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**How technology influences languages:  
a study on Italian Sign Language (LIS)**

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## **ABSTRACT**

Over the years, technology has revolutionised the world and our daily lives. Nowadays' technology has paved the way for multi-functional devices, has created impressive tools and resources, and put useful information at our fingertips.

The current work is a linguistic analysis of the possible variations within the context of Italian Sign Language, with the aim of investigating the possible effects of the technological “transformation” on the language itself.

The research first takes into account the most important moments in the technological evolution and the possible effects on language, then it dwells on the history of deaf education and the use of sign languages, to conclude with the linguistic analysis of some videos, respectively making a comparison between some early video recordings, more complicated in terms of accessibility and devices, and some newest videos, which are easily accessible. The videos present the same person who signs and a similar topic to be discussed, but at different time moments, in order to offer a linguistic comparative analysis of the collected data, and to highlight every linguistic and sociocultural change which could be connected to the use of technology.

## INTRODUCTION

The current work is the result of a research on the connection between language and media, the “transformation” which is happening nowadays and which is revolutionising our world. The history of communication can be seen as a continuous development, from scarcity to abundance, without any significant interruption.

The aspect I want to investigate about this evolution is language, the most powerful instrument of the human, which allows the spread of culture and has the function of collecting social events, which create strong identities and a stable asset handed down through generations.

At the basis of this study, there is a search in the linguistic field, an exploration of the possible variations within the context of Italian Sign Language (hereafter LIS).

The change of mass media’s world has reached incredible numbers until nowadays, results which were almost unknown and unimaginable until a few decades ago. The most incredible aspect of modern communication stems in the fact that this evolution has happened faster than ever and has reached a huge number of people, revolutionising the entire field of means of mass communication, including the oldest and established media.

My research work consists of a linguistic analysis of LIS with the aim of investigating the possible effects of the new technologies on the language itself.

The comparison to the base of this study concerns the linguistics and sociocultural sphere. The idea is that of analysing, at the level of linguistics, some videos, respectively a pair of old videos and some recent one. A couple of videos presents the same person who signs and a similar topic to be discussed, but in different time moments. This choice has been thought exactly to make a comparison between the early video recordings, more complicated in terms of accessibility and devices, and the newest videos, which use cutting edge technology and are easily accessible.

The idea of technological development we have reached until nowadays was almost unthinkable in the early 1990s, or rather no one would have expected such a technological evolution, a changeover which, within a few years from its introduction, was able to achieve a gigantic number of people.

The technological development has conditioned not only the way of communicating, but also the way of thinking, the way of approaching new experiences, the world of fashion, the world of school, politics, marketing and advertising, etc. Everything has become faster, always at hand, and since the dotcom bubble burst back in 2000, technology has radically transformed our daily lives and our societies.

My analysis regards a specific generation, the generation of people who have experienced the evolution on their skin from the beginning. The changeover has been as rapid as it is profound, that people living in the 80's probably didn't expect to end up in a world of vast technological advances and innovations.

My idea developed because I feel astounded thinking about how much the spread of technology can have influenced the everyday life of deaf people. Certainly very deep, but I would like to investigate the existence of any linguistic influence.

The purpose of this thesis is to offer an accurate linguistic analysis of the collected data, and try to highlight the lexical, syntactic and expressive characteristics of sign language, and every linguistic and sociocultural change which could be connected to the use of technology.

The thesis consists of four main chapters. The first part concerns the general topic of language and media, so I will provide an overview on how media usage can shape and reflect both attitudes and language use in the speech community. This chapter will be a general brief on the media's growing impact on society and on how communication has modernised until nowadays. Moreover, I will offer a general view of the impact of the language change, the way technology is evolving language and the modifications we see in the linguistic tradition.

The second chapter is, in terms of cultural background, the most important part of the work, because it concerns the history of deaf education and the use of sign languages. In my opinion, a basic knowledge of Deaf Culture is essential to understand the variations occurring in the deaf world. Hearing people often think that deafness is simply "an inability to hear." Being Deaf, though, is more than just a medical condition, it's about being part of a community with its own history, values, and culture. Thanks to the linguist William Stokoe and his research on American Sign Language (ASL), which revolutionised the idea of sign languages worldwide, since the 1980s there has been a wider interest in this field, and among Deaf people is also a

growing awareness that they are part of a community in every way.

The third section discusses the focus and locus of the research, including materials, methodology and the linguistic analysis. This part includes the most practical step of my work. I will offer a detailed description of the material, including the searching and choosing methods. The aim of my analysis is v7mainly linguistics, therefore this chapter will include both the linguistics data, together with the process I followed to obtain this evidence.

The work closes with a general discussion of what I obtained, also making a comparison between my initial expectations and the final results of the research, and giving my personal conclusions.

## **1. LANGUAGE AND MEDIA**

Talking about language is not easy, because language is a very vast field. Language is a system made of complex symbols through which people belonging to a community can express themselves and communicate to each other.

The topic I will focus on in this chapter regards the connection between the language, intended as the communication used by a particular country or community, and the evolutionary world of technology.

Every instrument of communication, reducing distance and shortening the time, has profoundly been influential on our society and our culture, and has irreversibly modified the daily life of a growing number of people.

### **1.1 MEDIA'S GROWING IMPACT ON SOCIETY**

The diffusion of technology has generated numerous changes: on one side there has been a growth of opportunities, and on the other the relations have been modified.

All over the world, in recent times, we are facing a massive spread of the internet and of the media of communication. This phenomena has obviously led to some improvements in the way of communicating, because it permits us to cross time and space's barriers, until having an infinite possibility of access to every kind of source of information.

As with everything, the other side of the coin concerns the bad and excessive use of the internet.



Technologies have determined a deep evolution of modern society. Above all the new media, which have completely revolutionised the way we communicate, we inform ourselves, we work, we learn, we build relationships.

There is no part of our personal sphere, our professional or our social one, which has not been transformed from the technological revolution. The effects of this progress can be both positive and negative.

On one hand, the biggest change has been on a communicative level, the new media have transformed all the news' systems, and have determined a radical step for unidirectional information. On the web, people are able to communicate "from one to many", and this is an enormous change because in the past this possibility was reserved only to the traditional media, such as the press, TV or radio. Now, people who have access to the internet, are totally free to communicate and to choose the communication to be bidirectional and also interactive. In general, the access to information has become unlimited and personalizable.

On the other hand there also has been a change in the relational sphere. The transition from a communication "face to face" to a communication on the network, made of profiles and followers, has determined the birth of a new continuous mobility.

However, there is also something to say about the negatives sides of technology, that are the addiction issues related to it and the control of information, and the incorrect use. Above all during the evolutionary period and adolescence, the excessive use of technology risks creating a total detachment from reality,

so it could be very dangerous for one's health.

Having arrived at such a sad result demonstrates how much, on a practical level, but also, and particularly, a psychological one, technology can affect lives.

Among the results on the effects of technology, as it has been studied by many scholars, for example Yong Zhao or Dorothy Chun, Richard Kern and Bryan Smith, we find some evolutions which concern language. The pandemic time that we have been living in has enforced and made even more "indispensable" technology, mainly for communicative use. Almost automatically, due to the period in which my research is done, the topic I will deal with is closely associated with this argument.

For what the deaf community is concerned, this period of COVID-19 (C19) pandemic made communication even less accessible. Sign languages are visual-manual languages, so traditionally they are preferred to be "face to face". Though, it must be said that the evolution of technology has been a huge help for deaf people, particularly with the invention of smartphones and the possibility of communicating in sign languages at any time, via video.

The new media, or also called digital media, are systems of communication developed after the birth of computer science. The new media are often in contrast with the so called "old media", such as radio, television and print media. Differently from the old one, new media include processes which can be even interactive and multimedia. There are new media in which the users are also participants, and in fact they create a new environment, always evolving, in which new media has

overcome the traditional communication. In particular, if on one side technology has significantly increased our opportunities of interaction, on the other side this abundance of interactions can have had a bad impact on people's psychological wellness.

Social media has very often been a topic of discussion, due to the huge power they have over the mass public. For definition, "Social media are websites and computer programs that allow people to communicate and share information on the internet using a computer or mobile phone".<sup>1</sup>

In other words, social media are a web portal, thought to make users interact, to share information and to socialise. The connections created by these instruments allow us to build social networks that link users through knowledge, business or family relationships.

Society exists thanks to a system of values, ideas and models of behaviour, a sort of baggage which helps people to create an identity, to maintain and transmit it. Nowadays we are facing a continuous development and a consequential adaptation of people to it.

The arrival of the internet has been one of the most impactful phenomena of the last twenty years, and the impact on the so-called "new generation" has been huge, due to the fact that even kids have access to every type of information. The youngest generation, also called "Generation Z", was born and raised in completely different circumstances than the older generations. To give a better definition of Generation Z: "They were born in the 1990's and raised in the 2000s during the most profound changes in the century who exists in a world with web, internet,

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1 <https://dictionary.cambridge.org/dictionary/english/social-media> last accessed on 19<sup>th</sup> October 2022

smart phones, laptops, freely available networks and digital media” (Singh & Dangmei 2016, p. 2)

At this time, we have a lot of research, for example by Clements or Plowman, which is concerned with children. The technological boom means that children are becoming computer experts at a very young age. Kids from elementary school have classes on computers, and many of them have been using their tablets or computers at home well before they started school.

