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Translating YouTube Chemistry: An analysis of popular science based on YouTube video subtitles

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Introduction

The following work is intended as a study of subtitles and popular science made accessible to all through YouTube. As YouTube is a website that gives a plethora of possibilities to content creators, in the sense that there is a variety of uploaded videos in the whole platform, there is also some space for popular science, which is a topic that is generally associated to paper journals and online publications from scholars.

This dissertation deals with subtitling practice as an art, as a tool and as a means through which content creators can monetize their videos, exploiting algorithms that enable them to be known to a larger portion of YouTube users. As YouTube is a source of inspiration that helped me boost my listening skills, the following pages are also a homage to the platform that broadened my horizons by making me come into contact with numerous English-speaking creators which I follow on a daily or weekly basis.

Mixing YouTube with subtitles was also a pondered choice, as subtitling is, with its constraints and need for versatility, arguably the most challenging branch of translation studies to deal with. Subtitles not only need to fit in a small space, they also need to undergo a process of adaptation that takes summarization into account to convey concepts. In this sense, YouTube and subtitling are intertwined and two sides of the same coin. YouTube functions as a means to communicate a message through video and audio, whereas subtitles can be seen as an appendix, an adjunct that can convey the same message through text.

This dissertation is divided into four chapters. Chapter 1 is heavily focused on language and communication. The first part of the chapter is based on how translation should be performed and examples of good and bad translations are provided. Translation is seen as a decision-making process as it is an act of transformation of a text, from a source language to a target language. The second part then revolves around scholarly communication, from its origin in the 17th century, when learned societies began to become a symbol of science popularisation in general, through shared knowledge among scholars. The last part of the chapter deals with modern communication and monetization of said knowledge in recent times: advertising through AdSense and services offered by Google and applied to YouTube are the main focus of the last part of the chapter, based

on technical information concerning algorithms, tags and clicks that are a source of income in websites.

Chapter 2 deals with subtitling. The subtitling practice is seen under various circumstances. Subtitles will be analyzed first as a tool for YouTube videos, as they can be added to a video to help users understand the content in their source language (closed captions) or in a target language (translated subtitles). The second part of the chapter describes subtitles as a branch of translation studies, as an art that dates back to the beginning of last century and that was heavily used in silent movies. The third part of the chapter deals with subtitles as part of the movie industry, that is practical applications of subtitles in movies to add information to a context, as happens in *Back To The Future*, where some elements change throughout the movie and justify the presence of text on screen to give a more complete overview of a scene. The fourth part of Chapter 2 deals with YouTube, again, but from a different perspective. Subtitling is seen as a tool to boost monetization and increase income on videos that are then translated in more than a language, thus making them accessible to a larger portion of YouTube users, which implies that more people are going to watch ads on a video if translated. The last part of the chapter justifies the choice of subtitling for Italian audiences, as it gives some historical context on why dubbing is the standard audiovisual translation practice used in some countries, preferred over subtitling and vice-versa.

Chapter 3 features translations for the 11 videos chosen for this work, the first half being composed of videos in English that have been translated into Italian, the second half dealing with Italian videos translated into English.

Chapter 4, the last chapter in this dissertation, features some background to the authors behind the videos, to then delve into the analysis of subtitling in the making, that is software used while translating these subtitles from the source language to the target language. The final part is a detailed analysis of transcripts and translation choices, in a video-per-video subtitling analysis that features automatically-generated subtitles, transcripts written by users and also translations made by users.

1. Popular science and advertising on the internet – Google and YouTube

1.1 Language and science

The following chapter is meant as an introduction to specialized language and its use in popular science, in a context that can be multicultural and focused on the comparison between a source text and a target text, translated in a language that is intelligible to the audience it is directed to.

Language is used to express concepts, which may vary from basic, informal chats between friends, to journals that are written by scholars in an environment that features experts writing for fellow experts. Reeves (2001:14) provides an example that shows why specialized language has its own importance so that a concept is conveyed in a more precise way:

[...] no linguistic utterance is entirely representative of reality. In making choices about how to describe or explain an idea, writers or speakers are making linguistic selections based on what they see, what they have experienced and what they believe. [...] Scientists [...] must find language to report what they have seen. But their description is always going to be partial, especially at first, because their experience with the phenomenon is limited.

In her work, Reeves stresses the role of science and language and shows how intertwined they are when it comes to explaining a concept to a larger audience that is usually not in contact with specialized fields.

Indeed, science has its own set of words, i.e. terms that are different from one field to another, but there is no such thing as a perfect equivalent or unbiased information. This is the main reason why scientists in writing their hypotheses or testing their claims - when they express themselves by writing reports or articles in specialized journals – undergo a process of decision-making, where the right word could make the difference.

To quote Albert Einstein himself, “You do not really understand something unless you can explain it to your grandmother”. This shows that science and language should not be treated as concepts that are poles apart. Each scientists are humanists in the sense that they use words to explain their own view on a subject, whereas linguists use scientific methods to prove theories wrong or right - for example, grammar models have been a subject of discussion in the linguistic community, mainly concerning theories such as functional grammar and generative grammar.

Popular science will present various videos which feature the use of water and its chemical reactions in specific experiments. Water is the focus of my analysis to show how the ‘Einstein’s grandmother’ aphorism may apply to language and to its spread. Water is a ready-to-drink resource, the basis of all known life and fuel for the biological machines that nature has created, responsible for the biological development of each living being.

My goal is to analyse various videos from scientists or popularisers who use platforms such as YouTube to express themselves, talking about topics such as water in various fields, by analyzing its molecular structure featuring two hydrogen atoms and one oxygen atom, but also by showing how it behaves when heated up in low-pressure environments. This and other experiments will be shown and translated throughout my work.

1.1.1 Translation as a decision-making process

The translator’s job is hardly an easy task. It is a constant decision-making process in which choosing the right alternative could make the difference between a text that is comprehensible and a text that could be misunderstood.

To serve its purpose a translated text needs to be comprehensible to the audience it has been written for. Should a translation be opaque to the reader, the initial purpose of the author would completely be lost. The main reason why an abstract, a book or even a subtitled text-to-speech paragraph has a meaning to be preserved is that every reader should have the same experience when approaching a written work. To do so, a professional translator’s duty is to make sure everyone is on the same level.

Between a semantic and a communicative translation the choice or the other depends on the context. It also depends on the type of text one is given to translate. There cannot be little or no room for improvisation when rendering in a target language instructions for a kettle, where the manufacturer’s leaflet is intended to read as clearly as possible. Sometimes even adding images is useful to help the user better understand how that appliance works – whereas when translating poetry a translator should also be aware of external features such as rhythm, as in a poem it plays a role which is as important as the text itself.

Translators undergo a decision-making process which is helpful to underline what Barbe (1996:329) calls ‘The dichotomy *free* and *literal* translation’ by providing Blanchot’s point of view on ‘two opposing ideas’ (1990:83):

[O]ne either says of it that it does not read like a translation, or one marvels at just how identical it is with its origins, how it is truly one and the same work; but in the first case one effaces the origin of the work to the advantage of the new language, and in the second case, one effaces the originality of either language to the advantage of the work; in both cases, something essential gets lost.

Barbe (1996:329) also argues that ‘everybody who reads more than one language knows what a poor translator can do to a successful source language text’ and that ‘a translation can never be exactly like its original’, explaining how differences in culture and audiences could make a difference in choosing one approach or the other.

1.1.2 Remarkable adaptations and imprecise renditions

Assessing the quality of a translation may sometimes be difficult, but it is also helpful to be aware of how powerful a good or bad translation can be when shared with a target culture. To further my point I will try to analyze two examples of dialogues with a brief introduction of the subject: one will be what I consider to be a good translation, the other will be the opposite.

The first example that comes to my mind is a translation of CBS’s famous American sitcom ‘How I Met Your Mother’, more specifically a translation of a passage in episode 9x01. The two characters Barney and Robin, who are going to get married, share a limousine and talk about their upcoming wedding. In this scene there is a running gag based on the similarity between ‘bear’ and ‘bearer’. Barney, who always jokes about everything, talks about a ‘ring bear’ instead of a ‘ring bearer’ and is constantly corrected by Robin. Here is the dialogue¹:

R: Oh, look at my little cousins in their flower girl dresses.
B: Aw, they'll look so cute next to the ring bear.
R: Yeah.
R: Wait, you said ring bear-er, right?
B: Ring bear.
R: Ring bear-er.
B: Ring bear.

