific study, cross-linguistic experiments and/or analyses have the feature to comprise a wider scope and thereby sounder reflections (Ciccatosto 1991; Johansson 2013). The interactions of languages and the changes in history might draw common pictures in terms of sound selections.

Given the above alternatives of studying on sound symbolism, due to its relatively more spacious area of movement regarding playing with and around phonemes and providing clearer comprehension, polar meanings were preferred by inventing an artificial lexicon.

Another preference is the inclusion of multiple semantic categories rather than focusing on only one since this study will constitute a preliminary status in the field when Turkish speakers are concerned. Hence, the scrutinization of each meaning group is spared for future research by the interested.

The words formed for this study have certain reasons of embodiment rooted in several antecedents. How the phonemes were chosen and the last state of the words were formed will be explained subsequently for each semantic category.

The Stimuli and Their Base

Size

The pioneering study by Edward Sapir in the beginning of 20th century, paved the way for successive experiments on sound symbolism. His renowned polar set of coined words *mal* and *mil* testing size served as the inauguration of dwellings upon vowel contrasts denoting big and small entities. The ages of English speaking participants ranged from 11 to adults, and there was an additional small Chinese speaking group with no age specified. With a total number of 500 subjects, the results of the *a* in favor of *i* to matching with the big table emerged as percentages ranging from 74.65 to 96.4. Those triggering results caused other experiments on vowels to be conducted.

Another study in 1933 (Newman) had asked 606 students aged 9 and above 100 pairs of nonsense words including different parts of speech. 8 vowels were inserted in the pairs ; [i], [e], [ɛ], [æ], [ɑ:], [ʊ] , [ɔ:], [əʊ]. He found that there is a tendency to correspond the front vowels as smaller and the back vowels larger. This suggests that when magnitude is in question; the sound *i* has less volume than the sound *a*. Similar to Sapir, Newman states that there are kinesthetic (the position of the tongue), acoustic (frequency levels) and visual factors (the size of the oral cavity) underlying these inclinations of speakers (Newman 1933: 61, 62). His work tested the perceptions of consonants as well. What the results suggested was that the speakers of English regard voiced obstruents [b], [d], [g], [v], [ð], [z], [ʒ], [dʒ] to be greater than voiceless obstruents [p], [t], [k], [f], [θ], [s], [ʃ], [h], [tʃ].

A cross-linguistic study by Shinohara and Kawahara (2016) tested 103 participants overall and they had a questionnaire consisting of 40 disyllabic nonce words. This experiment revealed that the speakers of Korean, Mandarin Chinese, Japanese and English rated front vowels as small more with respect to back vowels which are generally found as large (p. 401). As for the consonants, voicing of obstruents were analysed. The coined words were comprised of the voiced obstruents [b, d, g, z] and the voiceless obstruents [p, t, k, s]. Except for an insignificant reversal of the results in Korean, all the other three languages showed a consistent tendency towards a higher rating of voiced obstruents to be relatively larger (pp. 401, 402). According to these researchers, tests on both vowels and consonants have their articulatory and acoustic bases of explanation.

Knoefler et. al. (2017) further discuss on the sound symbolic acoustic properties of speech sounds and they suggest that consonants have certain implications of size and shape perceptions. Since in this part the focus is on size, that respect of consonants will be propounded. They experimented 30 Oxford students with 100 nonce words including different vowels combined with the consonants in order to observe and eliminate the potential effect of vowels when attached to consonants. Size and shape perceptions were tested scaffolded by visual and auditory stimuli. For this part, the results of size category will be stated for consonantal sounds. With a 5 scale rating, the participants felt glides ([j], [w]) as the biggest and the voiceless stops ([p], [t], [k]) as the smallest. Together with the other categories of consonants all of the groups were scaled as such (p. 5);

Glides > Liquids > Nasals > Voiced Fricatives > Voiced Stops > Voiceless Fricatives > Voiceless Stops

[j] [w] > [l] [r] > [m] [n] > [v] [ð] [z] [ʒ] > [b] [d] [g] > [f] [θ] [s] [ʃ] > [p] [t] [k]

Although there are some other sounds belonging to the above categories of consonants, they ([ŋ] from nasal group, [h] from voiceless fricatives group) were not among the nonce word auditory stimuli. Since the majority of sounds are included for each category, the results can be considered as significant.

Based on those early and recent studies on sound symbolism experimenting size-sound mappings, the nonce word sets below were formed:

VAZA – VIZI ➔ Testing high front and low back vowel contrast for size perception

Vowels are variable, consonants are invariable

PAKA – LAYA ➔ Testing voiceless stops and approximants contrast for size perception

Consonants are variable, vowels are invariable

BEGE – PEKE ➔ Testing of voiced stops and voiceless stops for size perception

Consonants are variable, vowels are invariable

Shape

Contemporary to Sapir's introduction of size symbolism by sounds, Wolfgang Köhler was the first to assert the symbolism of shapes by sounds in 1929. The famous TAKETE-MALUMA effect of his finding suggests that most people would definitely choose the nonce word takete as the name of an angular shape and maluma as the name of a round shape (Köhler 1947/1992: 224, 225).

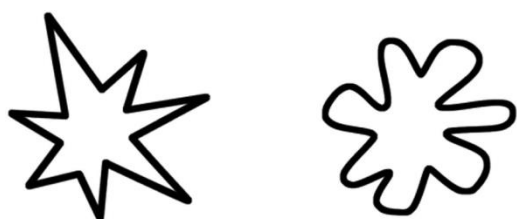


Figure 8. The original version of these symbolic round and angular visual stimuli and their correspondent names as KIKI-BOUBA was designed by Köhler. However, the subsequent studies all resemble these basic shapes.

This binary opposition of roundness versus angularity had evolved into KIKI- BOUBA effect later on. Like Köhler, Ramachandran and Hubbard (2001) did not suggest the perceptual fact that sharp sounds bring sharp objects into mind and vice versa. They dealt with the fields of psychology and neuroscience; however, since language is a phenomenon which involves these branches of science, the support of linguistic claims may well come out through these areas. They supported the

idea of shape symbolism through synaesthesia. According to them, the sensory-to-motor flow suggests that similar to our movements while dancing, the speech sounds would naturally reflect on movements on the paper thereby resulting in visual stimuli (p. 19).

The common point of the studies mentioned above is that the sharp sounding words both have voiceless stops and front vowels (except for one sound *a* in *takete*), and round sounding words have bilabial sounds and the liquid [l] combined with back vowels. Therefore, it could be inferred that not only consonants but also vowels are in effect which paves the way for a reinforced impact.

Another recent study (Knoeferle et. al. 2017: 5), which was referred in “size” part before, demonstrates that certain group of consonants may be regarded as more rounded than the rest. Using a 5 scale rating, the participants considered glides ([j], [w]) as the most rounded and voiceless stops as the most angular ([p], [t], [k]). The other consonantal categories fall as in the following;

Rounded	Angular
Glides > Liquids > Voiceless Fricatives > Nasals > Voiced Stops > Voiced Fricatives > Voiceless Stops	
[j] [w] > [l] [r] > [f] [θ] [s] [ʃ] > [m] [n] > [b] [d] [g] > [v] [ð] [z] [ʒ] > [p] [t] [k]	

Enabling 22 undergraduate students to select among the dissected syllables and combine them as they wish was the design of Nielsen and Rendall (2013). Through this design, it gave the subjects to move more freely and thus bringing about sounder results in terms of lack of force or guided alternatives as present in some other studies which use words. Although the questions of this thesis is comprised of invented words, it has the opportunity to have benefited from the results of the previous studies. By that scaffolding, the sounds of the words were chosen among the determined sounds of the experiments previously conducted. As for this study, 45 different image sets and syllables made up of sonorant and plosive consonants together with rounded and unrounded vowels were used to be tested. After the applications it was revealed that the plosive (stop) consonants [p, b, t, d, k, g] and unrounded vowels [i, a] were preferred for jagged images and sonorant consonants [l, r, j, w, m, n, ŋ] and rounded vowels [u, o] were labelled for curved images.

Based on those early and recent studies on sound symbolism experimenting shape-sound mappings, the nonce word sets below were formed:

NOMU – NEMÍ	→	Testing rounded and unrounded vowel contrast for shape perception
		Vowels are variable, consonants are invariable
KOTO – LOYO	→	Testing plosive (stop) and sonorant contrast for shape perception
		Consonants are variable, vowels are invariable

Funniness

When compared to size and shape the studies on funniness and sound symbolic occurrences is far less encountered. It could be resulting from the facts that; 1) That something is perceived as funny is a highly relative phenomenon, what makes something playful or serious differs a lot (Goffman 1974: 48-52). 2) Funniness is not as tangible as size and shape which means to illustrate something playful is not as simple as the former semantic categories.

There are obviously various factors that makes people regard something as funny. It could be ranging from theories of superiority to relief and benign violations (Borgella 2016). However, among them the linguistically relevant theory for this study is the “incongruity theory: it’s unexpected” (ibid). As Peter L. Berger puts it, the comic generally emerges from the unexpected that which “intrudes”. The other side of the coin is comprised of serious businesses (2014: 6).

What Dingemanse and Thompson (2020) very recently focused and revealed is this unexpectedness in linguistic terms which is “structural markedness”. It is a term which suggests that some forms of languages are neutral in their states but some stand out because of some **marks** on their structure. To illustrate; the verb “walk” is in its unmarked form, whereas “walked” is regarded as marked. This is a grammatical markedness. There are types of this feature in subcategories of linguistics, such as phonology, syntax, semantics and so on. In this study 70.000 English words are analysed in terms of their phonological markedness, iconicity and funniness ratings. What they came up with was that, structurally speaking, iconic (sound symbolic) words and funny words had complex onsets, codas and the diminutive suffix –le in common. These features are the ones which contribute to the foregrounding of the words like; *sniff*, *whirl*, *giggle* respectively. Thus, it is suggested that the unexpected combinations of sounds in a word may highly be felt as playful. The study entitled “Wriggly, Squiffy, LummoX, and Boobs: What makes some words funny?” (Westbury, Hollis 2019)

has its focus on the violation of the expected property as well thereby constituting a place as a basis of Dingemanse and Thompson's study (2020).

When structural markedness for Turkish is considered, vowel harmony could be taken into account as one of the grammatical and phonological issues where the expected and the unexpected sounds could be observed. There are two types of the rule as major and minor vowel harmony.

The major vowel harmony rule suggests that;

If the vowel in the first syllable is one of a/ı/o/u, the following syllables should have one of a/ı/o/u

If the vowel in the first syllable is one of e/i/ö/ü, the following syllables should have one of e/i/ö/ü

The minor vowel harmony rule is as such;

If the vowel in the first syllable is one of a/e/ı/i, the following syllables should have one of a/e/ı/i

If the vowel in the first syllable is one of o/ö/u/ü, the following syllables should have one of a/e/u/ü

In the first rule softness and hardness is the factor, whereas in the second rule straightness and roundness comes to the foreground. It is accepted that the words violating this vowel harmony rule must be borrowed from other languages. One of the expectations of this study is that if this rule prevail the majority of the words in Turkish, then the violation of it should stand out and be regarded as unexpected and thus marked. Below while presenting the survey questions of this funniness category, which rule is deliberately violated will be stated.