Some studies, for example “Children and Computer Technology: Analysis and Recommendations” by Margie K. Shields and Richard E. Behrman, or “Children, Wired: For Better and for Worse” by Daphne Bavelier, C. Shawn Green and Matthew W.G.Dye, show that there are obviously positive sides in using technology by young people. For example in school time, it has been noticed that DSA children (children with dyslexia, dysorthography, dysgraphia and dyscalculia), or more in general SEN children (children with special educational needs), have learning difficulties due to different causes. There is a brand of technology called AT (Assistive Technology) which is used as a support in learning and it helps people to study, at home or at school, to participate and to feel included in didactic activities, together with teachers and classmates.

Every day, the new generations spend a lot of time on the Web, and social networks are not only used as instruments of communication, but they also have the functions of transmission and collaboration between people and communities. People not only enter online communities, they also participate giving their contribution.

This topic, in a way, can be connected to all generations because of the fact that technology has modified human physiology: we

think, feel and dream in a different way. Technology influences our attention, our memory and our sleep cycle. Our brain has the ability to change, it is dynamic. This happens thanks to brain neuroplasticity. There have been different researches about how our brain can modify during life. According to some scholars our brain seems to be elastic and dynamic, that is it can be physically changed by both internal and external factors. In other words, our brain has the capacity to be remodelled, and this process is called “neuroplasticity” (Jill L. Kays et al. 2012, p. 119).

The article I cited above explains how the brain can be modified even in adulthood, because the structure of our brain and its organisation can be influenced by what we experience. Most of us have different thoughts, dreams or ambitions compared to some years ago. What we learn makes our brain able to adapt to different kinds of evolutionary factors.

Another important field which deserves to be mentioned, because of the several changes it has undergone over the last years, is the market. Technology has modified the way companies do business, because it allows them to automate manual operations and make the process of information faster.

Some years ago the internet was thought to be a “passing fad”, while nowadays this idea doesn’t exist anymore, because it has become a need, above all when we are talking about business. With the diffusion of digital technology, the consumer has switched from a passive user’s status to being the protagonist of the communicative activity. This change has pushed companies to rethink the relationship with the client, so technology has also influenced the marketing strategies.

As we can notice, the marketing strategies depend on the market demand, so these strategies are becoming more and more targeted and personalised in order to satisfy people's needs and interests.

The power of the internet was so high, that in the late 1990s the pioneers in digital marketing realised this opportunity, and an increasing number of users started to base their research on their personal interests. This is the starting point of the history of online marketing.

Now the priority is digital advertising, exploiting the internet's capabilities in reaching a remarkable amount of people. One of the main advantages of digital advertising is that the results can be tracked, and a seller can have a big picture of the effect on the public. In other words, the internet has taken an important role in media communication, thanks to the capacity of offering instant answers, efficient measuring levels and market analysis.

To sum up, the new media are part of our lives, they are used for instant gratifications, online advertising, immediate profit, educational purpose, etc. Social media are becoming the first platform of information and for this reason they are perfect for advertisement and propaganda, even political. The situation is even more complicated than we imagine, and there are many aspects to take into account when we talk about how technology influences society.

## **1.2 MODERN COMMUNICATION**

One of the aspects which we are more focused on is how

technology has been modifying the way people communicate, and consequently the social relationships between them.

To define communication, we can say that it is a process by which information is exchanged between, that is a system made of symbols, signs, or behaviour through which individuals communicate. Communication is a complex phenomena and it is fundamental for society. In fact, communication exists because people communicate with each other. Language is the most important instrument for socialisation, and communication is an instrument for social interaction.

We can all agree that the evolution of communication over time has led to having different types and instruments of expression. To talk, to sign, to write, they are just some of the many aspects to express ourselves, and they all have the scope of transmitting a message. One aspect of communication which has become very important with the development of new technologies is the “medium”. For definition, a medium is “a method or way of expressing something”.<sup>2</sup> In other words, it is a channel or a system through which a writer or a speaker addresses their audience.

Within the age of globalisation, communication is rapid and efficient. The connections between states and people have become immediate. It is possible to send messages anywhere in the world, and these messages can be received in real time. Nowadays, to find a particular piece of information, we can connect to the internet in a very easy way. We can “google” what we are looking for, and undoubtedly the info will appear on our screen. For example, every company has its own website, or at least a Facebook page to be found in the search engine.

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2 <https://dictionary.cambridge.org/dictionary/english/medium> last accessed on 22<sup>th</sup> October 2022

Once, communication was more “concrete” and also practical in a way. We wrote paper letters in envelopes, with handwritten addresses underneath. It took a long time to write, to send, to receive them and also to respond to these letters. It is funny also to remember the hard decision on the type of paper, colourful or fragrant, on the coloured ink. It was a long and exciting wait. Letters have been the most efficient and the most intimate way of communication before the invention of mobile phones. The first devices were very big, they had a black and white display, and they were only allowed to make and receive calls. They were heavy and cumbersome, but they appeared to be a miracle of technology.

Even if in the past the progress in the field of communication has been very slow, even though it had a strong impact, during the last twenty years we are witnessing an actual technological boom, which, thanks to the new and always improved devices, has radically modified the way we interact with human beings.

On one side, technological progress has allowed us to communicate more and faster, providing plenty of means of communications and more opportunities to connect with other people, but on the other side it has also created a situation in which communication is increasingly remote and silent.

All the history of the means of mass communication can be read as a transformation, a continuous transformation. At first, this process was slow and tedious, but later it has accelerated the rhythm. Social networks play an important role in how much communication has changed over the last few years. Social media has changed how our society works, and with no doubt also the way we share information.



It is so easy to capture a moment, taking a photo with our smartphones to share it immediately with our friends and relatives. Some years ago, the general opinion was against posting personal information on the internet, while nowadays people have a different view of social media, so much so that sharing personal photos, even those of newborns, has become the norm.

Communicating via social media, in today's society, consists of sharing as much information as we can, to be always updated on other people's lives. In fact, nowadays social media are the most popular way to share contents, above all videos, and they make it easier and "closest" to interpersonal interactions, be it either family or friends, or even strangers.

The applications which we call "app" are programs used above all with our smartphones, but also with other devices such as computers or tablets. While some apps have been created in order for the users, for example games, others have been created with the purpose of connecting two or more people simultaneously. Some of the most popular apps not only allow people to connect with contacts we already know, but they also help to meet new people and to be noticed by someone we don't know.

Technologies have grown in order to fulfil our needs, satisfying them completely thanks to the creation of new apps, designed for any purpose. In fact, smart phones have become essential devices, especially among young people, to communicate with everyone and in every moment and place we find ourselves.

With the arrival and the spread of this new frontier, the

opportunities to communicate with friends, relatives or to meet new people have multiplied. The simplicity with which we can send texts, photos, audios and videos enable us to communicate even in situations which seemed impossible, for example during a work break or a train ride. When people are in possession of such a powerful device, comparable to a sort of small computer, inevitably even the way we interact with the world changes. Smartphones enclose a lot of instruments, they have become our books, dictionaries, maps, newspapers, calculators, etc.

The idea of media can also be more complicated than we usually think, because the message is mediated, that is transmitted through a particular medium. “A medium is basically anything that comes between one entity and helps to facilitate communication or interaction (what Finnegan calls “interconnectedness”) between those two entities. We call this process of facilitating the interaction between two entities mediation.” (Rodney H. et al. 2013, p. 4).

In other words, the media selects, or better mediates, the way it shows people to serve its own purpose. Some of the most important factors which affect how media are used, are the social conventions around media use, which within particular communities and cultures have developed.

The pandemic COVID-19 has accelerated digital adoption. Our behaviours have become more and more digital. It does not surprise us at all, because of the distancing measures imposed by countries due to the health emergency. During the lockdown, e-shopping has become the first purchase channel for plenty of consumers. From the beginning of the pandemic, research interest for online shopping and “how to buy online” has grown by 100%. Only in Italy, during the first five months of 2020, the

new online consumers have tripled compared to the previous year.<sup>3</sup>

The digital adoption of e-commerce has increased, but also other sectors have been digitised during the pandemic. For example, consumers have started to use the internet for things such as classes, tests, virtual gym, etc. People have used digital channels to fulfil the various aspects of their life, from shopping to education, but also for personal use. Consequently, consumers now also have new expectations about what the internet can offer, and for this reason all the companies are being forced to accelerate their process of digital adoption and to adapt their operations to the consumer's needs. These changes will condition the consumers' choices even in the future. People have understood that online shopping, for example, is easy, convenient and fast. The online market is huge, but companies must differentiate from others to become known, and to do this they need to work with digital strategies.

To sum up, the advent of technology has marked the beginning of a “communicative revolution”, because communication has evolved over years and nowadays the online component tends to be predominant, thanks to the new available instruments.

### **1.3 THE INFLUENCE OF MEDIA ON LANGUAGE**

Language has been an instrument which has enabled humanity to make great strides. Thanks to language, we have transmitted ideas and concepts and the human brain has evolved higher and abstract concepts.

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<sup>3</sup> <https://www.thinkwithgoogle.com/intl/it-it/futuro-del-marketing/digital-transformation/covid-ha-accelerato-adozione-digitale/>, last accessed on 30<sup>th</sup> October 2022

The power of language has been studied since ancient times, and nowadays the analysis has become deeper and our knowledge has been expanding. In fact, it is easy to think about the importance of language in humans' lives: without language many of our daily activities would become impossible, or certainly very difficult. Language is used to ask for something, to communicate a need, to share memories, expectations or opinions. With the term "language", we generally mean every codified communication system, a particular style of speaking or writing, a system used by people of a particular country or area, and, talking about communication, to give a better definition we can say that "language is the use by humans of a system of sounds and words to communicate".<sup>4</sup> Language is a very complex instrument. When we express ourselves, in fact, it is necessary to follow a series of rules to be able to communicate and to be comprehended.

