Hacettepe University Graduate School of Social Sciences

Department of Translation and Interpreting

THE EFFECT OF SPEECH IMAGEABILITY AND THE SPEAKER'S GESTURES ON THE SIMULTANEOUS INTERPRETER'S GESTURES

Berkay TARIM

Master’s Thesis

Ankara, 2024

THE EFFECT OF SPEECH IMAGEABILITY AND THE SPEAKER'S GESTURES ON THE SIMULTANEOUS INTERPRETER'S GESTURES

Berkay TARIM

Hacettepe University Graduate School of Social Sciences

Department of Translation and Interpreting

Master’s Thesis

Ankara, 2024

ACCEPTANCE AND APPROVAL

The jury finds that Berkay TARIM has on the date of 03.06.2024 successfully passed the defense examination and approves his Master's Thesis titled "The Effect of Speech Imageability and the Speaker's Gestures on the Simultaneous Interpreter's Gestures".

Assoc. Prof. Dr. Sinem SANCAKTAROĞLUBOZKURT
(Jury President)

Asst. Prof. Dr. Alper KUMCU (Main Adviser)

Asst. Prof. Dr. Duygu ÇURUM DUMAN

I agree that the signatures above belong to the faculty members listed.

Prof. Dr. Uğur ÖMÜRGÖNÜLŞEN
Graduate School Director

YAYIMLAMA VE FİKRİ MÜLKİYET HAKLARI BEYANI

Enstitü tarafından onaylanan lisansüstü tezimin tamamını veya herhangi bir kısmını, basılı (kağıt) ve elektronik formatta arşivleme ve aşağıda verilen koşullarla kullanıma açma iznini Hacettepe Üniversitesine verdiğimi bildiririm. Bu izinle Üniversiteye verilen kullanım hakları dışındaki tüm fikri mülkiyet haklarım bende kalacak, tezimin tamamının ya da bir bölümünün gelecekteki çalışmalarda (makale, kitap, lisans ve patent vb.) kullanım hakları bana ait olacaktır.

Tezin kendi orijinal çalışmam olduğunu, başkalarının haklarını ihlal etmediğimi ve tezimin tek yetkili sahibi olduğumu beyan ve taahhüt ederim. Tezimde yer alan telif hakkı bulunan ve sahiplerinden yazılı izin alınarak kullanılması zorunlu metinleri yazılı izin alınarak kullandığımı ve istenildiğinde suretlerini Üniversiteye teslim etmeyi taahhüt ederim.

Yükseköğretim Kurulu tarafından yayınlanan ***"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"*** kapsamında tezim aşağıda belirtilen koşullar haricince YÖK Ulusal Tez Merkezi / H.Ü. Kütüphaneleri Açık Erişim Sisteminde erişime açılır.

- Enstitü / Fakülte yönetim kurulu kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren 2 yıl ertelenmiştir. (1)
- Enstitü / Fakülte yönetim kurulunun gerekçeli kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren ….. ay ertelenmiştir. (2)
- Tezimle ilgili gizlilik kararı verilmiştir. (3)

01/07/2024

Berkay TARIM

1"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"

*(1) Madde 6. 1. Lisansüstü tezle ilgili patent başvurusu yapılması veya patent alma sürecinin devam etmesi durumunda, tez **danışmanının** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulu** iki yıl süre ile tezin erişime açılmasının ertelenmesine karar verebilir.*

*(2) Madde 6. 2. Yeni teknik, materyal ve metotların kullanıldığı, henüz makaleye dönüşmemiş veya patent gibi yöntemlerle korunmamış ve internetten paylaşılması durumunda 3. şahıslara veya kurumlara haksız kazanç imkanı oluşturabilecek bilgi ve bulguları içeren tezler hakkında tez **danışmanının** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulunun** gerekçeli kararı ile altı ayı aşmamak üzere tezin erişime açılması engellenebilir.*

*(3) Madde 7. 1. Ulusal çıkarları veya güvenliği ilgilendiren, emniyet, istihbarat, savunma ve güvenlik, sağlık vb. konulara ilişkin lisansüstü tezlerle ilgili gizlilik kararı, **tezin yapıldığı kurum** tarafından verilir *. Kurum ve kuruluşlarla yapılan işbirliği protokolü çerçevesinde hazırlanan lisansüstü tezlere ilişkin gizlilik kararı ise, **ilgili kurum ve kuruluşun önerisi** ile **enstitü** veya **fakültenin** uygun görüşü üzerine **üniversite yönetim kurulu** tarafından verilir. Gizlilik kararı verilen tezler Yükseköğretim Kuruluna bildirilir.*
Madde 7.2. Gizlilik kararı verilen tezler gizlilik süresince enstitü veya fakülte tarafından gizlilik kuralları çerçevesinde muhafaza edilir, gizlilik kararının kaldırılması halinde Tez Otomasyon Sistemine yüklenir.

***** Tez **danışmanının** önerisi ve **enstitü anabilim dalının** uygun görüşü üzerine **enstitü** veya **fakülte yönetim kurulu tarafından karar verilir.***

ETİK BEYAN

Bu çalışmadaki bütün bilgi ve belgeleri akademik kurallar çerçevesinde elde ettiğimi, görsel, işitsel ve yazılı tüm bilgi ve sonuçları bilimsel ahlak kurallarına uygun olarak sunduğumu, kullandığım verilerde herhangi bir tahrifat yapmadığımı, yararlandığım kaynaklara bilimsel normlara uygun olarak atıfta bulunduğumu, tezimin kaynak gösterilen durumlar dışında özgün olduğunu, **Dr. Öğr. Üyesi Alper KUMCU** danışmanlığında tarafımdan üretildiğini ve Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Yazım Yönergesine göre yazıldığını beyan ederim.

Berkay TARIM

ABSTRACT

TARIM, Berkay. The Effect of Speech Imageability and The Speaker's Gestures on The Simultaneous Interpreter's Gestures, Master's Thesis, Ankara, 2024

The investigation of cognitive effects of gestures during simultaneous interpreting holds high interdisciplinary value. This value stems from the primary cognitive function of gestures during speaking and listening. Gestures that accompany speech, gesticulations, enhance the comprehension of the listeners and the speaker's thought formulating processes. Considering that simultaneous interpreters are concurrently both speakers and listeners, the quantitative investigation of their gesture production in a proper simultaneous interpreting enables the observation cognitive gesture functions in an extreme language task. Conducted experiment of the presented thesis investigates said functions in two main variables: the speaker's gesture production frequency and the source speeches' imageability, while introducing a new concept to the limited literature with the name of gesture synchronisation. Gesture synchronisation refers to the interpreters' mimicking the speaker's gesture both in terms of gesture type and timing. The analysed data highlights two main results. First, it highlights a predictive effect between the speaker's gesture frequency and their synchronisation by the participant interpreters. Second, the data suggest an interaction between the source speeches' imageability and the interpreters' iconic gesture production, hinting at imageability related cognitive functions of iconic gestures. Gesticulations in this context have a cognitive function as the alone interpreter's gesture production cannot be for communicative purposes. The presented thesis herein contributes to multiple disciplines in two veins, it demonstrates the cognitive functions of gestures in a simultaneous interpreting scenario with long interpretations and a relatively high number of participants and it introduces and demonstrates the concept of gesture synchronisation of simultaneous interpreters.

Keywords

Simultaneous interpreting, gesture, gesture synchronisation, cognitive load, multimodality, embodied cognition, imageability

ÖZET

TARIM, Berkay. Konuşmanın İmgelemi ve Konuşmacı Jestlerinin Andaş Çevirmenin Jestlerine Etkisi, Yüksek Lisans Tezi, Ankara, 2024

Andaş çeviride jestlerin bilişsel işlevlerinin incelenmesi disiplinler arası bağlamda önem arz etmektedir. Bu önem jestlerin dinleme ve konuşma sırasında gördüğü bilişsel işlevlere dayanmaktadır. Konuşmaya eşlik eden jestler, yani jestikülasyonlar, dinleyicilerin kavramasını artırır ve konuşmacıların düşünce oluşturma sürecini kolaylaştırır. Andaş tercümanların aynı anda ifa ettiği hem konuşmacı hem dinleyici rolü, jestlerin bilişsel işlevlerinin bir aşırı dil görevi sırasında nicel olarak incelenmesine olanak tanımaktadır. Sunulan tez için yapılan deneysel çalışma bu bilişsel işlevleri iki temel değişken özelinde incelemiştir: konuşmacının jest üretme sıklığı ve kaynak konuşmanın imgelemi. Ötesi, jest senkronizasyonu adında yeni bir jest kopyalama kavramı literatüre kazandırılmıştır. Jest senkronizasyonu, andaş tercümanın konuşmacının jestlerini hem tür hem de zamanlama açısından kopyalamasıdır. Veri analizi iki temel sonuç ortaya koymuştur. Bu sonuçlardan ilki konuşmacının jest üretim frekansı ve katılımcı tercümanların o jestleri senkronize etmesi arasındaki tahmin etkisidir. İkincisi ise kaynak konuşmanın imgelemi ile tercümanların ikonik jest üretimi arasındaki etkileşimdir. Bu etkileşim ikonik jestlerin imgelem özelindeki bilişsel işlevlerine ışık tutmaktadır. Kabinde yalnız çeviri yapan bir tercümanın jestlerinin iletişimsel işlevi olamayacağı, bu jestlerin bilişsel işlevlerine işaret etmektedir. Sunulan tez birden fazla araştırma alanına iki başlıkta katkıda bulunmaktadır. Öncelikle andaş tercümanların jestlerinin bilişsel işlevlerini uzun çeviriler ve nispeten daha fazla katılımcı sayısıyla göstermiştir ve bu işlevler bağlamında da jest senkronizasyonu kavramını literatüre kazandırmıştır.

Anahtar Sözcükler

Andaş çeviri, jest, jest senkronizasyonu, bilişsel yük, çoklumodalite, bedenlenmiş biliş, imgelem

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIXES

PREFACE

I've stumbled upon gestures as a research area in the middle of a global pandemic, during my last year as a Bachelor's student. Back then, it was easier to find unhealthy amounts of time to dedicate for researching boundless concepts, I simply was just unaware of how wonderful of a path this seemingly basic but contrarily fathomless research area and method of gestures would put me in. Looking back, I am confidently glad for every minute of research I have devoted to the concepts presented in the following pages.

Of course, this journey would have been nigh impossible and utterly joyless without the people that supported me throughout. My first heartfelt thanks go to my advisor Asst. Prof. Dr. Alper KUMCU, I vividly remember us laying out the experimental design of this thesis and I vividly cherish the joy of every accomplished step and the occasional nerdy banter.

Being a simultaneous interpreter graduate of Hacettepe inherently necessitates the warmest of thanks to Prof. Dr. Aymil DOĞAN as she was my inspiration to practice interpreting and pursue its research. Thanks to her we have a simultaneous interpreting laboratory in the department and thanks to her I am a simultaneous interpreting researcher and practitioner.

This piece of research has essentially two main parts, simultaneous interpreting and gestures. And any gesture research is incomplete without the special touch of Prof. Dr. Tilbe GÖKSUN. Being a part of her laboratory has been the highlight of my MA journey and I do feel privileged.

I find it most fitting to commemorate Prof. Dr. Doğan KÖKDEMİR without whom my interdisciplinary perspective would have been short of non-existent. He supported me to pursue experimental studies further and he stands as a beacon of genuine intent and a role model beyond academia.

A long journey is obviously not a steady course, it has its motivational spikes and slumps and I am glad that I share this rollercoaster ride with my family and friends. They know themselves very well and are, hopefully, fully aware that this journey would not be meaningful without them, just as I would be without my dearest SO.

I do not intent to keep the preface long as, knowing myself, I probably would be annoyed to read five pages of *thanks*. For every person that I couldn't mention here, you have my word that I will make it up to you.

CHAPTER 1

INTRODUCTION

This chapter aims to provide introductory information on the presented thesis. The “problem situation” in the recent crossroad of gesture studies and interpreting studies will be discussed and the following chapters will explain the aim and hypotheses. The key concepts such as modality, gestures and imageability will be presented.

1.1 PROBLEM SITUATION

Interpreting studies as an academic field had a lot to share with the field of psychology, both in its history and current state. Psychology scholars took interest in simultaneous interpreting practice when interpreting took the spotlight during and after the Nuremberg Trials (Gaiba, 1998). What made simultaneous interpreting as a practice so interesting were the inherent cognitive processing (Gerver, 1975), on which there has been a plethora of research both theoretically and experimentally.

During simultaneous interpreting, an interpreter processes the input and translates it as the output into another language. The input consists of the sources of information available to the interpreter. The interpreter takes advantage of every source of information in order to cope with the demanding task of interpreting. These sources can be audial such as the speech itself or the reactions of the listeners or visual such as the slides, screen shares or the banners (Seeber, 2007). Each of the channels that convey information are called modalities and the term multimodality refers to multiple inputs from various modalities such as verbal, audial, visual etc (Zagar Galvão, 2020).

Even though the concept of input has been investigated in interpreting studies since the late 90's, the multifaceted nature of the input conveying channels is a recent inclusion to the field. In the matter of visual input in simultaneous interpreting, there have been multiple innovative studies researching how interpreters take advantage of presentations, diagrams, maps and more (Stachowiak-Szymczak, 2019; Zagar Galvão, 2020; Martín León & Fernández Santana, 2021; Arbona et al., 2023a; 2023b), however, the visual input is not limited to said material.

This point marks the first problem situation of the current study, gestures. In a real-world interpreting scenario, the speaker performs gestures subconsciously with communicative intent. The interpreter also performs gestures subconsciously; however, their gestures cannot have any communicative function as they are either alone (Goldin-Meadow & Alibali, 2013) or, if they are not, their gestures during interpreting does not contribute to their communication with their partner. As a result, simultaneous interpreting intrinsically provides a suitable environment for investigating the cognitive functions of gestures. For this reason, the presented study's research design measures how gestures performed by the speaker affects the interpreter's gesture production. This experimental study's stimuli are specifically recorded for this purpose and in that regard, to the best of our knowledge, it is the first in interpreting literature.

A closely related term to both interpreting studies and cognitive processes is mental imagery, or more specifically imageability. Imageability is the capacity of a word to invoke a mental image, put simply, a higher imageable word would be easy to visualise mentally (Dellantonio et al., 2014). In a similar fashion to multimodality, research indicates a relation between gesture production and imageability, however, the studies yield mixed results in terms of the direct correlation (Clough & Duff, 2020). Considering that simultaneous interpreting is a highly demanding task in terms of language control (Hervais-Adelman et al.,

2011), it would be interesting to measure the effect of imageability. Especially with gestures as they are both directly observational and quantifiable.

All in all, this thesis brings together two current concepts in an experimental simultaneous interpreting setting. This setting provides a suitable testbed for both uncovering the possible cognitive functions of gestures and effect of imageability during a highly demanding language control task. Interdisciplinarity has always been the cornerstone of interpreting studies and this study hopes to contribute to that tradition.

1.2 AIM OF THE STUDY

The aim of the presented study is to investigate two progressive concepts in a simultaneous interpreting scenario under the banner of (cognitive) interpreting studies. Those concepts being gesture and mental imagery, the experimental design in the current study involves two variables. Both variables are integrated into the source material for the interpreting task.

First, two variables associated with gestures were identified: (1) frequency of gestures produced by the speaker, and (2) imageability of the source speech (input). Gestures produced by the speaker were included as, high gesture frequency and low gesture frequency. In four of the eight speeches, the speaker produced a low number of gestures while in the other four, the speaker produced a high number of gestures. It is expected that there will be a correlation in the gesture production of participants, which is thought to be associated with the cognitive load inherent in simultaneous interpreting.

The second variable is the imageability of the source speech. Four of the eight speeches were on topics that were easy to visualise mentally (high imageability), while the other four speeches' topics were harder to visualise mentally (low

imageability). With this variable, we aim to measure the effect of the imageability of source speech on interpreters' gesture production.

In brief, we have added two main variables in the stimuli of the participants, specifically the source material of the interpreters: speaker's gesture production and speech's imageability. Both of these variables are regarding the source of information (input) for the interpreters, as a result, any explicit change in interpreters' gesture production has the potential to be correlated to said variables.

Due to the inherent language control and immediacy (Kade & Cartellieri, 1971), simultaneous interpreting is a suitable testbed for investigating cognitive processes such as gesture production and imageability. By intertwining the conditions of gestures and imageability and having every condition twice, hence eight videos, we have created an ideal scenario for measuring gestures' role in how interpreters handle the cognitive demand of the profession. With all eight of the speeches having a very close number of words and length, this experimental study will hopefully highlight the cognitive functions of gestures during simultaneous interpreting. And further introduce these concepts into our field.

1.3 RESEARCH QUESTIONS

As explained in the previous sections, this thesis reports an experimental study on simultaneous interpreting conducted in order to investigate the interplay between speaker's gesture production and speech imageability. In this regard, the study has two main research questions:

Research Question 1: Do simultaneous interpreters produce gestures in proportion with the speaker? That is, do they gesture more frequently and more explicitly as the speaker does so and vice versa?

Research Question 2: Do simultaneous interpreters' gestures change as a function of the imageability of the source speech?

Research question 1 investigates the effect of speaker's gestures to the interpreter's gesture production. Even though the experimental literature in interpreting studies is scarce, it has been observed that when the speaker produces more gestures so do the simultaneous interpreters (Stachowiak-Szymczak, 2019; Zagar Galvão, 2020; Martín León & Fernández Santana, 2021). Presented study introduces more interpreting tasks with specifically recorded stimuli, as a result, it is fair to expect this hypothesis to be observed.

Research question 2 investigates how the imageability of the speech (input) affects the interpreters' gesture production. As gesture production is linked with both mental imagery and cognitive load by multiple studies (Ping & Goldin-Meadow, 2010; Acacia & Margaret, 2020) and simultaneous interpreting is a highly demanding task itself, we expect to see a difference in produced gestures between high and low imageable stimuli.

With the research questions laid out, we expect to observe these results:

Expectation 1: Participants produce gestures in direct proportion with the speaker. That is, they gesture more frequently and more explicitly as the speaker does so and vice-versa.

If this expectation proves true, its results will be twofold. First, it will mean the speaker's gestures are readily attended by the interpreters, and second, the number of gestures produced by the speaker has a correlational relation with gestures produced by the interpreters.

Expectation 2: Participants gesture more frequently when they are interpreting low imageable speeches (i.e., speeches describing objects and concepts that are harder to visualise mentally).

With this expectation, we aim to see a predictive relationship between imageability of the speech and interpreter gestures. The relationship between these two variables might have two directions. First, interpreters might produce more gestures while interpreting low imageability speeches due to needing more cognitive offloading (Martín de León & Fernández Santana, 2021), or, if the expectation is observed the other way around, high imageability speeches might invoke more iconic gestures as they both have visual associations (Ping & Goldin-Meadow, 2010).

The current literature on gestures in simultaneous interpreting is very limited and not consistent in terms of methodology, however, those few studies has pointed a correlational relationship between the speaker's and the interpreter's gestures (Stachowiak-Szymczak, 2019; Zagar Galvão, 2020; Martín de León & Fernández Santana, 2021). It is safe to expect that the presented research will extend the correlation.

The literature on imageability is vast and, in the specificity of gestures and imageability, multifarious. For this reason, the outcome of the second research question will hopefully provide the body of imageability research with results from a cognitively demanding experimental task; simultaneous interpreting. The inclusion of gesture studies into interpreting studies is a recent development and the presented study aims to shed light onto that intersection with specifically created stimuli and a proper simultaneous interpreting in terms of duration and participants.

1.4 IMPORTANCE OF THE STUDY

The contributions of this project to scientific knowledge can be explained in three categories; working memory allocation during comprehension, holistic gesture investigation and gesture studies literature lacking multilingual research.

The sections above briefly explained that in simultaneous interpreting, the input is made up of information coming from multiple modalities, given that our attention is limited, these sources of information compete for information (Kawashima & Matsumoto, 2017) however, not much is known how people allocate their limited attention to the concurrent visual and verbal signals (Özyürek, 2014). If the participants' gesture rate increases in accordance with the speaker's gestures, this might shed some light onto the allocated attention to visual, particularly, kinaesthetic input. In their short literature review on interpreting studies investigating gestures, de Léon and Fernandez Santana (2021) criticise previous studies' superficial approach to gestures. Specifically pointing out and criticising investigating only fragments of the interpretation and examining only one type of gesture. These fair criticisms were principally taken into consideration during the design of this proposed study. Similarly, criticisms from psychology scholars (Seyfeddinipur, 2006; Duncan, 2013; Ladewig & Bressem, 2013) on the inconsistency of methodology between different publications was accounted for in this study by choosing the most established software and design elements.

In a contemporary book, *Recent Perspectives on Gestures and Multimodality*, the authors (Rodrigues et al., 2019) underline the lack of work on gestures during multilingual situations. Especially stressing that the functions of gestures are not limited to only monolingual interactions (Streeck et al., 2011; Norris, 2012). Simultaneous interpreting addresses both of these comments as it is inherently bilingual and highly demanding. The crossroad of interpreting studies and gesture studies is interesting due to the mutual focal points and the synergic advancements in the respective fields. The proposed thesis herein would provide

a suitable proving ground for the theories and hypothesis explained in the following chapters and, hopefully, contribute to both fields.

CHAPTER 2

THEORETICAL BACKGROUND

The second chapter of the presented thesis will discuss the key concepts of the experimental design, namely, multimodality, gestures and imageability. The multimodal nature of cognitive processes at play during interpreting and gestures' function and effect are the over-arching topic of this chapter.

2.1 MULTIMODALITY

The first section of the Theoretical Background Chapter will delve into the definition and application of multimodality to language processing as a whole and its integration to cognitive interpreting studies.

2.1.1 Multimodal Language Processing

Because multimodality is a key concept in the following sections and chapters, it is important to establish the definition of multimodality. Multimodality refers to multiple modes or sources of information in a single context (Lyons, 2015). Essentially, multimodality as a concept is made up of multiple modes. In this regard, Gunther Kress (2010) puts forward the most well-established definition of "mode"; he designates two properties for modes. First, modes can be shaped socially and culturally; images, pieces of writing and speech patterns are suitable examples. Second, modes are semiotic: they carry the intrinsic advantages and disadvantages of their medium (channel) (Kress, 2010).

This approach defines modes as sources that create meaning in combination in their specific context (Lyons, 2015). For example, breaking the mode of speech into its constituents yields resources such as prosody (i.e. voice tone, speech rate, word choice), body language (i.e. gestures, facial expressions, posture)

and visual aids (i.e. slides, diagrams, banners) (Turner & Steen, 2012; Lyons, 2015).

These resources cover the first property of modes defined by Kress (2010) as every resource listed is socially created and culture-bound in their meaning (Lyons, 2015). And in a typical communication scenario the above listed resources combine and merge into a message, or in interpreting, the input (Arbona et al., 2023b).

What can be defined as a “mode” has long been a topic of discussion (Stachowiak-Szymczak, 2019). In this regard, Forceville (2006) has theorised one of the most widely accepted and also the most suitable list of modes. His approach categorises the modes by the relation to sensory perception (Forceville, 2021), these modes are as follows:

- Spoken language
- Written language
- Visuals
- Music
- Sound
- Taste
- Smell
- Touch
- Gestures

This mode categorization (Forceville, 2006) is suitable for both interpreting studies and gesture studies. It is useful for interpreting studies as it differentiates language into two modes; spoken and written, and also includes sources of information (visuals, gestures) that aids interpreters as separate modes. On this basis, interpreting has been defined as a multimodal activity (Seeber & Kerzel, 2012; Seeber, 2013).

This framework is also crucial from the viewpoint of gesture studies as it includes gestures as a separate mode. This approach has been widely hypothesised, experimentally tested, and is generally supported (Fröhlich et al., 2019). One prominent example to this phenomenon is a masked multitasking experiment (Arnell et al., 2004) that utilised electrophysical monitoring. Its results hint at the processing of the multimodal stimuli being done by the same working memory mechanisms. More importantly, this study (Arnell et al., 2004) suggests that the related modes that form the stimuli as a whole, are processed together by the working memory (Stachowiak-Szymczak, 2019).

In the specificity of gestures, this means that gestures that accompany speech are understood together with the speech and this process does not require any extra mental effort (for a detailed review see Özyürek, 2014). Gesture concepts that are related to multimodality and interpreting are explored further in Chapter 2.2. Here, it is imperative to discuss the framework of multimodality in interpreting, both as a field and as an act.

The application of the concept of multimodality to an interpreting scenario can be depicted as follows. In a typical simultaneous interpreting scenario, the interpreter takes advantage of two main modes: speech and vision, therefore the interpreter's input is audial and visual. Audial part of the input consists of the speaker's speech, tone and speaking speed; while the visual part of the input consists of the speaker's body language and materials such as projected slides and other related content. In some cases, the booth partner's feedback or prepared terminologies and other aids might also be visual and audial modes that simultaneous interpreters utilise.

In light of the multimodal approach, the input during simultaneous interpreting consists of multiple modes and resources, as a result, in the current literature, interpreting is defined as an "interlingual mediation that relies on verbal, auditory, visual and motor modalities" (Arbona et al., 2023b; Martín de León & Fernández

Santana, 2021, p. 283). This multimodal nature of interpreting is applicable to a myriad of interpreting contexts. Consecutive or simultaneous, remote or face-to-face; interpreters make use of every present source of information (Richardson, 1976).

During interpreting every mode that provides information is utilised to varying degrees (Arbona et al., 2023b). In interpreting, the predominant source of information is speech as the primary objective of interpreting is enabling communication over the language barrier (Kade, 1968). The general literature on multimodal comprehension suggests that having access to multiple, and sometimes overlapping, sources of information enhance comprehension (Kon, 2002), especially in L2 settings (Guichon & McLornan, 2008).

One of the first studies that investigated the effects of having access to multimodal input in simultaneous interpreting was conducted by Rennert (2008). In her study, the groups of participants were asked to interpret a ten-minute speech. One of the groups had full visual access to the stage while the other group's booth windows were blacked out. Their interpretations were recorded and after interpreting the participants filled a questionnaire on stress and fatigue.

In the qualitative analysis part of Rennert's study (2008) the participant group with no visual access are reported to frequently resorting to less accurate interpreting methods as they are missing key contextual cues such as gestures and facial expressions. In situations such as jokes or speaker errors, no visual access group is reported to have picked out on it later than the group with visual access.

These qualitative results are in-line with the cornerstones of interpreting studies by Bühler (1986) and Kurz (2002). In these studies, hand gestures were listed as one of the most important sources of information and their primary function were described as facilitating expression (Bühler, 1986; Kurz, 2002; Rennert, 2008).

These early findings hint at a cognitive load reducing role of having visual access to gestures and facial expressions. Specifically, being able to see the speaker's gestures and facial expressions are qualitatively reported to reduce the cognitive load of the interpreter. The said cognitive role, especially of gestures, has been investigated further by a few experimental interpreting studies (Stachowiak-Szymczak, 2019; Zagar Galvão, 2020; Martín de León & Fernández Santana, 2021).

2.1.2 Multimodality and Cognitive Load

The previous section explained the concept of multimodality and explored its application in interpreting studies. With the recent developments in our field, interpreting has been defined as a multimodal activity (Stachowiak-Szymczak, 2019; Arbona et al., 2023b). However, before the discovery of multimodality, interpreting studies always had an interest in the cognitive processes at play during interpreting (Pöchhacker, 2022). Naturally, the intersection of these two core approaches merits investigation.

One of the core concepts of cognition in interpreting is cognitive load. Cognitive load basically refers to the amount of working memory resources used for or during a task (Orru & Longo, 2019). In the context of interpreting, especially simultaneous interpreting, one the most resource intensive task is spoken language processing (Forceville, 2006; Pöchhacker, 2022). Spoken language processing is also the primary objective of interpreting as interpreting is producing the target speech, thus enabling communication over the language barrier, concurrently (Gile, 2009).