R: Are you planning some crazy stunt with a dangerous wild animal at our wedding? Because
B: Oh, oh, sorry, sorry, sorry, sorry.
Oh, boy.
[...]
B: Okay, so far, I've got 12 wild cards, not counting the ring bear.
R: Ring bear-er.
B: Oh, oh, here's another one.

¹ Both versions were retrieved from Netflix

R: Oh guarda che belle le mie cuginette con i loro vestitini a fiori
 B: Ah, staranno benissimo vicino all'orsetto degli anelli
 R: Volevi dire 'vicino al paggetto', vero?
 B: Orsetto
 R: No, è paggetto
 B: Orsetto

R: Hai forse architettato qualche numero creativo con delle belve feroci per il nostro matrimonio? Perché se-
 B: Oh, scusa scusa scus-
 Oh, ragazzi..
 [...]
 B: Ok, finora ho contato la bellezza di 12 jolly se escludiamo l'orsetto
 R: No, è paggetto
 B: Oh, oh, eccone un altro

This is an example of a translation carried out in the most accurate way possible. It maintains the general sense with the disambiguation between 'bear' and 'bearer', by using a pun intended to have the double sense of 'bear' as in 'dangerous wild animal' and the verb that means 'to carry/bring something'. In the final episode of the season, to maintain a comic relief, we see a bear walking through the aisle wearing a white dress like a ring bearer would do. The Italian rendition of this scene features a play on words based on the similarity of the sounds shared by *orsetto* and *paggetto*, with the same suffix of endearment that is intended to trick the listener into thinking that the wedding will feature a bearer instead of a bear in flesh and bones.

On the other hand, a translation that I think is carried out poorly can be heard in Netflix's Italian adaptation of the Neon Genesis: Evangelion *anime*, more specifically in episode 1x19. In this scene we see the protagonist, Shinji, who is given a speech about self-empowerment and about decisions that he has to make for himself. Since I do not have any knowledge of Japanese, which is the source language, I will now focus on the English version of the *anime*, by comparing it to the Italian version in the first dubbing and in the infamous Netflix re-dub.

Here is the English speech with its Italian counterpart:

Listen, Shinji, I can only stay here and water my plants, but there is something that you can do, something can be done that only you have the power to do. No one's gonna force you, you need to think about it and decide. Figure out what you need to do right now, so you don't have any regrets later, alright?²

Shinji, io non posso fare altro che stare qui a innaffiare queste piante... ma per quanto riguarda te c'è di certo qualcosa che puoi fare, qualcosa che soltanto tu puoi fare. Ma non c'è nessuno a costringerti: pensa tu solo, decidi tu solo che cosa tu debba fare in questo momento. Beh, spero che non avrai mai a rimpiangerlo.³

² English version on Netflix

Here is the version featured on Netflix, put in comparison with the previous translation:

Io non posso fare altro che starmene qui ad annaffiare, però quanto a te, quanto a quel che non puoi fare che tu, per te qualcosa da poter fare dovrebbe esserci. Ma non ti costringerà nessuno, pensa da te stesso, decidi da te stesso che cosa adesso tu stesso debba fare. Beh, che tu non abbia rammarichi.

Shinji, io non posso fare altro che stare qui a innaffiare queste piante... ma per quanto riguarda te c'è di certo qualcosa che puoi fare, qualcosa che soltanto tu puoi fare. Ma non c'è nessuno a costringerti: pensa tu solo, decidi tu solo che cosa tu debba fare in questo momento. Beh, spero che non avrai mai a rimpiangerlo.

This translation was made by Gualtiero Cannarsi, 'Head of dubbing adaptation for Studio Ghibli's animation movies [...] long-time amateur of *manga*'. He is also responsible of 'writing the Italian draft of those animation movies that will then be dubbed, after a group of Japanese-Italian translators write a pre-translation based on the original version', according to 'Lo Spazio Bianco', an independent, comic-based magazine whose staff interviewed Cannarsi in 2014.

The adaptation of Neon Genesis Evangelion has not received a positive feedback. Fans of the series harshly criticized Cannarsi's work, forcing Netflix – that has acquired the rights to the series in June 2019 - to remove the Italian dubbing and to, subsequently, hire new translators to re-adapt the anime. Cannarsi defended himself and his choices by stating that 'it is not the audience's task to understand an artwork, it is the translator's'.

I argue that, when translating for a broad audience such as teenagers or nostalgic fans of a series, who have already seen it – in Italy it aired on MTV in the 90s – the translator should not make their work opaque or extremely attached to the source language. In this specific case it is evident that Cannarsi chose to force a translation to make a piece of art out of it, in a poetic manner that should make the translation transcend the semantic meaning. However, syntactic structures such as 'decidi da te stesso che cosa adesso tu stesso debba fare' do not sound natural to an Italian native speaker, mainly for the convoluted structure but also for the repetition of *te/tu* and *stesso*. Similarly, 'quel che non puoi fare che tu', if followed by a pause and not a conjunctive verb makes the listener think the sentence lacks a conclusion. This, to me, is an example of a translation which breaks the viewer's concentration, because if one is forced to make an effort to understand the semantic meaning of the sentence, there is a higher risk to lose track of the dialogue

and of what happens in the scene. In this case I would have kept a simpler translation in order to preserve the sense of the original version without forcing an unusual set of words in that dialogue.

1.1.3 The perception of language

To better understand how language can shape the way a message is perceived it is fundamental that the writer is aware of what their audience knows about a certain subject. Scientists play a considerable role when confronting with readers that may vary in expertise when facing a certain topic; in fact, that topic may be perfectly intelligible to scholars that deal with science on a daily basis, but casual readers who, for instance, read science magazines as a leisure activity, may find it difficult to grasp all of its nuances. It is up to the scientist to convey a message that is not only targeted to the right audience, but also as clear as possible in the context it is written in.

To do so, I will now quote linguist M.A.K. Halliday, who ‘teaches us that scientific discourse exploits a capacity in our language that all of us use every day without realizing it [...], (the) grammatical metaphor’ (Reeves 2001:38). As Reeves points out:

Grammatical metaphor is the process whereby we think theoretically [...] we have an experience [...] we construe our experience in language. That is, we tell ourselves or someone else about our experience. [...] (and) we reconstrue our experience by rethinking and restating it as a theory about what sort of experiences we can expect in the future.

Halliday explains what happens when a person has a concept that is to be conveyed to another person. It is a natural process that takes place in our mind and is shaped accordingly and effortlessly when the idea of a thought is put into a subsequent set of words to make sentences that are audible and clear. Experiences are a matter of subjectivity, indeed, which makes a scientist’s task harder, especially when the scientist, as an expert, has in their mind a simple concept that should also be expressed in the simplest way possible. This does not mean, of course, that scientists must unravel complicated subjects in a few simpler words – which may cause the opposite reaction, that is to oversimplify a concept and thus making it lose its core meaning. It means that, whenever there is a chance to express a difficult concept in the most intelligible way possible, so scientist should at least try to follow that path and make an effort of empathy in order to understand what their reader or listener could grasp or not grasp of their

discourse. To put this in context, a scholar dealing with water and its transformations – for example when evaporating, thus turning from water into steam - when talking about water to a class of 5th graders should be aware that parts of their knowledge must be reshaped or omitted in order to make their listeners understand at least the core message. By contrast, the scholar should add as much information as possible if the same lesson takes place in front of a class of university students who, for instance, may be about to obtain their degree.

It is extremely important for an expert to be aware that the act of conveying a message is a serious matter. Whenever a concept risks being misrepresented or misunderstood it takes a great deal of clarity in order to disambiguate any other misleading representation of that same concept. This is why scientists play a primary role when teaching chemistry, physics, mathematics and other so-called ‘hard’ sciences. Any valid dissertation or point of view to be proven not only needs the aforementioned level of clarity which is the basis of a thesis, it also needs a medium to be conveyed.