Language is typically attributed to humans, but it is very important to investigate its evolution, because it is a very arduous topic. Human brain seems to have evolved due to the survival of the organism and to the need to build relationships. As the human brain has modified over time to satisfy needs, also technology has been created and designed to meet our needs. When we decide to use one app, in preference to the others, it depends on various factors: for example the degree of urgency, the convenience, the type of answer we expect, the kind of relationship we desire to establish, etc.

Technology no doubt influences us, and over evolutionary history, our cognitive systems have undoubtedly been

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4 Hornby A.S., *Oxford Advanced Learner's Dictionary*, Oxford University Press, 8<sup>th</sup> edition (2013)

conditioned and modified. New technologies are seductive because they offer what can satisfy our vulnerability, and human beings are highly vulnerable. We feel lonely, but at the same time we are scared of intimacy, so the digital connections can offer the illusion of the company without obligation. In a way, the internet allows us to be connected with each other, but also to remain hidden.

Technology offers various alternatives to face-to-face communication, we are able to easily communicate, but we also have the possibility to reduce human contact. In fact, new technologies have redesigned our emotional life, have made “digital native” children more superficial in behaviour and also in the elaboration of information. They adopt multitasking behaviour, but it also has negative aspects such as a rapid shift in focus, reduced capacity of reflection and a higher distractibility.<sup>5</sup>

As we can see, as individuals, human beings have a flair for adaptation. With the progression of the digital era and the establishment of social networks, we have “created” a new language, a rapid and figurative hybrid. If we think about emails or texts which had a character limit, we were already adapting to a new way of communicating, modifying our message to integrate with that technology. This new language, called “texting” or “fingered speech”<sup>6</sup> is a language category itself, with its rules, structures and models.

Even before the advent of the internet, linguistic researchers were interested in “youthful languages”. The Internet and social media have improved the ability of writing, even in people who

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5 <https://www.stateofmind.it/2016/02/nuove-tecnologie-stile-vita/> last accessed on 10<sup>th</sup> November 2022

6 <https://immedya.com/societa-digitale-internet-ha-cambiato-il-nostro-linguaggio/>, last accessed on 9<sup>th</sup> November 2022

didn't have this habit. Young people write more, but in a language which remains more informal and colloquial.

Informal talking and often playful, dialectal forms, jargon, expressions borrowed from advertising, media or cinema, merge with tradition. Internet slang is a linguistic variety, elaborated and used among internet communities, many of which are originated by stenographic needs, in order to save on keyboard movements. For this reason, users started to "summarise" whole words with single letters. This phenomenon is called "tachograph language" and it is very common in English, not only on the internet, but also in song's texts. We can find informal spelling, such as "nite" for "night", "UR" for "you are", "thru" for "through", and many others.<sup>7</sup>

Also in Italian, even if the phenomenon has less creative possibilities because the writing does not differ too much from the pronunciation, we can find similar tachograph cases. A sector which has become very important for tachograph writing is that of SMS, where people tend to substitute words with letters, or to reduce words omitting vowels in writing, for example "cmq" instead of "comunque", "msg" for "messaggio".<sup>8</sup>

It is evident that these structures have their meaning if they are used in certain contexts. If they are used in a correct way, they do not impoverish language, indeed they demonstrate how a language can be healthy and enriched. So, the fact that the internet has been changing our way of communication is evident: communication, absorbing the characteristics of the means of transmission, has become faster, more immediate,

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7 <https://accademiadellacrusca.it/it/consulenza/scritture-tachigrafiche/87> , last accessed on 12<sup>th</sup> November 2022

8 <https://accademiadellacrusca.it/it/consulenza/scritture-tachigrafiche/87> , last accessed on 12<sup>th</sup> November 2022

more direct and more informal.

One important change regards the fact that online communication is not just verbal, but it also has enriched visual and sound elements. New devices are programmed to use as many kinds of instruments to speak as possible.

As we have already mentioned, not only our way of communicating is changing, but also we can observe evident variations in the language itself. We know that language is not something set or immutable, indeed it is subject to evolution and change which can be determined by different factors. Observing deeper how language is used on the internet, we can notice how our language is influenced in some aspects, for example tone, lexicon, syntax or punctuation.

The tone of language, that is its being formal or informal, direct or indirect, colloquial or detached, was one of the most distinctive variables between the spoken and the written language. Not too many years ago, written language was considered to be more formal, while the spoken one was characterised by the use of informal expressions, even because of its directness. In fact, in spoken language we usually are less meticulous about grammatical correctness. With social networks, we are seeing the written language presenting more and more spoken language's features, above all immediacy and informality.

After the tone, the lexicon has visibly been modified with the internet. For its part, vocabulary is one of the most variable parts of language, I would dare to say the "youngest", because it is always subject to change, and technology has surely brought some news in it. The Internet saw the birth of new phenomena,

for example neologisms. We coin new words to describe new things but also when we don't find a word which is currently in existence and can accurately express what we are feeling. The words reflect our attitudes about the world in which we live, because they reflect what we experience, and for this reason they have a great cultural importance (McDonald 2005, p. 88).

The Internet and computers in particular have spawned a large and specialised jargon. For example, the prefix "e-" has been largely used to create words such as e-mail, e-commerce, e-solution, e-book, e-government, to name just a very few. The suffix is added to almost any term connected to the online computer world (McDonald 2005, p. 83). Also in Italian we have different new forms which have had a rapid advancements in our internet-based communication and are often connected with other languages, for example verbs or nouns as "chattare", "fake", "DAD", "postare", "matchare", "meme", but for example also words which regard the time we have just lived, so for example "green pass", "booster", etc.

In other words, the creation of neologisms meet the need of expressing new concepts, of naming or classifying new things or institutions. Neologisms can be forms which are completely new or forms which already existed, but can now assume a different meaning.

To sum up, technology does influence our language: on one side because we are assimilating a real new lexicon connected to the media used, on the other side the speed of the world in which we live acts also on other aspects of language, as we have seen for example syntax. In general, it is a totally natural phenomena and, if we look at it as a sign of health of our language, it has to be seen as positive, because it demonstrates to be adaptable and



disposed to changes.

## **2. SIGN LANGUAGE IN TECHNOLOGICAL ERA**

In this chapter, I will concentrate on sign language and its evolution over time. The chapter will have a more historical and cultural connotation, and I will begin to focus mainly on LIS. Firstly, I will briefly provide an overview of the most significant points, events and characters which have marked the historical evolution of sign language. Then, I will focus on the influence of the technological revolution for deaf people, indeed how new media has given different possibilities of access to the information. To conclude, I will therefore analyse these effects on the deaf world, that is every possible influence in signing through the new technologies.

### **2.1 EVOLUTIONARY HISTORY OF SIGN LANGUAGES**

Much like the spoken languages, tracing the “invention” of sign language to a particular point in history is impossible. Throughout history, different forms of sign language have evolved, often incorporating elements of other languages.

Before we developed spoken languages, the way of communication was via gestures and facial expressions (Corballis, 2003). During history, deaf people and sign language were often and sometimes hardly persecuted, and until the 16<sup>th</sup> century people thought that deaf people couldn't learn and no one bothered to try giving them a main education. Among history, many aspects and some major figures in the education of the deaf have been very important and extremely connected to the evolution of the language itself.

Sign Language was first documented in Ancient Greece, in a

dialogue by Plato, where he describes the way deaf people use gestures to express their needs, and, talking with his teacher Socrates, he refers to them as follows:

*“If we had neither voice nor tongue, and yet wished to manifest things to one another, should we not, like those which are at present mute, endeavour to signify our meaning by the hands, head, and other parts of the body?.”*<sup>9</sup>

Plato meant that Deaf people, who he wrongly considered unable to speak, use their hands and other parts of the body to communicate. Therefore, in his opinion, gestural communication is the natural form of expression for Deaf people, based on imitation and representation.

Only in the 16<sup>th</sup> century someone discovered the potential of educating the Deaf using Sign Language. Pedro Ponce De León (1573-1633) is considered the first teacher of the Deaf, and the inventor of a form of sign language he created to communicate among monks during the vow of silence (Russo Cadorna & Volterra 2007, p. 19).

The 16<sup>th</sup> century is characterised by other important developments in educational techniques. For example, the Spanish Juan Pablo Bonet (1579-1633) in *Reducción de las letras y arte para enseñar a hablar a los mudos* takes up the ideas of Ponce de León. He describes a manual alphabet which is used as a connection between the alphabet itself and the shapes of the vocal articulators during the production of words (Russo Cadorna & Volterra 2007, p. 21).

In summary, starting from the 16<sup>th</sup> century and throughout the 17<sup>th</sup> century Deaf people started to be educated, but it was an individual education, reserved for the children of rich families.

Only during the 18<sup>th</sup> century did things start to change, in particular in France, where a notable progress was made with Charles-Michel de l'Épée (1712-1789). He was a French priest who began to elaborate his method when he became the teacher of two Deaf girls. These twins were Deaf since birth and they had developed a complex gestural communication.<sup>10</sup> De l'Épée was impressed by the rapidity of communication and comprehension of the girls, and started to think that natural signs could be a great support in education. He elaborated a conventional Sign Language, made of signs and gestures used by his students and other signs which he added to distinguish objects, qualities and events. In his opinion, Sign Language wasn't a complete language. In fact, his objective was to teach written French, so he invented signs to indicate the French grammar elements (articles, verb tense, prepositions,...) which were absent in the natural Sign Language and were basically his adjustments to it. These signs were named "methodical signs" (Marziale & Volterra 2006, p. 24).