With the information discussed up to this point, it is fair to say interpreters operate beyond the verbal mode. The input of interpreters is made up of multiple modalities and not exclusively verbal (Arbona et al., 2023b; also see Forceville, 2021). In this regard, there have been scholars suggesting that any sort of

communication is multimodal due to spoken language mode evoking mental representations of expressed words (Hassemer and Evola, 2021).

It is important to highlight that the current literature on multimodality agrees on spoken language processing taking place on several levels of perception (Stachowiak-Szymczak, 2019). Multiple researchers (Levelt, 1993; Blamey et al., 2013) contributed to what constitutes spoken language processing. The list includes auditory, phonetic, semantic, syntactic, pragmatic levels (Stachowiak-Szymczak, 2019). These theories and their following supportive experimental results indicate that cognitive processing of perceptual stimuli is multimodal (Spence & Deroy, 2013).

The leading theory that ties the multimodal nature of human processing together is Dual Coding Theory (Clark & Paivio, 1991). Dual Coding Theory suggests that there are two main channels that convey stimuli for the working memory to process. These channels are verbal and nonverbal. The nonverbal channel is also called the imagery channel as it mainly conveys imagery content. These channels represent information and lead to their respective processing, as Paivio (2010) claims that verbal and nonverbal stimuli are processed uniformly in two codes.

This unique suggestion is based on the premise of two codes: analogue and symbolic, hence the name Dual Coding Theory (Paivio, 1990). Analogue codes represent images and symbolic codes form mental representations. To provide a simple example, when a person hears the word “cat”, that person can either retrieve the word “cat” or the image of a cat. Paivio (1990) suggests that one stimuli (cat) is made up of two representations; the word and the image. Retrieving one of the two results in the retrieval of the whole concept. As a result, Paivio hypothesised that humans code a stimulus in two channels.

The fundamental concept is very similar to Saussure's signifier and signified (Krampen, 1987). Here Paivio (1990) uses it as a basis and further adds that the "signifier" and the "signified" are coded uniformly in two channels and the retrieval of one is enough for the working memory to process (Paivio, 2010). In essence, Paivio's suggestion hints at a mental aid from visual stimuli that is congruent with the verbal stimuli.

The mental aid of visual stimuli was extensively tested by experimental studies and the general literature in the specificity of gestures as mode suggests that people benefit from congruent gestures during comprehension (for a review see Özer & Göksun, 2020).

There are two methods of designing an experimental gesture study for investigating cognition: comprehension study and production study. In a comprehension study, the effect of gestures on comprehension is investigated. While in a production study, the participants' gestures are analysed. When presented with different stimuli or tasks, each method provides insight from a different perspective. A comprehension study examines how gestures are understood by the listeners, while a production study examines how gestures are utilised for self-expression and thought regulation by the speakers (Kendon, 2004).

As if planned, the two methods to conduct a gesture study aligns ideally with the multimodal position and role of simultaneous interpreters. Simultaneous interpreters have an interesting role in a typical interpreting setting. This is because interpreters both listen to the speaker and also assume the primary function of the speaker: speaking. While simultaneous interpreters take full advantage of the multimodal delivery of the speaker, they only make use of the audio modality to deliver their interpretations. This creates a very interesting context in terms of both multimodality and gestures. The following section and chapters of the theoretical background are dedicated to shedding light onto this

interdisciplinary crossroad as the research design of the presented thesis involves both production and comprehension of gestures.

2.1.3 Multimodal Input and Output in Simultaneous Interpreting

The invention of multimodality as a concept has its roots in communication studies and discourse analysis (Yang, 2019). Multimodality's application in a monolingual context is relatively straightforward, it mainly involves the analysis of factors affecting the communication in question (Lyons, 2015). Interpreting firstly separates from multimodality's first applied context due to it being multilingual. But, more importantly, in simultaneous interpreting the message is transmitted simultaneously in two channels: in the source language by the speaker and in the target language by the interpreter.

This creates a positively conflicting role in terms of the simultaneous interpreter's multimodal position. From a communicative standpoint, the interpreter and the listeners take advantage of the speaker's multimodal delivery: body language, visual aids etc. However, the simultaneous interpreter assumes the role of the speaker for the verbal delivery of the speech in the target language. Consequently, the simultaneous interpreter is both listener and speaker at the same time. This phenomenon was observed in early interpreting studies literature, for example Chernov (1979) and Gerver (1975) noted that listening and speaking had a significant overlap during simultaneous interpreting. This overlap was between 65 and 80% of the time (Chernov, 1994).

These findings were reflected in the following frameworks that modelled the dual role of simultaneous interpreters in a multimodal setting. One of the most well-known of which is Seeber's (2017) Cognitive Resource Footprint model (Figure 1). This model has two foundational bases in its core; auditory speech is accompanied by visual speech in natural communication and the visual information supporting and facilitating the perception of auditory speech (Arbona

et al., 2023b). The finding that enables this facilitation is human cognition's automatic and no-effort ability to integrate related auditory and visual stimuli together (Opoku-Baah et al., 2021) is well supported by an extensive literature (Sugihara et al., 2006).

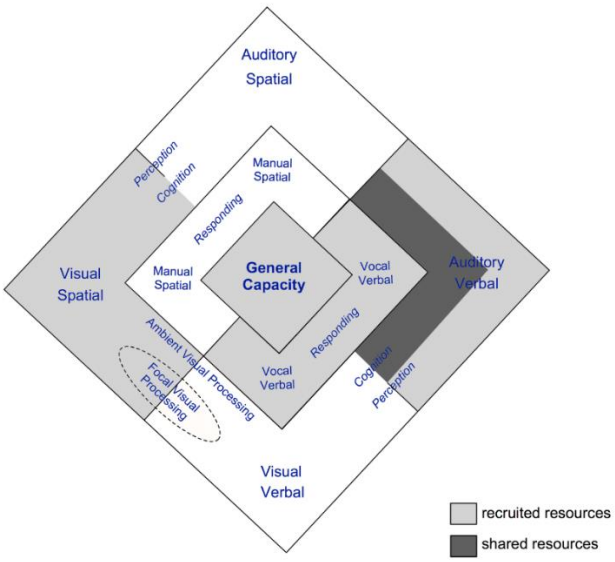


Figure 1. Cognitive Resource Footprint Model (as cited in Arbona et al., 2023b)

This model, though complicated on the surface, takes the perceptive input in simultaneous interpreting as a basis and hypothesises that the integration of auditory and visual information helps the interpreter to keep the synchrony of the source speech (Arbona et al., 2023b). This help is explained by the working memory's ability to integrate multimodal input without any extra effort (Giard & Peronnet, 1999).

The multimodal output of simultaneous interpreters is more cognitive than communicative because most of the simultaneous interpreting is done either in a booth or remotely. However, this only negates the communicative functions of the multimodal output, not cognitive functions, which are discussed in the following chapter.

In the matter of multimodality, there are multiple frameworks, one of which is a recent experimental study that suggests we construct our thoughts multimodally with bottom-up processing (Hoffmann & Pfeifer, 2018). This concept has its place in the cornerstones of interpreting studies by multiple renowned scholars of the field (Gerver, 1975; Moser-Mercer, 1994; Gao, 2011). In these models, the verbal input is followed by stages of language processing (Forceville, 2021), and it is fair to expect this processing to be reflected on interpreters' body language. Gestures, the primary mode of speech accompanying visual aid, help visualise the processed input (for a review see Chu & Kita, 2011).

With these in mind, the investigation of how imageability of the source speech and the gestures of the speaker affects interpreter's gesture production has highly revelatory potential with regard to cognitive interpreting studies. The presented experimental thesis explores this intersection in a both multimodal and bilingual setting, and therefore brings a new perspective to cognitive interpreting studies and gesture studies.

2.2 GESTURES

The second section of the Theoretical Background Chapter will provide conceptual and practical information on gestures, and more specifically on gesticulations. This section will also discuss the common ground between the presented thesis' two pillar research areas: cognitive interpreting studies and gesture studies.

2.2.1 Gesture Types and Definitions

Gestures as a concept is a hypernym. It includes multiple categories of gestures and, as a whole, they are defined as a range of hand and arm movements (McNeill, 2000). Also, as previously mentioned under the section of multimodality, gestures are closely related to speech (McNeill, 2000), therefore their first

categorization classifies gestures according to their relation to speech. The spectrum presented below (see Table 1) has been put forward and developed by Adam Kendon (2004) and David McNeill (1995, 2000). They are two of the most prominent gesture scholars and their work is the most widely accepted gesture classification.

Table 1. Gesture Types (Adapted from Kendon's continuum [Kendon, 2004])

Degree of conventionalization			
Conventionalised		Non-conventionalised	
Sign-language (Obligatory speech absence)	Emblems (Optional speech presence)	Pantomime (Optional speech presence)	Gesticulation (Obligatory speech presence)

In the table above, the term conventionalised refers to the degree of standardisation in that category. The left side of the continuum starts off as conventionalised, meaning their usage is highly standardised and rule-bound. Whereas the right side of the continuum is the opposite, it is non-conventionalised, which means that their usage is highly idiosyncratic and not rule-bound (McNeill, 2000).

Gesticulations are gestures that accompany speech and the speech's presence is obligatory, meaning that for a gesture to be classified as a gesticulation it must accompany speech. Inherently, this type of gestures is the most related to the cognitive processes of simultaneous interpreters as they are both listeners and speakers simultaneously. The subcategories of gesticulations are explained in the following section.

Pantomime gestures have a relatively self-explanatory definition; they are gestures that, alone, convey more meaning than gesticulations, especially when transferring non-contextual and more expressive content (Kendon, 2004).

Emblems, similar to pantomime gestures, do not require the presence of speech to convey meaning. Emblems on their own have contextual, cultural or universal meanings when performed. Universal thumbs-up gesture (closed fist, raised thumb), diver's contextual all-good ("O" shape with thumb and index finger with the other three fingers out) or culturally offensive Italian "mano a borsa (hand in purse)" gesture (rocking the hand with pinched fingers) all convey their desired meanings without the presence of speech.

Last but not least is sign language. Here the speech is inherently absent as the sign language itself substitutes for vocal communication. Both emblems and sign language are conventionalised, meaning that their usage and form is standardised through convention or tradition (Kendon, 2004). Though some minor idiosyncratic features are present in both, their essential meaning conveying form is the same in all applied contexts.

2.2.2 Gesticulation Types and Definitions

The previous chapter summarised the main classification of gestures by their relationship with the presence of speech. Interpreting's primary function is verbal transfer over a language barrier thus, gestures that accompany speech (gesticulations) have a fundamental connection with the act of interpreting. Similarly, research design presented in Chapter 3 focuses on possible cognitive functions of gesticulations in interpreting. As a result, it is essential to discuss gesticulations in an extensive manner. One important note, as is tradition in gesture studies, the terms "gesture" and "gesticulation" are used interchangeably in the following sections.

As previously touched upon in the multimodality section, simultaneous interpreters have an interesting role in a typical interpreting setting. This is because interpreters both listen to the speaker and also assume the primary function of the speaker, speaking. This creates an interesting conundrum in terms

of gesticulations. Because while the speaker's gestures are visible to the audience, the interpreter's are not. And as gesticulations are gestures that accompany speech, simultaneous interpreting provides a revelatory setting for investigating gesticulation functions.

In a calculated way of the presented thesis' design, gesticulations are categorised by their functions, similar to over-arching categorisation of gesture types (McNeill, 1994). Unlike gesture types, however, their functions are described by what kind of a meaning they convey when they accompany speech (Kendon, 2004).

In terms of gesticulation categorization, the most widely accepted model has been put forward by David McNeill (2000). He separates gesticulations into four main categories: iconic, metaphoric, deictic, and beat. Iconic gesticulations display the same concrete scene present in the speech (McNeill, 1994). Similar to iconic gesticulations, metaphoric gesticulations also depict an image, however, the depicted image stands for some abstract concept (McNeill, 1994).

To provide a simple differentiating example between iconic and metaphoric gestures is, while gesticulating upwards when saying "I climbed the ladder" is an iconic gesture, same gesticulation in the context of "The stocks are at an all-time high" would be a metaphoric gesture. McNeill (1994) classifies iconic and metaphoric gesticulations as "imagistic" and notes that what these gestures are referring to separates them.

Deictic gesticulations refer to speech accompanying gestures performed for interacting with or referring to the speaker's deixis. Most common types of these gesticulations are pointing and touching movements to some object in close proximity to the speaker.

And lastly, beat gesticulations are "movements that do not represent a discernible meaning" (McNeill, 1994, p.6). They are mostly basic movements such as finger

up and down or index finger to the side and they are mainly performed for prosodic purposes such as stressing a word or items in a list (Stachowiak-Szymczak, 2019).

McNeill's distinction drew from numerous previous studies (Bernard et al., 2015; Joue et al., 2018, 2020) and his approach related gesticulations to the formulation of the speech, hence the content-driven categorization. This speech formulation focusses on said categorization makes it a highly adaptable framework for interpreting studies, not to mention its canonical position. How these types of gesticulations are integrated into a dynamic and multifaceted nature of interpreting is explained in Chapter 3.

2.2.3 Communicative Functions of Gestures

Gesticulations, speech accompanying gestures or co-speech gestures, are produced in all languages and cultures (Fontaine & de Lannoy, 1991). We can infer their crucial role in communication by a few examples such as babies gesturing before their first words (Bates, 1976) and congenitally blind people gesturing to blind listeners (Iverson & Goldin-Meadow, 1997, 1998).

While the first example taps into the communicative functions of gestures, the second one taps into the cognitive functions, which we will explore in the following section. Gestures are essentially a form of conveying information visuo-spatially, and they are useful communicative tools even when they are performed without speech (Clough & Duff, 2020). This conveying of information is done holistically, spatially, and often simultaneously in a single event; while speech conveys information in discrete units in an incremental and cumulative manner (McNeill, 1995).

In the communicative vein of gesture functions, gestures can be performed for the speaker or for the listener. A simultaneous interpreter's listener and speaker

role in communication was explored in Chapter 2.1, the same concept is also very relevant here as the dual role of a simultaneous interpreter in communication affects how they take advantage of gesture functions.

Quite possibly the most apparent of communicative gesture functions are for the listeners. Apart from gesture's inherent visuo-spatial advantages such as information conveying in noisy or hard to listen environments, which are still relevant for some cases of simultaneous interpreting, gestures performed by the speaker have been shown to enhance the comprehension of listeners in multiple scenarios (Özer & Göksun, 2020; Özyürek, 2014).

Gesticulations, especially iconic gesticulations, sometimes convey information that is not present in the accompanied speech (Clough & Duff, 2020). For example, a pointing gesture accompanying "the goalkeeper threw the ball" sentence might add the meaning that the ball went too far and in such similar cases the intended message is not complete without the information conveyed via gestures (Clough & Duff, 2020).

Whether the information conveyed by the gesture is also present in the speech or not, gesticulations are readily attended by the listeners (Özyürek, 2014). People integrate the information inferred from the speech and the information inferred from gestures into a single memory representation (Cassell et al., 1999; McNeill et al., 1994; W. G. Smith & Kam, 2012). And this integration "is done without explicit awareness or attention to the gestures" (Clough & Duff, 2020, p.4). How gestures were attended in conjunction with the speech by the listeners has been investigated in multiple behavioural, electrophysiological, and neuroimaging studies (Wu & Coulson, 2005; Kelly et al., 2010; ; see Özyürek, 2014 for a review) and results are in line with the McNeill's original theory suggesting that multimodality in human understanding does not require extra effort (McNeill & Duncan, 2000).

Another communicative, and cognitive, function of gestures that is relevant to simultaneous interpreting practice and training is their ability to enhance L2 comprehension, having access to the speaker's non-verbal cues have demonstrated increased comprehension in interpreting studies and other fields (Sueyoshi & Hardison, 2005; Rennert, 2008).

2.2.4 Cognitive Functions of Gestures

The example of congenitally blind people gesturing while speaking to blind listeners (Iverson & Goldin-Meadow, 1997) taps into the cognitive functions of gestures beautifully as it implies gesture production is instinctive to humans even if we are not visually exposed to them. This way, gestures provide a person with a new and unique multimodal channel to express themselves idiosyncratically. This idiosyncrasy, behaviours peculiar to the individual, is not present in speech as speech has highly standardised form. As a result, gestures "uniquely reveal the speaker's thoughts" in ways not possible with only speech (Clough & Duff, 2020, p. 2; Goldin-Meadow & Alibali, 2013).

The previous section touched upon the multimodal nature of human understanding and how this multimodality eases the process of understanding without requiring extra effort (Özyürek, 2014). This notion was introduced by McNeill (McNeill et al., 2008) with the concept of "growth points", which suggested that before the utterance is spoken by the speaker it begins in the mind as a combination of verbal and gestural expression of the thought. This notion places gestures as a window into cognition (Hostetter et al., 2007) and their investigation provides a look into possible data points that would be nearly or completely inaccessible with other observational methods (Stachowiak-Szymczak, 2019). There have been multiple further theories developed to explain the interplay between gestures and cognition: conceptual models such as Gesture as Simulated Action Framework (Hostetter & Alibali, 2008), Information Packaging Hypothesis (Kita, 2000), Lexical Access Hypothesis (Krauss et al., 2000) and

Gesture-for-Conceptualization Hypothesis (Kita et al., 2017) have all been put forward in this regard.

The above-listed theories can also play crucial roles in cognitive interpreting studies as they touch upon key concepts in our field. Gesture as Simulated Action Framework (Hostetter & Alibali, 2008) introduced “thresholds” for gesture production while speaking. Hostetter & Alibali (2008) states that if the mental simulation of a concept exceeds the speaker’s gesture threshold, the speaker will gesticulate. The unique proposition of this theory is it can explain personal gesture production rate differences among speakers, or in this case interpreters.

Gesture as Simulated Action Framework (Hostetter & Alibali, 2008) explains the subconscious cause for the speaker to gesture, while the cognitive functions of speaking while gesturing were explained by the following three theories. Information Packaging Hypothesis (Kita, 2000) suggests that the embodiment of gestures helps the speaker to organise their thoughts into “verbalizable forms” (Hostetter et al., 2007, p.316), decreasing the cognitive load of speech organisation. In the same vein, Lexical Access Hypothesis (Krauss et al., 2000), which suggests that a gesticulation help the person speaking find the words by priming the mental representations of the gesticulated word. This theory is applicable in scenarios where a person is constantly looking for words, simultaneous interpreting is a prime example.

All the models presented above have been put forward to conceptualise the ways in which gestures facilitate cognition and are widely supported by empirical findings (for a short review see Özer & Göksun, 2020). The most recent of these theories is Gesture-for-Conceptualization Hypothesis (Kita et al., 2017). Gesture-for-Conceptualization Hypothesis (Kita et al., 2017) proposes that gestures are crucial for facilitation of concepts due to the ability to manipulate, package and explore “spatio-motoric information” (Clough & Duff, 2020, p. 6). In a reductionist way, gestures help not only for communicating our thoughts visually, but also

formulating our thoughts. Here, it is vital to underline the overlapping roles of simultaneous interpreters as both speakers and listeners. This overlap of roles highlights the crucial crossroads enabled to be studied by the integration of gesture studies into interpreting studies.

As a result of this intersection, it is important to explore the role of gestures in cognition. Goldin Meadow and colleagues (Goldin-Meadow et al., 2001) suggest that gesticulations, gestures that accompany speech, improves working memory performance by reducing cognitive load. In their experiment, the participants were tasked with memorising and then explaining objects and letters and the study resulted in improved accuracy in both tasks in terms of recall. These results hint at gesticulations reducing the cognitive load of speaking, thus leaving more cognitive capacity for recall. An experiment in the same vein hinted at meaningful gesticulations reducing cognitive load even more (Cook et al., 2012).

The results presented above clearly suggest that gesticulations reduce cognitive load, however, said function of gesticulations interpreted from another perspective, that is external inhibition of gesture production increases cognitive load and impacts task performance negatively (Clough & Duff, 2020). Studies conducted with participants who were asked not to gesture or their hands occupied with some other tasks (holding a pen etc.) are numerous and conclusive in this sense; inhibition of gesture production reduces task performance (Clough & Duff, 2020). These results were further supported by evidence found within individual differences such as working memory capacity (Burianová et al., 2013).

Both interpretations of studies conducted for investigating the cognitive functions of gesticulations point at a clear effect on cognition. When working memory is taxed (Gillespie & Graham, 2014) by speaking or recalling, tasks that interpreters must perform simultaneously, hence the dual role, gestures facilitate the work of working memory.

It is not just the dual role nature of interpreting that aligns with gesture's cognitive functions, gesticulations have been observed to have positive effects in second language environments and contexts. During foreign language learning, producing semantically meaningful gestures and novel word-learning tasks improves "subsequent retrieval" of learned words and concepts (Clough & Duff, 2020, p. 7; Krönke et al., 2013; Macedonia, 2014; Sweller, 2020). Same goes for experimental gesture inhibition studies, allowing participants to gesture improved recall of linguistic representations such as metaphors in multiple studies (Argyriou et al., 2017; Kita et al., 2017).

All in all, Section 2.3 has explained the communicative and cognitive benefits of gestures. Said cognitive functions, thoroughly put together by a recent review (Clough & Duff, 2020), are related to simultaneous interpreting. This section has explored how gesticulations are triggered (Gesture as Simulated Action Framework; Hostetter & Alibali, 2008), how the mental representations of related gesticulations are primed (Lexical Access Hypothesis; Krauss et al., 2000) and how gesticulations help to convey our thoughts by speaking (Information Packaging Hypothesis; Kita, 2000). Gesticulations' load decreasing and lexical and mental representation access enhancing functions are actively present in any simultaneous interpreting task. In sum, this section delved into how gestures help us think and access mental representations both as listeners and speakers, which simultaneous interpreters do simultaneously.

2.3 IMAGEABILITY

The third section of the Theoretical Background Chapter will constructively explain the concept of imageability. The section will start off with the term imagery and then explore the term's application in cognition, interpreting and gestures.

2.3.1 Imageability

While exploring the term multimodality in the Chapter 2.1, it was discussed that human perception is not unimodal (Lyons, 2015). Human perception is made up of multiple modalities that are combined (Arbona et al., 2023b) into a single string of information by the human brain (Turner & Steen, 2012). This integration of multiple modalities into a single information string is automatic and does not require any conscious effort (Giard & Peronnet, 1999).

These multiple modalities are mainly made up of spoken language, written language, visuals, music, sound, taste, smell, touch, gestures (Forceville, 2006). Though what constitutes as a “mode” and their exact categorisation is a topic of debate, the most well-accepted (Forceville, 2021) overarching modality categorisation is verbal and non-verbal, which was put forward by Paivio under the framework of Dual Coding Theory (Paivio, 2010).

Verbal mode of perception is inherently linked to written and spoken language processing (Schifferstein, 2009). Verbal processing is aided and enhanced by the processing of congruent non-verbal modes (Arnell et al., 2004). When the notion of visual processing and its related terms was newly being discovered, the experimental backing was in a primordial state. But the theoretical propositions of the time were hypothesising imageability as a very close concept, mainly led by Paivio (Forceville, 2006; Paivio, 2010). Therefore, in Paivio’s Dual Coding Theory, non-verbal modes were also referred to as imagery modes (Clark & Paivio, 1991).

Imagery and imageability are intrinsically related terms since their conception (Yang, 2019). As a result, it would be illuminating to discuss their respective definitions and practical applications before exploring their implications in cognitive interpreting studies and in the specificity of the presented thesis.

Imagery refers to the mind's ability to evoke a "perceptual experience" (Stachowiak-Szymczak, 2019, p. 28) without the actual stimulus being present (Kosslyn et al., 1997). A real-world example to imagery would be a person imagining themselves on a beach while their eyes are closed in a different environment or rotating the letter "N" to "Z" mentally. Naturally, mental imagery is highly related to visual modalities (Schifferstein, 2009). In a reductionist manner, imagery can be defined as the ability to envision visual material without the envisioned material actually being present (L. Smith & Gasser, 2005).

To avoid any possible confusion, it is important to note that the term "mental imagery" in this thesis is used as an umbrella term that encompasses visual imagery or any other quasi-perceptual processes. This approach is widely agreed upon in the literature (Nanay, 2013), and is due to the experimental research body on imagery producing numerous cognitive sub-branches (Stachowiak-Szymczak, 2019). The extent of the research body on mental imagery is presented in the figure below (Figure 2).

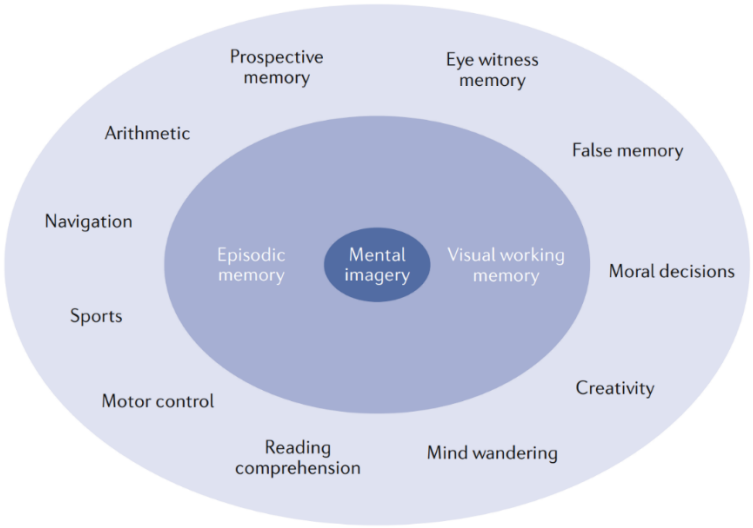


Figure 2. Cognitive Processes Related to Mental Imagery (Pearson, 2019)

Applying the concept of imagery to word level yields imageability. Imageability is how easily a word can invoke a clear mental image (Lynch, 2008). A word can be high or low imageability. High imageability words (e.g., tree) are easy to mentally visualise, whereas low imageability words (e.g., hope) do not evoke a clear mental image of themselves.

It is important to discuss the difference between imageability and concreteness because, superficially, they seem to refer to the same concept, however, this is not the case. Concreteness refers to how easily an object can be perceived by the senses (Sabine, 1907). For example, the word “dream” is high imageability as it easily evokes a mental image, but it is low concreteness because it is not perceivable by the senses (Richardson, 1976).

To sum up, imagery is the mind’s ability to evoke a mental image (Kosslyn et al., 1997) while imageability is a word capacity to evoke a mental image (Paivio, 2010). Imagery and imageability constitute for the perception of multimodal input as they shape what the stimuli invokes (Hassemer & Evola, 2021). This perceptive stimulus processing is a big field of research and has implications in cognitive interpreting studies. The following sections will discuss the key aspects of imageability and multimodality in cognition that is present in the thesis’ experimental design.

2.3.2 Imageability and Cognition

The effects of imageability in cognition ties in with multimodal language processing. The previously explored theories such as Gesture as Simulated Action Framework (Hostetter & Alibali, 2008), Information Packaging Hypothesis (Kita, 2000), Lexical Access Hypothesis (Krauss et al., 2000) and Gesture-for-Conceptualization Hypothesis (Kita et al., 2017), and primarily Dual Coding Theory (Clark & Paivio, 1991), tap into the role of imagery in multimodal language processing.

This is due to the central position of imagery in perception and sensory stimulation. The imagery's utilisation in many cognitive processes such as language comprehension, problem solving and emotion regulation was compiled profoundly by a recent review by Pearson (2019). His review paper corroborates that almost all behavioural or cognitive process resulting from sensory simulation "tends to utilise mental images" (Pearson, 2019, p.1).

Imageability is a recent and important inclusion to the field of cognitive interpreting studies (Kumcu & Öztürk, 2023). One of the most relevant examples of this to interpreting is visual imagery activation by auditory linguistic stimuli (Stachowiak-Szymczak, 2019). In a neuro-imaging study (Mellet et al. 1998) the participants were asked to visualise a 3D object from a spoken instruction, during which the participants' brain was monitored using fMRI. The study concludes with evidence hinting at the activation of both language and visual processing parts of the brain are needed for language comprehension and processing.