Along with markedness studies, while forming the survey questions the work by Wiseman and Van Peer (2003) was also considered. Although their focus was not directly funniness, having a relevant perception in minds their findings reveal results about grief and joy. Experimenting a group of 84 Brazilian and German participants, they presented vowels (not the focus of this study) and consonants (plosives and nasals) in isolation. They did not follow the route of inventing words. As a result, what they reveal is that holding for both language groups, nasal sounds [m, n] were rated as better reflectors of grief and the plosives [b, t, p, d] correspond to joy more. Although there could be occurrences of exception, grief does not generally coexist with nonserious conditions and joy cooccur with smiles and laughter and thus may be arising from funny situations. Joy does not necessarily stem from funny moments; however, when there is playfulness there is smile and laughter as a common feature. Based on this assumption, and the studies above the survey questions about funniness are formed as in the following;

- POTOK – NOLOM → Testing plosive and nasal contrast for funniness perception
Consonants are variable, vowels are invariable
- MATI – MUTI → Testing vowel harmony and violation of it for funniness perception
Vowels are variable, consonants are invariable
- Matu* is in compliance with minor vowel harmony, while *Muti* is violating minor vowel harmony
- COLEK – CALAK → Testing vowel harmony and violation of it for funniness perception
Vowels are variable, consonants are invariable
- Calak* is in compliance with major vowel harmony, while *Colek* is violating major vowel harmony

Villainness

In this category, the sounds which were felt to be good and which were felt to be bad will be brought in. To determine those sounds, it could be observed that the studies mostly focused on fictitious character names. The miscellaneous analyses of good and bad characters in the literature shed a light on sound symbolic associations regarding this semantic category of villainness.

Because of the natural tendency that the big, large, heavy is felt as powerful and thus apt to damage if they wish, and in contrast the small, thin are delicate and naive thereby portraying an innocent or good features of character. Although indirectly, this idea may well lead to assume that if some sounds reflect largeness and smallness they can also be symbolic of villainness and cuteness. By analyzing 715 Pokemon names as of October 2016 collection, Kawahara et. al. (2018) revealed that voiced obstruents [b, d, g, z] reflect large and heavy images in Japanese. Despite the fact that this study is focused on sound, size, strength, and word length correlations, a side deduction could be drawn due to the common perception of size, strength and villainness link.

The following year, directly targeting the semantic category of villainness, Miyakoda and Oshita (2019) conducted a study by utilizing 224 Japanese character names demonstrating sound symbolic associations. What they found out was that some specific consonants are prevalently used for good and bad characters. The experiment including 80 participants reveals that the consonants [m], [r] and [s] were mostly perceived as having a relation with goodness, whereas [g], [b] and [k] were mostly linked to badness.

Another study conducted afterwards in 2020 (Uno et. al.) focused more specifically on the corpora of Pokemon and Disney character names. 964 Disney names and 794 Pokemon character names were scrutinized in terms of their sound features. They had two hypotheses;

- voiced obstruents [b], [d], [g], [v], [ð], [z], [ʒ], [dʒ] should occur more in villain names
- bilabial consonants [p], [b], [m] should be avoided in villain names as they stand for cuteness, in other words; babyiness, since babies first begin producing these sounds due to breastfeeding period when most of the time the lips are naturally closed

After decomposing the names into their individual sounds, it was found that the above hypotheses held considerably. The percentages of voiced obstruents in villain names both in Disney and Pokemon characters were higher than the frequencies in nonvillains and the presence of bilabial sounds in villains seems to have been avoided.

Taking those empirical studies into account, the survey questions regarding villainness category were formed as in the following;

A description of a good character was told to the participants in the first place. Then they were asked to choose between two invented names which they found more suitable to the character described.

“This kind-hearted character, who was loved by everyone, did her/his best to help the one in need.

Which of the names below do you think best fits this character?”

- a) Gaba b) Mara

This terrifying thing ravaged everything s/he came across and damaged them all.

Which of the names below do you think best fits this character?”

- a) Gaka b) Sama

The sound feautres of those binaries are as follows:

GABA – MARA ➔ Testing [g, b] and [m, r] sounds for villainness perception

Consonants are variable, vowels are invariable

GAKA – SAMA ➔ Testing velar stops [g, k] and [m, s] sounds for villainness perception

Consonants are variable, vowels are invariable

Strength

This is the category for which two factors were tested: 1) Sounds 2) Word length. According to the Pokemon names study (Kawahara et. al. 2018), which is known as the first to work on Pokemon names, it was deduced that voiced obstruents [b, d, g, z] and vowel height are in parallel with size and weight. That means, voiced obstruents and low vowels were prevalent when more powerful post-evolution Pokemon characters were considered. Moreover, there was the suggestion that the length of the word also has a bond with size and weight, thus strength. Hence, the longer-the-stronger idea was put forward based on iconicity of quantity principle (Jakobson 1965; Haiman 1980). The idea where they set off was the evolution of the Pokemon characters. Once they felt that the power features of the characters were boosted in line with the sounds in their names, the researchers experimented to build on this observation. Although this holds for Pokemon names, my expectation is different than this suggestion when contemplated cross-linguistically. At least for Turkish, English, Spanish and German I have gathered examples where the longer the word the smaller or cuter the item is. Namely, there are some suffixes which in contrast has a diminutive function. For example;

Turkish → küçük (small) – küçücük (tiny), vazo (vase) – vazocuk (a small vase)

English → book – booklet, kitchen – kitchenette (which is originally a French suffix)

Spanish → poco (small) – poquito (tiny), pajarito (bird) – pajarito (little bird)

German → Wurst (sausage) – Würstchen (sausage), Hund (dog) – Hündchen (puppy)

Building upon this linguistic fact, I hypothesized that;

It must be the sounds in effect rather than the length of the word which contribute to its powerfulness. It's the combination of strong-felt vowels and consonants, not solely the word length.

Apart from the presence of the diminutive suffixes in various languages, there is another reason why I expect that word length might not act alone in associations of sound and the meaning of strength in a word. That other side of the coin is the syllable structure of languages. Japanese language adjusts its prosody in line with moras which are sound units like syllables and distinct in the sense that they are timed. The rhythm is the essence in the formation and application of moras. For example, the long vowels have two moras whereas the short vowels have one mora; however, even a long vowel with consonants might be only one syllable. To illustrate;

a.ma.zon → syllabic partition (3 syllables)

a-ma-zo-n → moraic partition (4 moras)

Thus, Japanese which has a prosody based on moras, has a different pronunciation and a different perception of word length with respect to English when the study by Shih et. al. (2018) is taken into consideration and with respect to Turkish as for the present work. Their analysis takes not only Japanese Pokemon names but also English versions with all their development stages for both languages. Therefore, in that sense it provides a comparative picture of the effects of both the sounds and the length of the word. It is stated that after the analysis of 805 Pokemon names, there are common points as well as some differences. Although when sounds are added, it is observed that the power of the character is accelerated in terms weight and evolution as for both languages, the lengthening of the word is more salient in Japanese due to its prosodic structure. For example; a Japanese Pokemon character called Kodakku becomes Gorudakku. Even if one sound was intended to be added to make the word beginning like Gor in place of Ko, it is actually illicit in Japanese to make the word Gordakku. This results from the fact that a vowel is needed to be inserted to finalize the word appropriately as Gorudakku. However, as for the English names although sounds are added the rythm of the word may not necessarily be extended as there is no vowel insertion. For example, the name Zorua evolves into Zoruar. As a result, the duration of the word at the time of articulation does not display any difference. All in all, the length of a word might be perceived differently for various languages resulting in a change in their perception of strength as well.

Moreover, when sounds are considered, back vowels [u, o, ɔ] were seen to reflect more weight for Japanese and low vowels [æ, ɐ] for English names. The use of voiced obstruents affected names in both languages in parallel with their weights. Specifically in Japanese, it was seen that the use of voiceless obstruents and bilabials affected the Pokemon characters in a negative fashion. Especially, for bilabials it is timely to remember the previously mentioned evaluation that bilabial sounds were avoided as they represent babyishness and cuteness (Uno et. al. 2020). Furthermore, another previous suggestion supports the effect of voiceless obstruents which were contended to correspond to small size (Shinohara, Kawahara 2016).

The study by Godoy et. al. (2020) brought a new perspective to the issue by two factors. First of all they experimented Brazilian Portuguese speakers, which was unprecedented, and secondly they designed their experiment in such a way that those 141 participants themselves named the visuals of the 20 pair characters themselves from the ground up. The results demonstrate that for the post-evolution characters the participants were more inclined to use longer names. With respect to vowels, the subjects mostly preferred /a/ for post-evolution (stronger) characters, and /i/ for pre-evolution Pokemons. When consonants are considered, a supportive result of the previous studies comes to the

foreground stating that the use of voiced obstruents [b, d, g, z] were more frequent than other sounds while naming post-evolution (stronger) characters.

When the above results and analyses were taken into consideration, the survey questions below were formed in order to experiment whether it is the word length or the sounds or combination of both which correspond to strength:

ZAGO – ZAGORANODA → Testing word length – Words have “strong” sounds

Syllables are variable, sounds are invariable

PİTE – PİTENİLERİ → Testing word length – Words have “weak” sounds

Syllables are variable, sounds are invariable

GAZU – TERİNELİ → Testing word length + strong and weak sounds

Syllables are variable, sounds are variable

TONUHORO – GODUZORO → Testing strong consonants for long words

Consonants are variable, syllables are invariable

GODO – KUMO → Testing strong consonants for short words

Consonants are variable, syllables are invariable

As can be observed, vowel test was not included separately since the focal point of the test was to prove the hypothesis that rather than the word length the sounds affect the correspondence to the meaning of powerfulness. The GAZU-TERİNELİ pair has both vowel and consonant contrast with a view to intensify the impact of the short word and to mitigate the effect of the long word via sound preferences.

Speed

Similar to strength and villainness, how humans perceive speed might be linked to the perception of size as well. That is, since there is a correlation that small objects, characters are mostly reflected as innocent, naive and delicate, thus good, and vice versa; and since objects and creatures which are big in size may most of the time be regarded as strong; there will probably be the similar tendency for speed as well. The inclination is expected to be such that the small sounding sounds

(voiceless stops, front vowels) may well be diverting the feelings of individuals to regard them as swift, fast and more easily mobile due to their small size. The opposite idea then could be depicted as big sounding sounds (voiced stops, back vowels) will most probably be perceived as large, bulky, and thus relatively slower in motion.

The recent work experimenting 92 participants (77 of whom native English speakers and the remaining from various origins) to evaluate the speed feature of nonce words displayed significant results for the sounds [b, d, g] in a way that they stand for slowness more (Monaghan, Fletcher 2019).

Furthermore, conducted with the attendance of 49 participants and the presence of 105 nonce words, the motion style of a ball as the visual stimuli was presented to be matched with the invented words (Cuskley 2013). Voicing and vowel quality along with reduplication features were examined. Since reduplication will not be tested in this study, voicing and vowel quality are in focus. As for vowel quality, as a conclusion it was reached that words having back vowels were more frequently mapped to slow motion. The hypothesis of the study was to find out that voicing would lead to slowness; however, the results were not significant in that sense. It was deduced that the effect of reduplication together with voicing might lead to a mixed perception. In parallel with the researcher's advice, in this study there was no used any reduplication of sounds, rather totally different consonants and vowels were in effect. Therefore the survey question emerged as;

TEKİ – DAGO → Testing voiced stops and voiceless stops for speed perception

Testing front and back vowels for speed perception

Consonants are variable, vowels are variable

Brightness

Apart from the semantic categories size and shape, the remaining titles constitute a subsidiary place. Namely, brightness, like other meanings other than size and shape, is not a category which has been researched and experimented as much as the symbolism of magnitude and form.

606 students with ages 9 and above were tested in Newman's experiment with nonce word pairs of 113 including the comparison of vowels and consonants both (1933: 62). The participants were asked to select the "darker" words (simultaneously in the same experiment they were also tested for largeness; however, it is not within our scope in this category). The results turned out to be, although as for consonantal sounds not as much smooth as size results mathematically, surprising in several senses in that brightness and darkness have no link to size of the oral aperture and vocalic

length as for vowels. Rather the articulatory factors and frequency are in effect. Thus, the bright to dark scale emerged as follows:

Bright [i] < [ɪ] < [æ] < [ɑ] < [ɔ] < [u] Dark

The scale of bright to dark vowels depict a glass-like picture when the international phonetic vowel chart is visualised (See Appendix 1). The brighter perceived sounds start from the high front position and goes to low and then from low back to high back position. According to Newman, the explanation of the vowel preferences could not be bound to the length of the sound and the size of the mouth when opened. Tongue and lip position is thought to affect the perception of darkness and brightness in the sense that when the tongue is up the glottal area is more free and when it is down the glottis is felt more thus having a deeper feeling for the articulator (See Appendix 2 for the vocal tract images) Although [u] is high in the position, the fact that it is perceived as the darkest lies in the position of the lips as when it is uttered it gives a feeling of closure of all the oral operators, thus triggering the effect of darkness.