In the same years the interest for the new educational methods grew also in the United States. In 1815 a Protestant minister from Connecticut, Thomas Gallaudet (1787-1851), was in Europe to learn the new educational methods. In 1816 Gallaudet visited the "Institut national des sourds-muets" in Paris and met also Laurent Clerc, who had just become an educator in the school. In the same year Clerc and Gallaudet left together for the United States to found the "Connecticut Asylum for the Deaf and Dumb" (Sacks 2000: p. 55-56). The Institute still exists

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10 <https://aslblog.goreact.com/2017/04/19/the-history-of-sign-language/>, last accessed on 22<sup>th</sup> November2022

nowadays: it is the “Gallaudet University”, the only university in the world for the deaf and hard of hearing.

But not all the teachers of the time were in favour of signs. Samuel Heinike (1727-1790) was the creator of the “German method” of Deaf education. Unlike de l'Épée, Heinike was a staunch oralist, and he was convinced that lip-reading was the best technique to make his students speak.<sup>11</sup>

At the end of the 19<sup>th</sup> century there was a real regression in the history of Deaf education. In 1880 an International Congress of Deaf was organised in Milan, where delegates of seven different countries participated. The key people of the congress were Giulio Tarra (1832-1889), Serafino Balestra (1831-1886) and Tommaso Pendola (1800-1883). During the congress the majority of the delegates thought that the oral method was superior to the manual one, because signs were believed to isolate Deaf people from the hearing world and to interfere with the learning of the spoken language. For these reasons the Congress decided that Sign Languages would be banned from schools. Furthermore, also Deaf educators were banned and fired from the institutes (Russo Cadorna & Volterra 2007, p. 28).

The consequences of the Milan Congress were catastrophic for Deaf people all over the world, not only in terms of education, but also in private, political and cultural aspects. Sign Languages were used in secret, at home, but Deaf people lost the awareness of the potential of their language and the concept of community.

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<http://www.storiadeisordi.it/2015/06/11/educatore-tedesco-samuele-heinicke/>, last accessed on 29<sup>th</sup> November 2022

We must wait until the 1960 when for the first time a sign language, specifically American Sign Language (ASL), was the subject of a linguistic study by William Stokoe, who was the first linguist to state that sign language is a real language, just like other languages, and to coin a new term for sign language, cherology, which is the equivalent of phonology in spoken language.<sup>12</sup>

William Stokoe was the figure who changed the view of sign language, and after 1960 there has been several research on the various and unexplored linguistic aspects. Spoken languages and their evolution have been studied since the middle of the 19<sup>th</sup> century thanks to traditional comparative methods, and more recently to new phylogenetic methods. By contrast, the evolutionary history of sign languages has received less attention, and scholars have had difficulties in grouping sign languages into language families. Although spoken languages and their history have received the majority of scientific attention over time, scientists presume that signing, even if it has been far less studied, is at least as ancient as speech.

One of the most recent studies about sign language evolution entitled “Evolutionary dynamics in the dispersal of sign languages” was made by a team of scientists from the University of Texas, Power, Grimm and List, who tried to study the evolution and the worldwide dispersal of European sign languages. As one of the authors claims, much of what we know about the histories of contemporary sign languages has come from historical accounts of the contact between the deaf educational institutions and the educators. The aim of the research is to know more about how European sign languages have developed and spread around the world, and the instrument

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12 <https://beta.nsf.gov/news/american-sign-language-spoken-here> , last accessed on 24<sup>th</sup> November 2022

of this work is a comparison of sign languages via the historical and contemporary sources.

This team of scientist used a phylogenetic approach, as we do for spoken languages, and for the first time they published a research on sign languages made on a large scale, because they made a phylogenetic analysis and report the results of 40 contemporary and 36 historical SL manual alphabets coded for morphological similarity. (Power et al. 2020, p. 3). The results of the study confirmed the dispersal of sign languages connected to the events we know from historical records, but they also revealed something new. For example, the study showed the influence that French Sign Language (SFL) had on the deaf education, but also on the deaf communities, including many European regions, but also America.

To sum up, it is clear that human capacities do not limit to oral modality, but over history human beings have developed a natural and complex gestural-visual language. This was possible especially thanks to the deaf signing communities throughout human history. The birth and the development of educational institutions for deaf people was central in Europe between the late 18<sup>th</sup> and the first 19<sup>th</sup> centuries. Thanks to these institutes, we can see the formation of signing communities and the creation of conventional and widespread sign languages. In these institutions. Large numbers of deaf children were exposed to a natural language at early ages, and sign languages were transmitted and acquired naturally from signers.

## **2.2 MEDIA ACCESS FOR DEAF PEOPLE**

Throughout history deaf people have always had limited access

to many services and information, because they have to face oral and printed language barriers. Even if history has allowed a great development of accessibility under many aspects, hard challenges still exist for the deaf community. Policy changes and particularly technological developments have provided solutions for many obstacles, but a great number of challenges persist. When we talk about obstacles in the deaf world, we mostly refer to communication barriers.

The difference between the hearing and the deaf communication, talking about the remote one, is that hearing people can easily have a direct contact, for example making a call, while deaf people must undergo the time required by communication via accessible channels, for example email. Nowadays the internet and the new media has also allowed deaf people to have more immediacy and velocity in communication.

In recent times there has been much research on our society which is always more digitised. For example, a very recent research made by UNICEF (United Nations International Children's Emergency Fund) has demonstrated how during the pandemic time 100% of the families which have at least five children did buy a computer.<sup>13</sup> These instruments are very important for interpersonal communication, and they also remain a crucial variable in childhood development. There are different types of new technologies, from computers, to smartphones, to tablets, etc., and they all have particular characteristics of accessibility and usage. For this reason, we must take into account that adults have the role of digital mediator. In other words, nowadays in one way or another everyone is exposed to technology, from adults to children.

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13 <https://www.unicef-irc.org/publications/pdf/la-didattica-a-distanza-durante-l%E2%80%99emergenza-COVID-19-l'esperienza-italiana.pdf>, last accessed on 27<sup>th</sup> November 2022



1964 was an historic date for deaf people all over the world, because the first telephone device was introduced. These devices are composed of a keyboard and a screen. Two users can simultaneously connect via a telephone line and they can talk by typing messages on the keyboard. The innovation has been the fact that messages are displayed in real time on the screen of the other apparatus. This has been a fundamental invention, because it broke down the barriers of long-distance communication for the deaf. In Italy the process of technology in deaf communication started in the 80's and has been long. The first technological adventure for deaf people was word-processing, for example the telematic network, the subtitles or the DTS, which stems for "Dispositivo Telefonico per Sordi"<sup>14</sup>, in English TTY ("TeleTYpewriter").<sup>15</sup> In the same year, in England, a national free "relay service" was set up. This service arrived also in Italy: it was available starting from the 1998, and it was called "servizio ponte" or "servizio di ritrasmissione", because of its functioning.<sup>16</sup>

The technological experience of deaf people can be described as a phase of independence and conquest of autonomy. In fact, for example with the telephone, almost always deaf people had to ask for help from hearing people (family members, neighbours, colleagues, strangers, etc.). These people transmitted the message, so deaf were not totally independent in wireless communication. From a "multimedia" point of view, the wireless experience has been pioneering. Thanks to the new technological devices there has been a gradual conquest of mediatic autonomy. As we already mentioned, with the arrival

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14 <http://www.storiadeisordi.it/2007/05/18/servizio-ponte-telefono/>, last accessed on 27<sup>th</sup> November 2022

15 <https://www.washington.edu/doit/do-tty-tdd-and-tt-mean-same-thing>, last accessed on 26<sup>th</sup> November 2022

16 <http://www.storiadeisordi.it/2007/05/18/servizio-ponte-telefono/>, last accessed on 28<sup>th</sup> November 2022

of the DTS deaf people finally have the independence to receive and send messages in real time. At the same time, there was another technological innovation: the subtitles on television, which allowed deaf people to have an independent access to this type of information.

During the 90's the DTS developed and became smaller, more handy and lighter, in order to be easier to use when travelling. While DTS could be used just between two people who own the device, a new non real time communication finally started, a communication which worked also between hearing people who didn't own DTS.<sup>17</sup> The advent of mobile phones and the internet began at the end of the 90's, and SMS and email started to be used more and more, while the DTS was used much less. With the new millennium we have seen a technological boom which includes internet and chatline, webcam, communication via dialogues, texts, but also pictures and video, and access to every different kind of information.

To sum up, starting from the 90's, with the internet all has become easier thanks to the computer, modem and ADSL (Asymmetric Digital Subscriber Line). The young deaf have an easier and more independent life in communication, compared to the old generations which have lived an historical evolution of the technological instruments, and thanks to it they have gained autonomy, above all in direct communication.

Technology can have many different uses in the area of deafness and they deeply affect educational, working and social spheres, being crucial for more possibilities in school and in general in society. Deaf people are usually very penalised, because the

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17 <http://www.storiadeisordi.it/2007/09/30/la-tecnologia-i-sordi-e-la-comunicazione-newsletter-della-storia-dei-sordi-n-324-del-1-ottobre-2007/>, last accessed on 27<sup>th</sup> November 2022

sensory deficit usually distinguishes and labels them as incapable of communicating, of comprehending and understanding what they are told, and in general considered people with lack of intellect, but this is not the truth. When we talk about technological progress, we must take into account that for deaf people, and for people with disabilities in general, every kind of progress and improvement also decreases a sense of discomfort and isolation.