This result is important in two regards. First, it highlights a mode transformation in language comprehension. A verbal stimulus evoking a mental image of a three-dimensional object is a sound example to Dual Coding Theory's (Clark & Paivio, 1991) suggestion of verbal modes being coded together with imagery modes. Second, it highlights the central role of imagery in multimodality by showcasing the brain's activation response to a imagery mode.

Additionally, imageability is linked with enhancing the associative function of the human brain (Caplan & Madan, 2016). This is also a very relevant function of mental imagery as interpreters are constantly searching for relevant words and concepts in two languages under time pressure (Arbona et al., 2023b).

With all the theoretical and experimental information presented, it would be safe to say that mental imagery and word imageability is a curious topic for cognitive interpreting studies. This is because mental imagery and word imageability's

research body includes cognitive functions that are at an extreme level (Hervais-Adelman et al., 2015; Hervais-Adelman & Babcock, 2020) during interpreting such as language processing, language production, multimodal input and output. For these reasons, it is vital to approach the investigation of these concepts with a suited experimental design.

2.3.3 Imageability and Gesture Production

This section is of particular importance because it ties together the presented thesis' two main variables: gesture production and speech imageability. Until this point, the Theoretical Background chapters have presented the conceptual and experimental body of research on the topics of multimodality, gestures and imageability. Regarding this, there is one more key element that needs to be introduced and it is the simple question of "What triggers gesture production?"

Among the previously discussed theories, Gesture as Simulated Action Framework (Hostetter & Alibali, 2008) specifically taps the phenomenon of gesture triggers by introducing "thresholds". Simply stating that each person has an idiosyncratic threshold, that once exceeded, triggers gesture production. Though this is an experimentally sound explanation (Hostetter & Alibali, 2008), it does not cover the specific types of gestures such as iconic gestures.

The search for specific explanation of gesture type triggers stems from McNeill's seminal piece on gestures, as in it, he states that gestures convey "the imagistic form of the speaker's sentences" (McNeill, 1994, p. 109). With this statement, McNeill (Hadar & Butterworth, 1997) defines gestures as a means of conveying the imagistic content of the speaker's thoughts. Hadar & Butterworth (1997) further advanced McNeill's (1994) approach into the specificity of iconic gestures by defining iconic gestures as "the motor manifestation of imagistic activation" (Hadar & Butterworth, 1997, p. 166).

The reason behind imageability and iconic gestures are associated is due to the intrinsic function of iconic gestures. Iconic gestures are mainly produced to depict or support highly concrete and imageable words (Kendon, 2004). Naturally, iconic gestures are generally produced before, after or during a highly imageable utterance (Beattie & Shovelton, 2000) and are effective at conveying concrete details during speech (Straube et al., 2011).

Imageable utterances being accompanied by iconic gestures was also predicted in the two main theories in that field of research by both McNeill (1992) and Hadar and Butterworth (1997). An experimental study by Beattie and Shovelton (2000) provides one of the most solid experimental backings to the relationship between iconic gestures and imageability. In their study, the participants produced iconic gestures almost inclusively while trying to explain multiple cartoon scenes. This hints at imageability having a significant effect on whether the essential meaning of the word is associated with an iconic gesture or not (Beattie & Shovelton, 2002).

It is important to note that iconic gestures and imageability literature is “somewhat mixed” (Beattie and Shovelton, 2002, p. 408). While some studies reported a positive correlation between iconic gestures and imageability (Beattie and Coughlan 1999) some did not hint at a clear correlation (Marcos, 1979).

The cognitive interpreting literature does not have the luxury of comparable studies in terms of imageability and iconic gestures. To the best of our knowledge there isn’t any simultaneous interpreting study that investigates mental imagery and gesture production as a variable. In this regard, the closest and most extensive study was conducted by Stachowiak-Szymczak (2019). Its results hint at cognitive load reducing behavioural changes such as producing more gestures when interpreters are faced with auditory linguistic input (Stachowiak-Szymczak, p. 131).

From a cognitive standpoint, the investigation of the relationship between mental imagery and gesture production in a simultaneous interpreting setting has the potential to generate important implications. As explored in this section, mental imagery is a highly cognitive concept (Clark & Paivio, 1991) and iconic gestures might be their behavioural reflection (Masson-Carro et al., 2016). Considering that simultaneous interpreting is an extreme language control task (Hervais-Adelman & Babcock, 2020) and two languages are actively pushing mental imagery concepts, this intersection might yield results that are relevant to multiple research areas.

2.4 INTERPRETING AS A COGNITIVE PROCESS

The last section of the Theoretical Background Chapter will investigate the previously explored concepts; multimodality, gestures and imageability, under the banner of cognitive science. The section's aim is to discuss the conceptual and experimental work as a whole and provide the full extent of the Theoretical Background Chapter.

2.4.1 Embodied Cognition in Simultaneous Interpreting

Cognitive science's interest in interpreting studies is due to the inherent cognitive processes of interpreting. During simultaneous interpreting, the interpreter constantly multitasks between listening and talking. Between 60 to 80% of the time, the interpreter listens and speaks simultaneously (Chernov, 1994). The challenge unique to simultaneous interpreting is the fact that this multitasking is multilingual (Stachowiak-Szymczak, 2019). The main working memory intensive task is translating the listened speech into the target language and this notion is well supported in the literature (Szarkowska et al., 2016). As a result of this high working memory usage, interpreting is defined as an extreme language task (Hervais-Adelman & Babcock, 2020).

High working memory usage and utilisation are so crucial aspects of simultaneous interpreting, working memory capacity is hinted as a predictor of interpreting performance (Macnamara & Conway, 2016). In light of this, it is important to place the definition and function of working memory in cognitive interpreting studies correspondingly.

Working memory, in short, is a cognitive system that is able to store information for a short period of time (Miyake & Shah, 1999). Its differentiation from short term memory, which also stores information for a short period of time (Cowan, 2008), is working memory's ability to manipulate the stored information (Atkinson & Shiffrin, 1968). In the context of simultaneous interpreting, this manipulation is translating the input into the target language (Kade & Cartellieri, 1971).

The manipulation task of interpreting benefits from multimodal processing (for a short review see Stachowiak-Szymczak, 2019). As discussed, the essential feat of multimodal processing results from the mental representations activated by external stimuli (Arnell et al., 2004). In that, mental imagery, the mind's ability to "evoking a perceptual experience" (Stachowiak-Szymczak, 2019 p. 28) is an internal part of working memory because working memory translates the input into the target language (Timarová et al., 2014).

The key assumption behind this approach is as follows: the interpreter receives multimodal input (spoken language, written language, gestures and more [Forceville, 2006]), a network of mental representations (Smith & Gasser, 2005) emerge via mental imagery (Caplan & Madan, 2016), and working memory translates the activated network mental representations (Moser, 1978).

Working memory benefiting and being enhanced by perception is modelled in the early conceptual frameworks. Currently supported models such as Baddeley's (2012) and Daró and Fabbro (1994), both feature a buffer zone before the actual processing. Therefore, the key aspect of interpreting performance is cognitive

load management (see Gile, 2016). The multimodal approach to cognitive processing elaborates the cognitive load as input from different modes (Arbona et al., 2023b; Giard & Peronnet, 1999).

The concept of embodied cognition stems from the relationship between perception and working memory (Smith & Gasser, 2005). Smith and Gasser's (2005) states that human perception and the resulting cognitive processing is "inseparable" (Stachowiak-Szymczak, p. 36). Embodied cognition suggests that working memory's activation of mental representations during processing should be observable in physical activities as they are triggered and facilitated by human perception (Stachowiak-Szymczak, 2019; Smith & Gasser, 2005). Moreover, Smith and Gasser's (2005) theory claims that the embodiment of the stimuli increases in proportion to the quantity of modalities present in the input.

Fundamentally, the approach of embodied cognition (Smith & Gasser, 2005) puts forward that the network of representations is activated by external multimodal stimuli and the effects of said activation should be observable in embodied responses such as gestures (Shapiro, 2014).

This is one of the key assumptions that create the central theoretical starting point of the presented thesis. The current literature on gestures suggest that they have pivotal role in both speech comprehension and production (Shaphiro, 2014).

The interpreter's, a listener and speaker simultaneously, embodied responses to multimodal and sometimes overwhelming cognitive load is currently understudied, therefore this research investigates the interpreter's gestural responses to multimodal and imageable simultaneous interpreting input.

2.4.2 Gestures as a Form of Embodied Cognition

Embodied cognition, as the name implies, refers to cognition being shaped by and reflected in the body (Shapiro, 2019). This approach is highly encompassing in terms of behavioural responses, in which the most relevant to simultaneous interpreting is gesture production (Seeber, 2023). With all the above presented theoretical and experimental knowledge, it is fair to expect gesture production during interpretation's cognitive load. Though the interpreting literature on this is highly limited, two current studies (Arbona et al., 2023b; Zagar Galvão, 2020) both reflect interpreters gesturing while simultaneously interpreting.

This is highly interesting as the gestures of simultaneous interpreters alone in the booth cannot be for communicative purposes (Nobe et al., 2005). This phenomenon can be explained with embodied cognition; therefore, it is important to discuss gestures in the context of embodied cognition.

Gestures are present on both sides of language, language production and language comprehension. Gestures help the speaker organise their thoughts (Hostetter et al., 2007) and increase the listener's comprehension (Sueyoshi & Hardison, 2005). The unique proposition of interpreters being listener and speaker simultaneously provides an interesting test bed for investigating the cognitive functions of gestures. In this interdisciplinary crossroad, embodied cognition comes into play as a facilitator and indicator of cognitive load during simultaneous interpreting (Martín de Léon & Santana, 2021).

The primary demanding cognitive task during interpreting is language processing (Kade, 1968) and the embodied approach suggests that language processing may be visible in kinaesthetic activities such as gestures (Kosslyn et al., 1997). The combination of linguistic elements to produce speech is a highly formative process and the embodiment of content may help the speaker to bring it all together (Barsalou, 1999; Pickering & Garrod, 2013).

In his seminal work on gestures McNeill (1994) places gesture production as both an understanding facilitator and a content verbaliser. In an extensive experimental study on gesture's cognitive functions Kita (Alibali et al., 2000) finds that gestures are active in "conceptual planning of speech" (Alibali et al., 2000, p. 1). This finding is relevant to simultaneous interpreting on a fundamental basis because the "conceptual planning of speech" (Alibali et al., 2000, p. 1) is relevant to both language production and comprehension. Said planning of speech helps the speaker in forming the speech and helps the listener in parsing the delivered speech.

In this conceptual vein, gesture types (iconic, beat, etc.) play different cognitive roles and fill different cognitive functions. Chapter 2.3.3 explores the relationship between mental imagery and iconic gestures. In an embodied cognitive fashion, Hadar and Butterworth defined iconic gestures as "the motor manifestation of imagistic activation" (1997, p. 166).

Similar to the iconic gestures, beat gestures are associated with cognitive functions. In an experimental study (Lucero et al, 2014.), the effect of gesture types on speech by investigating while producing which gestures did the participants respond faster. There were three sets of instructions: produce iconic gestures, produce iconic gestures and no instruction on gesture production. These instructions were also tripled by adding the condition of left hand only, right hand only and with both hands. While producing beat gestures both with their left hands and two hands, the participants, when compared to baseline, were faster to respond (Lucero et al, 2014.), hinting at a lexical retrieval enhancing function on beat gestures. Even more interestingly, the participants were slower to respond while producing iconic gestures, suggesting that producing an iconic gesture is more cognitively resource-intensive (Lucero et al, 2014.).

This phenomenon, beat gestures' word recall and speech parsing enhancing, is a relatively large body of research with multiple affirmative studies (for a short review see Biau & Soto-Faraco, 2013). Considering the cognitive functions of iconic gestures, beat gestures and gestures as a whole, it is reasonable to conclude that language production and comprehension are inherently intertwined with gesture production. The narrated experimental research seems to support the approach of embodied cognition's suggestion that mental activation should be visible in gestures (McNeill et al., 2008).

2.4.3 Cognitive Offloading via Gestures

In essence, embodied cognition asserts that a cognitive load should be "embodied" in bodily actions (Clark & Paivio, 2011). This cognitive demand-reducing function of embodiment is called "cognitive offloading" (Risko & Gilbert, 2016). As the task of interpreting itself is highly demanding, effects of embodied cognition should be visible during interpreting.

The experimental research explored in the previous sections (primarily sections 2.2.4, 2.3.3, 2.4.2) suggest that people gesture as a method to reduce cognitive demand (Cook et al., 2012). The investigation of this gestural response in the context of interpreting is very limited, however, the available studies collectively hint at interpreters gesturing as response to the cognitive load of interpreting (Stachowiak-Szymczak, 2019; Zagar Galvão, 2020; Martín de León & Fernández Santana, 2021).

Therefore, it is vital to explore this limited body of research. In chronological order, Stachowiak-Szymczak (2019) investigates during which prosodic elements do interpreters produce gestures and highlights that interpreters produce significantly more gesture while interpreting lists. Zagar Galvão's (2020) research focuses on interpreter style and gestural mimicry. She concludes that interpreter's gesture production is a matter of interpreting style, however,

regardless of the style difference, the interpreters tend to produce more gestures if the speaker is also producing more gestures (Zagar Galvão, 2020). This gestural mimicry, increase in interpreter's gesture production in correlation with the speaker's gesture production, is crucial because it highlights a subconscious aspect of gesture production in interpreting (Kimbara, 2006).

Last but not least, Martín de Léon and Santana (2021), investigates interpreter's gesture production in relation with multimodal input. Their study replicates the gesture literature in the sense of representational gestures (McNeill, 1992) aiding in "construction of meaning" (Martín de Léon & Santana, 2021, p. 302) and iconic gestures enhancing comprehension (Özer & Göksun, 2020). Importantly, their study hints at gestures helping organise the interpretation. This is crucial in that it highlights the interpreter's simultaneous speaker and listener role (Martín de Léon & Santana, 2021).

These experimental studies demonstrate the embodied nature of gesture production during a cognitively demanding task. Simultaneous interpreting provides this aspect of cognitive psychology and linguistics a curious testbed for investigating the intricacies of language comprehension and production. The presented thesis herein aims to carry the body of research further by introducing a full-length simultaneous interpreting task with manipulated stimuli, the details of which are presented in the following chapter.

CHAPTER 3

METHODOLOGY

The methodology used in this study is designed to assess and analyse the frequency of the interpreter's gestures and the collected gestures' types during 8 different simulated simultaneous interpreting scenarios (low and high imageability, low and high gesture frequency). Methodological details will be further expanded in this chapter by presenting information about the participants, data collecting instruments, materials, procedure, hardware and software used in the study at hand.

3.1 PARTICIPANTS

A total of 10 senior translation and interpreting students (2 males; M_{age} = 21.8, *SD* = 0.63, range: 21-23) from Hacettepe and Başkent University participated in the study (see Table 2). Six of the participants were from Hacettepe and four were from Başkent University. All of the participants were senior students who had completed multiple interpreting courses ($M_{completedcourse}$ = 5.6, *SD* = 0.69) and their respective grade ranges are presented in Table 1. None of the participants reported any speech or hearing disorders and all of them had either normal or corrected vision. This study has been approved by Hacettepe University's Social Sciences Ethics Boards and Commission (Document Number: E-35853172-300-00002990494) (see Appendix 1). Also, it is important to note that the participants were not given any information about their body language or gesture production, the experiment was portrayed as a simple interpreting task.

Table 2. Descriptive Characteristics of the Participants

ID	Age	Gender	Dominant Hand	Current Semester	Completed Courses	Grades	L2 Proficiency	L2 Immersion	L2 Dominance
1	22	Female	Right	8	6	A3 to B1	0.82	0.44	0.44
2	22	Male	Right	8	6	A1 to B2	0.89	0.41	0.50
3	21	Female	Right	8	7	A1 to B1	0.64	0.26	0.33
4	21	Female	Right	8	5	A2 to B2	0.43	0.43	0.23
5	22	Female	Right	8	5	A1 to B2	0.75	0.40	0.49
6	23	Female	Right	8	5	A2 to A3	1.00	0.91	0.77
7	22	Male	Right	8	5	A2 to A3	0.86	0.64	0.55
8	22	Female	Right	8	6	A2 to B3	0.79	0.89	0.42
9	22	Female	Right	8	5	A2 to B1	1.00	0.81	0.68
10	21	Female	Right	8	6	A1 to A3	0.89	0.79	0.53

Their language proficiencies were collected via Language History Questionnaire (Li et al., 2020). Every participant had Turkish as an A and English as an B language. The participants' reported L2 knowledge similar to each other ($M_{proficiency}$ = 0.80, *SD* = 0.17; $M_{immersion}$ = 0.59, *SD* = 0.23; $M_{dominance}$ = 0.49, *SD* = 0.15) and reported practising interpreting regularly for their course exams. Every participant's native language was Turkish. This is also important as the interpreting task are in EN-TR directionality.

3.2 MATERIALS

The experiment consists of eight simultaneous interpreting tasks, for which eight videos were specifically prepared. Firstly, the topics of the videos were determined to suit the variables (imageability and gesture production), because, for example, writing a high imagery text about a philosophical debate would be

unnatural and be picked up by the participants. The topics for the videos were identified as follows:

1. James Webb Space Telescope’s development and launch
2. The importance of hope during adolescence
3. Michelangelo's David and its effect on modern art
4. Differences between constructive and destructive criticism
5. Setting up a home office
6. Approaches of great philosophers towards change
7. A wildlife photographer’s trip to Africa
8. Evaluating success as a process and an outcome

The scripts for the speeches were prepared using ChatGPT-3. More than ten English prompts for each topic were generated. The result of each prompt was between 200 and 500 words, the combined word count was more than 3000 for one topic. These outcomes were cut, sewn together and edited by the researcher to around 750 words. These texts are presented in Appendix 3.

The length of the speeches was set at a maximum of 750 words. The 750-word mark was deliberate as research indicates that average daily speeches are spoken at a rate of around 190 words per minute, and less than 120 words per minute is considered slow (Brysbaert, 2019). With these in mind, the ~750-word texts would transform into ~6-minute videos with a “not so fast” speech rate of ~130 words per minute (Rayner & Clifton, 2009). The recorded videos turned out as calculated ($M_{\text{wordcount}}$ = 749.12, SD = 24.53; M_{wpm} = 127.25, SD = 4.62, $M_{\text{sentcount}}$ = 37.25, SD = 2,76; M_{duration} = 351, SD = 14.08).

3.2.1 Norming of Speeches

After the editing of the texts were completed, the texts were sent to the academic experts of the field as a rating questionnaire (see Appendix 4). The survey asked two questions for the source material, which were:

1. How easy/hard is this text's content to visualise mentally?
2. How easy/hard would it be to simultaneously interpret this text?

The answers were distributed to a seven-point Likert scale. For the imageability question the scale was 1 (no mental imagery) to 7 (very vivid mental image), for the interpreting question the scale was 1 (very easy to simultaneously interpret) to 7 (very hard to simultaneously interpret). The survey was answered by four field experts, who professors from Hacettepe University's English Translation and Interpreting department. Gunning Fog Index (Gunning, 1969), a preliminary measure of readability, was utilised to crosscheck comprehensibility results of the survey. Fog Index has a formula that calculates the comprehensibility of the text by the number of complex words and sentences. The average index result of the videos (M_{GFI} = 14.09, SD = 1.45) indicates that the texts are suitable to the understanding of a senior college student. This level of complexity suits the experiment very well as the interpreting task should not be either too basic or too difficult. The outcomes of the survey and variables are presented Table 3. The methodology of the norming is similar to the norming done by Korpal and Jasielska (2019) with improvements in the survey in terms of comparable difficulty and duration.

High and low imageability group comparison

The texts were normed in terms of imageability by using imageability norms of 3000 disyllabic words (Shock et al., 2012) Accordingly, the script of speeches was lexicalised and compared against the imageability normed list of 3000 words (Shock et al., 2012). Every comparison yielded more than 80 matches for each

text. A Welch t-test was performed to compare the high imageability texts with the low imageability texts. Welch t-test showed that there was a significant difference in imageability between the words in high imageability speeches (*M* = 8.88, *SD* = 0.27) and words in low imageability speeches (*M* = 3.06, *SD* = 0.16); *t*(4.17) = 7.15, *p* = .002.

High and low gesture frequency group comparison

Similarly, a Welch t-test was done to compare high gesture frequency texts with low gesture frequency texts. Welch t-test showed that there was a significant difference in the number of gestures performed by the speaker in high gesture frequency texts (*M* = 29.5, *SD* = 4.56) and low gesture frequency texts (*M* = 8.25, *SD* = 2.28); *t* (4.41) = 7.23 *p* = .001.

Length comparison between gesture groups

On the other hand, there was no significant difference in speech length between high gesture frequency speeches and low gesture frequency speeches or high imageability speeches and low imageability speeches (all *p*s > .05).

Two main variables were selected for the source material, the imageability of the texts and the number of gestures produced by the speaker. These two variables have been selected specifically for their shown interplay between them. An experimental study by Beattie and (2002) found that units with higher imageable units had higher gesture production, and gesture production's effect on recall, among other cognitive processes, were reviewed by Alibali et al (2000). Considering the positive effects of gesture production on word retrieval in L2 scenarios (Morett, 2018) investigating the imageability and its effect on interpreter's gesture production in a simultaneous interpreting scenario should contribute to the current literature.

Table 3. Descriptive Characteristics of the Speeches

Title	Imageability	Gesture Frequency	Word Count	Word per Minute	Sentence Count	Iconic Gestures	Beat Gestures	Total Gesture Count	Duration (sec.)	Calculated Imageability	Imageability Rating	Difficulty Rating	Gunning Fog Index
Change	Low	Low	707	120	34	5	3	8	351	3.4	2.5	3.25	13.97
Criticism	Low	High	770	128	36	16	9	25	360	3.43	2.5	3.5	16.27
David	High	Low	746	127	36	4	2	6	350	3.78	6	3	12.62
Home	High	High	757	130	39	26	11	37	348	4.08	5.5	3	11.78
Hope	Low	Low	752	124	36	6	1	7	362	3.48	4	2.5	15.43
Success	Low	High	784	130	42	25	4	29	361	3.07	3.25	3.25	14.81
Telescope	High	High	754	124	35	19	8	27	362	3.64	5.75	2.5	14.2
Wildlife	High	Low	723	135	40	3	9	12	320	4.35	6.25	2.5	13.69

To control the texts' imageability, four highly imageable and four low imageable topics were determined. Intrinsic properties of topics such as sculptures or wildlife make those texts easier to visualise mentally, thus the higher imageability values. The imageability of each text was calculated by matching their words with the largest imageability inventory, which included 3000 words (Schock et al., 2012). Each text had more than 70 matched words and the average of those were calculated (M_{high} = 3.96, SD = 0.18; M_{low} = 3.34, SD = 0.31). Note that the imageability values of each text was also asked to the field experts and the results were coherent (M_{high} = 5.87, SD = 0.71; M_{low} = 3.06, SD = 0.32).

Figure 3. Examples of the Speaker's Gesture Production

Gesture descriptions were inserted into every text. For the high gesture frequency texts, the number of gestures coded was 30 and for the low gesture frequency texts the number was five, however, the speaker was instructed that she was free to produce more gestures in the high production videos. Similarly, the speaker was instructed to produce gestures that felt natural while speaking. As a result, there were small increases and decreases in produced gestures by the speaker. The high gesture frequency texts (M_{iconic} = 21.5, *SD* = 4.79, M_{beat} = 8, *SD* = 2.94, M_{total} = 29.5, *SD* = 5.25) had ~30 gestures coded, while low gesture frequency ones (M_{iconic} = 4.5, *SD* = 1.29, M_{beat} = 3.75, *SD* = 3.59, M_{total} = 8.25, *SD* = 2.62) had ~8 gestures coded (see Figure 3).

Prepared texts were performed as a speech by a native speaker of English and full-time instructor at Hacettepe University School of Foreign Languages. She

volunteered for the study and the related consent form is presented in Appendix 7. Prior to the recording sessions, the researcher provided the coded texts and general knowledge on gestures such as basic types of gestures and other tips and the speaker was asked to wear the same attire for the sessions.

For the sessions, one of Hacettepe University School of Foreign Languages' Remote Teaching Studios (Figure 4) was used. These studios had professional lighting and sound insulation, creating an ideal environment for consistent video recordings.

Figure 4. Photographs of the Studio

In the studio, a table was placed longitudinally with the speaker sitting at one end and the recording equipment placed at the other end. For the camera an iPhone 12 Mini's main lens (f/1.6 aperture) was used, recording at 4K resolution with 60 frames per second. The phone was positioned with a tripod that held it just above the laptop's screen. The laptop was placed on an angled stand to keep it at eye level and had the speech displayed towards the speaker. The speech was displayed using an online teleprompter tool (www.telepromptermirror.com), the font size was adjusted to the speaker's preference and the scroll rate for the texts was kept the same for all eight recordings to ensure a steady speaking pace.

Since the studio provided excellent sound stage, the laptop's internal microphone was used used to record audio. All of the recordings were done offline with the phone saving the material both on device and to the laptop which was connected via USB cable. Multiple takes were taken for the recordings and, apart from adding black screen as intro and outro, none of the eight videos were edited or modified in any way. This was done in order to keep the natural flow of the speech and the gestures.

3.3 PROCEDURE

The experimental procedure consisted of 5 consecutive steps:

1. Email invitation
2. Demographic Information Form
3. Language History Questionnaire
4. Session date and time selection
5. Simultaneous interpreting tasks

The participants were contacted via e-mail which informed them about the researcher and the contents of the study. The e-mail included the appointment link and the two forms explained above. Every participant was assigned an ID for the Language History Questionnaire (Li et al., 2020) (see Appendix 6) and their related data was collected with that ID, not with their given names.

After the participants picked a date and time for the session, they received another e-mail that confirmed the session and included the Microsoft Teams link. Every participant received a reminding e-mail one hour prior to the session. The simultaneous interpreting sessions were conducted online over Microsoft Teams.

When the session started the details of the study and the fact that they can leave without any given reason were reminded to the participants. None of the participants were given any clue or instruction regarding their gesture production and they were instructed to not take notes during interpreting. In some cases, the researcher asked the participants to adjust their webcam angle.

Following that the participants were asked to interpret a “warm-up” video, which was picked from EU’s Speech Repository and the video was titled “Walking” (https://speech-repository.webcloud.ec.europa.eu/speech/walking-0). This warm-up interpretation served two purposes, enabled the researcher to test the audio and video quality and also preserved the integrity of the first “real” interpreting tasks as the participant would already be ready to interpret. The participants were told that they could stop interpreting the practice video when they felt ready for the main task. These warm-up interpretations were not included in the data analysis.

After the warm-up process was completed, the researcher reminded the participant that the main task was coming up and they were free to take short breaks between speeches. Then, the researcher sent the link to the first interpreting task to the participant. The order of the videos was counterbalanced and each participant interpreted the videos in the order determined by Latin Square.

During every interpreting task, the researcher’s microphone and webcam were off and after each task the researcher asked the participants whether they would like to take a break or not. Some of the participants did not feel the need to take any breaks until the mid-point while some participants took short breaks after every task. The length of these breaks did not exceed two to three minutes.

CHAPTER 4

FINDINGS

The penultimate Chapter of the thesis will present the analysis of the data collected and annotated from the experiment. This Chapter will include the methods and purpose of data analysis. The results will be presented in categories in relation to the research questions and with the necessary explanations. The results will be discussed in the following Chapter.

The collected data were analysed in R (R Core Team, 2024) first using Pearson's correlation test and second linear regression models. Linear regression models were utilised to investigate the causal relationship between the speaker's gesture production and the interpreters' gesture production.

4.1 GESTURE MIMICRY

The first section of the Findings Chapter is on Research Question 1 and in this section, the data is analysed for the correlation between the speaker's gesture production frequency and the interpreters' gesture production frequency.

Research Question 1: Do simultaneous interpreters produce gestures in proportion with the speaker? That is, do they gesture more frequently and more explicitly as the speaker does so and vice-versa?