Speaking of media that a scientist has to express their views on a specific subject, experts have a plethora of means to spread their work. Paper journals are their most reliable source for sharing their work, view or studies on a certain subject. Scholars may also decide to publish their knowledge on electronic journals (which will be presented in the next paragraph), conferences – that may even be recorded and then uploaded on official channels such as TED – blogs and, lastly, YouTube, which is a growing and fast means to share even the smallest thought with virtually everyone. In this chapter and the next I will try to analyze and underline the pros of choosing YouTube as a platform to share contents and make popular science.

1.2 Communication through popularisation: an overview

1.2.1 What is scholarly communication?

For a better understanding of the role of scholarly communication in context, a brief excursus on paper journals may be relevant, starting from the first years of their existence until the appearance of the first electronic journals, with the advent of the World Wide Web.

What impact have science journals had on the process of knowledge-sharing among intellectuals? Harter and Kim (1996) argue that ‘science as we know it is scarcely

imaginable without the scholarly journal’, due to the continuous evolution of scholarly communication that sparked from the ‘Journal des Sçavans’ in 1665. Speaking of formal means of distribution, scholars undergo a research process whilst working for an organization which may be a university they are under contract to.

Since academic knowledge becomes effective when shared with other scholars or experts it is fundamental that a peer review is conducted, so that research activities can be appraised as groundbreaking or proven wrong by other experts. Fjällbrant (1997) focuses on the fact that ‘scholarly activity [...] creates a need to spread and share information about the results, methods, new processes and products’, underlining the basic concept that ‘there is a need for both informal and formal communication’. Whilst informal communication is to be considered as any means that a scholar has to divulgate their ideas to a broader audience – with the aforementioned methods, such as videos or conferences – formal communication pivots around journals and official channels that experts exploit in order to have their work published. There are some factors that Kauffer and Carley (1993) – as presented by Fjällbrant – have to take into account when conducting a research activity when it comes to publishing academic writings. Those factors are:

- ownership of an idea
- societal recognition for the author
- claiming priority for a discovery
- establishing an accredited [...] community of authors and readers

To do so, journals not only should provide an author with the certainty that their work is recognized, but also with the exclusivity of their idea, whether an innovative concept is shared with a community.

Unfortunately, this set of rules has not always been applied equally, there were no limits of regulations concerning copyright issues that could protect an author from theft of their writings or plagiarism by another scholar or organization. Fjällbrant insists on legal authorities and how scholarly communication had to be regulated in the sixteenth century, when:

publishing in England had been the monopoly of a cartel – the Congers. This group possessed the right of granting publishing licenses and this could be withheld from a freelance publisher. They insisted on fixed copyright fees and insisted on their right of perpetual copyright. Prior to 1709 an author had no copyright to his own work.

This *impasse* changed in 1709, when copyright was ‘reduced [...] to 21 years’ and a court ‘ruled that only the author could claim permanent copyright’. Although the court’s decision did not solve the problem of vexed authors who had spent months or years doing research on a subject just to see their work usurped by strict and unfair laws, serious changes occurred in 1774, when the case *Donaldson v. Beckett*, as Fjällbrant describes ‘was instrumental in changing the perception of copyright to an author’s property rather than that of the publisher’. She also argues that ‘in this way a scientific author had some legal guarantee of intellectual ownership for his published material’.

Shared knowledge by an author has the power to spark an idea to another, maybe to improve the starting concept and come up with a better and more refined idea: as Tesla’s studies on electricity and Hertz’s research on electromagnetic fields influenced Guglielmo Marconi to invent the radio, in a similar way even Leonardo da Vinci with his visionary dreams of machines flying in the sky inspired the Wright Brothers in their invention of the airplane four centuries after his death.

1.2.2 Learned societies as a catalyst for scholarly communication

The importance of divulgation generated serious concern amongst scientists way before the very concept of ‘copyright’ was known. London’s Royal Society, founded in 1660, had the aim of ‘represent(ing) a move towards a co-operative organization for scientists, irrespective of political views or professional association’. These ‘learned societies’, as Fjällbrant describes them, were born out of a desire to cooperate in a context where censorship and condemnation were serious matters that made single authors afraid of publishing their work in the fear of being seen as boycotters, heretics, subversive elements that could corrupt the masses with their works – the sixteenth century in Europe was the age of the Counter-Reformation, that established the Catholic church’s meddling in scientific research and discoveries. The Royal Society was born out of a will to share scientific research in order to release culture and knowledge from the interference of sovereign organizations or groups of power such as the Catholic Church. It is to be noted that the Royal Society was born before the Age of Enlightenment.

Speaking of authors and their efforts to prevent their work from being stolen or censored, it is interesting to underline the fact that some scholars - even before such organizations had the power to protect them – had their own means to encrypt their

writings. Fjällbrant (1997) presents us with several stratagems that scientists such as Galileo used to protect their work:

Other forms for scientific printed communication - were the letter, or personal communication, the scientific book and the newspaper. In addition there was the scientific cipher or anagram system.

In the early seventeenth century scientists established priority of discovery by means of an anagram. A sentence announcing a discovery was encrypted into an anagram, which was then deposited with an official witness. The scientist could then continue his work at leisure. If any competitor publicly claimed the same discovery, the original scientist could then refer to his witness to unscramble the anagram, and in this way establish his priority!

Fjällbrant also talks about Meadows (1974), who showed an anagram written by Galileo and addressed to Kepler when studying the rings of Saturn. The message was encrypted so that 'he was able to gain time to check his observations before making a public official announcement'.

Personal letters functioned in a similar way, in that it 'was a method used for transferring news about research carried out by both individuals and groups to other individuals and groups [...] sent to a person who acted as a "gatekeeper" or a mailbox for transmitting news to other people'.

The scientific book was a precursor of today's publications, in that an author could publish a book that was worth a lifetime of research, so that it could be – through learned societies – shared with the science community. This method, however, had its cons. Learned societies were not always keen on taking the risk to publish an entire book if they were not certain that such work could have real value on the market. If a scholar wanted to publish such book, he or she had to be patronized by the organization in the distribution of the book. If the organization refused – because the product was not valuable or could not be sold as planned – the author had only one means to share their work: to publish the book at their own expenses. This risky move could result in medium or long-term success – books being a 'slow and expensive process', as defined by Fjällbrant – or failure, 'the market for scientific books (not being) large'.

The newspaper, however, was a simpler and less expensive way to have some research published. It was a widespread resource that could be published weekly or daily. The pros in sharing knowledge on newspapers are especially based on the assumption that the demand for newspaper was higher than the demand of scientific books. Market rules applied differently to a product which was shorter and available to a greater portion

of the population. Moreover, Fjällbrant points out that ‘Seventeenth century Europe saw a large rise in population and this may have been a contributory factor in that the demand for information increased’. She also adds that ‘by this time roads had improved considerably and postal services were beginning to be reliable’. This is a serious factor to be taken into account; newspapers were a cheaper alternative to books, they could be read as source of news, general information or scientific discoveries. Although the first newspapers were not purely science-based, they started to become a growing reliable source of information accessible to most.

It is important to take into account that what moved learned societies was not only the mere pursuit of knowledge for the sake of knowledge itself. There was – and there still is, as it will be presented in the following paragraphs – financial interest in publishing an author’s work.

Scientists could rarely afford to publish their work on their own: it was, as previously said, expensive and it did not guarantee success to the author. Publications follow rules which are dictated by the market. This assumption is based on the very rule of the demand and the offer. In the sixteenth and seventeenth century scientific journals did not exist in the form that we know now, they needed to be published by organizations such as the aforementioned learned societies. To do so, the work needed to convince the organization to sponsor the author and make the work published and shared with the community. Popular science was only starting to take its share on the market, so authors needed either to cooperate – which was less likely, since research was conducted by a single person or a restricted group of people who rarely trusted other individuals in the fear of be deprived of their exclusivity on their research – or to rely on said societies.