In a few years the production of software for deaf people has incredibly increased, above all in the educational field. With digital, the level of accessibility to the information and the events has grown a lot, and now there are different programmes on the market, programmes for the interpreting service, for teaching children to read or write, for transcribing messages, etc. In Italy technological development has increasingly risen, there are smartphone's app designed to assist deaf users to communicate with people around them or at a distance, in order to eliminate the communication barriers for deaf people. For example, we have "Pedijs", which is an app which allows deaf people to make a call to a landline number or a mobile one. Thanks to the synthesis technologies and the voice recognition, after the login the user can make a call, during which a voice reads loudly and in real time everything that is written or spoken. This is an example of how much technology can help deaf people to manage their independence and to have calls without intermediaries.<sup>18</sup>

Another example of digitalized services is "Veasyt", which is a start-up which works on the complex accessibility to information and contents, in order to overcome language and sensory barriers. Veasyt offers different services, which are

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18 <https://www.pedijs.org/it/home/>, last accessed on 28<sup>th</sup> November 2022

“Veasyt Tour”, “Veasyt Live!” and “Veasyt Translate”. The first one is an accessible and inclusive guide for touristic and cultural contents, “Veasyt Live!” is a service of remote video interpreting, while “Veasyt Translate” is an interpretation service which makes multimedia and paper contents accessible for deaf people. “VeasytLive!” is a very important service because it is the first one in Italy to remotely offer a professional interpreting, so everyone can take advantage of this service in any language and in any place.<sup>19</sup>

With technological evolution there has been a development also of the educational field. When we talk about deafness, in fact, technology is supposed to be helpful for the deaf person, eliminating or reducing the communicative barriers. These innovations, in the majority of cases, are intended to improve the scholastic inclusion of the deaf children, but there are also, as we have already seen, a whole series of services useful for socio-occupational integration. With technology it is possible to gain autonomy through direct communication, the writing and the reading, the study of foreign languages for example. In everyday life everything becomes more accessible and easier. Before technology, the access to information by deaf people was not limited because of their scarce capacity, but because they always needed an intermediary. In general, technology has brought significant benefits to people with sensory disabilities.

What we can notice is that, on the national scene, the inclusion of deaf people in daily life, but also that of those with disabilities in general, still has a welfare approach. Padius and Veasyt are two examples of innovative services which make it possible for deaf people to have independence and autonomy, also in the working environment. These are innovative, real and

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19 <https://www.veasyt.com/>, last accessed on 29<sup>th</sup> November 2022

efficient solutions to significantly improve the integration of people with disabilities in the labour field, in small or big companies, but also in public administration.

The research today is aiming at a better use of technology and digital materials to make life easier for the consumer. A great news which can promote and facilitate everyday life is the “AT” which stands for “Assistive Technology”, and includes all the possible products, systems and equipment that enhance the daily living, working or educational life for people with disabilities.<sup>20</sup> Very often AT is confused with the classic aids which many states have guaranteed for years, as hearing aids, wheelchairs, etc. We can describe the AT as the software of the computer, which refers to all the programmes and functions which help the computer to solve its problems. AT, in some cases, can be considered as a subspecies of aids, because their aim, in fact, is that of helping people in their daily lives, but they just refer to products with a digital nature. AT can be fundamental for deaf people, but also for particular disabled categories, both young and old people.

### **2.3 THE EFFECT OF THE NEW TECHNOLOGIES ON THE DEAF WORLD**

The biggest discomfort connected to deafness is not the difficulty in speaking. This is just a way to see deafness from the perspective of hearing people. The real problem in deafness is that when deaf children are born, they don't have access to their natural language, that is sign language. This is the reason why usually deafness is directly connected to the idea that deaf

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<sup>20</sup> <https://www.atia.org/home/at-resources/what-is-at/#what-is-assistive-technology>, last accessed on 29<sup>th</sup> November 2022

people are born with cognitive delays, and therefore, educational and behavioural problems. Deafness has inevitable and different effects on the dimension of existence which represents our way of being in the world: language. To master a language is the condition which allows us to access knowledge, and consequently to exercise our freedom and our rights. Technology has been entering every different daily context of humanity, as a continuous medium to solve problems and satisfy needs, to remove barriers and to make activities and actions more easy. In the case of deaf people, who have a deeply visual intelligence, new technologies can have a real important role. Information technologies have numerous uses in the area of deafness and have consequences in educational, working and social fields.

The access of deaf people to information and culture is a right, which is absolutely essential for a fulfilled and dignified life. Nowadays to be informed is not just a pragmatic value, it also conditions the exercising of other rights, which means that it conditions the existence of a person as a civilised human being. Technology has been helping deaf people to have equal access to the information, but this chance is still denied to many of them, causing lack of consideration to difference and lack of respect for individual needs. In the case of deaf people, we are not talking about physical obstacles and lack of special devices, for example stairs which can prevent entering public places, but we are talking about solutions which are not available, for example the translation into sign language, and which prevent the ability to communicate with the rest of society. In other words, this issue can also be read as a problem of inequality and social marginality of disabled.

As we have already mentioned, when we talk about technology

and development in the deaf world, in most cases the innovations refer to the educational and to the rehabilitative fields. In fact, one of the most developed sectors in the use of technology is the educational one, in order to support and improve autonomy and communication. The methods of intervention in the educational field regards the fact that the communication between teacher and students is based on verbal communication. The use of visual instruments can largely help deaf students. The informatics technologies now allow adaptations such as the use of images, animations, subtitles, etc. Teachers can use different means during classes, for example multimedia vocabulary, textual editors with images, sign language vocabulary and others. From a didactic view, the use of didactic supports and concrete material allow deaf students to fill the hearing loss using another sense: the sight. Some studies have shown that deaf adolescents use the internet more frequently and longer compared to their hearing contemporaries, and they are highly competent in the use of computers compared to the past. It seems there are two independent factors that might be responsible for the significant use of the Internet. On one hand the Internet provides unique tools for communication, which are convenient, but most important they are non-auditory communication tools. This advantage can be read not only as a technological advance, but it is largely psychological and connected to a sense of independence, control and ability. On the other hand, these communication tools are based on textuality, invisibility and anonymity, and deaf people can experience the same circumstances of hearing people. Also this one is a psychological factor, because it can contribute to a feeling of security and confidence (Barak & Sadovsky, 2008: p. 1811-1812).

Since society has begun to be conscious of the issue of

disability, technologies have always been at the service of it. Three aspects in particular have changed over years. The first one is the great availability of these technologies. Over a century technological supports for disabled have developed a lot in terms of accessibility. Most of them are now available and are free, thanks to the state grants and to the subsidies from other public institutions. The second one is that these media have developed and they turned from rudimental supports to modern instruments which allow autonomy and a great usefulness. The third aspect regards the perception which society has towards these aids for the disabled, not only from the side of public opinion, but also from an institutional point of view. Recently, the United Nations Convention on the Rights with Disabilities (CRPD) has established that every member state has to guarantee and offer the access to mobility aids and AT devices to its citizens.<sup>21</sup>

Technology over years not only supported deaf people in communication, but there are different options which have improved their lives. Talking about practical things, we can mention for example the alerting devices which convert the doorbell, the alarm clock and all the audio alerts into physical, like vibration, or visual alert, in order to be perceived by the deaf person. Deaf people are extremely visual, so visual technology has helped the deaf communities all around the world. Social media has also helped deaf people to open to more opportunities and connection also with hearing people. Now the Internet, together with social media, is a big and also very important part in our lives, and this is the same for the Deaf community. In a way, the Internet has allowed deaf people, but in general all people with disabilities, to share information about

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21 [https://www.esteri.it/mae/resource/doc/2016/07/c\\_01\\_convenzione\\_onu\\_ita.pdf](https://www.esteri.it/mae/resource/doc/2016/07/c_01_convenzione_onu_ita.pdf), last accessed on 30<sup>th</sup> November 2022



their community, to make the world aware of their existence, their feelings and the difficulties they have to face, but also to share something that hearing people didn't know.

Social media and modern technology have impacted the Deaf community in a positive way in terms of communication and accessibility to information. In this historical period technology and distance communication have extremely improved, and minority communities have reacted to the emergency. According to a recent study (Gulli & Volterra, 2021: p. 2-3) on the deaf community during the pandemic era, the Italian Deaf community has been particularly active on social media and other communication media, proving to be a real reality. For the first time in history, for example, the Italian Song Festival of San Remo has entirely been translated into LIS, thanks to the presence of professional interpreters and deaf and hearing performers who have interpreted all the song lyrics. The community has a positive and encouraging attitude, asking and obtaining, in part, access to the information. There have been plenty of debates in LIS in the most varied fields: linguistics, philosophy, psychological support, activities and products for children, and many others. One aspect which is very important for the community is the accessibility thanks to the use of LIS. During the pandemic there were daily press conferences with the constant presence of a LIS interpreter. The translation into sign language has aroused curiosity and interest among the public.

In other words it is not a secret that social media have changed our way of communicating with each other, and compared to some years ago we know more about people's lives thanks to the Internet, and we prefer visual and written communication. For some groups, as for the deaf community, we are talking about a literally life-changing issue, because more people prefer texting

over talking on the phone, and this is enormously advantageous for deaf people. The importance of social media stems in the fact of giving people the power to build a community and to bring it closer, but at the same time to share information to the world. On the internet a community has the possibility to organise, to connect, but most important to be seen from a different perspective. Finally deaf people can demonstrate their capabilities through a channel which is totally accessible for them.