When consonants are taken into consideration, the scale is more vague than the vowels as for the results. But, still the same there could emerge a descending scale of brightness as such:

Bright [k] = [s] ≈ [l] << [h] < [p] < [dʒ] << [n] < [g] < [b] < [r] << [gl] << [d] << [m] < [gr] < [br] Dark

The most general deduction that could be reached out of this scale was the fact that voiced consonants were regarded darker as they have more acoustic weight and thus low frequency as in the case of largeness. And by means of corollary, the voiceless consonants were perceived as brighter owing to the fact that they have less acoustic body and thus high frequency level.

Basing several semantic categories on Newman's study (1933), Rausch (2014) dealt with the meaning of brightness under "colors ad luminosity" part in his study entitled "Sound Symbolism in Elvish". Elvish is an invented language by J.R.R. Tolkien, who is the well-known writer of *The Lord of the Rings*. Definitely, it is not a natural language, however, it has such a complexity that this language of the elves was even formed to have variances such as; Quenya, Goldogrin, Noldorin, Sindarin and so on with rich lexicons. Analyzing this corpus of vocabulary, he inferred that in Elvish, words could be classified into three categories as; pale, pure and sombre when luminosity is concerned, and that the vowel /i/ appears more often in words connoting pale vision, /a/ pure, and predictably /u/ and /o/ having frequent presence in sombre words (Rausch 2014: 14). There are also some other findings regarding the colors of the spectrum; however I am particularly dealing with the concept of brightness and darkness. As for the consonants, not a specific scale was formed as in Newman's study, He notes that the words having the prefixes KAL- , LOS- had "bright" meanings and

Built upon the above studies, I intended to test one more sound, which is [ʃ]. The reason why this sound was chosen is the existence of several words in English and Turkish which are common in the sense that they include this [ʃ] sound and have bright denotations. To illustrate; *shine, shimmer, ışıık, ışııl ışııl, ışııltı, şıkır şıkır, şık, şaşaa, şavk* all have various versions of shine with respect to their meanings in different parts of speech. For the contrastive side of the pair, I coined a word consisting of voiced obstruents based on the studies (Newman 1933; Shinohara, Kawahara 2016; Knoeferle et. al. 2017) proving largeness, and bulky reflection of any entity which in turn may expectantly cause the language users to map those sounds with darkness as well.

NİĞİ – NUGU	➔	Testing high front and high back vowel contrast
		Vowels are variable, consonants are invariable
LESE – MEDE	➔	Testing [l, s] and [m, d] contrast
		Consonants are variable, vowels are invariable
ŞİLİRİM – GİZDİF	➔	Testing [ʃ] + liquids, nasals and strong sounds contrast
		Consonants are variable, vowels are invariable

When compared to the previous semantic categories, “gender” is one and only in the sense that it is the most controversial due to its theoretical background and interestingly enough bearing the clearest results among the survey questions. Surely, the perception of gender related features depends highly on time and place. It is evident that gender roles shift cross-culturally, and within the same culture it shifts diachronically as well. It could be observed in such a way to stretch from the

stereotypical perceptions of nursing, as it is corresponded with women so much that men who in fact would like to pursue their careers in that profession are found to be afraid of being marked as gays (Williams 1989) to gendering revolution times when even the most evident and dominant cases of equality discourses and layers of society take place. However, as Marie-Claire Vallois (2001) puts it, during the 18th century if a woman was out in the street, namely in the public, no matter what the aim of her streetishness is, her action would be called as prostitution, whereas men in the public were translated as a politician. On the other hand, regardless of the once upon a time prehistoric maternal societies of women when worshipped as the heralds of goddesses, there are still modern matriarchal societies in which women are the chains of not only ancestry but also property inheriting (Goettner-Abendroth 2018). As stated before, all these discrepancies have temporal and/or spatial factors. They could be arising from metamorphosis within the same society in time, or having a cross-cultural nature occurring contemporaneously.

Now that the conspicuous disparities between females and males were reiterated, how sounds reflect their properties is the actual question of this study. Since the representation of size, shape and other categories of meaning could be thought of represented by specific speech sounds, then, it would be as predictable to demonstrate any kind of sound symbolic correspondence for the binaries of gender. Regardless of the social and psychological attributes or judgements of femininity and masculinity, even if the physical, tangible features are taken into account, it could be stated that in general female body has a more delicate and soft structure, while male body is rough and hard. In parallel with the ideas of roundness/sharpness, weakness/strength, brightness/darkness and small/large, there were various studies conducted on not only existent proper names of gender, but also including nonsense names. The overall conclusions driven out of the experiments were that certain phonological features tend to cooccur with male and female names (Cassidy et. al. 1999; Cutler et. al. 1990; Sidhu et. al. 2015, 2019; Slepian, Galinsky 2016; Whissell 2001). To illustrate, by taking the *Oxford minidictionary of first names* as a reference for 1667 name entries, the relatively earlier finding demonstrates that the high front vowel /i/ occurs more frequently in female names (Cutler et. al. 1990: 480). This may suggest that since the sound /i/ has been perceived as smaller, weaker and brighter, these attributes may have been correlated with femaleness. The concept of roundness and sharpness may be thought as; as mentioned before though female body is more smooth, when the association of round to straight sounds are considered, the perception of the language speaker may divert towards the idea that the female is more slender and thin, and that the male is relatively bulky. Thus, the perception turns into straight, spiky and narrow associated with /i/ sound, and rounded vowels /o, u/ with more volume. As for the perceptions of consonantal sounds, the picture is not that consistent and clear both when compared to vowel association and within itself as consonantal association. To

express in more details, the recent comprehensive work by Slepian and Galinsky (2016) conducted eleven experiments differing in their foci as testing English and Indian participants, or testing real names (270 million) and constructed names (p. 80). Nevertheless, as for each experiment what they looked at was the distinction of the mappings between voiced/voiceless consonants and gender. As a consequence, the studies yielded the results that most of the time voiced consonants [b, d, g, v, ð, z, ʒ, dʒ, m, n, l, r, j, w] outnumbered voiceless consonants [p, t, k, f, θ, s, ʃ, h, tʃ] in their occurrences in male names and vice versa. The explanation was through the vibration of vocal cords, which requires more energy and strength while producing. Contrarily, while producing the voiceless sounds they flow relatively with ease resulting in consuming less energy and producing a softer sound. Given that this approach has a perspective based on the hardness/softness of sounds as a factor to correspond to gender, when it comes to sharpness/roundness though with a similar semantic notion in mind a different mapping comes to the ground. Theoretically basing the study on maluma/takete matches (see part Shape of this chapter), it was found that the sharp sounding sounds /p, t, k/ and round sounding sounds /l, m, n/ in 100 real names scattered in such a way that female names were more likely to embody round sounding sounds. However, sharp sounding sounds were found to be not necessarily predictive of the gender of names (Sidhu, Pexman 2015: 11).

Upon taking the above findings into consideration, a collage of the sounds and gender perception expectations were formed. That is, the front vowel /i/ and the back vowel /o/ were used as vowel selection in the nonce words of the present study. The consonants accompanying them were; /f, m, b/ with /i/ sound for a female combination, and /k, n, d/ with /o/ sound for the male combination. /f/ was preferred as the representative of the voiceless consonants which do not vibrate and force the articulatory organs, /m, b/ as round sounding sounds which were stated to be matched with female names most of the time. /k/ was preferred as it is a sharp sounding sound alongwith /n/ and /d/ as they are voiced sounds causing the vocal cords to vibrate with the use of more energy. Another factor intended to affect was bilabiality of the sounds; /m, b/ in contrast to /n, d/ are bilabial sounds which were marked in a previous study as sounds evoking softness and cuteness (Uno et. al. 2020) which may in turn be referents of femaleness.

FĪMBĪ-KONDO → Testing front/back vowel contrast

Testing bilabial/alveolar, voiceless fricative/voiceless stop contrast

Consonants are variable, vowels are variable

Participants

Since the aim of this study is to depict a picture of how native Turkish speakers perceive sound symbolic relationships, all participants' mother-tongue is Turkish. 55 participants attended the study voluntarily by their oral consent. 33 of them are females, and the remaining 22 are males. They are from various backgrounds, such as employees, pensioners, housewives and students. The average age of the group is approximately 33. The oldest member is 61-years-old and the age of the youngest contributor is 12. Owing to the existence of evidence that even in the pre-school years language development in children in terms of phonological sensitivity particularly was observed to progress significantly (Anthony, Lonigan 2004; Anthony et. al. 2002, as cited in Tzeng et. al. 2017:114), the youngest person in the experimented group is regarded linguistically mature enough for this study.

Procedure

The experiment was conducted via phone calls each of which lasted for around 9 minutes on average. Each participant was informed about the average duration beforehand. Upon the short information about the aim of the experiment, the participants' oral consent was taken.

The experiment was deliberately applied through phone calls so as to enable the participants to concentrate solely on the speech sounds they hear. If they had been provided with the survey questions in written form, orthographic factors could have applied. Especially, when the semantic category 'shape' is concerned, the cross-modal mappings seem to be activated with regards to sound and meaning associations. For example, it was observed among native English speakers that when they were asked to match the non-words including curved /d, g, s, f/ and angular /z, v, k, t/ consonants with the emblematical kiki/bouba (round/spiky) figures, the inclination was towards the mappings between the curved sounds to bouba shape and the angular sounds to kiki shape (Cuskley et. al. 2017: 125, 126). In this test, there was the pronunciation of the constructed words accompanied in order not to force an evaluation of visuality only. In the complementary experiment, only the spoken representations were in effect to be matched with the shapes (graphemes were not present this time). The results showed that, the participants answers drew a more lenient table compared to the first experiment where the discrepancies were wider. This study demonstrates that orthography invigorates sound-symbolic correspondences of shape. In compliance with what Monaghan and Fletcher (2019) advise in the recent work about the link between written forms and phonemes, the experiment facet of this study was comprised of auditory stimuli. They underline that orthography might have additional importance in brand-naming as a corroborating factor in consumer perceptions.

20 antonym pairs belonging into eight semantic categories (size, shape, funniness, villainness, strength, speed, brightness, gender) were presented to the participants. They were asked to choose between each constructed word in a pair to fit for the meaning as they perceive. An exemplary instruction is as in the following:

“Imagine a small and a large character in a new cartoon. Which one of the names do you think best fits for each of these characters?

VAZA – VİZİ”

In order to simplify the visualisation process, the non-existent words in Turkish language were presented as potential names of a cartoon production. Although the semantic attributes are not as abstract or highly relative as the concepts, such as hope, trust and beauty, I preferred to facilitate the process of mapping first-time heard words with certain meanings by mediating the imagination of cartoon characters.

DATA ANALYSIS AND RESULTS

In this study, the preferences and thereby the tendencies of the participants, who are native Turkish speakers, were aimed to be examined. The numbers of accordant responses (for example, a constructed name with high front vowels associated with a small-sized character) and discordant (that is, the other alternative response) were inscribed for each participant. When all answers were added, the total number of accordant and discordant answers were 55 for each binary (in sum 20 binary oppositions distributed unevenly in 8 semantic categories). Conforming to the philosophy of linguistic iconicity, the numbers of accordant answers were expected to be outnumbering the discordant ones.

In order to detect whether the preferences of the subjects have significant discrepancies or not, the crosstab results were analysed by chi-square tests. In the first place, the preferences were coded as 1-0 matrix. Subsequently, these results were compared by chi-square goodness of fit test. After the comparison of binaries, the same statistical method were applied for cross-categorical relations.