It is also interesting to note how Fjällbrant underlines the various elements which play a role in scientific communication. She shows all of the groups concerned in writing and publishing starting from the author himself. She defines the author as a ‘primary producer’, who writes a book, an article to a targeted audience.

Students, amateurs and publishers are the primary readers of these works, the former being learners, university students or casual readers approaching to the subject as non-experts, whereas the latter are defined as ‘secondary producers’. Publishers undergo a process of reading and revision, as a medium the author can relate to in order to get their

work shared to the whole community, usually through fees or subscriptions that users pay to the publishers or to similar organizations in order to access multiple resources.

As for an author, recognition for their writings may be given through a certain amount of money – that the author receives as an emolument for selling their work to the organization publishing it – or through credit and citations that may help in making the work known to a larger portion of the audience.

1.2.3 Citations and shared knowledge

Speaking of citations, they constitute a basic tool for an author to gather social recognition in the whole community. The more a book is quoted, the more widespread its knowledge is amongst scholars. The Institute for Scientific Information is an organization that – according to the ISI indexing website - ‘provides indexing of major international journals and proceedings’.

ISI served as a publisher of citation indexes, which Harter and Kim (1996) employed as a tool for their research on electronic journals. They briefly described ISI’s activities in that it

Publishe(d) three citation indexes -- Science Citation Index (SCI), Social Sciences Citation Index (SSCI), and Arts and Humanities Citation Index (AHCI) -- that allow searches of journal names as cited works. When a cited work search on an e-journal such as PACS Review is conducted on SSCI, one retrieves bibliographic citations to all the articles in journals indexed by SSCI that have cited PACS Review in one or more reference.

Harter and Kim regard ISI’s indexes as ‘widely recognized as providing a valuable measure of the scholarly impact of articles, journals, and authors -- that is, the formal impact.’

Although the Institute is not known under the name of ISI anymore, as it is part of Clarivate Analytics, it was ‘re-established in 2018 and serves as a home for analytic expertise, guided by (founder Eugene Garfield’s) legacy and adapted to respond to technological advancements’. To better understand the advantages and possibilities of this indexing service it may be helpful to quote the Web of Science Group’s view on ISI:

Selective, structured and complete data in the Web of Science provide rich insights into the contribution and value of the world's most impactful scientific and research journals. These expert insights enable researchers, publishers, editors, librarians and funders to explore the key drivers of a journal's value for diverse audiences, making better use of the wide body of data and metrics available.

The Web of Science Group, which is also part of Clarivate Analytics, is a reliable resource when quoting articles, journals, books, making it ‘the world’s most trusted publisher-independent global citation database’, according to their website.

Eugene Garfield (1979), founder of the ISI, stated that ‘citation counts [...] provide a measure of the utility or impact of scientific work’.

It is thanks to such tools that researchers can share their knowledge easily in the era of the World Wide Web. The Internet can become an even more powerful tool if scholars are able to harness its potential. Since scholars can rely on other scholars in order to investigate a subject when doing research and since knowledge is generally shared in the scientific community, one can make their work known to the rest of the community through citations on other works and, vice-versa, other works can be quoted in order to establish a network of experts who may pursue a common objective. Shared knowledge is helpful when it sparks competitive behavior amongst scholars, to help each other or prove a theory wrong or right. Pérez, López-Cózar et al. (2006) give a significant definition of the role of science journals in the scientific community: ‘together with databases, journals are an evaluation instrument which determines the rise in the professional and social scale of scientists and has a decisive influence in the allocation of resources for research’. They also define ISI’s goals and results:

The objectives pursued by ISI are two-fold: on the one hand, import quality bibliographic databases with unique products such as citation indices, and on the other to collect relevant scientific literature produced and published the world over in the different areas and disciplines. [...] Some general data of the ISI evaluation processes indicate that about 2000 journals are assessed every year, comprising new journals submitted to evaluation as well as those being reassessed (Established Journals Re-Evaluated) for possible exclusion or change of category.

The service ISI provides, similarly to what other competitors do, have the power to make an author’s work sky-rocket and potentially be known to the whole community. On the contrary, if a work is not cited enough an author – may their work be the result of weeks or even months of research – may be not have proper recognition.

Oransky and Marcus (2017) point out that

For authors, the payoff is clear: The more citations your articles generate, the more influential they appear. And journals have similar incentives: Encourage authors to cite papers that appear in your pages and you’ve created the illusion that your journal is highly influential. Indeed, the controversial Impact Factor ranks scientific periodicals on how frequently their articles earn citations.

Although the intentions of Oransky and Marcus in writing that article were different – they make speculations about the existence of scientific ‘cartels’ that are organized in a way that a web of authors in the scientific field ‘reference each other’s work’ so that a certain set of articles lies on top of the ranking lists – it is not the objective of the present work.

The point of this dissertation is that - similarly to what happens in journals and in the spreading of science-based articles - quoting and sharing may become a key factor in the ecosystem of websites and platforms such as YouTube.

YouTube in this case serves as a pivot to the following analysis. This website has an analog function to what has been previously observed in journals and electronic journals. Parallelisms can be made in the sense that YouTube works as a journal or a book when it comes to quoting, citing, referencing other works.

What the standard system of referencing may do in indexing works written by scholars, YouTube does through a Uniform Resource Locator or, more specifically, a URL, commonly known as ‘link’. Tim Berners Lee’s creation in the late 80’s – the World Wide Web – is not a resource available to an élite of people or a closed circle of experts, it is a tool that anyone with an internet connection can have access to.

1.3 Algorithms and online advertising: Google and YouTube

1.3.1 Google’s algorithms and consequences on digital marketing

What makes websites similar to journals? As it has been previously mentioned, the more an article is referenced, the higher the chance it has to be featured in top ranking lists and the more prestige it gets.

Google’s algorithm is refined to the point that top-clicked websites are awarded with a place in the first page of Google and, therefore, they can be easily found in the top results by a casual user with a simple query. It can be rapidly demonstrated by looking at the results that Google offers when searching, for instance ‘amazon’. Being the e-commerce company it is, Amazon is one of the highest-grossing enterprises in the world. It is clear that the only result that can occupy the first page of Google is that of ‘amazon.com’ and not the description of a mythological female warrior or a South American river. To put things into perspective, Amazon is so largely known that, as for

November 2019, the first result in the query that is not related to multi-billionaire Jeff Bezos' company cannot be found before the 10th page of Google.

The reason why Google is extremely precise in trying to display the most exact result possible is that the algorithm is based on Search Engine Optimization, in short SEO. Investopedia gives a concise yet clear definition of SEO:

SEO (Search Engine Optimization) aims to draw the greatest amount of traffic possible to a website by bringing it to the top of a search engine's results. SEO is used by businesses and individuals to maximize the visibility of their websites and content in order to boost traffic and therefore business.

What is interesting to notice is that, as Investopedia describes: 'the first search engines [...] couldn't do much more than search for pages that included specific keywords'. Today SEO is based on keywords, refined graphical user interface (GUI), referenced websites through hyperlinks (or 'linkbacks', as written on Investopedia) and updates.

Updating may be the most valuable action to perform when confronting with the possibilities of the internet. Constant hardware and software updates can make a difference and grant a company more visibility in the market. To gather greater visibility it is fundamental that companies are aware of the changes in the Google algorithm or algorithms, in that Google's Penguin, Pigeon, Hummingbird or Panda may scan the website and rate it in a certain manner – thus giving it more or less visibility. Google's 'silent judges', as reported in Search Engine Journal's website, may 'evaluate websites based on the quality of their content', determine 'rankings [...] by (the website's) respective business' location and distance from the user' or even 'return webpages that (are) most qualified' by 'interpreting the user intent behind a query'.

SEO and Google's algorithms are the protagonists of this introduction: in fact they are a necessary preface to the next topic that will be discussed, that is AdSense and how it affects advertising on the net and YouTube.

1.3.2 Revenue through online ads: Google AdSense

As previously mentioned, journals and e-journals thrive and flourish thanks to the support of authors that sell their work or pay to be featured and thus get recognition in the scientific community of scholars. Journals and similar organizations flourish not only thanks to knowledge shared by such authors, they also rely on user subscription (paper-based journals, in particular), agreements made with organizations such as universities –

that pay a certain amount of money to have the license to make students access the resources the journals offers - and, more importantly, advertisements.