In this regard, it is important to discuss gestural mimicry. Gestural mimicry refers to the speaker's gesture production influencing the listener's gesture production (Kimbara, 2006). In the specificity of the presented thesis, gesture mimicry refers to the interpreters' gesture production increasing or decreasing in relation to the speaker's gesture production. In basic terms, in the high gesture production

videos the interpreters are expected to produce more gestures overall and vice versa.

The investigation of this effect was conducted by Pearson's correlation tests and linear regression models. Overall, when the data were analysed without any regard to gesture types or synchronisation, no correlation was found between the speaker's gesture frequency (M = 9.44, SD = 7.74) and the interpreters' gesture frequency (M = 4.22, SD = 4.54); $r(318) = .09$, $p = .11$.

Similarly, linear regression models were fitted to investigate the overall causal relationship between the speaker's and the interpreters' gesture frequency. Results show that overall, when all speech types were included, speaker gesture frequency did not predict interpreters' gesture frequency; $B = 0.05$, $t = 1.6$, $p = .11$.

4.1.1 Gesture Synchronisation

Gesture mimicry is a well-known concept in the gesture literature (Kimbara, 2006). The presented thesis' experiment design takes it one step ahead by integrating gesture mimicry into the temporal nature of simultaneous interpreting. In this regard, gesture synchronisation refers to the interpreter mimicking the speaker's gesture both in terms of type and timing.

Assume that the speaker says a sentence with the verb "throw" in it and produces an iconic gesture to describe throwing, synchronisation means the interpreter produced the same gesture at the same time. Therefore, the interpreter produced an iconic gesture depicting the act of throwing. The investigation of simultaneous interpreter's gestures' synchronicity in terms of both gesture type and timing is, to the best of our knowledge, a first in the field and has great implications interdisciplinarity as it is a temporal concept investigated in a multilingual and multimodal context. In this section, data subsets are introduced for analysing the

correlation between the speaker's gesture production frequency and the interpreters' gesture production frequency.

As expected, the results showed that there was a positive correlation between the speaker's gesture production (*M* = 9.44, *SD* = 7.75) being synchronised by the interpreter's gesture production (*M* = 3.7, *SD* = 3.89); *r*(158) = .44, *p* > .0001. These results show a significant positive correlation between the speaker's gestures being mimicked both in terms of type and synchronisation.

Correlations were also investigated within non-synchronised gestures of the interpreters. Results showed that there was a negative correlation between the speaker's non-synchronised gestures frequency (*M* = 9.44, *SD* = 7.75) and interpreters' non-synchronised gesture frequency (*M* = 4.75, *SD* = 5.06); *r*(158) = -.18, *p* = .02. This outcome supports the above-presented result. In the data set of gestures produced by the interpreters, the increase in synchronised gestures naturally decreases the amount of non-synchronised gestures (Figure 5).

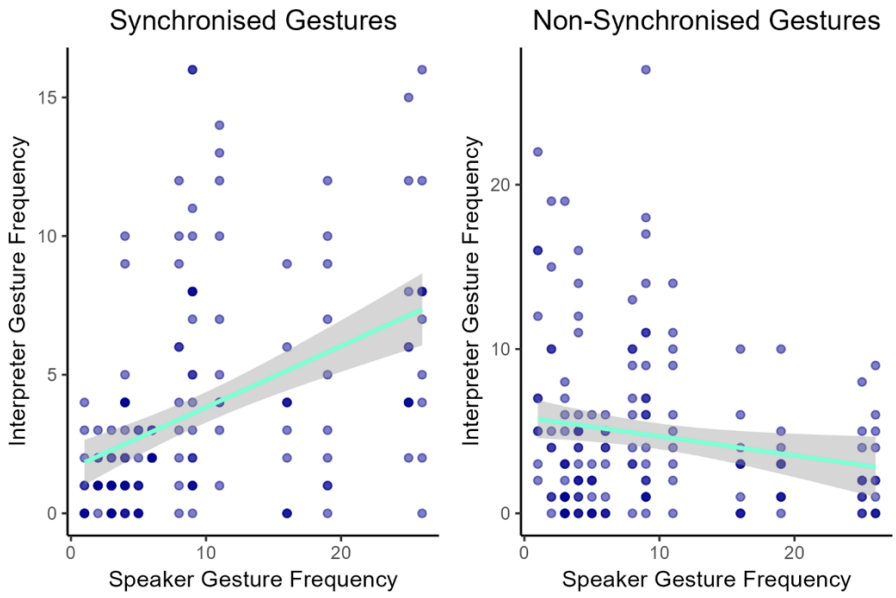


Figure 5. Scatterplot of Interpreters' Synchronised Gesture Frequency (the graph on the left visualises the positive correlation between the speaker's gesture

production and the interpreters synchronised gesture production, the graph on the right visualises the negative correlation between the speaker's gestures frequency and interpreters' non-synchronised gesture production.

4.1.2 Gesture Types and Synchronisation

The data analysis and subsets in this section are similar to that of 4.1.1., however, linear regression models are utilised to uncover the cause-and-effect relationship observed in the previous section.

When gesture types and synchronisation are analysed as data sets, the results are even more illuminating. Starting off with iconic gestures, results show that there was a direct effect between the speaker's iconic gesture production and the interpreter's iconic gesture production; $B = 0.15$, $t = 6.37$, $p < .0001$. When combined with synchronicity, the correlation is significant. Speaker's iconic gesture production predicted interpreter's iconic gesture synchronisation; $B = 0.25$, $t = 7.23$, $p < .0001$. Non-synchronised iconic gestures also show significant effect, although not as strong; the speaker's iconic gesture production predicted interpreters producing more iconic gestures non-synchronically; $B = 0.05$, $t = 2.0$, $p = .05$.

Similar results were also present in the investigation of beat gestures. Results show that there was an interaction effect between the speaker's beat gesture production and the interpreter's beat gesture production; $B = 0.26$, $t = 2.27$, $p = .025$. When combined with synchronicity, the correlation is even more significant. Speaker's iconic gesture production predicted the interpreter's iconic gesture synchronisation; $B = 0.63$, $t = 5.77$, $p < .0001$. Non-synchronised beat gestures p value is barely above 0.5 and the correlation is minimally negative, suggesting that the speaker's beat gesture production does not predict interpreter's producing more beat gestures non-synchronically; $B = -0.1$, $t = -0.6$, $p = .06$ (Figure 6).

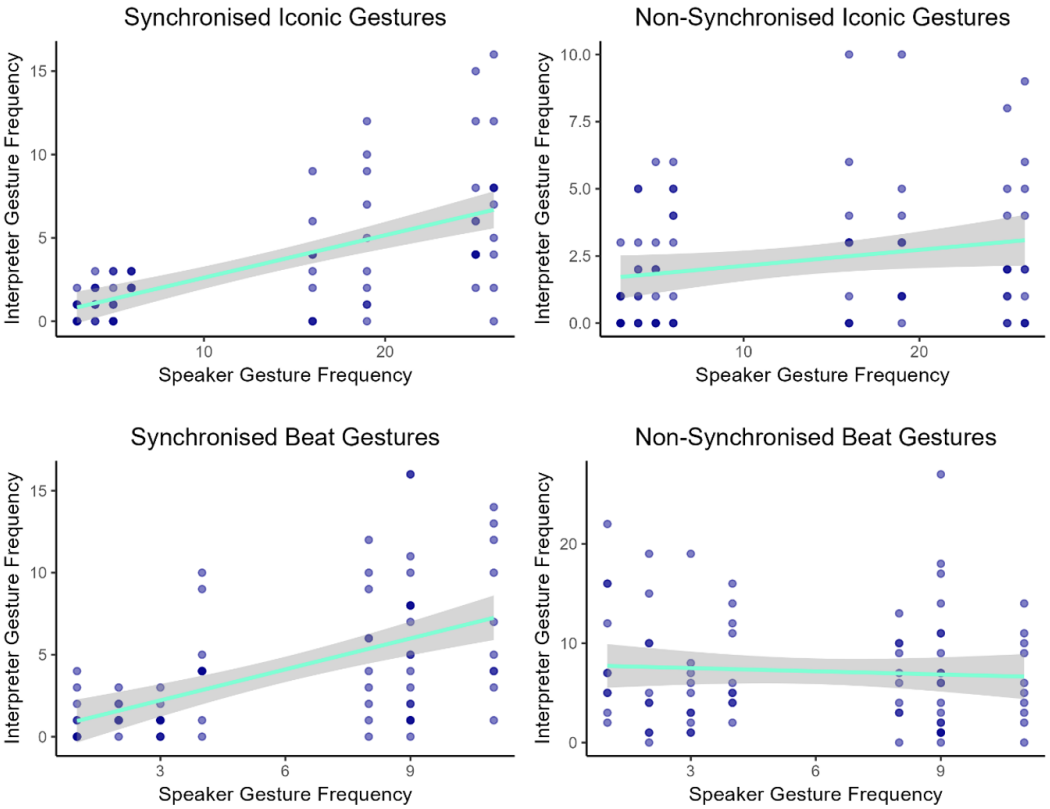


Figure 6. Scatterplot of Interpreters' Synchronised Gesture Frequency by Gesture Types (the graphs on top visualise the positive correlations between the speaker's iconic gesture production and the interpreters' iconic gesture production in synchronisation and non-synchronisation, the graphs below visualise the interaction between the the speaker's beat gesture production and the interpreters' beat gesture production in synchronisation and non-synchronisation)

The analysis presented in Section 4.1 investigated the effect of the speaker's gesture production on the interpreters' gesture production as per Research Question 1. Without any subsets, the data did not suggest a predictive effect, however, the data showed multiple significant predictive effects when the subsets of synchronisation, non-synchronisation and gesture types were included in the correlative data analysis. The predictive effect of the speaker's gestures being mimicked is especially strong in two conditions: as an overall effect in synchronised gesture subset and synchronised iconic gesture subset.

4.2 IMAGEABILITY AND GESTURES

The second section of the Findings Chapter is on Research Question 2 and in this section, the data is analysed for the relationship between the source speeches' imageability and the interpreters' gesture production frequency.

Research Question 2: Do simultaneous interpreters' gestures change as a function of the imageability of the source speech?

As every source speech was normed in terms of its imageability value, the data analysis of imageability on the interpreters' gesture production was done with linear regression models both in entirety and data sets.

Results show that overall, there was no interaction between the imageability of source speeches and the effect of speaker gesture frequency on interpreters' gesture frequency; $B = 0.01$, $t = 1.68$, $p = .01$. To further analyse the effect of imageability, two main subsets were created. These are gesture types and gesture synchronicity.

For iconic gestures, the results show that there was a strong interaction effect between the imageability of the source speech and the iconic gesture production of the speaker on the iconic gesture production of the interpreter; $B = 0.04$, $t = 6.27$, $p < .0001$. For beat gestures, the results show that there was an interaction effect between the imageability of the source speech and the beat gesture production of the speaker on the beat gesture production of the interpreter; $B = 0.05$, $t = 1.91$, $p = .05$.

In synchronised iconic gestures, results show that there was a strong interaction effect between the source speech's imageability and the interpreter's synchronised iconic gesture production; $B = 0.06$, $t = 7.01$, $p < .0001$. In synchronised beat gestures, results show a significant interaction between the

source speech's imageability and the interpreter's synchronised beat gesture production; $B = 0.13$, $t = 4.93$, $p < .0001$.

In non-synchronised iconic gestures, results show interaction effect between the source speech's imageability and the interpreter's non-synchronised iconic gesture production; $B = 0.01$, $t = 1.97$, $p = .05$. Though the effect is lesser, this finding reinforces the relation between iconic gestures and imageability. In non-synchronised beat gestures, results do not show an interaction between the source speech's imageability and the interpreter's non- synchronised beat gesture production; $B = -0.02$, $t = -0.65$, $p = .5$.

When the interaction between imageability and synchronicity is investigated without gesture types, both results are significant. Results show that the imageability value positively predicted the interpreters' synchronising the speaker's gestures; $B = 0.06$, $t = 6.13$, $p < .0001$. In terms of non-synchronised gestures, results show that the imageability value negatively predicted the interpreters' not synchronising the speaker's gestures; $B = -0.03$, $t = -6.13$, $p = .03$. This means that the interpreters' synchronised the gestures that accompanied higher imageability words more often.

The analysis presented in Chapter 4.2 investigated the effect of source speeches'' imageability on the interpreters' gesture production as per Research Question 2. Similar to Chapter 4.1, when no subsets are introduced, the data did not indicate a predictive effect between source speeches'' imageability on the interpreters' gesture production. The most significant finding, in terms of both literature and this study, is the interaction regarding gesture types. Both for iconic and beat gesture types, the source speeches' imageability predicted the interpreters' synchronising the speaker's gestures. Similar effect is also strongly present regarding iconic gestures, hinting at a connection between iconic gestures and imageability, which is discussed further in the following Chapter.

Chapter 4 presented the analysis of the data collected from the interpreting task. The data analysis of gesture mimicry was conducted both in terms of synchronicity and gesture types. Overall, there are multiple statistically significant results supporting Research Question 1. The data analysis of the effect of imageability on the interpreters' gesture production was conducted both in terms of synchronicity and gesture types. There are also multiple statistically significant results illuminating Research Question 2.

Altogether, there are multiple results that confirm Expectation 1 and 2. The analysed data is discussed in the following chapter along with the research design's limitations and the results' implications. Likewise, the results' correspondence with Expectation 1 and 2 including the unique propositions contributed to the literature by the presented thesis.

DISCUSSION AND CONCLUSION

The ultimate Chapter of the presented thesis will conclude the study by first discussing the results. The data analysed in the previous Chapter will be discussed with its implications and limitations. Based on the implications, the contributions to the body of research will be shared and based on the limitations, possible future studies will be proposed.

Discussion

The data analysis presented in the previous chapter has shown supporting results to both research questions. However, this was not the case when the data was analysed as a whole; without including gesture types or synchronisation, the data does not indicate an interaction between the speaker's gesture frequency (M = 9.44, SD = 7.74) and the interpreters' gesture frequency (M = 4.22, SD = 4.54); $r(318) = .09$, $p = .11$. In the same fashion, without including gesture types or synchronisation the data does not indicate a predictive effect between the imageability of source speeches and the effect of speaker gesture frequency on interpreters' gesture frequency (B = 0.01, t = 1.68, p = .01).

This outcome resulting from a very wide data analysis approach is not surprising when the idiosyncratic gesture production differences between the participants is considered. A few participants' gesture production was not consistent between two videos that included the same two variables (e.g., low gesture frequency and high imageability), hinting at the inherent idiosyncrasy in gestures. Having two sets of variables of the same combination enabled this sort of an explanation and, though with a smaller sample group, the idiosyncrasy of interpreters' gesture production was observed in another simultaneous interpreting study (Zagar Galvão, 2020).

Although the data does not show an overall correlation, when gesture types, mimicry and synchronisation are included in the data analysis, the results significantly and uniquely support Expectation 1. Before delving into the results with the aforementioned categories, it is important to define gesture mimicry and gesture synchronisation. Gestural mimicry refers to the speaker's gesture shaping the listener's gesture in terms of form (Kimbara, 2006). In the experimental design of this thesis, the listeners are the participants interpreters and mimicry in this context means the interpreters producing gestures of the same type as the speaker. Gesture mimicry constitutes one half of the first Expectation.

Research Question 1: Do simultaneous interpreters produce gestures in proportion with the speaker? That is, do they gesture more frequently and more explicitly as the speaker does so and vice versa?
Expectation 1: Participants produce gestures in direct proportion with the speaker. That is, they gesture more frequently and more explicitly as the speaker does so and vice-versa.

This hypothesis is supported by both gesture types included in the experiment design. Results show a strong interaction effect between the speaker's iconic gesture production and the interpreter's iconic gesture production ($B = 0.15$, $t = 6.37$, $p < .0001$) and also an interaction effect between the speaker's beat gesture production and the interpreter's beat gesture production ($B = 0.26$, $t = 2.27$, $p < .025$). This means that the more iconic gestures the speaker produces, the more iconic gestures the interpreters produce. Same interaction is also the case for beat gesture mimicry. The interaction effect of iconic gestures is significant and it is most probably due to the source speeches including more iconic gestures than beat gestures (total iconic gesture count: 104, total beat gesture count: 47). The stimuli was intentionally created as such because the ratio of iconic and beat

gestures are close to this ratio (~2:1) in normal communication (Clough & Duff, 2020).

Gesture synchronicity constitutes the second half of Expectation 1. Gesture synchronicity refers to the interpreters' gestures matching the speaker's gestures both in terms of type and timing. For a gesture to be synchronised, the interpreters' gesture must be performed in relation to the same word as the speaker's gesture, whereas gesture mimicry refers to overall changes in gesture production in that condition. An example is as follows; the speaker says the word "throw" in a sentence and produces an iconic gesture depicting the act of throwing while saying it, then during interpreting that sentence, the interpreter says the translation of "throw" and produces an iconic gesture depicting the act of throwing. This temporal matching of gesture production is enabled by the dual-channel nature of simultaneous interpreting as the source speech and its interpretation is delivered simultaneously. To the best of our knowledge, this sort of gesture analysis is the first in interpreting studies literature.

The effect of synchronisation is strong both overall and with gesture types. As an overall effect, the data shows a positive correlation between the speaker's gesture production (M = 9.44, SD = 7.75) being synchronised by the interpreter's gesture production (M = 3.7, SD = 3.89; $r(158) = .44$, $p > .0001$), meaning that the interpreters synchronised the speaker's gestures on the whole. Simply put, the interpreters tend to match the speaker's gestures in type and timing, and this effect is in proportion with the speaker's gesture production. This result is further supported by the negative correlation ($r[158] = -.18$, $p = .02$) of non-synchronised gestures. Together, these results hint that the interpreter's gesture production is tied to the speaker's gesture production and an increase in synchronisation results in a decrease in non-synchronised gesture production because of the speaker's gesture production being a set amount.

Even more importantly, this synchronisation effect is also present in gesture types. The predictive effect between the speaker's iconic gesture production and interpreters' synchronisation is significant (B = 0.15, t = 6.37, p < .0001). This means that the increase in speaker's iconic gesture production predicts the interpreters synchronising those iconic gestures. In terms of iconic gestures, non-synchronous iconic gestures also show predictive effect, though not as strong (B = 0.05, t = 2.0, p = .05). When expounded together, these two results show a significant interaction between the speaker's iconic gesture frequency and the interpreters' iconic gesture frequency. The increase in speaker's iconic gesture frequency results in significant increase in iconic gesture synchronisation and overall iconic gesture production of the interpreters.

The analysis of beat gestures within gesture synchronisation also yields significant results. Speaker's iconic gesture production significantly predicts the interpreter's iconic gesture synchronisation (B = 0.63, t = 5.77, p < .0001). Even though the predictive effect is significant (p < .0001), unlike non-synchronic iconic gestures, non-synchronous beat gesture analysis is not statistically significant (B = -0.1, t = -0.6, p = .06). The increase in speaker's beat gesture frequency results in significant increase in beat gesture synchronisation but has no effect on overall beat gesture production of the interpreters.

All in all, it is fair to say that Expectation 1 held true. Even though no over-arching effect of gesture production effect was observed without any categorisation, when the full extent of the experiment design (gesture types, mimicry, synchronisation) is integrated in the data analysis the collected data shows multiple significant results. A positive predictive effect in iconic gesture mimicry and beat gesture mimicry both observed with iconic mimicry showing significant interaction (p < .0001). The predictive effect is statistically significant in all three of the conditions: as an overall effect and in iconic and beat gesture types (all ps < .0001).

The results of gesture mimicry and synchronisation are highly promising for cognitive interpreting studies literature for two reasons:

1. The interpreting studies literature on gesture mimicry is limited (Zagar Galvão, 2020) and this study advances that literature by significant results in iconic and beat gesture mimicry in simultaneous interpreting.
2. The synchronisation effect is a first in the field and is strongly supported by the results of this study both as an overall effect and also in terms of iconic and beat gestures.

With the Expectation 1's related data analysis and results discussed; the following paragraphs will discuss Expectation 2:

Research Question 2: Do simultaneous interpreters' gestures change as a function of the imageability of the source speech?
Expectation 2: Participants gesture more frequently when they are interpreting low imageable speeches (i.e., speeches describing objects and concepts that are harder to visualise mentally).

Here, we expect the interpreter participants to produce more gestures while interpreting speeches with low imageability. This expectation assumes that since the low imageability words are harder to visualise mentally, they would require more mental effort to interpret into Turkish, hence creating more cognitive load and resulting in more gesture production to compensate for low imageability. This assumption mainly covers iconic gestures as they are closely related to mental imagery (Hadar & Butterworth, 1997). However, the research body on imageability and iconic gestures is vast and mixed in terms of their relationship (Beattie and Shovelton, 2002). Consequently, it is not unreasonable to expect high imageability words resulting in more gesture production, polar opposite of Expectation 2.

Beat gestures on the other hand, are associated with enhancing word recall and speech parsing (Biau & Soto Faraco, 2013). As a result, the result of their production is tied to which imageability condition results in more cognitive load than the other in the specificity of this experiment design. The elements of which investigate the concept of imageability during simultaneous interpreting.

When analysed without any categorisation, the data does not suggest an overall predictive effect between source speech imageability and interpreter gesture production ($B = 0.01$, $t = 1.68$, $p = .01$), however, when gesture types, mimicking and synchronisation are incorporated in the analysis, the data suggests multiple statistically significant results. For the sake of clarity, the discussion of the effect of imageability is done in two branches: iconic gestures and beat gestures.

The data shows a predictive effect between source speech's imageability and the interpreter's iconic gesture production ($B = 0.04$, $t = 6.27$, $p < .0001$). Simply put, the interpreters produce more iconic gestures while interpreting highly imageable speeches. This result is further supported by another predictive effect between the source speech's imageability and the interpreter's synchronised iconic gesture production ($B = 0.06$, $t = 7.01$, $p < .0001$). Simply put, the interpreters synchronised the speaker's iconic gestures in highly imageable speeches. These two results strongly highlight that high imageability has a positive predictive effect on the interpreter's iconic gesture production. The non-synchronised gestures do not show any effect ($B = 0.01$, $t = 1.97$, $p = .05$) and it is most likely due to the iconic synchronisation effect being significant ($p < .0001$), resulting in most of the iconic gestures produced by the interpreters being synchronised.

In terms of beat gesture production of the interpreters, the data does not show significant results as an overall effect and in non-synchronised gestures. It is not surprising to see both overall and non-synchronised beat gestures not significant as there were fewer beat gestures coded into the source speeches. Yet, the data shows a significant predictive effect between the source speech's imageability

and the interpreter's synchronised beat gesture production (B = 0.13, t = 4.93, p < .0001), similarly, though to a lesser significance, the interaction between the imageability of the source speech and the beat gesture production of the speaker predicted the beat gesture production of the interpreter (B = 0.05, t = 1.91, p = .05).

These results are probably due to two factors, one of the reasons being that beat gestures generally are easier to mimic and synchronise. An iconic gesture depicts an act or an event to an extent and, as a result, has to convey more information which makes the gesture more complicated and more cognitively demanding to produce. On the other hand, beat gestures are relatively more basic gestures such as counting with fingers or simply word stressing moves such as underlying with an open palm etc.

The second factor is similar to the reason for the high interaction between iconic gestures and gesture synchronisation, therefore should be discussed together. The imageability results discussed contradict Expectation 2 in a positive way. These strong predictive effects regarding imageability is probably due to the embodiment of mental imageries activated by high imageability words (McNeill et al., 2008). We expected the higher cognitive load resulting from low imageability words would be visible in gesture production, however, the results strongly suggest that higher imageability speeches result in higher gesture production by the interpreters. This relationship between gestures, especially iconic gestures, and imageability was discussed in Chapter 2.2, 2.4 and 4.2. The imageability literature has supporting studies to both of the approaches (Beattie and Shovelton, 2002) and it seems that our results strongly support mental imagery being embodied. Though this is in stark contradiction to Expectation 2, it is as important, if not more important, contribution to the body of research.

The results of the effect of imageability on interpreters' gesture production are highly promising for cognitive interpreting studies literature for two reasons:

1. These results advance the body of research on imageability and simultaneous interpreting by showing its relationship with gesture production and gesture types.
2. Similarly, these results provide our field with an interdisciplinary opening as they contribute to a highly interdisciplinary field of imagery and imageability with experimental results.

In summary, this Chapter has discussed the results presented in Chapter 4. Overall, there are multiple significant results in all of the included factors. The results further advance the literature on gesture mimicry in simultaneous interpreting, the experimental design and its supporting results introduce a new concept to gesture studies in the form of gesture synchronisation and the highly cognitively demanding and multilingual context of simultaneous interpreting provide the body of research on imageability with unique and significant outcomes. The listed implications will be discussed in the following Chapter.

Implications

Simultaneous interpreting is inherently multimodal (Arbona et al., 2023b) and multilingual. These traits render the field and the practice of interpreting very interesting especially for concepts and frameworks related to multimodality and multilingual contexts. Simultaneous interpreting is also a cognitively demanding task (Kade & Cartellieri, 1971). Combining these traits together proves a suitable testbed for investigating the cognitive functions effective during simultaneous interpreting.

The presented experimental design investigated the effect of speaker's gesture production and speech imageability by quantifying the participant interpreters' gesture production. This was done on the basis of embodied cognition (Paivio, 1990), essentially suggesting that the activated mental imageries and the resulting cognitive load is visible in bodily actions. In that regard, the presented study took gesticulations as the primary embodiment of cognitive load since the

literature on gesture production during cognitive load and gestures' relationship with imageability is well established.

For the reasons presented above, the presented thesis is interdisciplinary and the discussed results have the potential to contribute to multiple research disciplines. First, this study advances the cognitive interpreting studies field by further supporting gestural mimicry (Kimbara, 2006; Zagar Galvão, 2020) and, even more importantly, introducing the gesture synchronisation both as a concept and a shown effect. From a broader perspective, this study highlights the importance of visual access and hints at a potential benefit in interpreting training in terms of non-verbal communication.

Second, this study investigated response to cognitive load in the cognitively demanding and multilingual context of simultaneous interpreting. The presented results support the view of embodied cognition and highlight the specific cognitive functions of gesture types. Also benefiting from the multimodal approach of communication studies, this study highlights how gesticulations help the speaker cognitively.

Third, and also in the cognitive vein, this study investigated the effect of imageability on gesture production. In that, the study's results shed light on the relationship between mental imagery and gesture types. The simultaneous interpreter's being speaker and listener simultaneously in the interdisciplinary crossroad of gesture studies and imageability has granted this experiment design the possibility to present unique propositions to multiple fields, to our delight, the data delivered the expected results.

Limitations

The limitations of the presented study can be listed under two main categories: sample group and experimental design. Sampling limitations is a prevalent factor in interpreting studies literature as it is generally hard to have many professional or senior student participants. The presented study had 10 participants, which is more than almost all the previous studies investigating gesture in simultaneous interpreting with a long (2 minutes or higher) interpreting task (Stachowiak-Szymczak, 2019 (18 participants); Zagar Galvão, 2020 (2 participants); Martín de León & Fernández Santana, 2021 (4 participants), however, the number of participants is still lacking in terms of experimental study standards. This matter can also explain the difficulty to find overall effects.

The second set of limitations are related to reasons that were beyond control. Due to the devastating and sorrowful earthquake that happened on the 6th of February, one of the participants completed the simultaneous interpreting task at the Simultaneous Interpreting Laboratory at Hacettepe University, while the other nine participants completed the simultaneous interpreting tasks remotely. Even though this inconsistency is a limitation, the experiment showed the effect of gesture synchronisation in a remote interpreting setting, which has been gaining more relevance since the global pandemic.

Future Studies

Apart from the improvements of the above-mentioned limitations, recommendations for future research are twofold. First, this study can be extended by cross-cultural investigation. As gestures are a natural part of communication, they are highly cultural, for this reason interpreters from different cultures might produce gestures in different ratios or frequencies. For example, an interpreter from a different culture might be more reserved in terms of gesture production or produce only small beat gestures.