In the tables below the results will be demonstrated for each binary opposition distributed in specified semantic categories. Following the pairs, the cross-categorical results will be shared.

Size

Table 1. Chi-square test results of mapping big-small meanings to Vaza-Vizi constructed names for SIZE

			Vaza small	big	Total
Vizi	small	N	0	51	51
		%	0	92.8	92.8
	big	N	4	0	4
		%	7.2	0	7.2
	Total	N	4	51	55
		%	7.2	92.8	100
$\chi^2=41.171$	df=1	p=0.00			

Table 1 shows the comparative results of high-front and low-back vowel mappings to SIZE. Whether there is any discrepancy between the frequency of designation as for the vowel features of the constructed words Vaza-Vizi was analysed.

It was observed that while the participants who corresponded Vizi to ‘big’ were 4 out of 55, representing 7.2 % of the group, 51 participants preferred Vaza as beter matching to a ‘big’ character, which constitute 92.8 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=41.171, $p<0.05$. In other words, it was found that Vaza, which was expected to show results in congruence with largeness, was perceived as ‘big’ noticeably more frequently than Vizi. This result demonstrates that Turkish speakers are inclined to perceive low-back vowel /a/ as bigger than the high-front vowel /i/.

Table 2. Chi-square test results of mapping big-small meanings to Paka-Laya constructed names for SIZE

			Laya small	big	Total
Paka	small	N	0	18	18
		%	0	32.73	32.73
	big	N	37	0	37
		%	67.27	0	67.27
	Total	N	37	18	55
		%	67.27	32.73	100
$\chi^2=50.552$	df=1	p=0.00			

Table 2 shows the comparative results of voiceless stop and approximant sound mappings to SIZE. Whether there is any discrepancy between the frequency of designation as for the consonant features of the constructed words Paka-Laya was analysed.

While the participants who corresponded Laya to ‘big’ were 18 out of 55, representing 32.73 % of the group, 37 participants preferred Paka as better matching to a ‘big’ character, which constitute 67.27 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.552, $p<0.05$. In other words, it was found that Laya, which was expected to show results in congruence with largeness, was perceived as ‘small’ more frequently than Paka. This result demonstrates that Turkish speakers are inclined to perceive the approximants /l, j/ as smaller than the voiceless stops /p, k/, which was in fact unexpected.

Table 3. Chi-square test results of mapping big-small meanings to Bege-Peke constructed names for SIZE

			Peke		
			small	big	Total
Bege	small	N	0	23	23
		%	0	41.82	41.82
	big	N	32	0	32
		%	58.18	0	58.18
	Total	N	32	23	55
		%	58.18	41.82	100
$\chi^2=50.967$	df=1	p=0.00			

Table 3 shows the comparative results of voiceless stop and voiced stop sound mappings to SIZE. Whether there is any discrepancy between the frequency of designation as for the consonant features of the constructed words Bege-Peke was analysed.

The participants who corresponded Peke to ‘big’ were 23 out of 55, representing 41.82 % of the group, whereas 32 participants preferred Bege as better matching to a ‘big’ character, which constitute 58.18 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.967, $p<0.05$. In other words, it was found that Bege, which was expected to show results in congruence with largeness, was perceived as ‘big’ more frequently than Peke. This result demonstrates that Turkish speakers are inclined to perceive the voiced stops /b, g/ as bigger than the voiceless stops /p, k/.

Shape

Table 4. Chi-square test results of mapping angular-round meanings to Nomu-Nemi constructed names for SHAPE

			Nemi angular	round	Total
Nomu	angular	N	0	15	15
		%	0	27.27	27.27
	round	N	40	0	40
		%	72.73	0	72.73
	Total	N	40	15	55
		%	72.73	27.27	100
$\chi^2=50.074$	df=1	p=0.00			

Table 4 shows the comparative results of rounded and unrounded vowel mappings to SHAPE. Whether there is any discrepancy between the frequency of designation as for the vowel features of the constructed words Nomu-Nemi was analysed.

According to the results, it could be followed that while the participants who corresponded Nemi to ‘round’ were 15 out of 55, representing 27.27 % of the group, 40 participants preferred Nomu as better matching to a ‘round’ character, which constitute 72.73 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.074, $p<0.05$. In other words, it was found that Nomu, which was expected to show results in congruence with roundness, was perceived as ‘round’ more frequently than Nemi. This result demonstrates that Turkish speakers are inclined to perceive the rounded vowels /o, u/ as more round than the unrounded vowels /e, i/.

Table 5. Chi-square test results of mapping angular-round meanings to Koto-Loyo constructed names for SHAPE

			Loyo round	angular	Total
Koto	Round	N	0	7	7
		%	0	12.73	12.73
	angular	N	48	0	48
		%	87.27	0	87.27
	Total	N	48	7	55
		%	87.27	12.73	100
$\chi^2=46.365$	df=1	p=0.00			

Table 5 shows the comparative results of plosive (stop) and sonorant sound mappings to SHAPE. Whether there is any discrepancy between the frequency of designation as for the vowel features of the constructed words Koto-Loyo was analysed.

It was observed that while the participants who corresponded Loyo to ‘angular’ were 7 out of 55, representing 12.73 % of the group, 48 participants preferred Koto as better matching to a ‘angular’ character, which constitute 87.27 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=46.365, $p<0.05$. In other words, it was found that Loyo, which was expected to show results in congruence with roundness, was perceived as ‘round’ more frequently than Koto. This result demonstrates that Turkish speakers are inclined to perceive the sonorants /l, j/ as more round than the plosives /k, t/.

Funniness

Table 6. Chi-square test results of mapping funny-serious meanings to Potok-Nolom constructed names for FUNNINESS

			Nolom		
			funny	serious	Total
Potok	funny	N	0	26	26
		%	0	47.27	47.27
	serious	N	29	0	29
		%	52.73	0	52.73
	Total	N	29	26	55
		%	52.73	47.27	100
$\chi^2=51.061$	df=1	p=0.00			

Table 6 shows the comparative results of plosive and nasal sound mappings to FUNNINESS. Whether there is any discrepancy between the frequency of designation as for the consonant features of the constructed words Potok-Nolom was analysed.

The attendants who mapped Nolom to ‘serious’ were 26 out of 55, representing 47.27 % of the group, 29 participants preferred Potok as better matching to a ‘serious’ character, which constitutes 52.73 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=51.061, $p<0.05$. In other words, it was found that Potok, which was expected to show results in congruence with funniness, was perceived as ‘serious’ more frequently than Nolom. This result demonstrates that Turkish speakers are inclined to perceive the plosives /p, t, k/ as more serious than the nasals /m, n/, which was in fact unexpected and will be discussed further about the possible factors contributing to this result more of which will be found in discussion part.

Table 7. Chi-square test results of mapping funny-serious meanings to Matı-Muti constructed names for FUNNINESS

			Mati		
			serious	funny	Total
Muti	serious	N	0	8	8
		%	0	14.55	14.55
	funny	N	47	0	47
		%	85.45	0	85.45
	Total	N	47	8	55
		%	85.45	14.55	100
$\chi^2=47.249$	df=1	p=0.00			

Table 7 shows the comparative results of structural markedness mappings to FUNNINESS with respect to compliance / violation of minor vowel harmony rule in Turkish. Whether there is any discrepancy between the frequency of designation as for the vowel cooccurrence features of the constructed words Matı-Muti was analysed.

It could be examined that while the participants who corresponded Matı to ‘funny’ were 8 out of 55, representing 14.55 % of the group, 47 participants preferred Muti as better matching to a ‘funny’ character, which constitutes 84.45 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=47.249, $p<0.05$. In other words, it was found that Muti, which was expected to show results in congruence with funniness, was perceived as ‘funny’ more frequently than Matı. This result demonstrates that Turkish speakers are inclined to perceive the violation of minor vowel harmony (if the first syllable of a word contains a rounded vowel, and is followed by ı [u] or i [ɪ] in the second, it is a violation of minor vowel harmony in Turkish) as relatively more funny than the case when the vowel features of a word is in compliance with it (the first syllable of a word containing a rounded vowel followed by any of a [ʌ], e [ɛ], u [ʊ], ü [y] vowels in the next). When the violation occurs, there emerges an unexpected structure and thereby structural markedness. This may suggest that Turkish speakers are sensitive to structural markedness while perceiving a sense of funniness.

Table 8. Chi-square test results of mapping funny-serious meanings to Colek-Calak constructed names for FUNNINESS

			Calak serious	funny	Total
Colek	serious	N	0	17	17
		%	0	30.91	30.91
	funny	N	38	0	38
		%	69.09	0	69.09
	Total	N	38	17	55
		%	69.09	30.91	100
$\chi^2=50.417$	df=1	p=0.00			

Table 8 shows the comparative results of structural markedness mappings to FUNNINESS with respect to compliance / violation of major vowel harmony rule in Turkish. Whether there is any discrepancy between the frequency of designation as for the vowel cooccurrence features of the constructed words Colek-Calak was analysed.

While the participants who corresponded Calak to ‘funny’ were 17 out of 55, representing 30.91 % of the group, 38 participants preferred Colek as better matching to a ‘funny’ character, which constitutes 69.09 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.417, $p<0.05$. In other words, it was found that Colek, which was expected to show results in congruence with funniness, was perceived as ‘funny’ more frequently than Calak. This result demonstrates that Turkish speakers are inclined to perceive the violation of major vowel harmony (if the first syllable of a word contains a back vowel and is followed by a front vowel in the second, it is a violation of major vowel harmony in Turkish) as relatively more funny than the case when the vowel features of a word is in compliance with it (The first syllable of a word containing a back vowel followed by a back vowel in the next, and the first syllable of a word containing a front vowel followed by a front vowel again in the next). When the violation occurs, there emerges an unexpected structure and thereby structural markedness. This may suggest that Turkish speakers are sensitive to structural markedness while perceiving a sense of funniness.

Villainness

Table 9. Chi-square test results of mapping good-bad meanings to Mara-Gaba constructed names for VILLAINNESS

			Gaba		Total
			bad	good	
Mara	bad	N	0	6	6
		%	0	10.91	10.91
	good	N	49	0	49
		%	89.09	0	89.09
	Total	N	49	6	55
		%	89.09	10.91	100
$\chi^2=45.219$	df=1	p=0.00			

Table 9 shows the comparative results of [g, b] and [m, r] sound mappings to VILLAINNESS. Whether there is any discrepancy between the frequency of designation as for the consonant features of the constructed words Gaba-Mara was analysed.

The participants who associated Gaba with ‘good’ were 6 out of 55, representing 10.91 % of the group, 49 participants preferred Mara as better matching to a ‘good’ character, which constitutes 89.09% of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=45.219, $p<0.05$. In other words, it was

found that Mara, which was expected to show results in congruence with goodness, was perceived as ‘good’ more frequently than Gaba. This result demonstrates that Turkish speakers are inclined to perceive the consonantal sounds [g, b] as more villain than [m, r].

Table 10. Chi-square test results of mapping good-bad meanings to Gaka-Sama constructed names for VILLAINNESS

			Sama good	bad	Total
Gaka	good	N	0	10	10
		%	0	18.18	18.18
	bad	N	45	0	45
		%	81.82	0	81.82
	Total	N	45	10	55
		%	81.82	18.18	100
$\chi^2=48.483$	df=1	p=0.00			

Table 10 shows the comparative results of the velar stops [g, k] and [m, s] sound mappings to VILLAINNESS. Whether there is any discrepancy between the frequency of designation as for the consonant features of the constructed words Gaka-Sama was analysed.

According to what the results demonstrate, the participants who matched Sama to ‘good’ were 10 out of 55, representing 18.18 % of the group, 45 participants preferred Gaka as better matching to a ‘bad’ character, which constitutes 81.82 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=48.483, $p<0.05$. In other words, it was found that Sama, which was expected to show results in congruence with goodness, was perceived as ‘good’ more frequently than Gaka. This result demonstrates that Turkish speakers are inclined to perceive the velar stop sounds [g, k] as more villain than [m, s].