Internet advertisements, or ‘adverts’, ‘ads’, are literally a click away from a website’s revenue. Google’s fine-grained control over the internet and longtime experience have made it possible for the company to gain a great market share and establish their authority as an advertisement provider all over the world. Although investigations have been made over the opacity of Google’s means and intentions, the company’s wealth and possibilities are undoubtedly the simpler alternative for a person or a company willing to advertise a product or a service.

Nonetheless, The Guardian reported in September 2019 that

Google will control 31.1% of global digital ad dollars in 2019, according to eMarketer estimates, crushing a distant second-place Facebook. And many smaller advertisers have argued that Google has such a stranglehold on the market that it becomes a system of whatever Google says, goes, because the alternative could be not reaching customers.

Google AdSense is a valid resource because it is user-friendly, it has numerous features that can make ads endearing and help better the esthetic appeal of a banner, but it also gives the advertiser a certain degree of freedom when it comes to managing which adverts to show, when and how. To better understand what it is and how it works, it may be helpful to take a look at what Google says about AdSense.

Getting started is easy, AdSense aids the advertiser by giving them a wide range of choices, such as text ads, text and display ads, banners, pop-up windows and more. This is step 1. Step 2 focuses on where ads are displayed on the webpage, whereas step 3 and 4 deal with analytics and how ‘the highest paying ads go live’. This is a user-friendly interface and service because it does not require that the user have detailed knowledge of financial aspects, since Google takes care of the bureaucratic and financial steps concerning the acquisition and lending of money to the advertiser as soon as an ad is clicked on a sufficient number of times.

Google establishes the thresholds necessary to maintain active an AdSense account, because the service is offered conditionally. One has to prove to be able to offer a valuable product and, therefore, ads must receive clicks. When an account AdSense is created, the advertiser agrees that, after reaching the threshold, if said threshold is not improved ads will not be monetized, which means that the advertiser will not receive any

money if the ad has not enough revenue. The Italian version of this explanation can be found at Google's *Centro di Assistenza*'s webpage.

There are more details that could be presented in order to better understand how AdSense works, but I will not delve deeper into the matter because the objective of this work is not to give a step-by-step description of how to open an AdSense account and gain money on the web. On the contrary, the goal of this dissertation is to analyze the common points between journals and the internet, to see how these two worlds intertwine when moved by the same motives, this being the case of surviving on financial feedback that derives from advertisements.

1.3.3 Online advertising with a click: Cost Per Mille and Click-Through Rate

This premise was necessary to introduce a couple concepts: CPM and CTR.

The latter cannot be explained before introducing the former: Cost Per Thousand, or CPM (from Latin '*cost per mille*') is the basic way the price of an ad is monitored, in the sense that, according to Investopedia, CPM 'is a marketing term used to denote the price of 1,000 advertisement impressions on one webpage'. This is better rendered with an example: 'If a website publisher charges \$2.00 CPM, that means an advertiser must pay \$2.00 for every 1,000 impressions of its ad.'

The CPM is the starting point from which the website publisher can decide the price for an ad, based on the interest shown by users. It is up to the website owner to show ads that are well-targeted or related to what the user may be interested in buying or watching. For instance, an ad for Photoshop or another software from Adobe is worth more than an ad for pet toys may be on Salvatore Aranzulla's website – an IT guru who, in Italy, is a problem-solver for any PC or internet-related issue. In this case it is clear that an ad for a software is coherent to the content that Aranzulla offers, as an ad for toys would be of less or no use for a casual internet user willing to, for instance, transfer a file from Dropbox to a PC folder.

Calculating CTR is unconceivable without at least introducing the CPM, which is why the Click-Through Rate will be explained here. To quote Investopedia once more, 'the click-through rate (CTR) is the percentage of individuals viewing a web page who click on a specific advertisement that appears on the page. Click-through rate measures how successful an ad has been in capturing users' interest'.

CTR is a more complex concept to explain, because it is dynamic, it takes factors such as time and interest into account. Clicking on an ad while scrolling on a webpage from a smartphone may have happened to anyone, at least once. This is why basic clicks are not a reliable source of information, they do not discern real interest from mis-clicks.

The CTR offers a more precise and refined data: ‘The higher the click-through rate, the more successful the ad has been in generating interest.’, as Investopedia argues. They also add that CTR ‘can also be used to measure the effectiveness of advertising copy, titles, and descriptions that make up the metadata of online content.’. An ad can be considered as a successful way to present a service or a product when it generates interest. To do so, it should be targeted properly based on the content offered by the website it is displayed in.

CPM and CTR are key factors in the ecosystem of YouTube, which will be the next topic to be discussed in this context.

1.3.4 “YouTube - Broadcast Yourself”

YouTube is a video-sharing platform that was launched in 2005. YouTube’s first video features one of the three founders, former PayPal employee Jawed Karim, in a 18-second video, at the zoo. The title is self-explanatory: ‘Me at the zoo’. Although the content of the video is not of much value, the idea behind it was, at the time, revolutionary. What made YouTube a ground-breaking website was the fact that it was conceived as a means to let anyone share clips and moments at any time. Uploading videos required only an internet connection, there were no expensive cameras or directors behind the scenes shooting a movie. All an user needed was a phone or a cheap camera, nothing more, nothing less. YouTube’s first slogan ever was ‘Broadcast Yourself’, to underline the fact that YouTube was an open platform, easily accessible and free.

It sky-rocketed in performances and daily logs from users all around the world in the first years it was launched. It became so popular that, as Iqbal (2019) from Business of Apps reports:

by the end (of 2015) kingmakers Sequoia Capital had invested \$3.5 million, followed by another \$8 million alongside Artis Capital Management in early 2006. Venture capital was not the only source of interest in the company: in late 2006, Google, no less, came knocking. \$1.65 billion in stock later, YouTube was a Google (now Alphabet) property.

YouTube has undergone a great deal of aesthetical and technical changes since its launch on the 14th of 2005 – to put them in context there is a year-to-year selection of screenshots ⁴from the platform’s early days until present day.

What makes YouTube unique is the longevity it has – by standing out when compared to defunct social networks or platforms that have not had the same success, such as Netlog or MySpace – and its hegemony against other competitors, such as Dailymotion or Vimeo.

Iqbal points out that

Time would include YouTube on its person of the year cover the same year. The person in question was ‘you’ – specifically content creators – with the cover incorporating a mirror, rather than YouTube itself. The choice of YouTube, however was not insignificant – cementing the young platform’s place as the place where independent content creators could share their work with the world.

The influence exerted over the internet by YouTube makes it the most visited website in the US and the world (as of 2019), according to Ahrefs, ‘a data-driven marketing toolset powered by a huge index of backlinks, keywords and content’.

1.3.5 The popularity of YouTube: statistics and facts

To have a little insight on the results achieved by YouTube, here is some statistics (as of November 2019):

-the most-viewed video on YouTube is a song named *Despacito*, by Luis Fonsi and Daddy Yankee, with over 6.5 billion views (and a ‘like/dislike’ ratio of 35 million likes to 4.2 million dislikes)

-the most-subscribed YouTube channels are the Indian music label T-Series with 118 million subscribers and Felix Kjellberg, better known as PewDiePie, a Swedish entertainer, comedian and former ‘let’s player’ (Kjellberg started his career on the platform by playing videogames and reacting to them whilst playing) with 102 million subscribers. Those two channels were involved in a battle for the first one to reach 100 million subscribers, from October 2018 to March 2019, the ‘PewDiePie vs. T-Series’ internet match. T-Series ultimately won against the Swede after PewDiePie has ‘rul(ed) YouTube for more than six years now’ as reported by numerous websites such as The

⁴ The link to the webpage can be found in the sitography at the end of this work

Guardian and the BBC. The news has had great coverage and involved both the media and creators all over the world supporting a faction or another.