Second, this study can be extended by a longitudinal experiment design. Even though the combined literature of experimental psychology and cognitive interpreting studies have a good understanding of cognitive gesture functions, the effects of speaker's gesture production on interpreter training are unknown. Even though there are other limiting factors for this type of a study (such as sample group and coordination) the results of this sort of an experimental design have the potential to contribute to the said fields.

Conclusion

Simultaneous interpreting has an interesting proposition in terms of cognitive processing. This proposition results from the simultaneous interpreter fulfilling two communicative roles concurrently: being the listener and the speaker. The presented thesis herein essentially expanded on this concept by the integration of multimodality, gestures and imageability into cognitive interpreting studies. Said expansion mainly is a result of a unique experimental design that utilised an observational and quantifiable measuring method: gesticulations.

Experimental design allowed the gesticulations to be investigated both as the speaker's production tool and also as the listener's comprehension tool. The cognitively demanding nature of simultaneous interpreting enabled closely related concepts of imageability and gesture types to be investigated at play during an extreme language task. This investigation was carried out in a proper simultaneous interpreting scenario with variables manipulated into the source speeches.

The analysis of the collected and annotated data resulted in statistically significant results in both gesture types and imageability. The results advanced the concept of gesture mimicry in simultaneous interpreting and further advanced the integration of gestures into cognitive interpreting studies by introducing

gesture synchronisation and demonstrating it experimentally. And perhaps most importantly, these results further establish the inherent interdisciplinarity of interpreting studies and contribute to its stakeholder fields thanks to its multimodal and multilingual nature.

BIBLIOGRAPHY

Alibali, M. W., Kita, S., & Young, A. J. (2000). Gesture and the process of speech production: We think, therefore we gesture. *Language and Cognitive Processes*,*15*(6), 593–613. https://doi.org/10.1080/016909600750040571

Arbona, E., Seeber, K. G., & Gullberg, M. (2023a). Semantically related gestures facilitate language comprehension during simultaneous interpreting. *Bilingualism: Language and Cognition*, *26*(2), 425–439. https://doi.org/10.1017/S136672892200058X

Arbona, E., Seeber, K. G., & Gullberg, M. (2023b). The role of manual gestures in second language comprehension: A simultaneous interpreting experiment. *Frontiers in Psychology*, *14*, 1188628. https://doi.org/10.3389/fpsyg.2023.1188628

Arnell, K. M., Helion, A. M., Hurdelbrink, J. A., & Pasieka, B. (2004). Dissociating sources of dual-task interference using human electrophysiology. *Psychonomic Bulletin & Review*, *11*(1), 77–83. https://doi.org/10.3758/BF03206464

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: a proposed system and its control processes. In *Psychology of Learning and Motivation* (Vol. 2, pp. 89–195). Elsevier. https://doi.org/10.1016/S0079-7421(08)60422-3

Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, *22*(4), 577–660. https://doi.org/10.1017/S0140525X99002149

Bates, E. (1976). *Language and context: The acquisition of pragmatics*. Academic Press.

Beattie, G., & Coughlan, J. (1999). An experimental investigation of the role of iconic gestures in lexical access using the tip-of-the-tongue phenomenon. *British Journal of Psychology*, *90*(1), 35–56. https://doi.org/10.1348/000712699161251

Beattie, G., & Shovelton, H. (2000). Iconic hand gestures and the predictability of words in context in spontaneous speech. *British Journal of Psychology*, *91*(4), 473–491. https://doi.org/10.1348/000712600161943

Beattie, G., & Shovelton, H. (2002). What properties of talk are associated with the generation of spontaneous iconic hand gestures? *British Journal of Social Psychology*, *41*(3), 403–417. https://doi.org/10.1348/014466602760344287

Bernard, J. A., B. Millman, Z., & Mittal, V. A. (2015). Beat and metaphoric gestures are differentially associated with regional cerebellar and cortical volumes. *Human Brain Mapping*, *36*(10), 4016–4030. https://doi.org/10.1002/hbm.22894

Biau, E., & Soto-Faraco, S. (2013). Beat gestures modulate auditory integration in speech perception. *Brain and Language*, *124*(2), 143–152. https://doi.org/10.1016/j.bandl.2012.10.008

Blamey, P. J., Artières, F., Başkent, D., Bergeron, F., Beynon, A. J., Burke, E., Dillier, N., Dowell, R. C., Fraysse, B., Gallego, S., Govaerts, P., Green, K., Huber, A., Kleine-Punte, A., Maat, B., Marx, M., Mawman, D., Mosnier, I., O'Connor, A. F., . . . Lazard, D. S. (2012). Factors affecting auditory performance of postlinguistically deaf adults using cochlear ımplants: an update with 2251 patients. *Audiology & Neuro-otology*, *18*(1), 36–47. https://doi.org/10.1159/000343189

Brysbaert, M. (2019). How many words do we read per minute? A review and meta-analysis of reading rate. Journal of Memory and Language, 109, 104047. https://doi.org/10.1016/j.jml.2019.104047

Burianová, H., Marstaller, L., Sowman, P., Tesan, G., Rich, A. N., Williams, M., Savage, G., & Johnson, B. W. (2013). Multimodal functional imaging of motor imagery using a novel paradigm. *NeuroImage*, *71*, 50–58. https://doi.org/10.1016/j.neuroimage.2013.01.001

Bühler, H. (1986). Linguistic (semantic) and extra-linguistic (pragmatic) criteria for the evaluation of conference interpretation and interpreters. *De Gruyter*, *5*(4), 231–236. https://dl.acm.org/citation.cfm?id=18979

Caplan, J. B., & Madan, C. R. (2016). Word ımageability enhances association-memory by ıncreasing hippocampal engagement. *Journal of Cognitive Neuroscience*, *28*(10), 1522–1538. https://doi.org/10.1162/jocn_a_00992

Cassell, J., McNeill, D., & McCullough, K.-E. (1999). Speech-gesture mismatches: Evidence for one underlying representation of linguistic and nonlinguistic information. *Pragmatics & Cognition*, *7*(1), 1–34. https://doi.org/10.1075/pc.7.1.03cas

Chernov, G. V. (1979). Semantic aspects of psycholinguistic research in simultaneous ınterpretation. *Language and Speech*, *22*(3), 277–295. https://doi.org/10.1177/002383097902200308

Chernov, G. V. (1994). Message redundancy and message anticipation in simultaneous interpreting. In S. Lambert & B. Moser-Mercer (Eds.), *Benjamins Translation Library* (Vol. 3, p. 139). John Benjamins Publishing Company. https://doi.org/10.1075/btl.3.13che

Chu, M., & Kita, S. (2011). The nature of gestures' beneficial role in spatial problem solving. *Journal of Experimental Psychology: General*, *140*(1), 102–116. https://doi.org/10.1037/a0021790

Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review*, *3*(3), 149–210. https://doi.org/10.1007/BF01320076

Clough, S., & Duff, M. C. (2020). The role of gesture in communication and cognition: ımplications for understanding and treating neurogenic communication disorders. *Frontiers in Human Neuroscience*, *14*, 323. https://doi.org/10.3389/fnhum.2020.00323

Cook, S. W., Yip, T. K., & Goldin-Meadow, S. (2012). Gestures, but not meaningless movements, lighten working memory load when explaining math. *Language and Cognitive Processes*, *27*(4), 594–610. https://doi.org/10.1080/01690965.2011.567074

Cowan, N. (2008). Chapter 20 What are the differences between long-term, short-term, and working memory? In *Progress in Brain Research* (Vol. 169, pp. 323–338). Elsevier. https://doi.org/10.1016/S0079-6123(07)00020-9

Daro, V., & Fabbro, F. (1994). Verbal memory during simultaneous ınterpretation: effects of phonological ınterference. *Applied Linguistics*, *15*(4), 365–381. https://doi.org/10.1093/applin/15.4.365

Dellantonio, S., Job, R., & Mulatti, C. (2014). Imageability: Now you see it again (albeit in a different form). *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.00279

Duncan, S. (2013). 65. Transcribing gesture with speech. In C. Müller, A. Cienki, E. Fricke, S. Ladewig, D. McNeill, & S. Tessendorf (Eds.), *Handbücher zur sprach- und kommunikationswissenschaft / Handbooks of Linguistics and Communication Science (HSK) 38/1* (pp. 1007–1014). DE GRUYTER. https://doi.org/10.1515/9783110261318.1007

Fontaine, P., & De Lannoy, J. (1992). Gestures and speech: psychological investigations. *Choice/Choice Reviews*, *29*(08), 29–4803. https://doi.org/10.5860/choice.29-4803

Forceville, C. (2006). Non-verbal and multimodal metaphor in a cognitivist framework: Agendas for research. In G. Kristiansen, M. Achard, R. Dirven, & F. J. Ruiz De Mendoza Ibáñez (Eds.), *Cognitive Linguistics: Current Applications and Future Perspectives* (pp. 379–402). Mouton de Gruyter. https://doi.org/10.1515/9783110197761.5.379

Forceville, C. (2021). Multimodality. In X. Wen & J. R. Taylor (Eds.), *The Routledge handbook of cognitive linguistics* (1st ed., pp. 676–687). Routledge. https://doi.org/10.4324/9781351034708-45

Fröhlich, M., Sievers, C., Townsend, S. W., Gruber, T., & Van Schaik, C. P. (2019). Multimodal communication and language origins: Integrating gestures and vocalizations. *Biological Reviews*, *94*(5), 1809–1829. https://doi.org/10.1111/brv.12535

Gaiba, Francesca (1998): The origins of simultaneous interpretation: The Nuremberg Trial, Ottawa, University of Ottawa Press. *Meta: Journal des traducteurs*, *44*(3), 511. https://doi.org/10.7202/001948ar

Gao, W. (2011). *Coherence in simultaneous interpreting : an idealized cognitive model perspective*. https://www.ros.hw.ac.uk/bitstream/handle/10399/2504/GaoW_1111_sml.pdf?sequence=1&isAllowed=y

Gerver, D. (1975). A psychological approach to simultaneous interpretation. *Meta: Journal des traducteurs*, *20*(2), 119. https://doi.org/10.7202/002885ar

Giard, M. H., & Peronnet, F. (1999). Auditory-visual ıntegration during multimodal object recognition in humans: a behavioral and electrophysiological study. *Journal of Cognitive Neuroscience*, *11*(5), 473–490. https://doi.org/10.1162/089892999563544

Gile, D. (2009). *Basic concepts and models for ınterpreter and translator training: revised edition* (2nd ed., Vol. 8). John Benjamins Publishing Company. https://doi.org/10.1075/btl.8

Gile, D. (2016). *The Effort Models—Clarifications and update*. https://doi.org/10.13140/RG.2.1.4221.7849

Gillespie, A., & Graham, S. (2014). A meta-analysis of writing ınterventions for students with learning disabilities. *Exceptional Children*, *80*(4), 454–473. https://doi.org/10.1177/0014402914527238

Goldin-Meadow, S., & Alibali, M. W. (2013). Gesture's role in speaking, learning, and creating language. *Annual Review of Psychology*, *64*(1), 257–283. https://doi.org/10.1146/annurev-psych-113011-143802

Goldin-Meadow, S., Nusbaum, H., Kelly, S. D., & Wagner, S. (2001). Explaining math: gesturing lightens the load. *Psychological Science*, *12*(6), 516–522. https://doi.org/10.1111/1467-9280.00395

Guichon, N., & McLornan, S. (2008). The effects of multimodality on L2 learners: Implications for CALL resource design. *System*, *36*(1), 85–93. https://doi.org/10.1016/j.system.2007.11.005

Gunning, R. (1969). The Fog Index After Twenty Years. Journal of Business Communication, 6(2), 3–13. https://doi.org/10.1177/002194366900600202

Hadar, U., & Butterworth, B. (1997). Iconic gestures, imagery, and word retrieval in speech. *Semiotica*, *115*(1–2). https://doi.org/10.1515/semi.1997.115.1-2.147

Hassemer, J., & Evola, V. (2021). Cognitive linguistics and gesture. In *Routledge eBooks* (pp. 512–525). https://doi.org/10.4324/9781351034708-34

Hervais-Adelman, A., & Babcock, L. (2020). The neurobiology of simultaneous interpreting: Where extreme language control and cognitive control intersect. *Bilingualism: Language and Cognition*, *23*(4), 740–751. https://doi.org/10.1017/S1366728919000324

Hervais-Adelman, A., Moser-Mercer, B., Michel, C. M., & Golestani, N. (2015). fMRI of simultaneous ınterpretation reveals the neural basis of extreme language control. *Cerebral Cortex*, *25*(12), 4727–4739. https://doi.org/10.1093/cercor/bhu158

Hervais-Adelman, A., Moser-Mercer, B., & Golestani, N. (2011). Executive control of language in the bilingual brain: ıntegrating the evidence from neuroimaging to neuropsychology. *Frontiers in Psychology*, *2*. https://doi.org/10.3389/fpsyg.2011.00234

Hoffmann, M., & Pfeifer, R. (2018). Robots as powerful allies for the study of embodied cognition from the bottom up. In A. Newen, L. De Bruin, & S. Gallagher (Eds.), *The Oxford Handbook of 4E Cognition* (pp. 840–862). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198735410.013.45

Hostetter, A. B., & Alibali, M. W. (2008). Visible embodiment: Gestures as simulated action. *Psychonomic Bulletin & Review*, *15*(3), 495–514. https://doi.org/10.3758/PBR.15.3.495

Hostetter, A. B., Alibali, M. W., & Kita, S. (2007). I see it in my hands' eye: Representational gestures reflect conceptual demands. *Language and Cognitive Processes*, *22*(3), 313–336. https://doi.org/10.1080/01690960600632812

Iverson, J. M., & Goldin-Meadow, S. (1997). What's communication got to do with it? Gesture in children blind from birth. *Developmental Psychology*, *33*(3), 453–467. https://doi.org/10.1037/0012-1649.33.3.453

Iverson, J. M., & Goldin-Meadow, S. (1998). Why people gesture when they speak. *Nature*, *396*(6708), 228–228. https://doi.org/10.1038/24300

Joue, G., Boven, L., Willmes, K., Evola, V., Demenescu, L. R., Hassemer, J., Mittelberg, I., Mathiak, K., Schneider, F., & Habel, U. (2018). Handling or being the concept: An fMRI study on metonymy representations in coverbal gestures. *Neuropsychologia*, *109*, 232–244. https://doi.org/10.1016/j.neuropsychologia.2017.12.033

Joue, G., Boven, L., Willmes, K., Evola, V., Demenescu, L. R., Hassemer, J., Mittelberg, I., Mathiak, K., Schneider, F., & Habel, U. (2020). Metaphor processing is supramodal semantic processing: The role of the bilateral lateral temporal regions in multimodal communication. *Brain and Language*, *205*, 104772. https://doi.org/10.1016/j.bandl.2020.104772

Kade, O., Cartellieri, C. (1971). Some methodological aspects of simultaneous interpreting. *Babel. Revue Internationale de La Traduction / International Journal of Translation*, *17*(2), 12–16. https://doi.org/10.1075/babel.17.2.04car

Kade, O. (1968). Kommunikationswissenchaftliche probleme der translation. In Beihefte zur Zeitschrift ‘Fremdsprachen’ II, 3 – 19. Leipzig: VEB Enzyklopadie.

Kawashima, T., & Matsumoto, E. (2017). Cognitive control of attentional guidance by visual and verbal working memory representations: control over visual and verbal guidance. *Japanese Psychological Research*, *59*(1), 49–57. https://doi.org/10.1111/jpr.12141

Kelly, S., Özyürek, A., & Maris, E. (2010). Two sides of the same coin: speech and gesture mutually ınteract to enhance comprehension. *Psychological Science*, *21*, 260–267. https://doi.org/10.1177/0956797609357327

Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge University Press. https://doi.org/10.1017/CBO9780511807572

Kimbara, I. (2006). On gestural mimicry. *Gesture*, *6*(1), 39–61. https://doi.org/10.1075/gest.6.1.03kim

Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and Gesture* (1st ed., pp. 162–185). Cambridge University Press. https://doi.org/10.1017/CBO9780511620850.011

Kita, S., Alibali, M. W., & Chu, M. (2017). How do gestures influence thinking and speaking? The gesture-for-conceptualization hypothesis. *Psychological Review*, *124*(3), 245–266. https://doi.org/10.1037/rev0000059

Kon, C. K. (2002). *The influence on outcomes of ESL students' performance strategies on a CALL listening comprehension activity* (p. 7227743) [Master of Arts, Iowa State University, Digital Repository]. https://doi.org/10.31274/rtd-180813-6753

Kosslyn, S. M., Thompson, W. L., & Alpert, N. M. (1997). Neural systems shared by visual imagery and visual perception: a positron emission tomography study. *NeuroImage*, *6*(4), 320–334. https://doi.org/10.1006/nimg.1997.0295

Korpal, P., & Jasielska, A. (2019). Investigating interpreters' empathy: Are emotions in simultaneous interpreting contagious? *Target*, *31*(1), 2–24. https://doi.org/10.1075/target.17123.kor

Krampen, M. (Ed.). (1987). *Classics of semiotics*. Plenum.

Krauss, R. M., Chen, Y., & Gottesman, R. F. (2000). Lexical gestures and lexical access: A process model. In D. McNeill (Ed.), *Language and Gesture* (1st ed., pp. 261–283). Cambridge University Press. https://doi.org/10.1017/CBO9780511620850.017

Kress, G. R. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Routledge.

Krönke, K.-M., Mueller, K., Friederici, A. D., & Obrig, H. (2013). Learning by doing? The effect of gestures on implicit retrieval of newly acquired words. *Cortex*, *49*(9), 2553–2568. https://doi.org/10.1016/j.cortex.2012.11.016

Kumcu, A., & Öztürk, A. (2023). Visual mental imagery and verbal working memory: Evidence from consecutive interpreting. *Journal of Cognitive Psychology*, *35*(5), 545–560. https://doi.org/10.1080/20445911.2023.2216917

Kurz, I. (2002). Conference Interpreting: Quality in the Ears of the User. *Meta*, *46*(2), 394–409. https://doi.org/10.7202/003364ar

Ladewig, S. H., & Bressem, J. (2013). 69. A linguistic perspective on the notation of gesture phases. In C. Müller, A. Cienki, E. Fricke, S. Ladewig, D. McNeill, & S. Tessendorf (Eds.), *Handbücher zur Sprach- und Kommunikationswissenschaft / Handbooks of Linguistics and Communication Science (HSK) 38/1* (pp. 1060–1079). DE GRUYTER. https://doi.org/10.1515/9783110261318.1060

Levelt, W. J. M. (1993). *Speaking: From Intention to articulation*. The MIT Press. https://doi.org/10.7551/mitpress/6393.001.0001

Li, P., Zhang, F., Yu, A., & Zhao, X. (2020). Language History Questionnaire (LHQ3): An enhanced tool for assessing multilingual experience. *Bilingualism: Language and Cognition*, *23*(5), 938–944. https://doi.org/10.1017/S1366728918001153

Lucero, C., Zaharchuk, H., & Casasanto, D. (2014). Beat gestures facilitate speech production. In *Cognitive Science Society* (Vol. 36, Issue 36). https://escholarship.org/content/qt8pw1x0sx/qt8pw1x0sx.pdf?t=op9xps

Lynch, K. (2008). *The image of the city* (33. print). M.I.T. Press.

Lyons, A. (2015). Multimodality. In Z. Hua (Ed.), *Research methods in intercultural communication* (1st ed., pp. 268–280). Wiley. https://doi.org/10.1002/9781119166283.ch18

Macedonia, M. (2014). Bringing back the body into the mind: Gestures enhance word learning in foreign language. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.01467

Macnamara, B. N., & Conway, A. R. A. (2016). Working memory capacity as a predictor of simultaneous language interpreting performance. *Journal of Applied Research in Memory and Cognition*, *5*(4), 434–444. https://doi.org/10.1016/j.jarmac.2015.12.001

Marcos, L. R. (1979). Nonverbal behavior and thought processing. *Archives of General Psychiatry*, *36*(9), 940. https://doi.org/10.1001/archpsyc.1979.01780090026003

Martín de León, C., & Fernández Santana, A. (2021). Embodied cognition in the booth: Referential and pragmatic gestures in simultaneous interpreting.

Cognitive Linguistic Studies, *8*(2), 277–306. https://doi.org/10.1075/cogls.00079.mar

Masson-Carro, I., Goudbeek, M., & Krahmer, E. (2016). Can you handle this? The impact of object affordances on how co-speech gestures are produced. *Language, Cognition and Neuroscience*, *31*(3), 430–440. https://doi.org/10.1080/23273798.2015.1108448

McNeill, D. (1995). *Hand and mind: What gestures reveal about thought*. The Universoty of Chicago Press.

McNeill, D. (Ed.). (2000). *Language and gesture* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511620850

McNeill, D., Cassell, J., & McCullough, K.-E. (1994). Communicative effects of speech-mismatched gestures. *Research on Language & Social Interaction*, *27*(3), 223–237. https://doi.org/10.1207/s15327973rlsi2703_4

McNeill, D., & Duncan, S. D. (2000). Growth points in thinking-for-speaking. In D. McNeill (Ed.), *Language and Gesture* (1st ed., pp. 141–161). Cambridge University Press. https://doi.org/10.1017/CBO9780511620850.010

McNeill, D., Duncan, S. D., Cole, J., Gallagher, S., & Bertenthal, B. (2008). Growth points from the very beginning. *Interaction Studies. Social Behaviour and Communication in Biological and Artificial Systems*, *9*(1), 117–132. https://doi.org/10.1075/is.9.1.09mcn

Miyake, A., & Shah, P. (Eds.). (1999). *Models of working memory: Mechanisms of active maintenance and executive control*. Cambridge University Press.

Morett, L. M. (2018). In hand and in mind: Effects of gesture production and viewing on second language word learning. *Applied Psycholinguistics*, *39*(2), 355–381. https://doi.org/10.1017/S0142716417000388

Moser, B. (1978). Simultaneous ınterpretation: a hypothetical model and its practical application. In *Springer eBooks* (pp. 353–368). https://doi.org/10.1007/978-1-4615-9077-4_31

Moser-Mercer, B. (1994). Paradigms gained or the art of productive disagreement. In S. Lambert & B. Moser-Mercer (Eds.), *Benjamins*

Translation Library (Vol. 3, p. 17). John Benjamins Publishing Company. https://doi.org/10.1075/btl.3.03mos

Nanay, B. (2013). *Between perception and action* (First edition). Oxford University Press.

Nobe, S., Furuyama, N., Someya, Y., Sekiné, K., Suzuki, M., & Hayashi, K. (2008). A longitudinal study on gesture of simultaneous interpreter. *The Japanese Journal of Speech Sciences*, *8*, 63–83. https://pure.mpg.de/pubman/faces/ViewItemOverviewPage.jsp?itemId=item_2366524

Norris, S. (2012). *Multimodal Communication: Overview*.

Opoku-Baah, C., Schoenhaut, A. M., Vassall, S. G., Tovar, D. A., Ramachandran, R., & Wallace, M. T. (2021). Visual ınfluences on auditory behavioral, neural, and perceptual processes: a review. *Journal of the Association for Research in Otolaryngology*, *22*(4), 365–386. https://doi.org/10.1007/s10162-021-00789-0

Orru, G., & Longo, L. (2019). The Evolution of Cognitive Load Theory and the Measurement of Its Intrinsic, Extraneous and Germane Loads: A Review. In L. Longo & M. C. Leva (Eds.), *Human Mental Workload: Models and Applications* (Vol. 1012, pp. 23–48). Springer International Publishing. https://doi.org/10.1007/978-3-030-14273-5_3

Overoye, A. L., & Wilson, M. (2020). Does gesture lighten the load? The case of verbal analogies. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.571109

Özer, D., & Göksun, T. (2020). Visual-spatial and verbal abilities differentially affect processing of gestural vs. Spoken expressions. *Language, Cognition and Neuroscience*, *35*(7), 896–914. https://doi.org/10.1080/23273798.2019.1703016

Özyürek, A. (2014). Hearing and seeing meaning in speech and gesture: Insights from brain and behaviour. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *369*(1651), 20130296. https://doi.org/10.1098/rstb.2013.0296

Paivio, A. (1990). *Mental representations*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195066661.001.0001

Paivio, A. (2010). Dual coding theory and the mental lexicon. *The Mental Lexicon*, *5*(2), 205–230. https://doi.org/10.1075/ml.5.2.04pai

Pearson, J. (2019). The human imagination: the cognitive neuroscience of visual mental imagery. *Nature Reviews. Neuroscience*, *20*(10), 624–634. https://doi.org/10.1038/s41583-019-0202-9

Pickering, M. J., & Garrod, S. (2013). An integrated theory of language production and comprehension. *Behavioral and Brain Sciences*, *36*(4), 329–347. https://doi.org/10.1017/S0140525X12001495

Ping, R., & Goldin-Meadow, S. (2010). Gesturing saves cognitive resources when talking about nonpresent objects. *Cognitive Science*, *34*(4), 602–619. https://doi.org/10.1111/j.1551-6709.2010.01102.x

Pöchhacker, F. (2022). *Introducing interpreting studies* (3rd ed.). Routledge. https://doi.org/10.4324/9781003186472

Rayner, K., & Clifton, C. (2009). Language processing in reading and speech perception is fast and incremental: Implications for event-related potential research. Biological Psychology, 80(1), 4–9. https://doi.org/10.1016/j.biopsycho.2008.05.002

Rennert, S. (2008). Visual input in simultaneous interpreting. *Meta*, *53*(1), 204–217. https://doi.org/10.7202/017983ar

Richardson, J. T. E. (1976). Imageability and concreteness. *Bulletin of the Psychonomic Society*, *7*(5), 429–431. https://doi.org/10.3758/BF03337237

Rodrigues, I. M. G., Galvão, E. Z., & Cruz-Santos, A. (Eds.). (2019). *Recent perspectives on gesture and multimodality*. Cambridge Scholars Publishing.

Sabine, G. H. (1907). The concreteness of thought. *The Philosophical Review*, *16*(2), 154. https://doi.org/10.2307/2177470

Schifferstein, H. N. J. (2009). Comparing mental ımagery across the sensory modalities. *Imagination, Cognition and Personality*, *28*(4), 371–388. https://doi.org/10.2190/IC.28.4.g

Schock, J., Cortese, M. J., & Khanna, M. M. (2012). Imageability estimates for 3,000 disyllabic words. *Behavior Research Methods*, *44*(2), 374–379. https://doi.org/10.3758/s13428-011-0162-0

Seeber, K. G. (2007). Thinking outside the cube: Modeling language processing tasks in a multiple resource paradigm. *Interspeech 2007*, 1382–1385. https://doi.org/10.21437/Interspeech.2007-21

Seeber, K. G., & Kerzel, D. (2012). Cognitive load in simultaneous interpreting: Model meets data. *International Journal of Bilingualism*, *16*(2), 228–242. https://doi.org/10.1177/1367006911402982

Seeber, K. G. (2013). Cognitive load in simultaneous interpreting: Measures and methods. *Target. International Journal of Translation Studies*, *25*(1), 18–32. https://doi.org/10.1075/target.25.1.03see

Seeber, K. G. (2017). Multimodal Processing in Simultaneous Interpreting. In J. W. Schwieter & A. Ferreira (Eds.), *The Handbook of Translation and Cognition* (1st ed., pp. 461–475). Wiley. https://doi.org/10.1002/9781119241485.ch25

Seyfeddinipur, M. (2006). *Disfluency: Interrupting speech and gesture*. 10180362. https://doi.org/10.17617/2.59337

Shapiro, L. (2019). *Embodied Cognition* (2nd ed.). Routledge. https://doi.org/10.4324/9781315180380

Shapiro, L. A. (Ed.). (2014). *The Routledge handbook of embodied cognition* (1 [edition]). Routledge, Taylor & Francis Group.