### 3. THE STUDY

This chapter consists in the most practical section of my work, and it includes a linguistic analysis of a selected video material. It has been designed in order to enrich the current literature about sign languages, and it actually provides data on LIS, considering the linguistic variation due to the technological development over the years.

Language is not homogeneous, it is not used by all speakers in the same way, and for this reason, it can show variation due to sociolinguistic factors. These factors can be internal or external to language, and they allow speakers to have many alternative expressions to refer to the same referent. Generally, the kinds of variation are believed to be five: diachronic, diastratic, diaphasic, diasemic, and diatopic. The first type of variation can be noted in the comparison between young and old signers, so it depends on temporal factors. The diastratic variation regards the modifications connected to the social and economic conditions. The diaphasic variations are due to the communicative settings, for example the transition between formal and informal registers, while the diamesic one depends on the medium in the communication (face-to-face, video-message, calls, etc.). The last variation, the diatopic one, is connected to the geographical areas (Branchini & Mantovan 2020).

In sociolinguistics, there are other important factors among the language-external modifications, which include for example age, socio-economic environment, religion, gender, etc. As regards LIS, we can find a high level of sociolinguistic variation. These variations of language are believed to be influenced by

different factors, which include for example the presence of deaf relatives in the family, the parents' hearing status, the type of education (institute, bilingual projects, ordinary school, etc.), the pressure of the spoken Italian language, the lack of a written form of LIS, and others. Taking into account this purpose, I based the linguistic research on some previous studies regarding the grammar of LIS (Radutzky 2009, Bertone & Cardinaletti 2007, Branchini & Mantovan 2020), so as to have common and comparable data. In particular, the principal aim is, comparing the video material, to understand if there has been any changes in LIS due to the growing and impacting importance of technological communication in our modern society.

### **3.1. MATERIALS**

To conduct the linguistic research I decided to analyse four videos in LIS. The comparison to the base of this study concerns all the aspects of language, particularly lexicon and grammar. We are looking for every variation that could have occurred in the execution of signs due to the increasing use of new media and new technological devices for communicating, for example variations in the use of sign space or any modification in the execution of the signs. I will also briefly analyse and comment on the sociocultural aspects connected to technological development.

The research of material has been done on Youtube, a global online video sharing and social media platform, which was launched in 2005. It is a web platform which allows sharing and watching multimedia contents, and it has been innovative all

over the world because its initial aim was to host only video material directly released by the person who uploads it.

For my research, I chose four different videos which I mainly found on the ENS<sup>22</sup> Youtube channel. My decision has been influenced by the expectations of this research, that is to find out how technology has been transforming our communication. The videos selected are respectively two old videos, dating back to the years of the first uploads on the YouTube site, and two recent videos dating to a couple years ago. These clips are available on the platform at the links I report below:

1. <https://youtu.be/nfAFLXeMAM4>  
(“Video 1° Messaggio - Presidente CGSI Nazionale del 06-04-08 - A cura di Angelo Raffaele Cagnazzo”, last accessed on 8<sup>th</sup> February 2023)
  
2. <https://youtu.be/J5moA5iVNAg>  
(“Saluto del Presidente ENS Nazionale Angelo Raffaele Cagnazzo per i Soci Siracusani”, last accessed on 8<sup>th</sup> February 2023)
  
3. <https://youtu.be/Gy-Yls8kXDI>  
(“Introduzione ai navigatori del sito [www.ens.it](http://www.ens.it)”, last accessed on 8<sup>th</sup> February 2023 )
  
4. <https://youtu.be/9RX9T4Ax18U>

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<sup>22</sup> The acronym ENS stands for “Ente Nazionale Sordi” (“National Deaf Association”). The institution was founded in 1932 and it is the oldest association of the Italian deaf community.

(“È online il nuovo sito dell'ENS!”, last accessed on 8<sup>th</sup> February 2023 )

The video 1 is entitled “*Video 1° Messaggio - Presidente CGSI Nazionale del 06-04-08 - A cura di Angelo Raffaele Cagnazzo*” and it lasts 1.58 minutes. It is the first video-message recorder by Angelo Raffaele Cagnazzo, the president of CGSI (“Young Italian Deaf Committee”), on the 6<sup>th</sup> April 2008. The message was published on YouTube about 13 years ago, precisely on 30<sup>th</sup> November 2009 by the channel “CGSI Nazionale”. The second link, 2, regards the video entitled “*Saluto del Presidente ENS Nazionale Angelo Raffaele Cagnazzo per i Soci Siracusani*”, in which the National President ENS (“Ente Nazionale Sordi”) Angelo Raffaele Cagnazzo sends his greetings to the members from Syracuse. The video lasts 1.18 minutes, it was uploaded on Youtube on 11<sup>th</sup> August 2021 by the channel “Multimediale SP ENS Siracusa”.

The first pair of videos 1 and 2, for a better linguistic analysis, present the same person who signs, who is Angelo Raffaele Cagnazzo. Cagnazzo is an Italian activist from Taranto and he is deaf since birth. He was the fifth president of the CGSI (“Comitato Giovani Sordi Italiani”) from 2007 to 2011, and from 2021 he has been the president of ENS (“Ente Nazionale Sordi”).

The second pair of videos, 3 and 4, will be taken into account for making considerations about the language change as well, but also in sociolinguistic terms. The people who sign are different, and this is the most important factor to take into account in a linguistic analysis, for this reason, we will mainly discuss vocabulary modifications in overall terms. Video 3 is

entitled “*Introduzione ai navigatori del sito www.ens.it*”, it lasts 2.02 minutes and was uploaded to Youtube on 2<sup>nd</sup> September 2009. Video 4 is entitled “*È online il nuovo sito dell'ENS!*”, it was published on 9<sup>th</sup> November 2022 and it lasts 2.31 minutes. Both videos were published by the channel “Ente Nazionale Sordi”. This pair of videos present different characteristics of the first two videos, because, first of all, the people who sign are different. As I already mentioned, in this case, we will focus more on the topic which regards accessibility and specifically the development and the use of the official site of ENS. It is interesting to observe how, at a distance of years, the exchange of information has changed and what the Internet and the new technological media can offer to make the communicative world “faster and easier”.

### **3.2 METHODOLOGY**

The videos I chose for the comparative analysis present some similarities. As already mentioned, I decided to analyse the videos comparing 1 to 2 and 3 to 4. The first pair of videos present the same person who signs, while in 3 and 4 we can see two different people signing. The videos 1 and 2 will be considered more for the linguistic analysis of LIS and any possible linguistic variation, while the second pair of videos concerns more the linguistic modifications in terms of vocabulary and the sociocultural aspects connected to the use of the increasingly advanced technology.

I tried to select the material taking into account that, in order to make a comparison, I needed a similar topic to be discussed, but at different times. This choice has been thought exactly to compare the early video recordings, more complicated in terms of accessibility and devices, and the newest videos, which use

cutting edge technology and are easily accessible.

Before starting the analysis, it is important to say that this work takes into account this specific data in order to make a general discussion, but, at a linguistic level, there are many important factors that have to be taken into consideration, for example the level of deafness, the accessibility and exposure to the language and also the exposure quality, the geographical origin and the dialectal variant, the age of the person who signs, the parents' hearing status, etc.

### **3.3 DATA ANALYSIS**

#### **3.3.1 The linguistic analysis**

The observation of our video material has directed me into the idea that signing has been modifying in order to fulfil some articulatory and visual needs. Observing the videos 1 and 2, firstly we can make a list of the processes of change that we can notice between them at a distance of years. The processes of change I noticed more regard the space of articulation and the fluidity of the signs.

The signing space is a three-dimensional area which corresponds to the area in front of the signer's torso, and it usually extends, in the horizontal plane, from elbow to elbow. The signing space is where the signs are articulated, and, grammatically speaking, it plays a fundamental role in LIS. In fact, it is not only the space for articulating signs, it also has two different uses, which can be distinguished in abstract use and the topographic use. The first one regards the fact that the space can convey syntactic information and abstract references, while the



second concerns the ability of encoding the spatial distribution of the described referents (Calderone in Branchini & Mantovan, 2022). In fact, in morphology and syntax, there is the need to make a distinction between "definite" and "indefinite" space. This distinction has two reasons: the first regards the specificity and definitiveness connected to the individuation of a distinctive point in the space, the second regards the fact that the specific points in the space are equivalent to the morphemes which allow predicates to agree with the names. The "indefinite" space is the neutral space, while the "definite" space is intended as a point which was already cited during the discourse and it is specified by an indication or an agreement with the space (Bertone, 2009).

It is interesting to note how the space is experiencing a gradual reduction and how the articulation of signs has been the subject of a modification over time (Radutzky, 2009). Analysing and comparing video 1 and 2 we can notice, for example, that in the older record, that is video 1, the signs seem to be more extensive in space during the articulation. While in the older video signs seem to be articulated with the hands moving in a wider space, in video 2 signs seem to be limited to a smaller area, because hands almost never get over the head or the shoulders.

To clarify this point, we can make an observation. Generally speaking, in video 2 there is an evident reduction of the sign space. This can be noted simply in the execution of signs, where in video 2, differently from video 1, the signer tends to move principally just the hands and the forearms, and it seems that the arms remain in a more static position, near the body, even during the execution of the signs. Making a general observation, it is evident that signs in video 1 are articulated much more widely, while in video 2 they are in a way "reduced" to the

limited area of the camera.