-T-Series also holds the record for the channel with most views overall, with nearly 90 billion views for a single channel:

Speaking of statistics, it is interesting to notice what Statista, a provider of market and consumer data, reports:

As of May 2019, more than 500 hours of video were uploaded to YouTube every minute. This equates to approximately 30,000 hours of newly uploaded content per hour. The amount of content on YouTube has increased dramatically as consumer's appetites for online video has grown. In fact, the number of video content hours uploaded every 60 seconds grew by around 40 percent between 2014 and 2019.

Another data worth mentioning is YouTube's revenue, that the website Business of Apps sets to 9.5-14 billion dollars, as for 2018. In the same list of trivia it is reported that 'ads command an attention rate of 62%', thus proving the influence of Google's platform.

Investopedia reports that Google 'makes money' through its advanced search engine and algorithms that 'attempt to provide the most relevant results for your query, and, along with these results, you may find related suggested pages from an AdWords advertiser'.

The next step comes from investors, in that 'advertisers pay Google each time a visitor clicks on an advertisement', that 'may be worth anywhere from a few cents to over \$50 for highly competitive search terms, including insurance, loans, and other financial services'.

1.3.6 Monetization on YouTube

The last paragraph introduced YouTube as a multi-million-dollar platform and Google as a well-established company that has achieved a relevant place in the market gaining the lion's share of visits on the internet. Google ads are the basis of YouTube's business model, because they grant content creators the revenue they need to work full-time on videos.

YouTube's advertising system is similar to Google's, in the sense that they both works through clicks. In the case of Google, CTR and CPM are key factors because it is thanks to those that advertisers and website owners gather their revenue.

In the case of YouTube other features have to be taken into account. Amanda Perelli from Business Insider US retrieved some data after interviewing Shelby Church, a YouTuber who has 1.3 million subscribers:

-YouTube's Partner Program allows influencers to earn money off their channels by placing ads within videos.

-Google filters these ads and pays a creator based on factors like a video's watch time, length, and viewer demographic.

Watch time indicates the amount of minutes or hours that users watch videos on a specific channel. In the 'Content Owner Dashboard' and more specifically in the 'analytics' tab content creators can monitor their videos, see how many people viewed what they uploaded, how much time they spent on that specific video and whether that video is monetized, that is how much revenue derives from the video.

The dashboard is a YouTuber's way to keep control of their content and analyze the trend of their video, with all of the features that help them understand whether the video has had positive or negative feedback – for example through the like/dislike ratio bar. From the dashboard it is also possible to color correct videos, add subtitles, add or remove background music – that may or may not be copyrighted. Monetization comes with a certain type of criteria that must apply in order to gather revenue. Those criteria are determined, for instance, by family-friendly content – i.e. absence of swear-words – or original content. In case a YouTuber uses copyrighted material, the owner of the song, image or video can claim property of said elements for copyright infringement, thus claiming all of the revenue generated by that video. Although this is an issue that still affects a great deal of creators who struggle to maintain their job as full-time YouTubers – the Verge features an article discussing the copyright issue on the platform - it is not the objective of this dissertation to explain how the copyright system affects the platform. The objective here is to show how the ad system works in context, that is how YouTubers earn their money and how they have to captivate the audience to increase their revenue.

To resume how YouTube's Partner Program function, Amanda Perelli explains that

Creators become eligible to earn money by placing ads within their videos through YouTube's Partner Program. These ads are filtered by Google and creators get paid a certain amount based on factors like a video's watch time, length, and viewer demographic.

Those features are essential in the life of a YouTuber, in the sense that the more ads are put in a video, the higher the revenue will be. Shelby Church also told Business Insider that ‘lengthening her videos to over 10 minutes long has helped her channel earn more money because she can place more ads’. Another method that proved to be successful for other YouTubers consists in ‘placing about four ads on a single video [...] to maximize the revenue you earn from Google AdSense’.

This chapter served as an introduction to what will be discussed in the next, that is what makes a good translation, based on empirical factors such as fluency, a good use of syntax and proper vocabulary – Cannarsi’s translation, for instance, is an example of opaque translation. The second topic of this chapter is the evolution of journals, from paper-based sources to e-journals, that are now commonly used. The third part of the chapter involves Google and the rise of online advertisement, as a *trait d’union* that links journals with modern communication. Advertising is a common practice through which publishers can earn money thanks to subscription similarly to what YouTubers do when asking viewers to subscribe and like a video that may contain ads – thus helping the creator gain more money. The chapter ends with some statistics about YouTube and how it works, in the sense that creators need to target their content and be aware of the rules of the market if they want their videos to be monetized, through the Partner Program. The introduction of such elements – translation, journals and online advertising – is essential to what will be explained in the second chapter, that is subtitling and translating on YouTube to help a channel grow, or at least gather greater visibility in countries that may not speak the same language in other parts of the world – as may happen to an Italian YouTuber whose video is subtitled in English.

2. The subtitling practice in movies and YouTube videos

2.1 Subtitles and their impact on YouTube

2.1.1 Uploading and editing videos

In the previous chapter we analyzed the very basic concept of translation and the means through which popular science has been used over the centuries, until present day. The world wide web has surely improved the possibilities of scholars willing to share their knowledge in the whole community. Although platforms such as YouTube have yet to gain their own importance in the scientific ecosystem, it is also true that the possibilities offered by the internet are plentiful and worth-mentioning. YouTube, born as a free-sharing platform for creators all over the world, has now turned into a multi-national business even experts can relate to in order to share their views on specific topics. This is possible thanks to the simplicity of Google's platform. Anyone with an internet connection can upload a video on YouTube, all it takes is a Google account, as it is shown at the YouTube Help center's webpage "Upload Videos".⁵

As YouTube is the primary source for this work of translation and analysis, it is also necessary to underline the fact that the video editor featured in the dashboard of the creator's account comes with some characteristics that are useful in order to refine a video before publishing it. Amongst the various features available, a creator can:

- change the title of the video;
- insert a brief description to summarize the content of the video, let the viewers know additional information that is not shown in the video and/or put some links – for instance, to the creator's Facebook, Twitter or Instagram profile, or to an online shop to buy the official merchandising endorsed by the creator themselves;
- put tags on a video – tags are helpful in the sense that they are keywords that the creator can exploit in order to gather visibility and let a greater deal of people access, randomly, their video. A video with the right tags, based on the interest shown by the viewer, can appear on the right side of the webpage, in the 'recommended videos' tab. Tags are, however, more of a Sword of Damocles: if

⁵ YouTube Help Center's tutorials can be found in the sitography at the end of this work

put accordingly, they can boost views on a video but, on the contrary, as Whiting (2015) from Techwalla explains:

If YouTube determines that a video's tags or other metadata are misleading, it will remove the video and count a strike against the uploader's account. YouTube uses metadata to provide context about videos to search engines. Providing inappropriate metadata may cause irrelevant videos to show up in search results, which would hurt Google's search engine business and credibility.

- analyze the feedback that the video generates: total views of the video, the like/dislike ratio and number of comments written by viewers under said video;
- toggle monetization on or off: videos can be monetized, following the aforementioned rules on Google AdSense - that is consistency in order to maintain a minimum threshold of revenue. If a video is not monetized, it will not generate revenue and will not run ads. A creator can lose the possibility to monetize videos if copyright infringement is detected;
- create playlists: videos in playlists can be automatically played one after the other in playlists. Revenue can increase because it is frequent for ads to be shown at the beginning or at the end of subsequent videos in playlists;
- upload a thumbnail: if tags are covert stratagems that the creator can use in order to advertise their video. Titles and thumbnails are overt features, they are the video's 'calling card', in the sense that a viewer may be attracted by an enticing title, or an image that functions as a 'bait' to stimulate the viewer's interest and get clicks on the video. Similarly to what happens with tags, a thumbnail can be misleading. In this case it is referred to as 'clickbait', that is literally a thumbnail to attract viewers with exaggerated features that may even be disconnected from the very content of the video. Users can report a video and the creator of that video is penalized and may even be blacklisted by YouTube. These are the basic features from a creator's point of view. They are powerful in the sense that if one is well aware of the trends, of the way the YouTube algorithm 'thinks', they can be exploited to generate a real network of viewers and followers. This, of course, can also be made through the development of a connection, a relationship with the viewer, thanks to the 'subscribe' button, that helps the user have track of the content creator's actions on their channel, thus getting a notification whenever a video is uploaded to YouTube.