Smith, L., & Gasser, M. (2005). The development of embodied cognition: six lessons from babies. *Artificial Life*, *11*(1–2), 13–29. https://doi.org/10.1162/1064546053278973

Smith, W. G., & Kam, C. L. H. (2012). Knowing ‘who she is’ based on ‘where she is’: The effect of co-speech gesture on pronoun comprehension. *Language and Cognition*, *4*(2), 75–98. https://doi.org/10.1515/langcog-2012-0005

Spence, C., & Deroy, O. (2013). Crossmodal mental imagery. In *Multisensory Imagery* (pp. 157–183). https://doi.org/10.1007/978-1-4614-5879-1_9

Stachowiak-Szymczak, K. (2019). *Eye movements and gestures in simultaneous and consecutive ınterpreting* (1st ed. 2019). Springer International Publishing : Imprint : Springer.

Straube, B., Green, A., Bromberger, B., & Kircher, T. (2011). The differentiation of iconic and metaphoric gestures: Common and unique integration processes. *Human Brain Mapping*, *32*(4), 520–533. https://doi.org/10.1002/hbm.21041

Streeck, J., Goodwin, C., & LeBaron, C. D. (Eds.). (2011). *Embodied interaction: Language and body in the material world*. Cambridge University Press.

Sueyoshi, A., & Hardison, D. M. (2005). The role of gestures and facial cues in second language listening comprehension: Language Learning Vol. 55, No. 4. *Language Learning*, *55*(4), 661–699. https://doi.org/10.1111/j.0023-8333.2005.00320.x

Sugihara, T., Diltz, M. D., Averbeck, B. B., & Romanski, L. M. (2006). Integration of auditory and visual communication ınformation in the primate ventrolateral prefrontal cortex. *The Journal of Neuroscience*, *26*(43), 11138–11147. https://doi.org/10.1523/JNEUROSCI.3550-06.2006

Sweller, J. (2020). Cognitive load theory and educational technology. *Educational Technology Research and Development*, *68*(1), 1–16. https://doi.org/10.1007/s11423-019-09701-3

Szarkowska, A., Krejtz, K., Dutka, Ł., & Pilipczuk, O. (2016). Cognitive load in intralingual and interlingual respeaking – a preliminary study. *Poznan Studies in Contemporary Linguistics*, *52*(2). https://doi.org/10.1515/psicl-2016-0008

Team, R. C. (2024). R: A language and environment for statistical computing. *MSOR Connections*, *1*(1). https://www.r-project.org/

Timarová, Š., Čeňková, I., Meylaerts, R., Hertog, E., Szmalec, A., & Duyck, W. (2014). Simultaneous interpreting and working memory executive control.

Interpreting. International Journal of Research and Practice in Interpreting, *16*(2), 139–168. https://doi.org/10.1075/intp.16.2.01tim

Turner, M. B., & Steen, F. F. (2012). Multimodal construction grammar. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2168035

Wu, Y. C., & Coulson, S. (2005). Meaningful gestures: Electrophysiological indices of iconic gesture comprehension. *Psychophysiology*, *42*(6), 654–667. https://doi.org/10.1111/j.1469-8986.2005.00356.x

Yang, Y. (2019). A review of multimodality research: origins and developments. *Language and Semiotic Studies*, *5*(2), 119–141. https://doi.org/10.1515/lass-2019-050206

Zagar Galvão, E. (2020). Chapter 6. Gesture functions and gestural style in simultaneous interpreting. In H. Salaets & G. Brône (Eds.), *Benjamins Translation Library* (Vol. 149, pp. 151–179). John Benjamins Publishing Company. https://doi.org/10.1075/btl.149.07gal

APPENDIX 1

Tarih: 01/08/2023 15:56
Sayı: E-35853172-300-00002990494

T.C.
HACETTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Rektörlük

Sayı : E-35853172-300-00002990494 01/08/2023
Konu : Etik Komisyon İzni (Berkay TARIM)

SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi: 06.07.2023 tarihli ve E-12908312-300-00002935770 sayılı yazınız.

Enstitünüz Mütercim Tercümanlık Anabilim Dalı İngilizce Mütercim Tercümanlık Bilim Dalı Yüksek Lisans Programı öğrencilerinden **Berkay TARIM**'ın **Dr. Öğr. Üyesi Alper KUMCU** danışmanlığında hazırladığı **"Konuşmanın İmgelemi ve Konuşmacı Jestlerinin Andaş Çevirmenin Jestlerine Etkisi"** başlıklı tez çalışması Üniversitemiz Senatosu Etik Komisyonunun **25 Temmuz 2023** tarihinde yapmış olduğu toplantıda incelenmiş olup, etik açıdan uygun bulunmuştur.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Sibel AKSU YILDIRIM
Rektör Yardımcısı

Bu belge güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu: F3C991ED-E81B-456B-8A88-381C54B5C923 Belge Doğrulama Adresi: https://www.turkiye.gov.tr/hu-ebys

Adres: Hacettepe Üniversitesi Rektörlük 06100 Sıhhiye-Ankara
E-posta:yazimd@hacettepe.edu.tr İnternet Adresi: www.hacettepe.edu.tr Elektronik Ağ: www.hacettepe.edu.tr
Telefon: 0 (312) 305 3001-3002 Faks:0 (312) 311 9992
Kep: hacettepeuniversitesi@hs01.kep.tr

Bilgi için: Musa KAYA
Memur
Telefon: 3051008

APPENDIX 2

	HACETTEPE ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ	Doküman Kodu *Form No.*	FRM-YL-15
		Yayım Tarihi *Date of Pub.*	04.12.2023
	FRM-YL-15 **Yüksek Lisans Tezi Orijinallik Raporu** *Master's Thesis Dissertation Originality Report*	Revizyon No *Rev. No.*	02
		Revizyon Tarihi *Rev.Date*	25.01.2024

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
MÜTERCİM TERCÜMANLIK ANABİLİM DALI BAŞKANLIĞINA

Tarih: 1/7/2024

Tez Başlığı: Konuşmanın İmgelemi ve Konuşmacı Jestlerinin Andaş Çevirmenin Jestlerine Etkisi
Tez Başlığı (Almanca/Fransızca)*:.....

Yukarıda başlığı verilen tezimin a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 128 sayfalık kısmına ilişkin, 30/06/2024 tarihinde tez danışmanım tarafından Turnitin adlı intihal tespit programından aşağıda işaretlenmiş filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezimin benzerlik oranı % 11'dir.

Uygulanan filtrelemeler**:

1. ☐ Kabul/Onay ve Bildirim sayfaları hariç
2. ☒ Kaynakça hariç
3. ☐ Alıntılar hariç
4. ☒ Alıntılar dâhil
5. ☒ 5 kelimeden daha az örtüşme içeren metin kısımları hariç

Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tezimin herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumlarda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Berkay TARIM

Öğrenci Bilgileri		
	Ad-Soyad	Berkay TARIM
	Öğrenci No	N21133863
	Enstitü Anabilim Dalı	Mütercim Tercümanlık Anabilim Dalı
	Programı	İngilizce Mütercim Tercümanlık Tezli Yüksek Lisans Programı

DANIŞMAN ONAYI

Dr. Öğr. Üyesi ALPER KUMCU
UYGUNDUR.

* Tez **Almanca** veya **Fransızca** yazılıyor ise bu kısımda tez başlığı **Tez Yazım Dilinde** yazılmalıdır.
**Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orjinallik Raporu Alınması ve Kullanılması Uygulama Esasları İkinci bölüm madde (4)/3'te de belirtildiği üzere: Kaynakça hariç, Alıntılar hariç/dahil, 5 kelimeden daha az örtüşme içeren metin kısımları hariç (Limit match size to 5 words) filtreleme yapılmalıdır.

	HACETTEPE ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ	Doküman Kodu *Form No*	FRM-YL-15
		Yayım Tarihi *Date of Pub*	04.12.2023
	FRM-YL-15 **Yüksek Lisans Tezi Orijinallik Raporu** *Master's Thesis Dissertation Originality Report*	Revizyon No *Rev. No*	02
		Revizyon Tarihi *Rev.Date*	25.01.2024

TO HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF TRANSLATION AND INTEPRETING

Date: 1/7/2024

Thesis Title: The Effect of Speech Imageability and the Speaker's Gestures on the Simultaneous Interpreter's Gestures

According to the originality report obtained by myself/my thesis advisor by using the Turnitin plagiarism detection software and by applying the filtering options checked below on 30/06/2024 for the total of 128 pages including the a) Title Page, b) Introduction, c) Main Chapters, and d) Conclusion sections of my thesis entitled above, the similarity index of my thesis is 11%.

Filtering options applied**:

1. ☐ Approval and Decleration sections excluded
2. ☒ References cited excluded
3. ☐ Quotes excluded
4. ☒ Quotes included
5. ☒ Match size up to 5 words excluded

I hereby declare that I have carefully read Hacettepe University Graduate School of Social Sciences Guidelines for Obtaining and Using Thesis Originality Reports that according to the maximum similarity index values specified in the Guidelines, my thesis does not include any form of plagiarism; that in any future detection of possible infringement of the regulations I accept all legal responsibility; and that all the information I have provided is correct to the best of my knowledge.

Kindly submitted for the necessary actions.

Berkay TARIM

Student Information		
	Name-Surname	Berkay TARIM
	Student Number	N21133863
	Department	Department of Translation and Interpreting
	Programme	English Translation and Interpreting Master of Arts Programme

SUPERVISOR'S APPROVAL

Asst. Prof. Dr. Alper KUMCU
APPROVED

**As mentioned in the second part [article (4)/3]of the Thesis Dissertation Originality Report's Codes of Practice of Hacettepe University Graduate School of Social Sciences, filtering should be done as following: excluding refence, quotation excluded/included, Match size up to 5 words excluded.

APPENDIX 3

Change (Low Imageability – Low Gesture Production)

Hello everyone, today we will be investigating a philosophical debate. The idea that "the only constant is change" is a popular one, often used to encourage people to embrace and adapt to change. However, upon thorough questioning, this idea does not hold up to philosophical scrutiny. In fact, there are several well-known philosophers who have argued that there are constants, or permanent and unchanging aspects, in life.

One (NUMBER ONE, ICONIC) philosopher who challenges the idea that change is the only constant is Plato. Plato argued that there are eternal and unchanging Forms or Ideas, such as the Form of Beauty or the Form of Justice, which are the perfect examples of these concepts. These Forms cannot be changed, and they are the basis for our understanding. We encounter different (HAND FACING UPSIDE TO SIDE, ICONIC) versions of these concepts in the world we live in.

Another philosopher who rejected the idea that change is the only constant is Aristotle. Aristotle believed in the concept of causation, which is the idea that every event or change has a cause or explanation. This means that there are certain underlying principles and causes that remain constant and unchanging, even as the events and changes that they produce may vary. For example, Aristotle believes in a principle that states something cannot both be and not be at the same time. This principle is constant, and it underlies all of our reasoning and understanding of the world.

In addition to Plato, other philosophers who have challenged the idea that change is the only constant include Confucius and Descartes. Confucius believed in protecting moral principles such as righteousness and having respect and empathy for others. These moral principles are constants that provide guidance in a constantly changing world. This provided guidance supports our inner balance. Descartes, on the other hand (EXCLAMATION MARK, ICONIC), argued that we can only be sure about ourselves, as we are the source of our thoughts and experiences. The self also cannot be changed, and it remains constant even as the body and external circumstances may change.

Given the ideas of these philosophers, it is clear that there are constants in life, such as (BEAT) eternal Forms, underlying causes, moral principles, and the self. These concepts are permanent. While change is certainly a fundamental aspect of life, it is not the only constant. There are many aspects of life that remain constant and unchanging, and it is important to recognise and appreciate these constants in order to gain a deeper understanding of the world and our place in it.

As for the question of which way leads to being happy, it is difficult to say definitively whether accepting the idea that "the only constant is change" or denying it leads to greater happiness. It is likely that different human spirits will find happiness in different ways, and what works for one person may not work for another. Some people may find happiness in embracing change and adapting to new situations, while others may find happiness in seeking out stability and living in a big loop. Ultimately, the determining factor of happiness may be finding a balance between these two approaches and learning to appreciate both the constants and the changes in life.

It is worth noting that some philosophers have argued that happiness itself is a constant, or at least an ambition that we should strive for in life. Aristotle, for example, argued that happiness is the highest good and the ultimate (IMPLY “ULTIMATE”, ICONIC) end that all human beings should strive for. According to Aristotle, happiness is not something that can be pursued directly, but rather it is something that is achieved by living a virtuous and fulfilling life. This means that happiness is not subject to change or alteration, but rather it is a constant that we can aspire to and work towards throughout our lives.

In conclusion, while change is an inevitable and fundamental aspect of life, it is not the one and only constant in our lives. Many philosophical arguments have been raised against such absolute claims. According to many, whether life has none, or any constants is trivial. What really matters is our capability to adapt to anything unexpected because the only meaningful measure of wisdom is the ability to react correctly and act accordingly. Thank you for listening.

Criticism (Low Imageability – High Gesture Production)

Greetings (GREET, ICONIC) everyone, today we will be talking about criticism and its types. One can give criticism in two distinct (NUMBER TWO, ICONIC) manners, constructively or destructively, and today we will argue their practical differences and effects.

Constructive criticism is a type of feedback that is meant to help someone improve, grow, and learn (BEAT). It is focused on specific actions or behaviours that can be changed, and it is given in a way that is respectful and supportive (THUMBS UP, ICONIC). The intention behind constructive criticism is to help the person receiving it to identify areas for improvement and to learn and grow. It is meant to be helpful and beneficial, and it is given with the goal of helping the person to become better at something or to achieve a specific goal.

On the other hand, destructive criticism is feedback that is meant to hurt or humiliate (INDEX FINGER DOWN, ICONIC) someone. It is often focused (FINGER POINTING, ICONIC) on personal characteristics or traits that cannot be changed, and it is given in a way that is critical, judgmental, or even abusive (BEAT). The intention behind destructive criticism is not (WAG FINGER, ICONIC) to help the person improve or grow, but rather to hurt them or make them feel bad about themselves. It is meant to be harmful, and it is given with the goal of hurting the person's feelings or causing them to feel shame or inadequacy (THUMBS DOWN, ICONIC).

One of the key moral differences between constructive and destructive criticism is the intention (PALM OPEN UP, ICONIC) behind it. Constructive criticism is given with the goal of helping someone improve and grow, (HAND TO THE OTHER SIDE, ICONIC) while destructive criticism is given with the goal of hurting or insulting them. This intention makes a significant difference in the impact of the criticism on the person receiving (HANDS TO CHEST, ICONIC) criticism.

When someone receives constructive criticism, they may feel a range of emotions, including frustration, disappointment, or even sadness (COUNT WITH FINGERS, BEAT). However, these emotions are typically accompanied by a sense of motivation to improve and a willingness to learn and grow. The person

receiving the criticism may feel grateful for the opportunity to identify areas for improvement and to make changes in their behaviour or actions.

On the other hand (HANDS TO SIDES, ICONIC), when someone receives destructive criticism, they are likely to feel a range of negative emotions, including hurt, anger and even shame or inadequacy. These negative emotions can be harmful to the person's self-esteem and can lead to feelings of hopelessness or despair. In some cases, destructive criticism can even cause someone to lose confidence in their abilities or to feel like they are not good enough.

There are a number of examples of feelings that may be experienced by both the criticiser and the criticised (HAND TO YOU THEN FORWARD, ICONIC), depending on whether the criticism is constructive or destructive (WAG FINGER, ICONIC). For example:

Someone who gives constructive criticism may feel a sense of responsibility or obligation to help the person improve. They may also feel a sense of pride or satisfaction in seeing the person grow and succeed. On the other hand, someone who gives destructive criticism may feel a sense of power or superiority (“VICTORY” FIST, ICONIC), or they may feel a sense of anger or resentment towards the person they are criticising. These are the feelings possibly felt by the person criticising. For (SWIPE FINGER, ICONIC) the person receiving the criticism, constructive criticism may give a sense of motivation to improve and a willingness to learn and grow (FISTS TO CHEST, ICONIC). They may also feel a sense of gratitude towards the person who gave the criticism, as it was meant to be helpful and supportive. On the other hand, someone who receives destructive criticism may feel hurt, angry, or resentful (BEAT) towards the person who gave it, as it was meant to be harmful and damaging. They may also feel a sense of shame or inadequacy, and may struggle with feelings of low self-esteem.

The societal (IMPLY “WHOLE”, ICONIC) effects of destructive criticism can be significant, as it can harm relationships and trust, and can lead to negative consequences for both the person receiving the criticism and the criticiser. Destructive criticism can cause damage to personal and formal relationships, as

it can lead to feelings of hurt, anger, and rage (BEAT). It can also harm trust and respect, as it is not given with the intention of helping someone improve or grow. Overall, the key difference between constructive and destructive criticism is the intention behind it. Constructive criticism is meant to help someone improve and grow (IMPLY “GROW”, ICONIC), while destructive criticism is meant to harm and demean (THUMBS DOWN). It is always important to strive to give and receive criticism in a way that is respectful, supportive, and focused on growth and learning (BEAT). This way, we may be able to continue our relationships respectfully, all the while encouraging intimate and sincere feedback. Thank you for listening (MEET HANDS, ICONIC).

David (High Imageability – Low Gesture Production)

Greetings everyone, today I’d like to talk about one of the most influential sculptures in history. The David sculpture is one of the most famous works of art in the world, created by the renowned artist Michelangelo. It took three years to be completed. The sculpture depicts the Biblical hero David, who is famous for saving many people. The statue stands at an imposing height of six metres (HAND BOTTOM TO TOP, ICONIC) and is carved from a single block of marble. After its completion the statue was planned to be placed on the roof of a Cathedral, however, when the sculpture was about to be completed, this idea was cancelled. As there were no cranes strong enough to lift the six-tonne statue more than 100 metres high. The statue was placed in front of a famous Palace in Italy. In 1873 David was taken to an art gallery and a replica statue was placed in its original place.

The exact age of the statue is hard to say for certain as Michelangelo did not leave any written records about the David sculpture but it is estimated to have been carved between 1501 and 1504, during the Renaissance period.

One of the reasons why the David sculpture is considered a masterpiece is because of the precision of Michelangelo's craftsmanship. The sculpture is incredibly detailed, with every muscle and vein perfectly visible. The sense of movement in the statue is also spectacular, with David appearing as though he

is about to step forward and engage in battle (“HEROIC” FIST, ICONIC). The expression on his face is one of determined concentration, conveying a sense of power and strength.

The physical aspects of the David sculpture that make it unique include its size and the fact that it is carved from a single block of marble. The statue is enormous, and its scale adds to its impact and presence (BEAT). Additionally, the quality of the marble used for the sculpture is of the highest quality. It is a type of marble known as Carrara marble, which is known for its shine as it can be polished very deeply. This allowed Michelangelo to achieve a level of realism and detail that would have been impossible with other types of stone.

The texture of the sculpture is smooth and polished, with the exception of the hair, which is slightly rougher to give it a more lifelike appearance. The colour of the marble is a bright white, which serves to emphasise the details and muscle definition of the statue. The statue weighs about 5.5 tons, it must be very hard to work with such a heavy statue. The David sculpture also represents an idealised image of the human form, with a strong emphasis on muscle mass and a heroic level of physical perfection. The hair is styled in tight curls (UPWARD SPIRAL WITH INDEX FINGER, ICONIC), arranged in a manner that gives the impression of movement.

The David sculpture has sadly sustained some damage over the years. The nose, for example, was chipped off during an attack by a rival artist, and was later restored. Additionally, the statue was damaged during World War II, when the Germans stole the sculpture's head as a war trophy. However, the head was later recovered and reunited with the rest of the statue. The sculpture has also been cleaned and restored several times over the centuries to preserve it for future generations.

The design of the David sculpture had a profound impact on the art world, and it is considered one of the greatest masterpieces of the Renaissance. The realism and attention to detail in the sculpture set a new standard for artistic excellence. Additionally, David sculpture's emphasis on the human form and its idealisation had a significant influence on the development of art in the centuries that

followed. Many artists, including those of the Baroque and neoclassical period, were inspired by the David sculpture and its ideals. Its influence can be seen in many statues and sculptures throughout the world, and it remains an important and iconic work of art to this day.

In conclusion, Michelangelo's David sculpture is considered a masterpiece because of the skill and precision of Michelangelo's craftsmanship, the statue's idealised image of the human form, and its impact on the art world. The David sculpture's realistic details, lifelike movement and its use of the marble made it stand out among the other sculptures from its era, and it remains as one of the most famous sculptures of all time. Thank you for your attention.

Home Office (High Imageability – High Gesture Production)

Good afternoon everyone (GREET, ICONIC). Today, I would like to talk to you about the importance of proper ergonomics when it comes to setting up a home office. Working from home is a growing (HAND MOVING UP, ICONIC) trend and, as a result of that, it's crucial that we create a comfortable workspace that will not only help us stay productive, but also protect our physical and mental (POINT TO HEAD, ICONIC) well-being. And today, we will be speaking about how to place your furniture (POINT TO THE TABLE, ICONIC) and electronic devices (MIMIC TYPING, ICONIC) for your in-home workplace.

First and foremost, let's talk about the desk (FINGER TO TABLE, ICONIC). The desk is the central (IMPLY CENTRAL, ICONIC) piece of any home office, and it's important that we choose one that is both functional and aesthetically (BEAT) good looking. The size of the desk should be proportional (HANDS BOTH SIDES, ICONIC) to the size of the room, and it should be placed in a spot that is both well-lit and has a good view. If possible, it's best to place the desk in front of a window, as natural light is not only beneficial for our mood and energy levels, but also helps reduce eye strain (POINT EYES, ICONIC). Placing your desk in front of a window also enables you to look outside while working. If your apartment is close to trees or parks, that’s even better. If you don't have a windowed room,

make sure to have enough light in your workplace and if your job needs a lot of lighting, a desk lamp might be beneficial.

When it comes to the placement of electronic devices, such as the monitor, keyboard, mouse, speaker, and printer, (BEAT) ergonomics should be the top priority. The monitor should be placed at eye level and about an arm's length away from you (REACH OUTWARD, ICONIC), so you don't have to strain your neck or eyes to see it (POINT NECK, ICONIC). The keyboard and mouse should be placed directly in front of the monitor, and they should be at a comfortable height that allows your arms to be at a 90-degree angle (DRAW “L”, ICONIC) when typing. The speaker should be placed near the monitor, so the sound is directed (HANDS TOWARDS YOURSELF, ICONIC) towards you. And the printer should be placed in a spot that is easily accessible, but not in the way. If you do not like using headphones (MIMIC HEADPHONES, ICONIC) you can place your speakers next to your monitor.

The office chair is also an important consideration when setting up a home office. It should be adjustable in height (HANDS UP AND DOWN) and have a comfortable backrest that supports the natural curve (DRAW “S”, ICONIC) of your spine. An office chair that supports your back correctly is crucial for your spine health. It's also important to make sure that your feet are able to touch the floor while sitting in the chair, as this will help prevent lower back pain. If you do not feel comfortable with your feet, you can buy a footrest that supports your knees at an angle.

Finally, it's important to make use of the space in the room efficiently. You can use a bookshelf to store documents and books, and a cabinet to keep your office supplies organised. You can also add some plants or a piece of art to the room to make it feel more colorful. You can place shelves on your walls to put your accessories such as cactuses or biblos.

While buying furniture or decorations for your home, consider their colour. Matching colours is the most important aspect of making a room look beautiful. For example, a white keyboard and mouse set might look cleaner on your office desk. Or buying a natural wood shelf for your cactuses might look more natural.

Before shopping, decide your favourite colours. Yellow, white and grey (BEAT) may make your room look more modern while beige, green and blue (BEAT) may make it classier. Deciding what type of aesthetic, you want beforehand ("BEFOREHAND", ICONIC) will help you a lot.

In conclusion, setting up a home office that is both functional and ergonomic is crucial for both our productivity and well-being. Remember to choose a desk that is proportional (HANDS OUT, ICONIC) to the room and place it in a well-lit spot with a good view, place electronic devices at a comfortable height (MIMIC TYPING, ICONIC), choose a chair that supports the natural curvature of your spine ("S", ICONIC), and make use of the space in the room efficiently. And lastly, do not forget to clean your workplace regularly. You can keep your desk and other devices clean with a cleaning spray and a microfiber towel (SPRAY BOTTLE, ICONIC). That's all I have for today's speech, with these tips in mind, you'll be able to create a comfortable home office that you will love spending time in.

Thank you for listening. (GOODBYE, ICONIC)

Hope (Low Imageability – Low Gesture Production)

Hello everyone, today's subject is the importance of hope in teenagers. Adolescence is a crucial time in an individual's life, and it is a period of great change and growth. It is also a time when an individual is faced with numerous challenges and decisions that can shape their future. During this time, it is important to maintain a sense of hope and optimism towards the future, as it can have a significant impact on an individual's wellbeing.

But first of all (MEET HANDS, ICONIC), what is the definition of hope? Hope is defined as "a feeling of expectation and desire for a particular thing to happen". And as an emotion, hope is often overlooked, but it is crucial in helping individuals to navigate through the challenges of adolescence. It is the belief that things will get better, and that the future (HAND FORWARD FROM EYE, ICONIC) holds promise and possibility. It is a source of motivation and determination, and it helps individuals to stay motivated and engaged in their goals and dreams.

There are several reasons why being hopeful towards the future is crucial during adolescence and how it can contribute to one's well-being. Firstly, hope can help individuals to cope with adversity and challenges. Adolescence is a time when individuals are likely to encounter many challenges, such as academic pressure, social pressure, and the challenges of identity formation (BEAT). These challenges can be overwhelming and can lead to feelings of stress, anxiety, and depression. Hope, however, can help individuals to cope with these challenges by providing a sense of purpose and motivation. It helps individuals to see that there is a light at the end of the tunnel, and that they have the strength to overcome their challenges. This, in turn, can contribute to an individual's wellbeing by reducing feelings of stress and anxiety and increasing feelings of hope and optimism.

Secondly, hope can help individuals to develop a sense of control over their lives. During adolescence, individuals are often at the mercy of external forces, such as parents, teachers, and peers. They may feel that they have little control over their lives and that their future is determined by these external forces. Hope, however, can help individuals to develop a sense of control over their lives by providing a sense of purpose and meaning. It helps individuals to see that they have the ability to shape their own future, and that they are not simply (WAG FINGER, ICONIC) passive recipients of their circumstances. This sense of agency and control can contribute to an individual's wellbeing by increasing feelings of empowerment and self-esteem.

Thirdly, hope can help individuals to build resilience and bounce back from setbacks. Adolescence is a time when individuals are likely to experience setbacks, such as failure in exams, rejection from friends, and disappointment in their goals. These setbacks can be demoralising and can lead to feelings of helplessness and despair. Hope, however, can help individuals to bounce back from these setbacks by providing a sense of optimism and determination. It helps individuals to see that setbacks are a natural part of the journey towards success, and that they have the resilience and perseverance to overcome them. This resilience ("FIST", ICONIC) and ability to bounce back from setbacks can

contribute to an individual's wellbeing by increasing feelings of resilience and determination, and decreasing feelings of helplessness and despair.

Finally, hope can help individuals to form positive relationships and connections with others. Adolescence is a time when individuals are forming their social identities and building relationships with others. These relationships can have a significant impact on an individual's well-being and sense of belonging. Hope can help individuals to form positive relationships and connections with others by providing a sense of optimism and positivity. It helps individuals to see the good in others and to build trust and respect. This, in turn, can lead to stronger, more meaningful relationships and a greater sense of social support (BEAT), which can contribute to an individual's wellbeing by increasing feelings of connection and belonging.

In conclusion, being hopeful towards the future is crucial during adolescence. It helps individuals to cope with adversity, develop a sense of agency and control over their lives, build resilience and bounce back from setbacks, and form positive relationships and connections with others. Hope is a powerful emotion that can have a transformative impact on an individual's life, and it is something that should be protected and taken care of during the challenging but exciting journey of adolescence. Hope is the first step towards being and feeling free. Thank you for listening.