Strength

Table 11 shows the comparative results of the long word with strong sounds and short word with strong sounds mappings to STRENGTH. Whether there is any discrepancy between the frequency of designation as for the word length features of the constructed words Zago-Zagoranoda was analysed.

Table 11. Chi-square test results of mapping strong-weak meanings to Zago-Zagoranoda constructed names for STRENGTH

			Zago		
			weak	strong	Total
Zagoranoda	Weak	N	0	16	16
		%	0	29.09	29.09
	Strong	N	39	0	39
		%	70.91	0	70.91
	Total	N	39	16	55
		%	70.91	29.09	100
$\chi^2=50.293$	df=1	p=0.00			

The participants who matched Zago to ‘strong’ were 16 out of 55, representing 29.09 % of the group, 39 participants preferred Zagoranoda as better matching to a ‘strong’ character, which constitutes 70.91 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.293, $p<0.05$. In other words, it was found that Zagoranoda, which was expected to show results in congruence with strength, was perceived as ‘strong’ more frequently than Zago. This result demonstrates that Turkish speakers are inclined to perceive the longer words with “strong” sounds as stronger than shorter words with “strong” sounds.

Table 12. Chi-square test results of mapping strong-weak meanings to Pite-Pitenileri constructed names for STRENGTH

			Pite		
			Weak	strong	Total
Pitenileri	weak	N	0	23	23
		%	0	41.82	41.82
	strong	N	32	0	32
		%	58.18	0	58.18
	Total	N	32	23	55
		%	58.18	41.82	100
$\chi^2=50.967$	df=1	p=0.00			

Table 12 shows the comparative results of the long word with weak sounds and short word with weak sounds mappings to STRENGTH. Whether there is any discrepancy between the frequency of designation as for the word length features of the constructed words Pite-Pitenileri was analysed.

In line with the frequency of preferences, the participants who matched Pite to ‘strong’ were 23 out of 55, representing 41.82 % of the group, 32 participants preferred Pitenileri as better matching to a ‘strong’ character, which constitutes 58.18 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.967, $p<0.05$. In other words, it was found that Pitenileri, which was expected to show results in congruence with strength, was perceived as ‘strong’ more frequently than Pite. This result demonstrates that Turkish speakers are inclined to perceive the longer words with “weak” sounds as stronger than shorter words with “weak” sounds.

Table 13. Chi-square test results of mapping strong-weak meanings to Gazu-Terinelı constructed names for STRENGTH

			Terinelı		Total
			weak	strong	
Gazu	weak	N	0	10	10
		%	0	18.18	18.18
	strong	N	45	0	45
		%	81.82	0	81.82
	Total	N	45	10	55
		%	81.82	18.18	100
$\chi^2=48.483$	df=1	p=0.00			

Table 13 shows the comparative results of the long word with weak sounds and short word with strong sounds mappings to STRENGTH. Whether there is any discrepancy between the frequency of designation as for the word length plus sound features of the constructed words Gazu-Terinelı was analysed.

The results reveal that the participants who matched Terinelı to ‘strong’ were 10 out of 55, representing 18.18 % of the group, 45 participants preferred Gazu as better matching to a ‘strong’ character, which constitutes 81.82 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=48.483, $p<0.05$. In other words, it was found that Gazu, which was expected to show results in congruence with strength, was perceived as ‘strong’ more frequently than Terinelı. This result demonstrates that Turkish speakers are inclined to perceive the shorter words with “strong” sounds as stronger than longer words with “weak” sounds.

Table 14. Chi-square test results of mapping strong-weak meanings to Tonuhoro-Goduzoro constructed names for STRENGTH

			Tonuhoro		
			weak	strong	Total
Goduzoro	Weak	N	0	19	19
		%	0	34.55	34.55
	Strong	N	36	0	36
		%	65.45	0	65.45
	Total	N	36	19	55
		%	65.45	34.55	100
$\chi^2=50.666$	df=1	p=0.00			

Table 14 shows the comparative results of the long word with weak consonants and long word with strong consonants mappings to STRENGTH. Whether there is any discrepancy between the frequency of designation as for the consonantal sound features of the constructed words Tonuhoro-Goduzoro was analysed.

When the results of this pair were observed, the participants who matched Tonuhoro to ‘strong’ were 19 out of 55, representing 34.55 % of the group, 36 participants preferred Goduzoro as better matching to a ‘strong’ character, which constitutes 65.45 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, $\chi^2(df=1, n=55)=50.666, p<0.05$. In other words, it was found that Goduzoro, which was expected to show results in congruence with strength, was perceived as ‘strong’ more frequently than Tonuhoro. This result demonstrates that Turkish speakers are inclined to perceive the long words with “strong” sounds as stronger than long words with “weak” sounds.

Table 15. Chi-square test results of mapping strong-weak meanings to Godo-Kumo constructed names for STRENGTH

			Kumo		
			weak	strong	Total
Godo	weak	N	0	15	15
		%	0	27.27	27.27
	strong	N	40	0	40
		%	72.73	0	72.73
	Total	N	40	15	55
		%	72.73	27.27	100
$\chi^2=50.074$	df=1	p=0.00			

Table 15 shows the comparative results of the short word with weak consonants and short word with strong consonants mappings to STRENGTH. Whether there is any discrepancy between the frequency of designation as for the consonantal sound features of the constructed words Godo-Kumo was analysed.

The frequencies of selections reflect that the participants who associated Kumo with ‘strong’ were 15 out of 55, representing 27.27 % of the group, 40 participants preferred Godo as better matching to a ‘strong’ character, which constitutes 72.73 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=50.074, $p<0.05$. In other words, it was found that Godo, which was expected to show results in congruence with strength, was perceived as ‘strong’ more frequently than Kumo. This result demonstrates that Turkish speakers are inclined to perceive the short words with “strong” sounds as stronger than short words with “weak” sounds.

Speed

Table 16. Chi-square test results of mapping fast-slow meanings to Teki-Dago constructed names for SPEED

			Dago		
			slow	fast	Total
Teki	slow	N	0	12	12
		%	0	21.82	21.82
	fast	N	43	0	43
		%	78.18	0	78.18
	Total	N	43	12	55
		%	78.18	21.82	100
$\chi^2=49.294$	df=1	p=0.00			

Table 16 shows the comparative results of the voiced stops plus back vowels and voiceless stops with front vowels mappings to SPEED. Whether there is any discrepancy between the frequency of designation as for the consonantal and vowel sound features of the constructed words Teki-Dago was analysed.

While the participants who preferred to match Dago with ‘fast’ were 12 out of 55, representing 21.82 % of the group, 43 participants preferred Teki as better matching to a ‘fast’ character, which constitutes 78.18 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=49.294, $p<0.05$. In other words, it was found that Teki, which was expected to show results in congruence with speed, was

perceived as ‘fast’ more frequently than Dago. This result demonstrates that Turkish speakers are inclined to perceive the words embodying voiced stops plus back vowels as slower than the words embodying voiceless stops with front vowels.

Brightness

Table 17. Chi-square test results of mapping bright-dark meanings to Nigu-Nugu constructed names for BRIGHTNESS

			Nugu dark	bright	Total
Nigi	dark	N	0	5	5
		%	0	9.09	9.09
	bright	N	50	0	50
		%	90.91	0	90.91
	Total	N	50	5	55
		%	90.91	9.09	100
$\chi^2=43.566$	df=1	p=0.00			

Table 17 shows the comparative results of the high front and high back vowel mappings to BRIGHTNESS. Whether there is any discrepancy between the frequency of designation as for the vowel features of the constructed words Nigi-Nugu was analysed.

According to what the results demonstrate, the participants who associated Nugu with ‘bright’ were 5 out of 55, representing 9.09 % of the group, 50 participants preferred Nigi as better matching to a ‘bright’ character, which constitutes 90.91 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=43.566, $p<0.05$. In other words, it was found that Nigi, which was expected to show results in congruence with brightness, was perceived as ‘bright’ quite more frequently than Nugu. This result demonstrates that Turkish speakers are inclined to perceive high front vowel as brighter than the high back vowel.

Table 18 shows the comparative results of the consonantal sounds [l, s] and [m, d] mappings to BRIGHTNESS. Whether there is any discrepancy between the frequency of designation as for the consonantal features of the constructed words Lese-Mede was analysed.

In line with the frequency of preferences, the participants who associated Mede with ‘bright’ were 7 out of 55, representing 12.73 % of the group, 48 participants preferred Lese as better matching to a ‘bright’ character, which constitutes 87.27 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=46.365, $p<0.05$. In other words, it was found that Lese, which was expected to show results in congruence with

brightness, was perceived as ‘bright’ more frequently than Mede. This result demonstrates that Turkish speakers are inclined to perceive the consonantal sounds [l, s] as brighter than [m, d].

Table 18. Chi-square test results of mapping bright-dark meanings to Lese-Mede constructed names for BRIGHTNESS

			Mede		
			dark	bright	Total
Lese	Dark	N	0	7	7
		%	0	12.73	12.73
	Bright	N	48	0	48
		%	87.27	0	87.27
	Total	N	48	7	55
		%	87.27	12.73	100
$\chi^2=46.365$	df=1	p=0.00			

Table 19. Chi-square test results of mapping bright-dark meanings to Şilrim-Gizdif constructed names for BRIGHTNESS

			Gizdif		
			dark	bright	Total
Şilrim	dark	N	0	4	4
		%	0	7.27	7.27
	bright	N	51	0	51
		%	92.73	0	92.73
	Total	N	51	4	55
		%	92.73	7.27	100
$\chi^2=41.171$	df=1	p=0.00			

Table 19 shows the comparative results of the consonantal sounds [ʃ] + liquids, nasals and strong consonantal sounds mappings to BRIGHTNESS. Whether there is any discrepancy between the frequency of designation as for the consonantal features of the constructed words Şilrim-Gizdif was analysed.

The results reveal that the participants who matched Gizdif with ‘bright’ were 4 out of 55, representing 7.27 % of the group, 51 participants preferred Şilrim as better matching to a ‘bright’ character, which constitutes 92.73 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=41.171, $p<0.05$. In other words, it was found that Şilrim, which was expected to show results in congruence with brightness, was perceived as ‘bright’ more frequently than Gizdif. This result demonstrates that

Turkish speakers are inclined to perceive the consonantal sounds [ʃ] + liquids, nasals as brighter than strong consonantal sounds.

Gender

Table 20. Chi-square test results of mapping female-male meanings to Fimbi-Kondo constructed names for GENDER

			Kondo		
			Male	female	Total
Fimbi	male	N	0	2	2
		%	0	3.64	3.64
	female	N	53	0	53
		%	96.36	0	96.36
	Total	N	53	2	55
		%	96.36	3.64	100
$\chi^2=30.164$	df=1	p=0.00			

Table 20 shows the comparative results of the front vowels + bilabial consonants + voiceless fricative consonants and back vowels + alveolar consonants + voiceless stop consonants mappings to GENDER. Whether there is any discrepancy between the frequency of designation as for the vowel and consonantal features of the constructed words Fimbi-Kondo was analysed.

When the results of this last binary opposition were observed, the participants who matched Kondo with ‘female’ were 2 out of 55, representing 3.64 % of the group, 53 participants preferred Fimbi as better matching to a ‘female’ character, which constitutes 96.36 % of the group. When the distributions were examined, the delineation of the specified rates suggests that the difference is significant, χ^2 (df=1, n=55)=30.164, $p<0.05$. In other words, it was found that Fimbi, which was expected to show results in congruence with femininity, was perceived as ‘female’ more frequently than Kondo. This result demonstrates that Turkish speakers are inclined to perceive the combination of front vowels + bilabial consonants + voiceless fricative consonants as more female than the combination of back vowels + alveolar consonants + voiceless stop consonants.