To show this different use of the space sign over time, we can observe some signs which are evidence of this reduction. In the examples below we find different signs: the first is the two-handed sign CERIMONIA (“ceremony”) from video 1 and the second sign is the two-handed NUOVO (“new”) from video 2.

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CERIMONIA (“ceremony”)



(Video 1)

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NUOVO (“new”)



(Video 2)

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The main areas where signs are located in LIS are the head, the body, the non-dominant-hand and the neutral space. The neutral space is the area in front of the upper body and it is the largest one. It constitutes the area where the majority of the signs in LIS are articulated. As in the case of the signs CERIMONIA, signs in neutral space can be articulated approximately in the high position, as for example the sign DIO (“God”). In the sign CERIMONIA, we can see that hands, in the maximum point of extension during the movement, reach the head and overcome the shoulders. The sign NUOVO from video 2 represents the tendency of the signer to limit his movements in order to adapt to the reductive space of the screen. Throughout the second video, the signer seems to be more “static” than in video 1, the arms remain, as in the example, mostly in a restricted neutral space next to the signer, without any significant distancing of the elbows from the body during the execution of signs.

To clarify how signs have been modifying in the articulation in order to fulfil some visual needs, we are taking into account another example from video 2, that is the sign SIRACUSA (“Syracuse”).

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SIRACUSA (“Syracuse”)



(Video 2)

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The sign SIRACUSA is a sign whose location is the cheek. The head is the area of the highest visual acuity, and it includes the major number of location distinctions. When people sign, the visual attention usually focuses on the person's face. In fact, the signs located on the face are not many, because there is the risk of covering the important facial expressions with the hands. As we can see in video 2, the sign SIRACUSA is slightly moved down, and, differently from the traditional sign reported below, there is no actual contact of the dominant hand with the face.

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## SIRACUSA (“Syracuse”)



(Spread The Sign)<sup>23</sup>

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Usually, a modification in order to have a reduction of space in signs can be influenced by different factors, including the formal environments, together with the absence of emphasis in the use of non-manual-markers, in particular facial expressions. On the contrary, in informal context signs usually tend to be realised in a larger signing space (Branchini & Mantovan, 2020).

To make a better comparison, we will take into consideration the sign SALUTO (“greetings”), which is present in both videos. This sign can have variant forms, but in this case we are talking about a symmetric two-handed sign. Symmetry, talking about sign languages, is a tendency of both hands to increasingly behave symmetrically over time. This symmetry regards the configuration, the movement and even the orientation of the hand (Radutzky, 2009).

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23 [https://www.spreadthesign.com/it.it/map/?lat=37.0692481798443&lng=15.2950355557971&z=9&rest=0&magnet=31829&lang=it\\_it](https://www.spreadthesign.com/it.it/map/?lat=37.0692481798443&lng=15.2950355557971&z=9&rest=0&magnet=31829&lang=it_it), last accessed on 16th February 2023)

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SALUTO (“greetings”)



(Video 1)

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SALUTO (“greetings”)



(Video 2)

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The phenomenon we can observe in the sign SALUTO regards a type of movement which concerns the sign moving toward the space in front of the neck and the shoulders' line, that is the area of the best visual acuity and the area where it is easier to

perform signs. These movements happen in order to not move the elbows, and to not move heavy arms, which requires time and effort, but also for reasons of visual appearance, because signs are moved to the radius of maximum visibility.

Comparing video 1 and 2, we must say that we can not exclude other factors which could have been crucial for any modification which has been occurring. The differences observed can be read under other important factors, which are connected to the environment, but are crucial for LIS and all the sign languages. For example, in video 1 the recording has been done with the signer standing in a space free from any obstructions, while in video 2 the signer is sitting in front of a plane surface, probably a table or a desk. This position of the signer depends also from the device with which the recordings were made. In video 1, basing my supposition on the year in which the video was uploaded, the signer was probably recorder with a digital camera, or a camera on a tripod, and usually this implied the fact that the person in front of the camera remained upright and, in some cases, implied also the presence of a second person to help with the recording. The second video is a very recent one, so it could have been done with a computer, a smartphone, a camera, a GoPro, etc., and, compared to the past, the comfort comes from the fact that these devices are extremely easy to handle and can be used in total autonomy. I made this note because, linguistically speaking, video calls and recorded video often imply a space reduction and some adjustments, because of a two-dimensional type of transmission, as well as the presence or absence of another person can modify the use of language.

There are other phenomena individuated in LIS which should be included in the category of “fluidity”. One of these phenomena includes the signs without movement which tend to include a

sort of movement over time. We are talking about a diachronic variation which can be observed in the videos 1 and 2 in the sign ENS (Ente Nazionale Sordi).

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ENS



(Video 1)

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ENS



(Video 2)

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ENS



(Video 2)

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The first image above, from video 1, is the old version of ENS, without movement, while the other two images from video 2 show the sign ENS, characterised by a non-repeated downward movement, in two different points of the recording. The two fragments from video 2 represent the most recent form of this sign, which has nowadays included a movement. There are many reasons why this variation has occurred over time. Talking about perceptiveness, a sign without movement is more difficult to understand, moreover, the fluidity of the sentence is interrupted and for the person who signs it is not comfortable to stop and hold the static pose. These variations are connected or determined by the linguistic need inherent to the visual-body mode. According to Donna Jo Napoli (2014:433), these needs usually are perceptive or articulatory, and in fact we can affirm that the evolution of signs meets the need to offer to the signer

an easier and efficient articulation, and to the receiver a maximal visual perception. There are two reasons at the base of these variations in sign languages. One is about the greater effort in articulating signs if compared to moving the various articulators in spoken language, and the second regards the lexical and sublexical levels, because sign languages units take longer to articulate than spoken language units. Generally speaking, it takes around twice as long to articulate a sign compared to articulating a spoken word.

Another detail which can be noted in comparing video 1 and 2, is the presence of a consecutive repetition of the sign IMPEGNO (“commitment”) in video 2, while in video 1 we do not observe any consecutive repetition. The variation in this case consists in a pluralization of the sign in the same point of the neutral space.

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IMPEGNO (“commitment”)



(Video 2)

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According to another research on the variation in LIS due to the technological development, we can observe that the repetition of

some signs could signify the need of the signer to reinforce the message and to be better understood. This is mostly the case when a message is realised in order to meet a specific request, in which there is a planning in the execution of the signed text, and with the scope of having a better comprehension of the text (Cracolici, 2016).

Observing the modifications in LIS, as emerged from the data analysis, it seems that variations usually tend to follow some common points, for example two-handed-signs tend to become more symmetrical, the signs articulated at the level of the front have undergone a “lowering” in the place of articulation and the dimensions of the sign space have had some changes.

All the modifications we have seen until now are due to technological development, in particular, in my opinion, due to the new devices in use which have a considerable weight in the linguistic variation of visual-gestural languages. However, this is not the only factor which drives this change. Generally speaking, language has been undergoing a significant modification because, thanks to the Internet, it is used for the most part in informal situations, and has been enriched with new terms, abbreviations, acronyms and a vocabulary that essentially represents the new technological generations.

### **3.3.2 The sociolinguistic analysis**

To discuss this topic we are taking into account the videos 3 and 4, respectively entitled “*Introduzione ai navigatori del sito www.ens.it*” and “*È online il nuovo sito dell'ENS!*”. These videos present two different signers, a man in the oldest video, which dates from the year 2009, and a woman in the video

uploaded in 2022. I report this important note to clarify that, differently from videos 1 and 2, these records will not be compared literally to each other, but they will be taken into consideration to make some general observations about the evolution of the vocabulary and new technological terms which have enriched sign languages over time.

In just more than ten years, the quality of videos in general has amazingly increased, not to mention how easier it is to have access to the information. There is another important aspect which is easily observable, that is the birth and the introduction of new terms connected to the technology and the use of the Web, which nowadays have become words of daily use. I chose videos 3 and 4 because there are many differences which are clearly dictated by the time and the huge technological growth. The first thing that catches your eye is the evident difference in the quality of the video, not only in technical terms of visual quality, but also in terms of accessibility. Together with the technological development there has been an impressive growth of services which can be noted if we compare videos 3 and 4: the first website of ENS, like all the first sites that were opened on the web, can now be considered as a prototype, if compared to the new site, rich in information, services, useful contacts and much more. Moreover, video 4 represents the digital innovation that allows users to have a better graphic design, several multimedia options and the presence of subtitles, and other measures which make information more accessible and clear.

Linguistically speaking, what is interesting to observe in video 4, is the presence of a modest number of words connected to the technological world. In video 3, despite the aim of the recording was the presentation of a huge innovation for the time, which was the first site of ENS, we can notice that the vocabulary

doesn't comprehend any particular technological term, except for SITO, in the example below, differently from video 4, where we can observe a kind of “technological vocabulary”, that includes signs such as TAG, LINK, FONT and others.

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SITO (“Site”)



(Video 3)

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TAG



(Video 4)

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## LINK



(Video 4)

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## FONT



(Video 4)

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The use of these “technological signs” in a context such as this, that is a recording with the aim of public information, make us think that, despite all the variations, also sign languages are undergoing this process of birth of a new language connected to the Web. Now it is impossible to know, but the transformation

and the actual power of the new communicative way could bring us to a uniformity of languages that will become even more standardised. Furthermore, we can also observe the presence of an even greater number of English words. Analysing video 4, I recorded different signs which are connected to technology, some of whom I reported below as examples.