Success (Low Imageability – High Gesture Production)

Greetings everyone (GREET, ICONIC), today we will be discussing the age-old question of whether success is an outcome (FINGER TO RIGHT AND LEFT, BEAT) or a process. But before we delve into this debate, it is important to first establish a common understanding of what we mean by success.

Success is a term that is often thrown around, yet it can mean different things to different people. For some (OPEN RIGHT HAND, ICONIC), success may be defined by achieving a certain level of wealth or fame, while for others (OPEN LEFT HAND, ICONIC) , it may be defined by personal satisfaction and happiness. Additionally, success can pertain to professional, personal or academic life

(COUNTING, BEAT). However, for the purposes of this discussion (EXCLAMATION MARK, ICONIC), let's define success as the achievement of a desired goal or outcome, whether it be financial, professional, personal or academic. This definition is broad enough to encompass a wide (HANDS WIDE, ICONIC) range of potential goals and outcomes, and it allows for success to be measured and quantified.

Now, let's consider the argument that success is an outcome. This perspective suggests that success is a specific (👌 , ICONIC) goal or achievement that one works towards, such as becoming an important person (BEAT), earning an honour, or reaching a certain amount of prosperity. These outcomes can be measured and quantified, making them easy to define (DEFINE “BORDERS”, ICONIC) as successful. Measuring every example above is easy and therefore they can be compared to each other. We will touch upon the effects of this factor later (IMPLY “LATER”, ICONIC).

One (NUMBER ONE, ICONIC) of the main benefits of the outcome-based perspective is that it provides a clear and measurable way to evaluate success. This can be particularly useful in one’s career, where specific goals and objectives must be met (DRAW “CHECKMARK”, ICONIC) in order to be considered successful. Additionally, the outcome-based perspective can also be motivating and help to focus one's efforts towards achieving a specific goal.

However, there are also some drawbacks to the outcome-based perspective. For one, it can lead to a focus on external validation, with an individual's sense of self-worth (POINT TO YOURSELF, ICONIC) being tied to the achievement of specific goals. This can be particularly damaging to one's mental health (KALBE EL KOYMA, ICONIC), especially if they fail to achieve their desired outcome. Additionally, the outcome-based perspective can also lead to a sense of competitiveness and a lack of empathy and understanding towards others who may not have achieved the same level (IMPLY “LEVEL”, ICONIC) of success.

On the other hand, there is also the belief that success is a process (DRAG FINGER, ICONIC). This perspective suggests that success is not a specific goal or outcome (WAG INDEX FINGER, ICONIC), but rather a journey that one

embarks on. It is about the growth, learning, and self-discovery that occurs along the way. For example, a person who spends countless hours consistently improving herself is a successful person by this definition, even if they never achieve widespread fame.

One of the main benefits of the process-based perspective is that it can lead to a more holistic (IMPLY “HOLISTIC”, ICONIC) understanding of success. Rather than just focusing on achieving specific goals, the process-based perspective encourages individuals to focus on personal growth and development. Additionally, the process-based perspective can also be less stressful and more enjoyable, as the focus is on the journey rather than just the outcome. And overall less taxing on the individual’s mental health.

However, there are also some drawbacks to the process-based perspective. For one, it can be difficult to quantify and measure success, which makes it harder to evaluate performance and progress. Additionally, the process-based perspective can also lead to the person losing their focus and direction (ACT “LOST”, ICONIC), as individuals may not have specific goals to work towards (POINT FORWARD, ICONIC) and therefore individuals may feel lost in the process.

In my opinion, success is a combination of both outcome and process (TO LEFT AND RIGHT, BEAT). Achieving a specific goal or outcome is important, but it is also important to recognise and appreciate the journey and personal growth that occurs along the way. Without both, true success cannot be achieved (WAG INDEX FINGER, ICONIC).

In conclusion (IMPLY “CONCLUDE”, ICONIC), success is a complex concept that can be viewed from multiple perspectives. While some may see it as an outcome (HAND TO RIGHT, ICONIC), others may see it as a process (HAND TO LEFT, ICONIC). Both have their own merits and drawbacks, and ultimately, the definition of success is a personal one that should be based on one's own values and goals. Success should be defined by a combination of outcome and process, not one or the other. Remember, success is not (DRAW A SHARP LINE, ICONIC) just about achieving a specific goal or outcome but about the journey and the person you become in the process. The way an individual defines success has a significant

impact on their mindset. And deciding between these two (NUMBER 2, ICONIC) inherently different ideologies may take a lifetime to reach a conclusive ending. But, with the correct approach anyone can make the most of every situation and thrive in the results. I wish you the best of luck.

Telescope (High Imageability – High Gesture Production)

Good afternoon (GREETING, ICONIC), today we will be talking about the biggest telescope ever built. The James Webb Space Telescope is an advanced telescope that was built by NASA. It is designed to be the successor to the Hubble Space Telescope, and is expected to be much more powerful and capable than its predecessor (REFER TO THE OLD, ICONIC). In fact, the James Webb Space Telescope is the largest (HANDS WIDE, ICONIC) and most powerful space telescope ever built. It will allow scientists to look at what our universe was like about 200 million years after the Big Bang (BOOM, ICONIC). The telescope will be able to capture images of some of the first galaxies ever formed. It will also be able to observe objects in our solar system from Mars and beyond, look inside dust clouds to see where new stars and planets are forming and examine the atmospheres of planets orbiting (ORBIT FINGERTIP, ICONIC) other stars.

One of the defining features of the telescope is its size. The Webb telescope is as tall as a 3-story building (HAND FLAT BOTTOM TO TOP, ICONIC) and as long as a tennis court. It is so big that it has to fold just like an origami to fit inside the rocket to launch. After being launched into space, the telescope will unfold (MIMIC ORIGAMI, ICONIC) to capture distant objects.

James Webb has to be that big in order to carry its massive primary mirror, which measures more than six metres in diameter. This giant mirror is made up of a series (SERIES, ICONIC) of smaller hexagonal mirrors that work together to focus light onto the telescope's scientific instruments. The James Webb’s mirror is made of ultra-lightweight beryllium, a very rare and special metal. This is important because the telescope will be operating in a very cold (HANDS TO SHOULDERS, ICONIC) environment, at temperatures beyond freezing. Also,

these mirrors are gold-plated to reflect (INDEX FINGER BOUNCE OFF, ICONIC) the infrared light.

The James Webb Space Telescope sees the universe in light that is invisible to human eyes. This light is called infrared radiation (QUOTE, ICONIC), and we can feel it as heat. The James Webb Telescope is also equipped with a suite of advanced scientific instruments that will allow it to study a wide range of objects in the galaxies such as stars and planets (BEAT). These instruments include a variety of infrared cameras, which will be used to study the exoplanets and their material formation. The James Webb Space Telescope will use its infrared cameras to see through (EL İLERİ, ICONIC) dust clouds in our universe. The Telescope will be able to see objects near the edge of our universe's expansion (FINGERS UNFOLDING, ICONIC). These objects are so far away that James Webb Space Telescope may even be able to catch a glimpse of the Big Bang itself.

Obviously the telescope will be working in space and the telescope's instruments are sensitive to heat from the Sun. Just like you might wear a hat or a visor (HAND SUNSHIELD, ICONIC) to block the Sun from your eyes, Webb has a sunshield to protect its instruments and mirrors. The telescope's sunshield is about the size of a basketball court. This sunshield drops (LOWER HAND, ICONIC) the overall temperature of the telescope by about 300 degrees Celsius.

Compared to the Hubble Telescope, the James Webb Telescope is nearly 5 metres wider (IMPLY "WIDE", ICONIC) and covers 15 times more area. And while the Hubble Telescope orbited the Earth, James Webb will orbit the Sun. Because of this difference, James Webb will be launched using a rocket, whereas Hubble was sent into space via a space shuttle. After its launch James Webb will be much farther away to Earth compared to the Hubble and due this distance difference (HANDS BOTH SIDES, ICONIC), NASA engineers will not be able to repair the James Webb Space Telescope after its launch.

Despite its many impressive features and capabilities, the James Webb Telescope project has faced numerous delays and cost overruns (BEAT), and there have been concerns about whether (HAND TO RIGHT AND TO LEFT,

BEAT) it will be able to meet its scientific goals. The metals and materials used in the mirrors were expensive and hard to mine. (BEAT) And the specialised labourship needed to put together the telescope took longer than expected, however (HAND THE OTHER WAY, ICONIC), James Webb Space Telescope was completed on 25th of December 2021 and has been launched into space on 11th of July 2022.

Overall, the James Webb Space Telescope is an exciting and ambitious project that has the potential to significantly advance our understanding of the cosmos. With its powerful instruments and advanced technology, it will be able to study some of the most mysterious and fascinating phenomena in the universe, shedding (FINGERS OPEN FOCUSED ON THE TABLE, ICONIC) light on the mysteries of the early universe and the formation and evolution of galaxies, stars, and planets (BEAT). Thank you for listening.

Wildlife Photographer (High Imageability – Low Gesture Production)

Good evening everyone, I am ("INTRODUCE", ICONIC) a professional wildlife photographer. I have been travelling to some of the most remote and beautiful places on Earth for the past 10 years, capturing the natural beauty of our planet and the creatures that inhabit it. Recently, I had the opportunity to travel to Central Africa to document the incredible biodiversity of the region. I want to share with you my experience and the amazing things I saw during this trip.

My journey began in the heart of the Congo River, where I was able to witness the incredible diversity of life in the rainforest. The rainforest is home to an estimated 10 million species of plants and animals, many of which are found nowhere else on Earth. I was particularly impressed by the vibrant colours of the birds (BEAT), butterflies, and monkeys that I saw. The pink, purple and yellow feathers of the African parrots and the blue and green of the mockingbirds was truly mesmerising. I also saw many different types of monkeys, including the endangered black monkey, and the endangered mountain gorilla.

As I journeyed deeper into the rainforest, I came across one of the most elusive animals on the planet, the okapi. This incredible animal is a close relative of the

giraffe, but has a much shorter neck (POINT TO YOUR NECK, ICONIC) and is covered in a dark, chocolate-brown fur. The okapi is incredibly shy and it was a privilege to be able to get such close shots of these magnificent creatures.

After spending some time in the rainforest, I headed to the savannas of Central Africa. The savannas are home to some of the most iconic animals on the planet, including lions, elephants, and zebras. I was able to witness the incredible power and grace of these animals as they roamed the grasslands. I also saw huge herds of antelopes and buffaloes as they migrated across the bare deserts of Africa.

One of the highlights of my trip was the opportunity to witness a group of lions in action. I was able to observe the lions as they hunted a herd of zebras. The female lions ran towards the herd and managed to grab one adult zebra. It was an incredible experience to see the lions working together to take down their prey. They were acting just like the street cats in İstanbul, apart from their size obviously ("OBVIOUSLY", ICONIC).

Another highlight of my trip was the chance to photograph the elephants of Central Africa. These gentle giants are truly awe-inspiring and it was a privilege to be able to capture their beauty on camera. I was also able to document the impact of illegal capturing on the elephant population. The sight of a poached elephant was heart-wrenching because after losing their tusks the elephants have no way to defend themselves. What I saw was a perfect reminder of the importance of conservation efforts to protect these magnificent animals.

In addition to the larger mammals, I also had the opportunity to document the incredible diversity of smaller animals in the savannas. I saw countless different types of insects and reptiles, as well as a wide variety of birds. The savannas are also home to a wide variety of plant life, including the iconic baobab tree. The tree that is most well-known for looking like it has been turned upside down. Its leaves resemble its roots and its roots resemble its leaves.

My journey through Central Africa was truly an unforgettable experience. I was able to witness the incredible biodiversity of the region, and I was able to capture the beauty of the animals and landscapes on camera. I hope that my photographs will inspire others to appreciate the natural world and to take action to protect it.

This experience has shown me why I love my profession. I got to see the beautiful and indigenous animals of Central Africa such as tigers, lions, elephants, monkeys, snakes, birds and much more (BEAT). Them thriving in their habitat, living as nature intended was such a sight to behold.

Thank you all for listening to my story and I hope that my photographs will be able to give you a glimpse of the beauty of Central Africa and the importance of conservation. We must all work together to protect these incredible animals and their habitats for future generations to enjoy. Thank you.

APPENDIX 4

Konuşma İmgelemi ve Eşzamanlı Çeviri Zorluğu Uzman Değerlendirmesi

Merhabalar,

Bu ankette aşağıda yazılı olan sekiz konuşma metninin imgelemini ve eşzamanlı çeviri zorluğunu değerlendirmeniz arzu edilmektedir. Anket, Dr. Öğretim üyesi Alper Kumcu'nun danışmanlığını yaptığı, Berkay Tarım'ın tez çalışması için hazırlanmıştır.
Metinlerin altındaki birinci soru, metnin imgelemini sormaktadır. İmgelem, zihinde canlandırma anlamına gelen bir değerdir. Buna göre çok yüksek imgeleme sahip metinleri okurken zihninize kolayca çok canlı resimler gelir. Bu durum bu testte 7 rakamı ile ifade edilmiştir. Öte yandan çok düşük imgeleme sahip metinler ise zihinde herhangi bir resim oluşturmaz. Bu durum testte 1 rakamı ile ifade edilmiştir. 1 çok düşük imgelem anlamına gelmektedir. Yani aklınıza oldukça zor bir şekilde ve çok zayıf bir resim gelebilir.
Metinlerin altındaki ikinci soru sizce o konuşmanın eşzamanlı çevirisi yapmanın ne kadar zor olacağını sormaktadır. Tahmini bir senaryoda sizce, soru metninin eşzamanlı çevirisin yapmanın ne kadar olacağını cevaplamanız arzu edilmektedir.
Lütfen önce üstteki metni okuyun, ardından altındaki soruları yanıtlayın. Bu soruda metinlerin imgelem değerlerini 0 (zihinsel resim yok) - 7 (çok yüksek) aralığında, metinlerin sizce tahmini eşzamanlı çeviri zorluğunu 0 (çok kolay) - 7 (çok zor) aralığında değerlendirebilirsiniz.

Bu testte doğru ya da yanlış cevap yoktur. Katılımınız için teşekkür ederiz.

* Indicates required question

1- The James Webb Space Telescope

Good afternoon, today we will be talking about the biggest telescope ever built. The James Webb Space Telescope is an advanced telescope that was built by NASA. It is designed to be the successor to the Hubble Space Telescope, and is expected to be much more powerful and capable than its predecessor. In fact, the James Webb Space Telescope is the largest and most powerful space telescope ever built. It will allow scientists to look at what our universe was like about 200 million years after the Big Bang. The telescope will be able to capture images of some of the first galaxies ever formed. It will also be able to observe objects in our solar system from Mars and beyond, look inside dust clouds to see where new stars and planets are forming and examine the atmospheres of planets orbiting other stars.

One of the defining features of the telescope is its size. The Webb telescope is as tall as a 3-story building and as long as a tennis court. It is so big that it has to fold just like an origami to fit inside the rocket to launch. After being launched into space, the telescope will unfold to capture distant objects.

James Webb has to be that big in order to carry its massive primary mirror, which measures more than six metres in diameter. This giant mirror is made up of a series of smaller hexagonal mirrors that work together to focus light onto the telescope's scientific instruments. The James Webb's mirror is made of ultra-lightweight beryllium, a very rare and special metal. This is important because the telescope will be operating in a very cold environment, at temperatures beyond freezing. Also, these mirrors are gold-plated to reflect the infrared light.

The James Webb Space Telescope sees the universe in light that is invisible to human eyes. This light is called infrared radiation, and we can feel it as heat. The James Webb Telescope is also equipped with a suite of advanced scientific instruments that will allow it to study a wide range of objects in the galaxies such as stars and planets. These instruments include a variety of infrared cameras, which will be used to study the exoplanets and their material formation. The James Webb Space Telescope will use its infrared cameras to see through dust clouds in our universe. The Telescope will be able to see objects near the edge of our universe's expansion. These objects are so far away that James Webb Space Telescope may even be able to catch a glimpse of the Big Bang itself.

Obviously the telescope will be working in space and the telescope's instruments are sensitive to heat from the Sun. Just like you might wear a hat or a visor to block the Sun from your eyes, Webb has a sunshield to protect its instruments and mirrors. The telescope's sunshield is about the size of a basketball court. This sunshield drops the overall temperature of the telescope by about 300 degrees Celsius.

Compared to the Hubble Telescope, the James Webb Telescope is nearly 5 metres wider and covers 15 times more area. And while the Hubble Telescope orbited the Earth, James Webb will orbit the Sun. Because of this difference, James Webb will be launched using a rocket, whereas Hubble was sent into space via a space shuttle. After its launch James Webb will be much farther away to Earth compared to the Hubble and due this distance difference, NASA engineers will not be able to repair the James Webb Space Telescope after its launch.

Despite its many impressive features and capabilities, the James Webb Telescope project has faced numerous delays and cost overruns, and there have been concerns about

whether it will be able to meet its scientific goals. The metals and materials used in the mirrors were expensive and hard to mine. And the specialised labour needed to put together the telescope took longer than expected, however, James Webb Space Telescope was completed on 25th of December 2021 and has been launched into space on 11th of July 2022.

Overall, the James Webb Space Telescope is an exciting and ambitious project that has the potential to significantly advance our understanding of the cosmos. With its powerful instruments and advanced technology, it will be able to study some of the most mysterious and fascinating phenomena in the universe, shedding light on the mysteries of the early universe and the formation and evolution of galaxies, stars, and planets. Thank you for listening.

1. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

2. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Sim	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

2- Maintaining Hope during Adolesence

Hello everyone, today's subject is the importance of hope in teenagers. Adolescence is a crucial time in an individual's life, and it is a period of great change and growth. It is also a time when an individual is faced with numerous challenges and decisions that can shape their future. During this time, it is important to maintain a sense of hope and optimism towards the future, as it can have a significant impact on an individual's wellbeing.

But first of all, what is the definition of hope? Hope is defined as "a feeling of expectation and desire for a particular thing to happen". And as an emotion, hope is often overlooked, but it is crucial in helping individuals to navigate through the challenges of adolescence. It is the belief that things will get better, and that the future holds promise and possibility. It is a source of motivation and determination, and it helps individuals to stay motivated and engaged in their goals and dreams.

There are several reasons why being hopeful towards the future is crucial during adolescence and how it can contribute to one's well being. Firstly, hope can help individuals to cope with adversity and challenges. Adolescence is a time when individuals are likely to encounter many challenges, such as academic pressure, social pressure, and the challenges of identity formation. These challenges can be overwhelming and can lead to feelings of stress, anxiety, and depression. Hope, however, can help individuals to cope with these challenges by providing a sense of purpose and motivation. It helps individuals to see that there is a light at the end of the tunnel, and that they have the strength to overcome their challenges. This, in turn, can contribute to an individual's wellbeing by reducing feelings of stress and anxiety and increasing feelings of hope and optimism.

Secondly, hope can help individuals to develop a sense of control over their lives. During adolescence, individuals are often at the mercy of external forces, such as parents, teachers, and peers. They may feel that they have little control over their lives and that their future is determined by these external forces. Hope, however, can help individuals to develop a sense of control over their lives by providing a sense of purpose and meaning. It helps individuals to see that they have the ability to shape their own future, and that they are not simply passive recipients of their circumstances. This sense of agency and control can contribute to an individual's wellbeing by increasing feelings of empowerment and self-esteem.

Thirdly, hope can help individuals to build resilience and bounce back from setbacks. Adolescence is a time when individuals are likely to experience setbacks, such as failure in exams, rejection from friends, and disappointment in their goals. These setbacks can be demoralising and can lead to feelings of helplessness and despair. Hope, however, can help individuals to bounce back from these setbacks by providing a sense of optimism and determination. It helps individuals to see that setbacks are a natural part of the journey towards success, and that they have the resilience and perseverance to overcome them. This resilience and ability to bounce back from setbacks can contribute to an individual's wellbeing by increasing feelings of resilience and determination, and decreasing feelings of helplessness and despair.

Finally, hope can help individuals to form positive relationships and connections with others. Adolescence is a time when individuals are forming their social identities and building relationships with others. These relationships can have a significant impact on an individual's well-being and sense of belonging. Hope can help individuals to form positive relationships and connections with others by providing a sense of optimism and positivity. It helps individuals to see the good in others and to build trust and respect. This, in turn, can

lead to stronger, more meaningful relationships and a greater sense of social support, which can contribute to an individual's wellbeing by increasing feelings of connection and belonging.

In conclusion, being hopeful towards the future is crucial during adolescence. It helps individuals to cope with adversity, develop a sense of agency and control over their lives, build resilience and bounce back from setbacks, and form positive relationships and connections with others. Hope is a powerful emotion that can have a transformative impact on an individual's life, and it is something that should be protected and taken care of during the challenging but exciting journey of adolescence. Hope is the first step towards being and feeling free. Thank you for listening.

3. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihir	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

4. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

3- David by Michelangelo

Greetings everyone, today I'd like to talk about one of the most influential sculptures in history. The David sculpture is one of the most famous works of art in the world, created by the renowned artist Michelangelo. It took three years to be completed. The sculpture depicts the Biblical hero David, who is famous for saving many people. The statue stands at an imposing height of six metres and is carved from a single block of marble. After its completion the statue was planned to be placed on the roof of a Cathedral, however, when the sculpture was about to be completed, this idea was cancelled. As there were no cranes strong enough to lift the six tonne statue more than 100 metres high. The statue was placed in front of a famous Palace in Italy. In 1873 David was taken to an art gallery and a replica statue was placed in its original place.

The exact age of the statue is hard to say for certain as Michelangelo did not leave any written records about the David sculpture but it is estimated to have been carved between 1501 and 1504, during the Renaissance period.

One of the reasons why the David sculpture is considered a masterpiece is because of the precision of Michelangelo's craftsmanship. The sculpture is incredibly detailed, with every muscle and vein perfectly visible. The sense of movement in the statue is also spectacular, with David appearing as though he is about to step forward and engage in battle. The expression on his face is one of determined concentration, conveying a sense of power and strength.

The physical aspects of the David sculpture that make it unique include its size and the fact that it is carved from a single block of marble. The statue is enormous, and its scale adds to its impact and presence. Additionally, the quality of the marble used for the sculpture is of the highest quality. It is a type of marble known as Carrara marble, which is known for its shine as it can be polished very deeply. This allowed Michelangelo to achieve a level of realism and detail that would have been impossible with other types of stone.

The texture of the sculpture is smooth and polished, with the exception of the hair, which is slightly rougher to give it a more lifelike appearance. The colour of the marble is a bright white, which serves to emphasise the details and muscle definition of the statue. The statue weighs about 5.5 tons, it must be very hard to work with such a heavy statue. The David sculpture also represents an idealised image of the human form, with a strong emphasis on muscle mass and a heroic level of physical perfection. The hair is styled in tight curls, arranged in a manner that gives the impression of movement.

The David sculpture has sadly sustained some damage over the years. The nose, for example, was chipped off during an attack by a rival artist, and was later restored. Additionally, the statue was damaged during World War II, when the Germans stole the sculpture's head as a war trophy. However, the head was later recovered and reunited with the rest of the statue. The sculpture has also been cleaned and restored several times over the centuries to preserve it for future generations.

The design of the David sculpture had a profound impact on the art world, and it is considered one of the greatest masterpieces of the Renaissance. The realism and attention to detail in the sculpture set a new standard for artistic excellence. Additionally, David sculpture's emphasis on the human form and its idealisation had a significant influence on the development of art in the centuries that followed. Many artists, including those of the Baroque and neoclassical period, were inspired by the David sculpture and its ideals. Its influence can be seen in many statues and sculptures throughout the world, and it remains

an important and iconic work of art to this day.

In conclusion, Michelangelo's David sculpture is considered a masterpiece because of the skill and precision of Michelangelo's craftsmanship, the statue's idealised image of the human form, and its impact on the art world. The David sculpture's realistic details, lifelike movement and its use of the marble made it stand out among the other sculptures from its era, and it remains as one of the most famous sculptures of all time. Thank you for your attention.

5. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

6. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

4- Constructive and Destructive Criticism

Greetings everyone, today we will be talking about criticism and its types. One can give criticism in two distinct manners, constructively or destructively, and today we will argue their practical differences and effects.

Constructive criticism is a type of feedback that is meant to help someone improve, grow, and learn. It is focused on specific actions or behaviours that can be changed, and it is given in a way that is respectful and supportive. The intention behind constructive criticism is to help the person receiving it to identify areas for improvement and to learn and grow. It is meant to be helpful and beneficial, and it is given with the goal of helping the person to become better at something or to achieve a specific goal.

On the other hand, destructive criticism is feedback that is meant to hurt or humiliate someone. It is often focused on personal characteristics or traits that cannot be changed, and it is given in a way that is critical, judgmental, or even abusive. The intention behind destructive criticism is not to help the person improve or grow, but rather to hurt them or make them feel bad about themselves. It is meant to be harmful, and it is given with the goal of hurting the person's feelings or causing them to feel shame or inadequacy.

One of the key moral differences between constructive and destructive criticism is the intention behind it. Constructive criticism is given with the goal of helping someone improve and grow, while destructive criticism is given with the goal of hurting or insulting them. This intention makes a significant difference in the impact of the criticism on the person receiving criticism.

When someone receives constructive criticism, they may feel a range of emotions, including frustration, disappointment, or even sadness. However, these emotions are typically accompanied by a sense of motivation to improve and a willingness to learn and grow. The person receiving the criticism may feel grateful for the opportunity to identify areas for improvement and to make changes in their behaviour or actions.

On the other hand, when someone receives destructive criticism, they are likely to feel a range of negative emotions, including hurt, anger and even shame or inadequacy. These negative emotions can be harmful to the person's self-esteem and can lead to feelings of hopelessness or despair. In some cases, destructive criticism can even cause someone to lose confidence in their abilities or to feel like they are not good enough.

There are a number of examples of feelings that may be experienced by both the criticiser and the criticised, depending on whether the criticism is constructive or destructive. For example:

Someone who gives constructive criticism may feel a sense of responsibility or obligation to help the person improve. They may also feel a sense of pride or satisfaction in seeing the person grow and succeed. On the other hand, someone who gives destructive criticism may feel a sense of power or superiority, or they may feel a sense of anger or resentment towards the person they are criticising. These are the feelings possibly felt by the person criticising. For the person receiving the criticism, constructive criticism may give a sense of motivation to improve and a willingness to learn and grow. They may also feel a sense of gratitude towards the person who gave the criticism, as it was meant to be helpful and supportive. On the other hand, someone who receives destructive criticism may feel hurt, angry, or resentful towards the person who gave it, as it was meant to be harmful and

damaging. They may also feel a sense of shame or inadequacy, and may struggle with feelings of low self-esteem.

The societal effects of destructive criticism can be significant, as it can harm relationships and trust, and can lead to negative consequences for both the person receiving the criticism and the criticiser. Destructive criticism can cause damage to personal and formal relationships, as it can lead to feelings of hurt, anger, and rage. It can also harm trust and respect, as it is not given with the intention of helping someone improve or grow.

Overall, the key difference between constructive and destructive criticism is the intention behind it. Constructive criticism is meant to help someone improve and grow, while destructive criticism is meant to harm and demean. It is always important to strive to give and receive criticism in a way that is respectful, supportive, and focused on growth and learning. This way, we may be able to continue our relationships respectfully, all the while encouraging intimate and sincere feedback. Thank you for listening.

7. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihir	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

8. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

5- Setting up a Home Office

Good afternoon everyone. Today, I would like to talk to you about the importance of proper ergonomics when it comes to setting up a home office. Working from home is a growing trend and, as a result of that, it's crucial that we create a comfortable workspace that will not only help us stay productive, but also protect our physical and mental well-being. And today, we will be speaking about how to place your furniture and electronic devices for your in-home workplace.

First and foremost, let's talk about the desk. The desk is the central piece of any home office, and it's important that we choose one that is both functional and aesthetically good looking. The size of the desk should be proportional to the size of the room, and it should be placed in a spot that is both well-lit and has a good view. If possible, it's best to place the desk in front of a window, as natural light is not only beneficial for our mood and energy levels, but also helps reduce eye strain. Placing your desk in front of a window also enables you to look outside while working. If your apartment is close to trees or parks, that's even better. If you don't have a windowed room, make sure to have enough light in your workplace and if your job needs a lot of lighting, a desk lamp might be beneficial.