Another feature that will be better explained further in this chapter concerns the language in which the video is uploaded: subtitles, to be precise. Although the subtitling process is a matter that mainly regards the third and fourth chapter, it is important that translation and subtitling are introduced in order to understand what is considered to be both a good translation and good subtitling practice. In this case, translation is rendered via subtitles - in absence, as for 2019, of a feature that allows dubbing over a video on YouTube.

Dubbing is also more complicated because it requires skills that go beyond translation: actors who dub the translated text need good pronunciation and prosody, in order not to spoil the original feeling of a native speaker in a video. Badly portrayed rendering of a work through poorly dubbed performances may result in an audio clip that is perceived by a native speaker as a disturbance, thus making the work's original intent vain. Since every movie, video or general audiovisual work is an artwork in itself – and in this case artists may argue whether a work should remain un-dubbed or un-subtitled in order not to spoil the original – a necessary degree of resemblance or fidelity to the original source is, at least, required.

YouTube offers a tool that allows non-native speaker users to understand a video through subtitles. All of the details are available at Google's YouTube Help center's webpage "Contribute translated content": this feature, as described in the guide, concerns

channels (that) let you contribute titles, descriptions, subtitles and closed captions to their videos. They're viewable on the video watch page and by clicking the [CC] icon in the player.

Contribution depends on the author of the video, that decides whether to enable or to disable subtitles and the possibility to change the title of a video. Nevertheless, thousands of content creators allow subscribers (or users, in general) to add closed captions or subtitles. Videos with subtitles come with the tag 'subtitles'⁶ alongside the description, but there also is the possibility to filter videos that feature subtitles, after a simple query.

⁶ *Sottotitoli*, in Italian and as shown in Figure 1

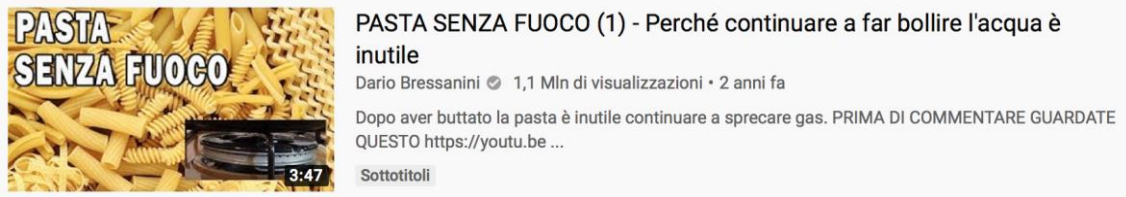


Figure 1. 'Subtitles' tag on YouTube

Subtitles are a serious matter, not only because they prove to be helpful even as closed captions – that is, as the transcript in the same language of the video – but also because they give a video international coverage, thus allowing the creator to be known in more countries than the one they upload videos from.

2.1.2 Controversies around subtitles on YouTube

Subtitles are a serious matter even because there has been criticism around some users that – when given the chance to subtitle autonomously – may abuse their power and add fake subtitles. The other side of the coin is better represented by an issue that had general coverage in August 2019.

Popular YouTuber PewDiePie, who has already been referred to as the second most-subscribed channel on the platform – with a subscriber count of 102 million users, as of November 2019 – had allowed his subscribers to contribute in his videos by adding subtitles in more than ten different languages. Patterson (2019), from E-sports and entertainment news provider Dexerto explains that PewDiePie “had to disable subtitles from his videos, as users were exploiting the system to promote their own channels on his viral videos.”. The Swedish YouTuber, due to internet ‘trolls’ was forced to disable subtitles on his videos after YouTube user BanglaFz1 spammed his own channel on PewDiePie’s latest videos – that hover at about five to ten million views. YouTuber JT explains the issue in detail in his own video, titled “Pewdiepie’s Translators RUIN his channel”.

This problem, of course, generated general discontent in the YouTube community, thus forcing YouTube to fix the issue and change the subtitling contribution system. In a tweet dated August 31st, 2019, YouTube @TeamYouTube released a statement addressing this issue:

Thanks for your patience - Based on the feedback we've heard, we are introducing some changes to Community Contributions. Moving forward, creators that have turned on this feature will need to manually review their Community Contributions and check for spam before publishing.

Controversies around YouTube spark criticism that may be resolved through helpdesks and updates from Google and YouTube, in order to solve problems as soon as possible.

The issue around PewDiePie had significant value because it showed the power of language and communication, proving how easy it can be to influence and shape information for one's own advantage. The case being now solved, the problem around closed captions has thrown light on the issue of poorly executed subtitles. There is a distinction, as was demonstrated, between well-executed, professional subtitling and amateur, spam-related subtitling.

2.2 Subtitling as a branch of translation studies

2.2.1 The art of subtitling

The subtitling discipline dates back to the early 20th century, when movies had no sound and needed a kind of caption in order to describe what characters involved in a scene were saying in their line of dialogue.

The first silent films relied heavily on facial expressions and gestures to captivate the viewer's attention with no sound – actors such as Buster Keaton, Charlie Chaplin, Oliver & Hardy being amongst the most iconic and appraised stars in the silent film industry. Closed captions were precious in order to give context to the scene and introduce characters or lines of dialogue to better explain a scene.

Downey's description of how silent films or 'talkies' worked, (2008:17) is useful to better understand how subtitles were perceived and used in the film industry a century ago:

In the first decade of the twentieth century, the "magic lantern" slide projector, used together with a film projector, allowed a skilled projectionist to actually pause the moving film periodically to display words on screen. By about 1909, however, such overlays were replaced with the intertitles [...] : printed cards that were photographed and integrated with the film itself. Although they [...] interrupted the action of a scene, intertitles required less projection skill and equipment than the magic-lantern technique, and quickly became a staple of silent film

This proves they soon became a practice movies could not exist without, mainly due to the informative and helpful features that made them the only exterior means to give some sort of detail or explanation to the narration. Still, intertitles were perceived as nuisance, sometimes a trivial adjunct to an audiovisual product in that they paused the narration and forced the viewer to stop and read them.

Subtitles have now gained their own place in the audiovisual translation industry, becoming a relevant part to the distribution of a product that, for instance, is distributed all around the world but is not dubbed, nor features a commentary or a voice-over dubbing.

2.2.2 Subtitling: practical applications

Subtitles are more than just a set of words on a screen, they have their own value that transcends images themselves. The subtitling practice, all over the years, has been studied and researched on by many scholars for various purposes. One of these purposes, which is worth-mentioning, is Noa's pedagogical application (2010:285). In her study she refers to subtitles as 'a source of laziness' according to 'some foreign language teachers'. In her approach, she proved that subtitles, on the contrary, can spark curiosity and help ameliorate one's bilingual ability in the sense that 'subtitling and subtitles bring together old and new technology', thus 'act(ing) as a motivating factor for students to face authentic foreign language exchanges'. She furthers her point by quoting Danan (2004:72):

Furthermore, it is important to realise that, no matter what, "automatic reading of subtitles does not prevent the processing of the soundtrack" (Danan, 2004:72). What is more, over time, viewers (more or less intentionally) develop strategies to process subtitles efficiently and increasingly derive more benefits from them.

Talavan based her research on fifty test subjects by making them subtitle a few clips. The group of subtitlers was divided into two, a 'control group (that did not practice subtitling)' and 'an experimental group (that performed the whole activity)' (Talavan, 2010:292). In the end, the results proved that, in two different tests (before subtitling and after subtitling the video clip), students improved their cross-linguistic skills, thus 'inferred that the use of subtitles as a support has a positive effect on the development of oral comprehension skills'. Talavan (2010:295) comes to the conclusion that 'from a

didactic perspective, subtitling as a task and subtitles as support both strengthen the role of mediation in foreign language education’.

The general conclusion of this research regards subtitles as a learning source that is ‘recreational, familiar and dynamic, utilizes multiple codes, and makes the achievement of this receptive skill easier, both individually and collaboratively’ (Talavan 2010:295).