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## NAVIGAZIONE (“browsing”)



(Video 3)

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## DIGITARE (“to type”)



(Video 4)

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Comparing video 3 and 4 it is clear how fast the technological and the social development influence languages in a concrete way. As we have seen in the examples above, it is interesting to note that there are different strategies adopted in order to create these neologisms. For what this research is concerned, all new neologisms seem to adopt the strategy of expanding the meaning of an existing sign. For example, the sign LINK is the extension of the meaning of the sign COLLEGARE in LIS, which I report below.

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COLLEGARE (“to link”)



(Spread The Sign)<sup>24</sup>

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Differently from the examples above, there are some new terms which have not a sign in LIS yet, above all foreign words. For instance, in video 4 we find the word FONT, which is signed in dactylology. When used in signed interaction, fingerspelling represents a form of borrowing from spoken languages. Generally speaking, and it is valid also for spoken languages, the lexicon of LIS includes both native signs, which are signs

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24 <https://www.spreadthesign.com/it.it/search/>, last accessed on 16th February 2023



that naturally developed among native signers, and other signs which are born thanks to the contact and the processes of borrowing from other languages. These signs derived from the contact with other languages constitute the non-native lexicon of LIS (Branchini & Mantovan, 2020). To make an example, valid both for sign and spoken languages, the word *Web* is the basis of numerous compounds nowadays, some of which have become permanently used, such as *webcam*, *webchat*, and so on. There are plenty of words connected to the structure of the web, including nouns, verbs, adjectives, etc. Within the Internet, social media have revolutionised the system of production and transmission of mass media. The first phase of web development has been marked by the technological convergence of media that once were distinct (television, radio, cinema, etc.), while nowadays all media are accessible through a single digital device. With the power of our web, the so called Web 2.0, we can say that the asymmetric relation between the production/transmission and the audience has been exceeded, because the users themselves produce material and share contents through networks. The initial phase of the web has given priority to the most striking elements at the linguistic levels, for example digital scripts, such as abbreviations, ideographs, emoticons and jargon, on which an attempt has been made to build a unified configuration of the Internet language, the attention of the studies has progressively focused on pragmatic and sociolinguistic aspects, therefore on multimodality. Thus, the fact that the Internet has influenced language is undoubted, but the effects of its impact are neither generalizable nor predictable, given the complexity of the phenomenon and its constant development.

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#### **4. GENERAL DISCUSSION AND COMPARISON OF THE RESULTS**

From the analysis of the material, we can confirm the initial expectations, which concerned the linguistic impact that technology can have on languages. In our particular case, the new devices and the use of the web are modifying some aspects which regard the visual-gestural modality of LIS.

This evolution and the variability of sign languages have been under investigation for different years. In signs, modifications regard the minimal units, the cheremes, which reflect in the parameters of the signs. It is exactly here that we find the changes, very often the same which we encounter in the spoken languages. This work consists of a very little part of the research about phonological modifications in LIS. Actually, we did not take into account the morphological variations, which regard signs completely changed over time, we have observed just the phonological modifications, which are those that seem to be connected to some linguistic need, in order to improve the visual-gestural modality. As we have seen, this phenomenon can be connected to a kind of movement which concerns the signs moving toward the space in front of the base of the neck, toward the area of the greatest visual acuity and the easier execution, in a process of shrinkage of the sign space.

It is interesting to note how the signing space has been modifying over time and it is experiencing a gradual reduction. As seen in chapter 3.3.1, our video material has directed me into the idea that signing has been linguistically modifying due to the technological development, particularly due to the use of new devices and social networks for deaf people, in order to fulfil articulatory and visual needs. These phenomena include mostly

the modification in the use of signing space, and other variations in the execution of signs, which we can include in the category “fluidity”.

The variation of LIS over time has been confirmed by other researchers (Radutzky, 2009). The sign ENS that we have analysed in the previous chapter is different from video 1 to video 2. The variation consists in an addition of the movement, in order to have a better visibility and also in order to be more fluid in the execution of the sentence. To better understand, I reported an explanatory image from Radutzky (2009:27) of the modification that sign ENS has undergone by the addition of the movement.

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ENS



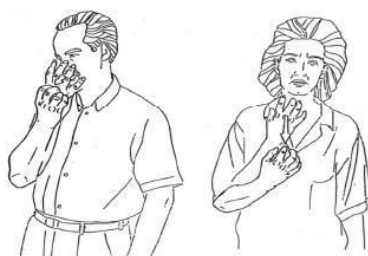
(Radutzky, 2009)

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Another curious change concerns the fact of moving more and more signs in order to have the face free from hands, which is very important because facial expressions convey different grammatical functions. As we have seen for the original sign of

SIRACUSA, in some cases the modification of signs includes a displacement of the place of articulation. The shift of the place of articulation is a phenomenon for which signs tend to leave the original place and move toward another place. These variations over time can also include signs which are slightly moved in order to not cover the face, allowing the execution and the visibility of the facial expressions. To clarify this point, I report below another example from Radutzky (2009) which regards the sign TRISTE (“sad”). As it is clear from the image, the modification of the place of articulation has taken place because facial expressions convey important information.

TRISTE



(Radutzky, 2009)

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The image shows the old sign for TRISTE, in which the hand covered the face before the movement, and the modern sign in which the place of the starting point of articulation is not the face itself, but the sign has distanced itself from it and is executed in the sign space in front of it, with no contact. This is a type of movement which goes from the face to the peripheral part of the face, and it is included in those movements which allow the release of parts of the face. For instance, over years, other movements allow for example to remove “obstacles” from

the eyes, the mouth, etc., because it is very important to maintain a visual contact between the signer and the interlocutor. In fact, for example, signs performed on the mouth moved to the chin, as in FIDANZATO (“boyfriend”), and signs articulated on the face or the ears which included grasping tend to lose it in time, as in COMPLEANNO (“birthday”), (Radutzky, 2009).

These variations are connected or determined by the linguistic need inherent to the visual-body mode. These needs usually are perceptive or articulatory, and in fact we can affirm that the evolution of signs meets the need to offer to the signer an easier and efficient articulation, and to the receiver a maximal visual perception.

All the modifications we have seen in the study until now are due to technological development, in particular, in my opinion, due to the new devices in use which have a considerable weight in the linguistic variation of visual-gestural languages. Generally speaking, in the case of videos recorded with the smartphone, usually some measures are neglected because of the dynamic and speed of the conversation. Among them, we can have for example the positioning of the phone to record the message. Sometimes, in order to be autonomous, the phone is placed on a surface which doesn't allow you to hold a full and comfortable position, therefore sometimes the signer tends to be a little inclined or looks down in the direction of the camera. Often the camera is not wide, so it is one of the reasons because also signs are not wide and the signer is forced to reduce the signing space.

In conclusion, we can affirm that the independent extra linguistics variables, such as age, exposure to high or low registers, geographical origin, can have a great influence on

linguistic variation. The advent of the Internet and the new media represent one of the most significant social phenomena of the twentieth century, and whether new technologies might influence languages is a new area of sociolinguistic research. In our case, the key process of language change seems to be connected to its diffusion, or in general the spreading of new terms, neologism, and linguistic innovations across geographical regions. New media can act as a source for the creation of a new lexicon and new idioms, or it can also become a source for language standardisation, a new channel through which syntax and phonology will gradually become more standardised.

## CONCLUSIONS

From what emerged in this work, new technologies can be an important instrument both in the evolution of LIS and in the removal of communicative barriers. Sign languages, whose characteristics have been presented in the second chapter, have as fundamental aspects the fact of explicating through a visual-gestural channel, therefore the contexts of use have been basically in person until today. With the development of new technologies and the environments of networked communication, whose peculiarities have been presented in the first chapter, it has emerged that the Web offers greater contents of socialisation also for deaf people, whose language was before confined only to meetings in presence.

Besides wanting to present how communication for deaf people can change thanks to new technologies and their potential, attention has been focused on understanding which can be the possible modifications in LIS due to the technological development.

From what has emerged from the research, the use of new technologies has had some impact on LIS. There are cases of variation which regard the actual execution, primarily the reduction of the signing space and the fluidity of signs, with the aim of improving the visual capacity, but there are also lexical variations due to the contact with other languages and to the general birth of a vocabulary connected to the new technologies. The use of the Web is therefore not only functional to the improvement of social relations and the autonomy in everyday life, but it can have an impact on language itself, because it increases the opportunities and the context of use for LIS.

Over the years, the research has helped in changing the perception of LIS, both for deaf people and hearing people, and this has increased the awareness, the knowledge, but also simply the curiosity about sign languages. As we have seen, for example with the ENS website, the Web offers the access to the information in a much easier way for deaf people, who can keep up with news, while social networks offer the possibility to share their opinions about the community, but also about any other topic. New technologies are not only a way of transmission of sign languages, but they are also a way of developing a standardisation of LIS all over the country.

Despite all these signals of a positive general improvement, we can not forget all the misunderstandings and false beliefs about LIS and the deaf community. The deaf people's fight will undoubtedly continue for a long time, because for real integration the recognition of LIS is not sufficient. Many other things are necessary, for example a full integration into everyday life, into the world of cinema, sport, working life, equal opportunities for business and education, because deaf people do have the ability, but they are excluded. I believe that "diversity", in all its forms, is an enormous wealth. Deafness is an "invisible disability", but deaf people are not: they want to be integrated into society.



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