When it comes to the placement of electronic devices, such as the monitor, keyboard, mouse, speaker, and printer, ergonomics should be the top priority. The monitor should be placed at eye level and about an arm's length away from you, so you don't have to strain your neck or eyes to see it. The keyboard and mouse should be placed directly in front of the monitor, and they should be at a comfortable height that allows your arms to be at a 90-degree angle when typing. The speaker should be placed near the monitor, so the sound is directed towards you. And the printer should be placed in a spot that is easily accessible, but not in the way. If you do not like using headphones, you can place your speakers next to your monitor.

The office chair is also an important consideration when setting up a home office. It should be adjustable in height and have a comfortable backrest that supports the natural curve of your spine. An office chair that supports your back correctly is crucial for your spine health. It's also important to make sure that your feet are able to touch the floor while sitting in the chair, as this will help prevent lower back pain. If you do not feel comfortable with your feet, you can buy a footrest that supports your knees at an angle.

Finally, it's important to make use of the space in the room efficiently. You can use a bookshelf to store documents and books, and a cabinet to keep your office supplies organised. You can also add some plants or a piece of art to the room to make it feel more colorful. You can place shelves on your walls to put your accessories such as cactuses or biblos.

While buying furniture or decorations for your home, consider their colour. Matching colours is the most important aspect of making a room look beautiful. For example a white keyboard and mouse set might look cleaner on your office desk. Or buying a natural wood shelf for your cactuses might look more natural. Before shopping, decide your favourite colours. Yellow, white and grey may make your room look more modern while beige and green may make it more classy. Deciding what type of aesthetic you want beforehand will help you a lot.

In conclusion, setting up a home office that is both functional and ergonomic is crucial for both our productivity and well-being. Remember to choose a desk that is proportional to the

room and place it in a well-lit spot with a good view, place electronic devices at a comfortable height, choose a chair that supports the natural curvature of your spine, and make use of the space in the room efficiently. And lastly, do not forget to clean your workplace regularly. You can keep your desk and other devices clean with a cleaning spray and a microfiber towel. That's all I have for today's speech, with these tips in mind, you'll be able to create a comfortable home office that you will love spending time in. Thank you for listening.

9. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

10. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

6- The Only Constant is Change

Hello everyone, today we will be investigating a philosophical debate. The idea that "the only constant is change" is a popular one, often used to encourage people to embrace and adapt to change. However, upon thorough questioning, this idea does not hold up to philosophical scrutiny. In fact, there are several well-known philosophers who have argued that there are constants, or permanent and unchanging aspects, in life.

One philosopher who challenges the idea that change is the only constant is Plato. Plato argued that there are eternal and unchanging Forms or Ideas, such as the Form of Beauty or the Form of Justice, which are the perfect examples of these concepts. These Forms cannot be changed, and they are the basis for our understanding. We encounter different versions of these concepts in the world we live in.

Another philosopher who rejected the idea that change is the only constant is Aristotle. Aristotle believed in the concept of causation, which is the idea that every event or change has a cause or explanation. This means that there are certain underlying principles and causes that remain constant and unchanging, even as the events and changes that they produce may vary. For example, Aristotle believes in a principle that states something cannot both be and not be at the same time. This principle is constant and it underlies all of our reasoning and understanding of the world.

In addition to Plato, other philosophers who have challenged the idea that change is the only constant include Confucius and Descartes. Confucius believed in protecting moral principles such as righteousness and having respect and empathy for others. These moral principles are constants that provide guidance in a constantly changing world. This provided guidance supports our inner balance. Descartes, on the other hand, argued that we can only be sure about ourselves, as we are the source of our thoughts and experiences. The self also cannot be changed, and it remains constant even as the body and external circumstances may change.

Given the ideas of these philosophers, it is clear that there are constants in life, such as eternal Forms, underlying causes, moral principles, and the self. These concepts are permanent. While change is certainly a fundamental aspect of life, it is not the only constant. There are many aspects of life that remain constant and unchanging, and it is important to recognize and appreciate these constants in order to gain a deeper understanding of the world and our place in it.

As for the question of which way leads to being happy, it is difficult to say definitively whether accepting the idea that "the only constant is change" or denying it leads to greater happiness. It is likely that different human spirits will find happiness in different ways, and what works for one person may not work for another. Some people may find happiness in embracing change and adapting to new situations, while others may find happiness in seeking out stability and living in a big loop. Ultimately, the determining factor of happiness may be finding a balance between these two approaches, and learning to appreciate both the constants and the changes in life.

It is worth noting that some philosophers have argued that happiness itself is a constant, or at least an ambition that we should strive for in life. Aristotle, for example, argued that happiness is the highest good and the ultimate end that all human beings should strive for. According to Aristotle, happiness is not something that can be pursued directly, but rather it is something that is achieved by living a virtuous and fulfilling life. This means that

happiness is not subject to change or alteration, but rather it is a constant that we can aspire to and work towards throughout our lives.

In conclusion, while change is an inevitable and fundamental aspect of life, it is not the one and only constant in our lives. Many philosophical arguments have been raised against such absolute claims. According to many, whether life has none or any constants is trivial. What really matters is our capability to adapt to anything unexpected because the only meaningful measure of wisdom is the ability to react correctly and act accordingly. Thank you for listening.

11. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

12. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

7- Wildlife Photographer

Good evening everyone, I am a professional wildlife photographer. I have been travelling to some of the most remote and beautiful places on Earth for the past 10 years, capturing the natural beauty of our planet and the creatures that inhabit it. Recently, I had the opportunity to travel to Central Africa to document the incredible biodiversity of the region. I want to share with you my experience and the amazing things I saw during this trip.

My journey began in the heart of the Congo River, where I was able to witness the incredible diversity of life in the rainforest. The rainforest is home to an estimated 10 million species of plants and animals, many of which are found nowhere else on Earth. I was particularly impressed by the vibrant colours of the birds, butterflies, and monkeys that I saw. The pink, purple and yellow feathers of the African parrots and the blue and green of the mockingbirds was truly mesmerising. I also saw many different types of monkeys, including the endangered black monkey, and the endangered mountain gorilla.

As I journeyed deeper into the rainforest, I came across one of the most elusive animals on the planet, the okapi. This elusive animal is a close relative of the giraffe, but has a much shorter neck and is covered in a dark, chocolate-brown fur. The okapi is incredibly shy and it was a privilege to be able to get such close shots of these magnificent creatures.

After spending some time in the rainforest, I headed to the savannas of Central Africa. The savannas are home to some of the most iconic animals on the planet, including lions, elephants, and zebras. I was able to witness the incredible power and grace of these animals as they roamed the grasslands. I also saw huge herds of antelopes and buffaloes as they migrated across the bare deserts of Africa.

One of the highlights of my trip was the opportunity to witness a group of lions in action. I was able to observe the lions as they hunted a herd of zebras. The female lions ran towards the herd and managed to grab one adult zebra. It was an incredible experience to see the lions working together to take down their prey. They were acting just like the street cats in İstanbul, apart from their size obviously.

Another highlight of my trip was the chance to photograph the elephants of Central Africa. These gentle giants are truly awe-inspiring and it was a privilege to be able to capture their beauty on camera. I was also able to document the impact of illegal capturing on the elephant population. The sight of a poached elephant was heart-wrenching because after losing their tusks the elephants have no way to defend themselves. What I saw was a perfect reminder of the importance of conservation efforts to protect these magnificent animals.

In addition to the larger mammals, I also had the opportunity to document the incredible diversity of smaller animals in the savannas. I saw countless different types of insects and reptiles, as well as a wide variety of birds. The savannas are also home to a wide variety of plant life, including the iconic baobab tree. The tree that is most well known for looking like it has been turned upside down. Its leaves resemble its roots and its roots resemble its leaves.

My journey through Central Africa was truly an unforgettable experience. I was able to witness the incredible biodiversity of the region, and I was able to capture the beauty of the animals and landscapes on camera. I hope that my photographs will inspire others to appreciate the natural world and to take action to protect it.

This experience has shown me why I love my profession. I got to see the beautiful and indigenous animals of Central Africa such as tigers, lions, elephants, monkeys, snakes, birds and much more. Them thriving in their habitat, living as nature intended was such a sight to behold.

Thank you all for listening to my story and I hope that my photographs will be able to give you a glimpse of the beauty of Central Africa and the importance of conservation. We must all work together to protect these incredible animals and their habitats for future generations to enjoy. Thank you.

13. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

14. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Simı	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

8- Success

Greetings everyone, today we will be discussing the age-old question of whether success is an outcome or a process. But before we delve into this debate, it is important to first establish a common understanding of what we mean by success.

Success is a term that is often thrown around, yet it can mean different things to different people. For some, success may be defined by achieving a certain level of wealth or fame, while for others, it may be defined by personal satisfaction and happiness. Additionally, success can pertain to professional, personal or academic life. However, for the purposes of this discussion, let's define success as the achievement of a desired goal or outcome, whether it be financial, professional, personal or academic. This definition is broad enough to encompass a wide range of potential goals and outcomes, and it allows for success to be measured and quantified.

Now, let's consider the argument that success is an outcome. This perspective suggests that success is a specific goal or achievement that one works towards, such as becoming an important person, earning an honour, or reaching a certain amount of prosperity. These outcomes can be measured and quantified, making them easy to define as successful. Measuring every example above is easy and therefore they can be compared to each other. We will touch upon the effects of this factor later.

One of the main benefits of the outcome-based perspective is that it provides a clear and measurable way to evaluate success. This can be particularly useful in one's career, where specific goals and objectives must be met in order to be considered successful. Additionally, the outcome-based perspective can also be motivating and help to focus one's efforts towards achieving a specific goal.

However, there are also some drawbacks to the outcome-based perspective. For one, it can lead to a focus on external validation, with an individual's sense of self-worth being tied to the achievement of specific goals. This can be particularly damaging to one's mental health, especially if they fail to achieve their desired outcome. Additionally, the outcome-based perspective can also lead to a sense of competitiveness and a lack of empathy and understanding towards others who may not have achieved the same level of success.

On the other hand, there is also the belief that success is a process. This perspective suggests that success is not a specific goal or outcome, but rather a journey that one embarks on. It is about the growth, learning, and self-discovery that occurs along the way. For example, a person who spends countless hours consistently improving herself is a successful person by this definition, even if they never achieve widespread fame.

One of the main benefits of the process-based perspective is that it can lead to a more holistic understanding of success. Rather than just focusing on achieving specific goals, the process-based perspective encourages individuals to focus on personal growth and development. Additionally, the process-based perspective can also be less stressful and more enjoyable, as the focus is on the journey rather than just the outcome. And overall less taxing on the individual's mental health.

However, there are also some drawbacks to the process-based perspective. For one, it can be difficult to quantify and measure success, which makes it harder to evaluate performance and progress. Additionally, the process-based perspective can also lead to the person losing their focus and direction, as individuals may not have specific goals to work towards and therefore individuals may feel lost in the process.

In my opinion, success is a combination of both outcome and process. Achieving a specific goal or outcome is important, but it is also important to recognize and appreciate the journey and personal growth that occurs along the way. Without both, true success cannot be achieved.

In conclusion, success is a complex concept that can be viewed from multiple perspectives. While some may see it as an outcome, others may see it as a process. Both have their own merits and drawbacks, and ultimately, the definition of success is a personal one that should be based on one's own values and goals. Success should be defined by a combination of outcome and process, not one or the other. Remember, success is not just about achieving a specific goal or outcome but about the journey and the person you become in the process. The way an individual defines success has a significant impact on their mindset and the way. And deciding between these two inherently different ideologies may take a lifetime to reach a conclusive ending. But, with the correct approach anyone can make the most of every situation and thrive in the results. I wish you the best of luck.

15. Size göre bu konuşma zihinde ne kadar kolay canlandırılabilir? *

Mark only one oval.

	1	2	3	4	5	6	7	
Zihi	◯	◯	◯	◯	◯	◯	◯	Çok canlı zihinsel resim (somut)

16. Size göre bu konuşmayı simultane çevirmek ne kadar kolaydır? *

Mark only one oval.

	1	2	3	4	5	6	7	
Sim	◯	◯	◯	◯	◯	◯	◯	Simultane çevirmek çok zor

APPENDIX 5

Simultane Çeviri Çalışması - Deney Öncesi Form

Merhabalar,

Bu araştırma sözlü çeviri öğrencilerinin katılabileceği bir simultane çeviri çalışmasıdır. Bu çalışmada dokuz tane beş dakikayı geçmeyen kısa süreli konuşmaları İngilizceden Türkçeye simultane olarak çevirmeniz beklenmektedir. Çeviriler arasında molalar verilecektir. Çeviriniz sırasında görüntü kaydınız alınacaktır, kimliğinizle eşleştirilmeyen bu görüntülere sadece bir kişi erişebilecek ve götüntüler bütün gizlilik ilkeleri uyarınca saklanacaktır. Bu görüntüler tez çalışmasında ve tezden çıkabilecek herhangi bir yayında kullanılabilecektir. Araştırma süreci bittiğinde kaydedilen bütün veriler silinecektir.

İngilizce Mütercim-Tercümanlık Bölümü bünyesinde gerçekleştirilen ve Dr. Öğr. Üyesi Alper Kumcu tarafından yürütülen bir tez çalışmasına katıldığınız için teşekkür ederiz. Bu formdaki bilgileri okuyup anladıktan sonra araştırmaya katılmak isterseniz, lütfen formu doldurarak ilerleyin. Süreç boyunca herhangi bir sorunuz olursa araştırmacı ile "berkaytarim1999[at]gmail.com" adresinden iletişime geçebilirsiniz.
Bu araştırmaya katılmak ve soruları cevaplamak tamamen gönüllülük esasına dayanmaktadır. Araştırmaya katılmamayı tercih eden katılımcılılar hiçbir yaptırım ile karşı karşıya kalmayacaktır. Araştırmaya katılmayı kendi isteğiyle kabul eden katılımcılardan araştırmaya gönüllü olarak katıldıklarını ifade eden bu formu doldurup imzalamaları gerekmektedir. Katılımcılar katılmayı kabul edip bu formu doldurmaları durumunda dahi dilediklerı zaman, herhangi bir neden belirtmeden araştırmadan ayrılma hakkına sahiplerdir. Araştırmaya katılmak katılımcılara herhangi bir risk veya aksi tesir getirmemektedir. Katılımcılardan hiçbir şekilde ödeme talep edilmeyecektir ve katılımcılara herhangi bir ödeme yapılmayacaktır. Araştırmada toplanan veriler her bir katılımcıya atanacak rastgele bir katılımcı numarasıyla kodlanacak ve katılımcıların kimliğini açık edecek hiçbir kişisel bilgi toplanmayacaktır. Veriler toplu bir şekilde analiz edilecek ve kişiye yönelik bir analiz yapılmayacaktır. Toplanan veriler gizlilik içinde saklanacak, yalnızca araştırmacılar tarafından erişilebilir olacak ve kimseyle paylaşılmayacaktır.

Katılımınız için teşekkür ederim.

* Indicates required question

1. Çalışmaya katılmayı onaylıyor musunuz? *

Mark only one oval.

Onaylıyorum

Temel Bilgiler

2. Language History Questionnaire'e giriş yapmak için kullandığınız, size mailde iletilen kısa ID *

Eğer elinizde ID yoksa lütfen tez sorumlu ile iletişime geçiniz.

3. Adınız *

4. Yaşınız *

5. Cinsiyetiniz *

Mark only one oval.

- ◯ Kadın
- ◯ Erkek
- ◯ Diğer

6. İşitmenizi engelleyen herhangi bir durumunuz var mı? *

Mark only one oval.

- ◯ Evet, var
- ◯ Hayır, yok

7. Görmenizi engelleyen herhangi bir durumunuz var mı? *

Mark only one oval.

- ◯ Evet, var
- ◯ Hayır, yok

8. Hangi elinizi baskın olarak kullanıyorsunuz? *

Mark only one oval.

- ◯ Sağ
- ◯ Sol
- ◯ İkisi birden

9. Kaçıncı sınıf öğrencisisiniz? *

Mark only one oval.

- ◯ 2
- ◯ 3
- ◯ 4
- ◯ Lisansüstü

10. Şu zamana kadar aldığınız ve almakta olduğunuz sözlü çeviri dersleri ve o derslerden aldığınız notlar (örnek: Konferans Çevirisi 1, A2) *

APPENDIX 6

Language history questionnaire (LHQ). Go to https://blclab.org/lhq3/ to use the online version and for reference

(1) Participant ID number				(2) Age	
(3) Gender	☐ Male	☐ Female	☐ Non-binary	☐ Non-relevant	
(4) Education	☐ Graduate school (Doctor)	☐ Graduate school (Master)	☐ College (Bachelor)		
	☐ High school	☐ Middle school	☐ Elementary school	☐ Other	
(5) Parents' Education — Father	☐ Graduate school (Doctor)	☐ Graduate school (Master)	☐ College (Bachelor)		
	☐ High school	☐ Middle school	☐ Elementary school	☐ Other	
(5) Parents' Education — Mother	☐ Graduate school (Doctor)	☐ Graduate school (Master)	☐ College (Bachelor)		
	☐ High school	☐ Middle school	☐ Elementary school	☐ Other	
(6) Handedness	☐ Right-handed	☐ Left-handed	☐ Ambidextrous		

(7) Indicate your native language(s) and any other languages you have studied or learned, the age at which you started using each language in terms of listening, speaking, reading, and writing, and the total number of years you have spent using each language.

*Notes For "Years of use", you may have learned a language, stopped using it, and then started using it again. Please give the total number of years.

Language	Listening	Speaking	Reading	Writing	Years of use*

(8) Country of origin	
(9) Country of residence	

(10) If you have lived or traveled in countries other than your country of residence for three months or more, then indicate the name of the country, your length of stay (in Months), the language you used, and the frequency of your use of the language for each country.

* You may have been to the country on multiple occasions, each for a different length of time. Add all the trips together

Never 1 Rarely 2 Sometimes 3 Regularly 4 Often 5 Usually 6 Always 7

Country	Length of stay (in Months)*	Language	Frequency of use
			☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
			☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
			☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
			☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.

(11) Indicate the way you learned or acquired your non-native language(s). Check one or more boxes that apply.

* e.g., Immigrating to another country where the dominant language is different from your native language so you learn this language through immersion in the language environment.

Non-native Language	Immersion*	Classroom instruction	Self-learning
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

(12) Indicate the age at which you started using each of the languages you have studied or learned in the following environments (Including native language).

Language	At home	With friends	At school	At work	Language software	Online games

(13) Indicate the language used by your teachers for instruction at each educational level. If the instructional language switched during any educational level, then also indicate the "Switched to" language. If you had a bilingual education at any educational level, then simply check the box under "Both Languages".

Environment	Language	(Switched to)	Both Language
Elementary school			☐
Middle school			☐
High school			☐
College (Bachelor)			☐
Graduate school (Master)			☐
Graduate school (Doctor)			☐

(14) Rate your language learning skill. In other words, how good do you feel you are at learning new languages, relative to your friends or other people you know?

Very poor	Poor	Limited	Average	Good	Very good	Excellent
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

(15) Rate your current ability in terms of listening, speaking, reading, and writing in each of the languages you have studied or learned (including the native language).

Very poor	Poor	Limited	Average	Good	Very good	Excellent
1	2	3	4	5	6	7

Language	Listening	Speaking	Reading	Writing

(16) Rate the strength of your foreign accent for each of the languages you have studied or learned.

None	Very weak	Weak	Moderate	Strong	Very strong	Extreme
1	2	3	4	5	6	7

Language	Accent
	☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
	☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
	☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.
	☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7.

(17) If you have taken any standardized language proficiency tests (e.g., TOEFL, IELTS, TOEIC, etc.), then indicate the name of the test, the language assessed, and the score you received for each. If you do not remember the exact score, then indicate an "Approximate score" instead.

Test	Year taken	Language	Score	Approximate score

(18) Estimate how many hours per day you spend engaged in the following activities in each of the languages you have studied or learned (including the native language).

Language	Watching television	Listening to radio	Reading for fun	Reading for school/work	Using social media and Internet	Writing for school/work

(19) Estimate how many hours per day you spend speaking with the following groups of people in each of the languages you have studied or learned (including the native language).

Note *Include significant others in this category if you did not include them as family members (e.g., married partners)
**Include anyone in the work environment in this category (e.g., if you are a teacher, include students as co-workers).

Language	Family members	Friends*	Classmates	Others (co-workers**, roommates, etc.)

(20) If you use mixed language in daily life, please indicate the languages that you mix and estimate the frequency of mixing in normal conversation with the following groups of people.

Note *Include significant others in this category if you did not include them as family members (e.g., married partners)
**Include anyone in the work environment in this category (e.g., if you are a teacher, include students as co-workers).

None	Very weak	Weak	Moderate	Strong	Very strong	Extreme
1	2	3	4	5	6	7

	Language 1	Language 2	Frequency of mixing
Family members			
Friends			
Classmates			
Others (co-workers, roommates, etc.)			

(21) In which language do you communicate best or feel most comfortable in terms of listening, speaking, reading, and writing in each of the following environments? You may be selecting the same language for all or some of the fields below.

	Listening	Speaking	Reading	Writing
At Home				
At school				
At work				
With friends				

(22) How often do you use each of the languages you have studied or learned for the following activities? (including the native language)

Note*This includes shouting, cursing, showing affection, etc.
**This includes counting, calculating tips, etc.
***This includes telephone numbers, ID numbers, etc.

Never	Rarely	Sometimes	Regularly	Often	Usually	Always
1	2	3	4	5	6	7

Language	Thinking	Talking to yourself	Expressing emotion*	Dreaming	Arithmetic**	Remembering numbers***	Praying

(23) What percentage of your friends speaks each of the languages you have studied or learned? (including the native language)

Language	Percentage
	%
	%
	%
	%

(24) Which cultures/languages do you identify with more strongly? Rate the strength of your connection in the following categories for each culture/language.

Very poor	Poor	Limited	Average	Good	Very good	Excellent
1	2	3	4	5	6	7

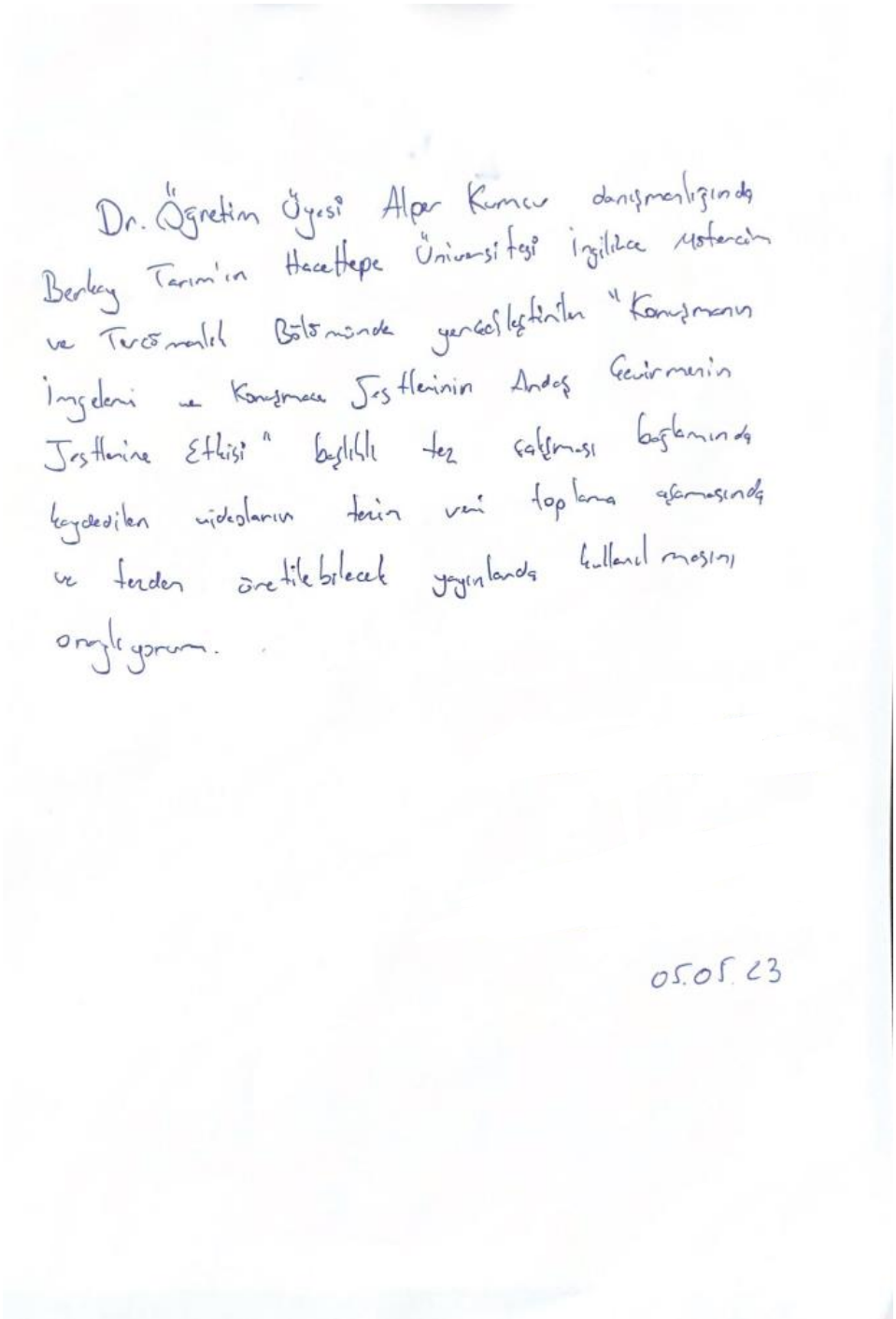
Culture/Language	Way of life	Food	Music	Art	Cities/Towns	Sports teams

(25) Use the comment box below to indicate any additional answers to any of the questions above that you feel better describe your language background or usage.

(26) Use the comment box below to provide any other information about your language background or usage.

(27) Do you also speak/use any dialects of the languages you know? Please indicate the name(s) of the dialect and the degree you use them.

APPENDIX 7



Dr. Öğretim Üyesi Alper Kumcu danışmanlığında Berkay Tarımcı Hacettepe Üniversitesi İngilizce Mütercim ve Tercümanlık Bölümünde gerçekleştirilen "Konuşmanın İngilizceden ve Konuşmacı Özelliklerinin Anlam Geçirmenin Özelliklerine Etkisi" başlıklı tez çalışması bağlamında kaydedilen videoların tezin veri toplama aşamasında ve ileride üretilebilecek yayınlarda kullanılmasını onaylıyorum.

05.05.23

AUTOBIOGRAPHY

Born on September 1999 in İzmir. He received his bachelor's degree in English Translation and Interpreting from Hacettepe University specifically loving simultaneous interpreting. He continues his master's degree in the same department and is interested in experimental psychology. In this context, he was the only graduate student to win Koç University's Summer Research Program.

During his undergraduate and graduate studies, he continued his education in two different departments with open education.

He is an interpreter by profession and has worked as an interpreter in international contexts such as the US Embassy, Red Crescent, World Human Relief. He has taught interpreting courses as a lecturer at Başkent University and is currently working on a virtual reality project on human-robot interactions. Berkay TARIM studied international relations and politics as part of METU Mediate Project and is working on securing artificial intelligence in simultaneous interpreting technologies.

He was first involved in the quality assurance system in higher education by being elected as a Faculty Representative. He served in the Senate of Hacettepe University and the Advisory Board of the School of Foreign Languages. In 2022, he was elected as a full member of the THEQC's Students Commission and assumed the International Relations Unit Leader of the Commission. Similarly, he has been in the ESU (European Students' Union) Quality Assurance Expert Student Pool for two mandates. He has held representative positions in Malta and Kyrgyzstan. He speaks advanced English and intermediate German.