DISCUSSION

Through 8 semantic macro categories as SIZE, SHAPE, FUNNINESS, VILLAINNESS, STRENGTH, SPEED, BRIGHTNESS, GENDER (in binaries of 16 semantic attributes as; small-large, round-angular, funny-serious, good-bad, strong-weak, fast-slow, bright-dark, feminine-masculine) and 20 oppositional pairs of constructed words unevenly distributed to each category, the extent of the tendencies which native Turkish speakers demonstrate was tested. The pairs were comprised of distinct individual phonemes or shared phonemic features when compared within the pair. Based on cross-linguistic (Hinton et. al. 1994; Shinohara, Kawahara 2016; Knoeferle et. al. 2017; Shih et. al. 2018; Uno et. al. 2020; Margiotoudi, Pulvermüller 2020; Wiseman, Van Peer 2003) and language-specific studies (English: Nielsen and Rendall 2013; D'onofrio 2013; Cuskley 2013; Perlman, Cain 2014; Cuskley et. al. 2017; Chinese: Lo et. al. 2017; Hebrew: Koriati, Levy 1977), the participants were expected to show inclinations towards certain sounds to associate with certain meanings, which might then suggest the existence of sound symbolic perceptions with regards to Turkish phonology and cultural tendencies.

Semantic Categories	Antonym Pairs	Sound Symbolic Associations of a Group of Turkish Speakers	
		Phoneme based description of the results	Sound feature description of the results*
SIZE (largeness)	Vaza-Vizi	/a/ is bigger than /i/	low back vowel > high front vowel
	Paka-Laya	/p, k/ are bigger than /l, j/	voiceless stops > approximants
	Bege-Peke	/b, g/ are bigger than /p, k/	voiceless stops > voiced stop
SHAPE (roundness)	Nomu-Nemi	/ɔ, u/ are more round than /ε, i/	rounded vowel > unrounded vowel
	Koto-Loyo	/l, j/ are more round than /k, t/	sonorants > plosives (stops)
FUNNINESS	Potok-Nolom	/n, l, m/ are more funny than /p, t, k/	sonorants > plosives (stops)
	Matı-Muti	/u-i/ in a row is more funny than /a-u/ in a row	violation of minor vowel harmony > minor vowel harmony
	Colek-Calak	/ɔ-ε/ in a row is more funny than /a-a/ in a row	violation of major vowel harmony > major vowel harmony
VILLAINNESS	Gaba-Mara	/g, b/ are more villain than /m, r/	no groups tested
	Sama-Gaka	/g, k/ are more villain than /m, s/	velar stops > /m, s/
STRENGTH	Zago-Zagoranoda	a long word with strong sounds is stronger than a short word with strong sounds	
	Pite-Pitenileri	a long word with weak sounds is stronger than a short word with weak sounds	
	Gazu-Terinelı	a short word with strong sounds is stronger than a long word with weak sounds	
	Tonuhoro-Goduzoro	a long word with strong sounds is stronger than a long word with strong sounds	
	Godo-Kumo	a short word with strong sounds is stronger than a long word with strong sounds	
SPEED (fastness)	Teki-Dago	/t, ε, k, i/ are faster than /d, a, g, ɔ/	voiceless stops + front vowels > voiced stops + back vowels
BRIGHTNESS	Nigi-Nugu	/i/ is brighter than /u/	high front vowel > high back vowel
	Lese-Mede	/l, s/ are brighter than /m, d/	no groups tested
	Şilrim-Gizdif	/ʃ, l, r, m/ are brighter than /g, z, d, f/	[ʃ] + liquids, nasals > strong consonants
GENDER (femininity)	Fimbi-Kondo	/f, m, b, i/ are more feminine than /k, n, d, ɔ/	front vowels+labial consonants+voiceless fricative > back vowels+alveolar consonants+voiceless stop

*(>) expresses intensity, not size specifically

Table 21: Sound Symbolic Associations of a Group of Turkish Speakers

It was found that for 16 different semantic attributes drawn from 8 antonym pairs, the responses of the participants were significant. Hence, the influence of sound symbolism comprising a considerable range of meanings were reflected with respect to the speech sounds which were present in the constructed nonsense words. There were specified expectations for each semantic category and for each binary pair. Table 21 shows a summarized list of all the oppositional meanings aimed to be

corresponding to the constructed combinations of phonemes and their perceived tendencies by the Turkish-speaking participants. 18 binaries met the expectations while 2 antonym pairs (highlighted in red) resulted in the reverse direction with respect to the previous findings in the literature.

Humboldtian World re-Views “Size” and “Funniness” Perceptions of Turkish-Speakers

Size is the first category to begin with the unexpected results. It is one of the most trailed semantic domain due to its extent of concreteness in terms of perception. The participants showed tendencies similar to the previous studies with respect to their size perception except for one pair containing voiceless stop and approximant sound contrast. This contrast was based on Knoeferle et. al.’s study (2017) in which the participants felt glides [j], [w] and liquids [l] [r] as the biggest respectively and the voiceless stops [p], [t], [k] as the smallest. Glides and liquids belong to the approximant group which covers all four consonants. With this affinity at hand and the two biggest perceived consonant groups (glides and liquids= approximants) with respect to their manners of articulation according to the findings of Knoeferle et. al.’s study (2017), the word Laya was constructed with the expectation of representing largeness, and Paka having voiceless stop consonants with the reversed aim. However, the word Paka turned out to be matched with a big character with 67.27 %, and Laya with 32.73 %.

One of the reasons of this outcome may be the nature of the stimuli as the constructed words of this category are in CVCV form whereas the related study had CV format which paves the way for the phonemes to reflect their individual influences, and that Turkish ear and mind might have different designations of those individual phonemes. Pointing at a limitation of this study it could be contemplated that if the nonsense words had different combinations but within the same manner of articulation frame, would the results have been different? For example, if the binary pair were constructed as Pete-Reve, would the results be similar? This then entails the possibility which the accompanying sound features in a word might impact sound symbolic perceptions in reverse or unexpected directions of semantic associations despite their close affinities. However, shared sound features were previously detected in Arabic that if the manner of articulation is close to each other for the focused sounds then the meanings assigned shows affinities as well (Ibni Jinni 2003, as cited in Asutay 2012: 312).

Another factor contributing to this outcome might stem from a deep down area in semantic domains which might imply a cultural variance. The results of Ciccotosto’s (1991) comprehensive analyses of varied languages from different phyla suggests that although there are similarities among some basic macro concepts and the phonemic distributions in a considerable amount of languages, the fact that they also show divergences within the same and different concepts demonstrate that the

communities' perceptions of speech sounds and meanings might differ. Other than the factor that the world languages cannot have pure lexicons because of various interactions between communities, and thereby their words might be modified in time or totally new words could be borrowed due to semantic gaps, the pre-existing different mindsets stemming from various geographical, historical, religious, social and political determinants could also be in effect. As he points out in the conclusion part of his dissertation, the way humans categorise events and phenomena in their minds could have been reflected upon their word selections. To concretize with the case in this experiment, the word *Paka* has voiceless stops which in turn are also regarded as angular in the other semantic domain with 87.27 % for the word *Koto* which also has voiceless stops. In contrast, its opposing lexical unit *Loyo* was negatively related to angularity with 12.73 %. The fact that the voiceless stops were more frequently mapped to angular shape, and the approximants to round shapes more often were also one of the findings of Knoeferle et. al.'s study (2017). Given those statistics, it might be inferred that Turkish speakers are likely to assign voiceless stops as more angular, spiky, sharp, and hard, whereas they perceive approximants as more round, smooth, and soft. This might lead them to match the voiceless stops with an angular, spiky, sharp, and hard thus a BIG figure, while they tend to match approximants to round, smooth, and soft, and thus a SMALL figure. As a consequence, sound symbolic associations of angularity might be linked to largeness for Turkish speakers, however as it depicts in the compared study with a mixture of bilingual and native English speakers (Knoeferle et. al. 2017:7) may not have shown tendencies to link these two semantic domains of size and shape in their associations of concepts.

Being one of the five mechanisms put forward by an encircling study about what lie(s) under the sound symbolic mappings, the shared-properties mechanism explains the reason why a set of connotations may reflect on specified phonemes (Sidhu, Pexman 2017:1628). They underline the suggestions that if a stimulus possess one connotation it will show an inclination to possess the others. The set of meanings idea was also previously proposed by Benjamin Lee Whorf, but with a highlighted division of linguistics and psychology. He believes that psychological facet of human nature may contradict the linguistic domain because the bright-cold-sharp-high-light(in weight)-quick-narrow and high-pitched form a series in psychic perceptions as a counterpart to dark-warm-yielding-soft-blunt-low-heavy-slow-wide and low pitched. However, as he goes on he points at the other side of the coin as well. For example, the German word *zart* (tsart) which means 'tender' should fall into bright-cold-sharp series with its prevailing 'sharp' sound, however it belongs to the soft series in its meaning. Another instantiation is provided by the English word *deep*. In this case, although with its long /i/ it has quite a high pitch and is supposedly a member of bright-cold-sharp series, yet its meaning actually points at the reverse group as dark-warm-soft series. For Whorf, such gaps between

psychic realisations and the linguistic experiences are like the clashes of two musics (Whorf 1956: 268).

Having carried this incongruity between sound and meaning, if we do not explain it by arbitrariness then is there any aspect of sound symbolism which could explain this representative subjective cases of German and English ears, and thereby the Turkish ear for the present Paka-Laya case? Towards the end of explaining the shared-properties mechanism, Sidhu and Pexman (2017) underlines the factor that since the stimuli and accordingly the linked properties might differ across cultures, it is probable to encounter a varied cross-cultural associations due to shared properties, which conveys a parallel idea of the study revealing the existence of both similar and divergent phonemic distributions of the same macro concepts in various natural languages (Ciccotosto 1991).

The same line of thought might well explain the unexpected results for Potok-Nolom pair. Wiseman and Van Peer's study (2003) experimenting a group of Brazilian and German participants, found that pertaining to both language groups, nasal sounds /m, n/ were rated as better matched with grief and the plosives /b, t, p, d/ correspond to joy more. Though with exceptions, a generalization could be made as grief does not coexist with nonserious context and joy cooccur with smiles and laughter. Funny events may cause joy; though not necessarily, it is observed that when there is playfulness it brings with it smile and/or laughter, again not necessarily for everybody. Based on this assumption, and the relevant study above Potok-Nolom antonym pair was formed. It had been expected that Potok (as including plosives) would be better mapped to funniness, and in parallel with it Nolom (as including nasals) was expected to be associated with seriousness. Nevertheless, it turned out to be the opposite. The shared-properties mechanism and to a more profound extent the worldview philosophy could constitute as the explanations for Paka to be perceived as more angular and hard and thus bigger. Voiceless plosives /p, t, k/ which were similarly associated with angularity by the present group of Turkish speakers, might have been associated with hardness, and seriousness with a similar connotative fashion of shared-properties mechanism. The counterpart Nolom could in turn be perceived as small and round (the results of the present study) and thus less serious with a relative comparison to voiceless stop sounds. The previous antonym pairs Paka-Laya and Koto-Loyo had /l, j/ consonants and belongs to the consonantal group; approximants. They are also a member of a bigger group called sonorants which comprise approximants and nasals. These consonants all have sonority (non-turbulent flow of air in the vocal tract) in contrast to obstruent sounds which are articulated by the obstruction of air in the oral cavity by the help of a related organs like the tongue, the teeth, the lip and the glottis. This re-visited explanation of the sound groups is made with the intention of clarifying a question mark as to the quasi-difference between prevailing nasals in Nolom and the common approximant sounds in Laya and Loyo. As a result, since they all belong to a larger group and thus

could be matched with smallness-roundness-funniness and more shared connotations because although nasal sounds were previously matched with grief (Wiseman, Van Peer 2003), another fact regarding other findings should be considered.

Sounds have multiple semantic functions and both their effects of individual occurrences and combinations with other sounds are ready to call more than one semantic attribute like a chain. This is in fact a very natural and more correctly a necessary phenomenon because with a limited set of speech sounds we try to express a limitless world. That's why, the sounds overlap in their functions of being connected to meanings. The sounds in the constructed word *Nolom* might have initially called another meaning and through that meaning assigned initially, it could have brought the meaning of funniness. That first meaning could be femininity, and vice versa *Potok* with masculinity. Within the scope of searching villainness, Uno et. al. (2020) suggests that;

It is not too surprising that these sound-shape associations are extended to other semantic dimensions via further semantic associations; for example, prototypically, male bodies tend to be more angular than female bodies, and hence obstruents may have gotten to be associated with maleness mediated by the notion of angularity. Likewise, sonorants may have gotten to be associated with femaleness mediated by the notion of roundness (p. 5).

Therefore, if sonorants are associated with smallness and/or roundness, then they might also be linked with femininity. Similarly, if voiceless stops (which are obstruents) are regarded as bigger, more angular and thus more masculine, then “seriousness” could be one of the rings of the chain, too.

One more reason of voiceless stops signaling largeness, with a possible relation to angularity and perhaps masculinity attached, specifically compared to words with sonorant combinations might be the fact that sound symbolic mappings occur because of language patterns (Sidhu, Pexman 2017: 1632). The repeated sound occurrences in the lexicon of a language may be linked to certain meanings. For example, the phonemes /g, l/ occurring at the beginning of a word and generally have connotations related to light such as; glimmer, glisten, gleam, glow and so on. Though not in the pattern of phonesthemes, /p, t, k/ sounds in Turkish occurring in the words like *kapı* (door), *kapatmak* (close), *kapak* (lid, cover), *kap* (container), *ket* (obstacle), *kutu* (box), *tıpa* (cork), *petek* (honeycomb) might have caused participants to link any combinations of these meanings of bordering, stopping acts, and angularities provided that they are compared to sonorants.

As it can be followed by the explained alternatives of causes, language is beyond simple and clear-cut reasonings. Even within segmental analyses, there might be several factors contributing to sound-meaning relationship. When suprasegmental, namely prosodic features are also taken into account, the factors in effect while making sense of the world around us form a longer list such as stress, intonation, pauses, loudness and rhythm.

Length of the Word or Strength of the Sounds

One of the aims of the present study was to demonstrate that iconicity of quantity may not always hold for sound symbolic associations. It is actually an effective and pervasive aspect of motivation in linguistic sign; however, sounds themselves proved to be more effective than the quantitative aspect of iconicity in language. The study on Japanese Pokemon names (Kawahara et. al. 2018) highlights that the power of the characters in Pokemon and Dragon Quest Series increase in line with the length of their names; such as *rizaado-rizaadon*, *gira-begirama-begiragon-giragureido* (pp. 231-232). This evolution of power in line with name length was explained by the longer-is-stronger principle, which was previously proposed as for the grammatical structures of natural languages. For example, plurality of nouns are stated to be iconic since the addition of plural suffix makes the word “more” compared to its singular form and meaning (Haiman 1980: 528). Another example could be the iconicity of the gradually increasing power of adjectives in line with their added constituents as in; bright-brighter-the brightest, which holds for various Indo-European languages (Jakobson 1965: 29). Nevertheless, there are cases in natural languages where it is obvious that although the the word gets longer, the meaning is mitigated rather than intensified as in Turkish: *kitap* (book) – *kitapçık* (booklet), or as in English *kitchen* – *kitchenette* (which is originally the diminutive suffix of French). Thus, taking the above facts and illustrations into consideration; 5 types of binaries were formed in order to test the reflections pertaining “strength” perceptions caused by word length and the phonemes. Those 5 pairs included;

- 1) Zago-Zagoranoda: a short and a long word with strong sounds
- 2) Pite-Pitenileri: a short and a long word with weak sounds
- 3) Gazu-Terineli: a short word with strong sounds and a long word with weak sounds
- 4) Tonuhoro-Goduzoro: a long word with weak sounds and a long word with strong sounds
- 5) Godo-Kumo: a short word with strong sounds and a short word with weak sounds

The results revealed that:

- I. a long word with strong sounds is stronger than a short word with strong sounds
- II. a long word with weak sounds is stronger than a short word with weak sounds
- III. a short word with strong sounds is stronger than a long word with weak sounds
- IV. a long word with strong sounds is stronger than a long word with strong sounds
- V. a short word with strong sounds is stronger than a long word with strong sounds

The expectations before the application of the survey were thus met bearing the inference that the speech sounds act the primary role in iconicity when compared to the the effect of word length. As

complexity and diversity are the cases with all linguistic phenomena, the word length and iconicity paradigms proved to be shifting when another dominating factor is present.

Another complex context where word length cues represent meaning is given name properties of gender. The semantic category “strength” appears to be related with “gender” category in this sense. Although word length was not a test factor for gender perceptions in this study, related with strength and word length issue it should be noted that there are some cultural diversities in this matter of linguistic phenomenon. As an instantiation, it was previously observed that “longer names indicate gender in both English and Japanese given names. But they indicate different sex: they are feminine in English given names but masculine in Japanese” (Mutsukawa 2011: 375). This situation might account for the fact that Japanese fictitious names are more powerful when they are longer. A correlation between strength and linguistic signs might be operating with this relation concerned. Turkish given names (although the derivation is originally Arabic) shows a pattern similar to English names. Names of women are generally longer than names of men such as; *Remzi-Remziye*, *Hayri-Hayriye*, *Nuri-Nuriye*, *Zeki-Zekiye*. This case of anthroponymy in Turkish might be said to be in parallel with the advent of cultural impacts into Turkish society because earlier the names of women seem to be of equal length before this interaction and linguistic borrowings. For example, *Alkım*, *Başak*, *Begüm*, *Gökçe*, *Özge*, *Tansu*, *Umay* are names of Turkish origin and they have been given to females. *Altay*, *Cengiz*, *Gökhan*, *İlker*, *Pekin*, *Selçuk*, *Toygar* have been among the alternatives of male names of Turkish origin. As it is salient, the syllabic and phonemic structures are similar in both male and female names. This may result from the fact that Turkish is not a gendered-language in the sense that generic nouns do not have genders which is not the case in Arabic and French. English is not a gendered-language except for three pronouns. Thus, in terms of anthroponymy, it could be said that Turkish borrowed proper names from Arabic, in which female names were derived from unmarked male names with the suffix /-ye/ bearing a past participle meaning. The words /waliyy/ (the one who takes charge of) and /waliyya/ (the one whom is taken charge of) are given examples of this type of derivation (Abd-al Jawad 1989: 315). Thus, it could be said that by this suffix the meaning of passivization is added to the active root meaning. With respect to French names, by the diminutive suffix -ette female names could be formed as in *Pierrette* from *Pierre*. These, word lengthenings of the specified suffixes in Arabic and French (although antique now in English as well; as in *Albertine* from *Albert*, *Josephine* from *Joseph*) seems not to strengthen the meaning as they have diminutivization and passivization functions when applied to nouns. Even regardless of a grammatical account, as Mutsukawa revealed (2011), English female names are generally longer than male names; very typically like *Elizabeth* and *John*. The prevalence of the fact that proper names show tendencies

to be longer in female names and shorter in male names could underline the finding of the present study as it cannot be generalized that length of the word strengthens the meaning of it.

Being another instantiation of linguistic complexity, it could be said that sometimes less is more as in the case of constructed words Gazu and Terineli. Although Gazu is relatively short, it was felt stronger by this group of Turkish ear. This results from the fact that the phonemes in Gazu are back vowels, and voiced obstruents which are low in pitch suggesting bulky, heavy, and threatening feelings. In a reversed fashion, Terineli consists of front vowels and a voiceless stop with sonorant sounds which are high in pitch and less obstructed in the vocal tract enabling a smooth articulation suggesting lightness, smoothness, and thus weakness. As a consequence, word length matters but when that word also has strong sounds.



CONCLUDING REMARKS

If only we were able to go back as far as the genesis for the explanation of the seemingly specific but literally profound question as to why language users have different perceptions and thus different motivations of appellations; however, the furthest and clearest destination of this journey starts in Plato's lines where Socrates makes an analogy of the name giver and the artist. As a painter or a musician imitates the nature by their arts, the name giver (the language users of all times) also imitates nature by the letters, the speech sounds (pp. 248, 249). This idea suggests that if the same scene were drawn and painted by two artists, the completed work would naturally reflect resemblances as well as differences in hues, the touches, the highlights and so on. Likewise, don't we travel back in time and remember the original version of the song of our age when the new version is released simultaneously with a feeling of nostalgia because although played with the same musical notes and the same theme, the two performances both have similarities and differences.

Leibniz shall continue this subjectivity within the framework of the objective with the example of gold. When it was first discovered gold could have been named as the "heaviest metal". But today we know that the element Francium is the heaviest, so the bond of the speech sounds assigned to that meaning might mitigate on the way of advancement and change. The descriptions of the same material and the names accordingly assigned to them might well shift in the same period as many as the perspectives existent. For example, one might regard gold as the yellow-colored and the valuable element while another one knows its meltability feature, and the goldsmith could know all its grades of fineness (Altınörs 2016: 117, 118). This implies that both in a diachronic and synchronic manner perceptions and thus the names of the objects might shift.

Around a century later Humboldt coins the word "worldview" and explains that the word is born through subjective perceptions which are in fact not the direct copies of the objects but the image produced in our minds and during the production "the objective perception is inevitably tinged with subjectivity". Thus, every individual is a representative of a worldview as *sui generis*. And since similar subjectivities impact the language in the same nation, every language becomes a dwelling of distinct features. And the speech sounds serve as media, constantly operating in an inward and outward direction concurrently (Humboldt 1836/1988: 59, 60).

Taking all facets into consideration, I contend that **linguistic sign is totally arbitrary, but totally motivated**. I use the term arbitrary with the sense of convention and the collective will of the society. However, when naming is processed individually, it is again motivated and it is arbitrary on an individual basis. Namely, the agreement takes place within a single unit, the mind of the namegiver. For example, in the early 1900s the word *ping-pong* was invented as the brand-name of the table

tennis products in U.S., however, it has become a generic name since then (Karau 2008). It is a generic noun entry in Turkish Language Society (TDK) Dictionary as well. This is one of the cases of a word's adoption by many languages. *Aspirin*, *yoyo*, *jetski* are some other examples of this kind. So, ping-pong was most probably motivated by the sound of the ball while being played, and it became a very much established word by collective agreement. A reverse case is about the name *yoğun teker*, which is 99 % unfamiliar to Turkish speakers, though it is in Turkish. This name was once proposed by Turkish Language Society instead of *compact disc*; however, it seems that Turkish society did not agree on it since the term *CD* has been used to denote the object. On the other hand, the name *bilgisayar* instead of computer was adopted and has been used as such since the proposal of electronic engineer Prof. Dr. Aydın Köksal in 1969. When very personal namings are taken into account, a group's agreement is not required and the feature that suggests the probability of the name to be adopted vanishes automatically. For example, any Turkish pet owner may well call their kitten as *Davul* (drum), or a Leonberger dog (a huge breed) as *Şiir* (poem). Although anyone can comment on this incongruity when their sizes and the speech sounds are taken into consideration, they cannot change the naming as long as the owner does not wish to. However, this does not mean that the naming is unmotivated stemming from the lack of fitness. Perhaps the kitten was rather greedy that the owner made an analogy between the stomach and the name drum. And since Leonbergers are very much emotional and sensitive, the owner might be fed by the correlation between the lyricism of the poems.

With these possibilities of diverse motivations while naming, I made an analogy of Peirce's taxonomy of signs in explaining the level of motivatedness. Onomatopoeic words and interjections are *iconic*; they are like sound pictures. The slight differences in their representations stem from two artists drawing the same scene as in *meow* and *miyav*. For sound symbolic words, like ideophones and words which have phonesthemes, and generally accepted individual phoneme-meaning relationships (as in *a/i* contrast for size) I call their level of motivatedness as *phondexical* (a blend word I invented by the combination of phoneme and index) because they *point at a meaning by the sounds* but that does not always have the same outcome as there are diverse worldviews and thus facts about such associations. Thus, the painters stand at different angles, though it is the same scene again as in *cat* and *kedi*. The last level of motivatedness is the *symbolic* class, in which words do only have symbolic values as in the case of the kitten *Davul* and the dog *Şiir*. Still, there is a motivation yet a very personal one. Now, the painters are free to focus on whatever they see in the scene as in *Mia* the kitten and *Davul* the kitten. As a consequence, if the linguistic term has not been convened as “sound-symbolism”, I would have changed the name of this study as *Phondexial Associations of Turkish Speakers*.

Limitations of The Study

As valid for all constructed word studies in this field, there is the difficulty in the attainability of all permutational combinations of sounds. As stated before, the constructed words Paka-Laya might have demonstrated different results if they were formed by the other sounds of the same group as; Tapa-Vara or Kata-Rala or any other combination. The invariable vowels could also be designed as variable in order to minimize the doubts about other possibilities.

Apart from the nature of the constructed words, the number of the participants may definitely have been more in order to see the extension of the tendencies. Although the statistical results show significance levels even within a small group, it inevitably makes the researcher wonder the reflections if the same questions could be asked to 1000 participants.

While applying the survey, the fact that I was the interlocutor as the articulator of the words might have impacted on the level of suprasegmentals as pitch, loudness, and intonation. Therefore, totally steady pronunciations of the computerized applications scaffolded by an objective environment would eliminate this possibility of effect as well.

Suggestions for Future Research

Since this study constitutes a preliminary position, there is a considerable amount of channels that the interested researchers might travel through. Initially, the participant groups might be focused in terms of various parameters. This study included both male and female, child and adult participants from various social and occupational backgrounds. The participants of the successive studies might be comprised even solely of blind attendants.

The present study has 8 semantic macro concepts as size, shape, funniness, villainness, strength, speed, brightness, and gender. Other categories as touch, color or very abstract concepts as injustice could be experimented. They could be studied in an isolated way concentrating on one category, or different categories could be experimented within one framework.

The phonemic distributions and thus the constructed words could be more varied per category in order to depict more comprehensive results.

Furthermore, a grand work of analysing the lexicon of Turkish awaits for enthusiastic researchers which would make a huge contribution to the field.

Implications of the World of Speech Sounds

The findings of the study imply several outcomes not only for linguistic realms but also for many other fields. To begin with, the expressive values of the words could be used on children in the period of language acquisition. Perhaps sound symbolism has already been utilized by Turkish parents and teachers, however it might lead to an increase in the awareness of its influence. As an illustration, the study by Yoshida (2012) revealed that the exposure of sound-symbolic verbs for English and Japanese 2-4 year-olds enhances their understanding of the contexts.

Moreover, the fact that Turkish speakers show tendencies towards sound symbolic associations might act as a facilitating role in brand-naming. It could raise awareness among brand-makers or company owners with regards to the effects on consumer preferences and thereby increase on sales if the name of the product reflects the properties of it.

Pharmaceutical companies might benefit from sound symbolism as well. Although if a drug is regarded as a functional address to resort, the name might not be that effective on its sales. However, the users and the pharmacists' lives could be simplified if sound symbolic, expressive names were to be generated rather than incongruous combinations of speech sounds with their functions.

Tv programme and film makers, alongwith the writers, authors of literary realms might benefit from sound symbolism while naming fictitious characters, cities, brutes, monsters, fairies, aliens, plants, objects and whatever they would like to name.

As a consequence, ranging from the simple appellation of a pet to naming a scientific invention, sound symbolism may be used as a catalyst in corresponding speech sounds to meanings. Last but not the least, with a discourse of art for art's sake yet turns out to be art for the society if the poet and the reader meets at the point of sound symbolic values of the letters. That's why, as the last words I would like to end with the power of sounds as in the beginnings of these poems inviting their readers to listen to the mechanic sounds in the first and in the latter the whispersss.

“Makinalaşmak istiyorum”

trrrrum,
trrrrum,
trrrrum!
trak tiki tak!
makinalaşmak istiyorum!
beynimden, etimden, iskeletimden geliyor bu!
her dinamoyu
altıma almak için çıldırıyorum!
tükrüklü dilim bakır telleri yalıyor,
damarlarımda kovalıyor
oto-direzinler lokomotifleri! ...

(Nazım Hikmet)

“In a Whispering Gallery”

That whisper takes the voice
Of a Spirit, speaking to me,
Close, but invisible,
And throws me under a spell
At the kindling vision it brings;
And for a moment I rejoice,
And believe in transcendent things
That would make of this muddy earth
A spot for the splendid birth
Of everlasting lives,
Whereto no night arrives...

(Thomas Hardy)

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APPENDICES

Appendix 1: International Phonetic Alphabet

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2015)

CONSONANTS (PULMONIC)

© 2015 IPA

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill				r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌ Bilabial	ɓ Bilabial	ʼ Examples:
◌ Dental	ɗ Dental/alveolar	pʼ Bilabial
◌ (Post)alveolar	ɟ Palatal	tʼ Dental/alveolar
◌ Palatoalveolar	ɡ Velar	kʼ Velar
◌ Alveolar lateral	ɠ Uvular	sʼ Alveolar fricative

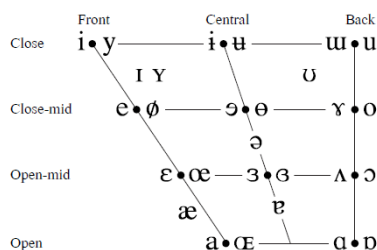
OTHER SYMBOLS

ʍ Voiceless labial-velar fricative	ɕ ʑ Alveolo-palatal fricatives
ʋ Voiced labial-velar approximant	ɭ Voiced alveolar lateral flap
ɥ Voiced labial-palatal approximant	ɥ Simultaneous ʃ and x
ʜ Voiceless epiglottal fricative	Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.
ʢ Voiced epiglottal fricative	
ʡ Epiglottal plosive	

DIACRITICS Some diacritics may be placed above a symbol with a descender, e.g. ŋ̥

◌ Voiceless	◌ Breathily voiced	◌ Dental
◌ Voiced	◌ Creaky voiced	◌ Apical
◌ Aspirated	◌ Linguolabial	◌ Laminal
◌ More rounded	◌ Labialized	◌ Nasalized
◌ Less rounded	◌ Palatalized	◌ Nasal release
◌ Advanced	◌ Velarized	◌ Lateral release
◌ Retracted	◌ Pharyngealized	◌ No audible release
◌ Centralized	◌ Velarized or pharyngealized	
◌ Mid-centralized	◌ Raised	
◌ Syllabic	◌ Lowered	
◌ Non-syllabic	◌ Advanced Tongue Root	
◌ Rhoticity	◌ Retracted Tongue Root	

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

SUPRASEGMENTALS

ˈ Primary stress	ˌ Secondary stress
ː Long	ˑ Half-long
◌ Extra-short	◌ Minor (foot) group
◌ Major (intonation) group	◌ Syllable break
◌ Linking (absence of a break)	

TONES AND WORD ACCENTS

LEVEL	CONTOUR
↗ Extra high	↗ Rising
↘ High	↘ Falling
↗ Mid	↗ High rising
↘ Low	↘ Low rising
↗ Extra low	↗ Rising-falling
↓ Downstep	↗ Global rise
↑ Upstep	↘ Global fall

Typefaces: Doulos SIL (metatext); Doulos SIL, IPA Kiel, IPA LS Uni (symbols)

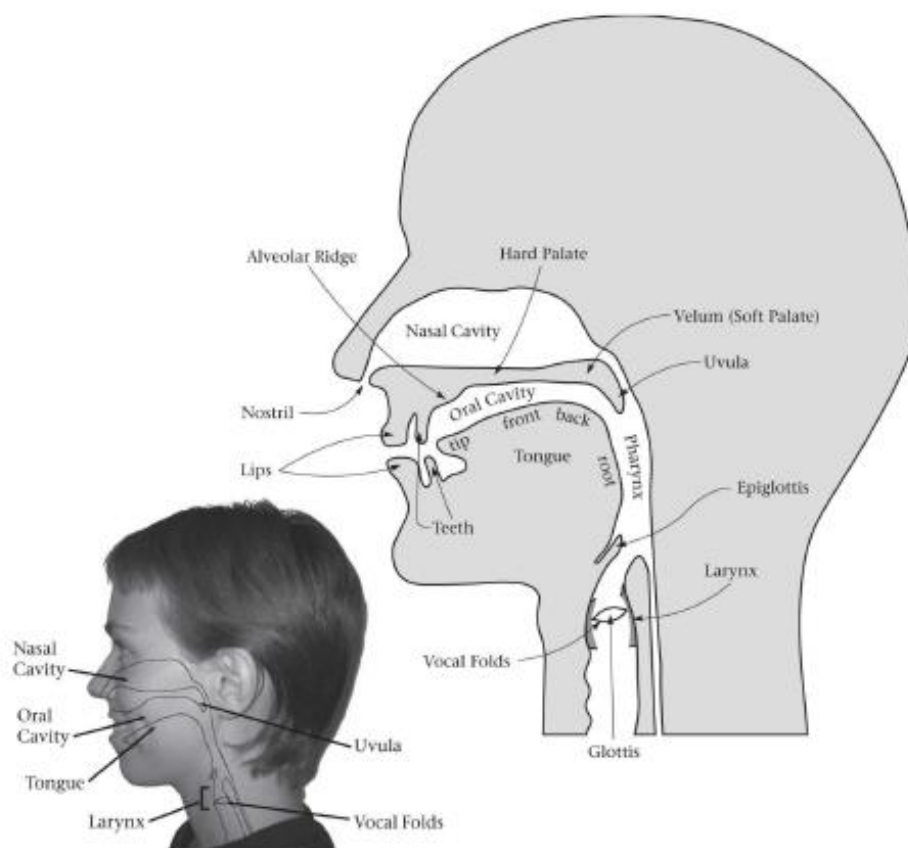
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Appendix 2: Consonant and Vowel Features of Standard American English

Consonant and Vowel Features (for Broad SAE)			
Consonants			
[p] : voiceless bilabial stop	}	Stops	}
[b] : voiced bilabial stop			
[t] : voiceless alveolar stop			
[d] : voiced alveolar stop			
[k] : voiceless velar stop			
[g] : voiced velar stop			
[f] : voiceless labiodental fricative	}	Fricatives	
[v] : voiced labiodental fricative			
[θ] : voiceless dental fricative			
[ð] : voiced dental fricative			
[s] : voiceless alveolar fricative			
[z] : voiced alveolar fricative			
[ʃ] : voiceless palato-alveolar fricative			
[ʒ] : voiced palato-alveolar fricative			
[h] : voiceless glottal fricative			
[tʃ] : voiceless palato-alveolar affricate	}	Affricates	
[dʒ] : voiced palato-alveolar affricate			
[m] : (voiced) bilabial nasal	}	Nasals	
[n] : (voiced) alveolar nasal			
[ŋ] : (voiced) velar nasal			
[ɹ] : (voiced) alveolar approximant	}	Liquids	}
[l] : (voiced) alveolar lateral approximant			
[j] : (voiced) palatal approximant	}	Glides	
[w] : (voiced) labialized velar approximant			
Sonorants			
Vowels			
[i] : high front unrounded tense		[u] : high back rounded tense	
[ɪ] : high front unrounded lax		[ʊ] : high back rounded lax	
[e] : mid front unrounded tense	[ə] : mid central unrounded lax	[o] : mid back rounded tense	
[ɛ] : mid front unrounded lax	[ʌ] : mid central unrounded lax	[ɔ] : mid back rounded lax	
[a] : low front unrounded tense		[ɑ] : low back unrounded tense	
[æ] : low front unrounded lax			

Source: www.scribd.com a digital library giving access by subscription

Appendix 3: Sagittal Section of the Vocal Tract Showing Places of Articulation



Source: *Language Files*, (2016), 12th Ed. by Dawson and Phalen, p. 108