This need for knowledge has its own value and gathers greater importance when put into a European context: multilingualism is one of the staples of the European Union. It is, in fact, a great concern in order to ‘improve the competitiveness of the EU economy’ (European Commission, 2018), as it is found in the European Commission’s official website.

Active subtitling has also proved to be a valuable exercise in developing language skills: Williams and Thorne (2000:217) analyzed the response that derived from subtitling videos and writing teletext for language learning. In their work they stress the importance of audiovisual translation, stating that ‘there is considerable demand for skilled subtitlers, working in various language combinations’. They refer to a joint operation between Saint David’s University College Lampeter and TROSOL, a translation agency. Those two organizations ‘launched a training programme in interlingual subtitling’ bringing ‘together teachers, researchers, students, practitioners and trainees with an interest in screen translation’ (Williams and Thorne, 2000:217). What they underline is that – at the end of the millennium – ‘research on subtitling as a medium for language learning (was) almost non-existent’ (Williams and Thorne, 2000:218).. This is an important remark because it gives context to the way subtitling was perceived, that is less precious than regular translations, in that the audiovisual product is already intelligible in the source language and it generally does not require to be translated in a target language. I argue that – since subtitles functions as an aid for viewers in a context of teletext subtitling – they can become a powerful means to convey the original broadcasted message. For instance, intratitles for hard-of-hearing viewers are a pristine example of equality in transmissions, in the sense that they help impaired listeners understand a concept in the same manner a non-impaired viewer would do.

Williams and Thorne (2000:219-220) delineate a series of fundamental steps a subtitler – a translator, in general – must follow in order to make an adequate and precise translation. A good subtitler should, therefore:

- 1) Listen attentively, recognize and fully absorb the content of the programme/film in the L2 [...]
- 2) Read/view the screen for visual clues which place the language into meaningful context [...]. The learner becomes aware that communication in another language is considerably more than merely stringing together a series of words [...]
- 4) [...] edit the content in such a way that the original meaning will remain intact, but will allow for comfortable reading by the audience [...]
- 5) Consider the register of the language of the subtitles [...]
- 7) Display the target language version [...] keeping the syntactical units intact and respecting punctuation conventions [...]

It is in this sense that subtitlers should act. Translation, in general, is not a mere act of semantic word-for-word rendition in an L1 to an L2. It is represented by a cognitive effort to transform, shape the source text and translate it into a target language so that the target text sounds as natural as possible. A good translation generally is, therefore, an act of transformation of a text that – to native speakers – has to flow and sound natural.

The result of Williams and Thorne's research shows a certain degree of improvement in students that, dealing with subtitles, have gathered greater proficiency in language and 'increased confidence' while translating, with 'considerable improvement in their listening skills' (Williams and Thorne, 2000:224).

Active subtitling has also proved to benefit students in their research activities, because they were 'forced to seek synonyms [...] as their preferred choice was unsuitable to fit into the time allocated for the particular subtitle'. Moreover, this activity also helped students memorize longer sets of words, thus being able 'to repeat long passages of speech, word for word' (Williams and Thorne, 2000:225). This approach is significant because of its ambivalence. It is both a demonstration of the possibilities deriving from continuous practice - which means confidence in translating and mastering the aforementioned translation skills – and proof that with good subtitling practice come refined subtitles that are, therefore, helpful.

Nevertheless, there are negative aspects in subtitling, when compared to 'standard' translation. Williams and Thorne (2000:227) point out that

subtitling training is time consuming and makes considerable demands on both staff and students [...] (and that) working on short excerpts can contribute to a lack of sense of wholeness"

Context matters, especially when translating. It is fundamental to have at least a part of the context the original work is set in. When this is not attainable, it is up to the translator to come up with methods or strategies to overcome the absence – total or partial – of context in order to translate a text that has the highest resemblance degree possible to the original.

2.2.3 Constraints and technical aspects of subtitling practice

As subtitling is a branch of translation studies, it also requires a determined amount of time to both familiarize with the subject and the specific rules involved in this particular kind of translation, and to compensate with the lack of space that comes with the nature of subtitles. Since the space available on a screen is limited to a portion of the image – as full-text subtitles would cover the movie or clip, thus making it impossible for the viewer to appreciate the original work in all its entirety – subtitling requires flexibility and capability to adapt to the limitation of both source and target languages.

The concise nature of subtitles comes with its hindrances that a translator faces when confronting with a text. *The code of subtitling* (Carroll and Ivarsson 1998:1) offers a list of actions to perform or not to perform when subtitling texts. To better understand what it means to be a good subtitler it is fundamental to know the rules for a coherent, cohesive and pleasant audiovisual translation. Carroll and Ivarsson state that:

- Translation quality must be high with due consideration of all idiomatic and cultural nuances.
- Simple syntactic units should be used.
- When it is necessary to condense dialogue, the text must be coherent. [...]
- All important written information in the images (signs, notices, etc.) should be translated and incorporated wherever possible.
- [...] "superfluous" information, such as names, off-screen interjections, etc., should also be subtitled. [...]
- Obvious repetition of names and common comprehensible phrases need not always be subtitled. [...]
- No subtitle should appear for less than one second or [...] stay on the screen for longer than seven seconds.
- A minimum of four frames should be left between subtitles to allow the viewer's eye to register the appearance of a new subtitle.

- The number of lines in any subtitle must be limited to two.
- [...] source language and target language should be synchronized as far as possible.

Subtitling practice revolves around these basic concepts, that are both language and style-related. Those two features will be better analyzed in the third and fourth chapter of this dissertation.

2.3 Examples of captions in the movie industry

2.3.1 Translating for broader audiences

Translation serves its purpose when it is effective and reaches an audience that is different from the audience to which the source text is directed. In this sense, subtitles are extremely similar, in the sense that they are a form of translation – audiovisual translation – based on transmission in more than a language. It is direct, rapid, it needs to portray a message which lasts a few seconds. Whereas standard text translation - literary translation - is more malleable – in terms of space and syntactic elaboration of sentences – subtitles follow the rules of movies and frames-per-second (FPS).

2.3.2 Display vs subtitle: changes in *Back To The Future*

Subtitles need not be explanatory: context is usually in the image itself, which means that incidental phrases or sentences are usually to be avoided. Conciseness is what audiovisual translation is based on, because the original work – the movie – is generally conceived as freed from text, if not put on purpose. When text is put on purpose in a frame or a scene, it gives context or details that are necessary to the plot. An example of ‘display’ text that is plot-driven – and, therefore, represents an important element to the plot – can be seen in *Back To The Future, Part I* (Gale, Canton and Zemeckis, 1985): the first part of the movie features Marty McFly, the protagonist, at the ‘Twin Pines Mall’ carpark in 1985. The mall’s sign, featuring two pine trees and the text ‘Twin Pines Mall’ does not appear on text, but it is evident because it appears in the shot for about three seconds. The origin of this name is explained later in the scene, where Doc Brown – the co-protagonist - says that thirty years before, on the land on which the mall was built, there was a farm owned by Mr. Peabody, who had “this crazy idea about breeding pine trees”.

Later in the movie, when Marty goes back in time – travelling back to 1955, when Mr. Peabody still had his farm and lived there with his family – he accidentally knocks

down one of Peabody's pine trees whilst running away from the farm with the DeLorean. This detail may seem irrelevant to the plot, but in the last part of the movie - when Marty manages to go back to 1985 – the mall's sign is different and only features a pine tree. The text has been replaced with 'Lone Pine Mall'. The shot features the same, slightly changed sign for about three seconds, to make the viewer aware of the change.



Figure 2. *Twin Pines Mall and Lone Pine Mall, Back To The Future (1985)*

Figure 2 was an example of display text, which is entirely part of the movie and – as it is conceived to be within the movie itself – is a primary element that cannot be detached by the film. Subtitles, on the contrary, are superposed on the film, they are a secondary element that is necessary to explain parts of a concept to the audience, may it be a matter of closed captions in the same language or subtitles in a target language for international renditions of the same work.

To show a case of subtitles that can be explanatory, the *Back To The Future* trilogy will serve again as an example: in *Back To The Future, Part II* (Gale, Canton and Zemeckis, 1985): Marty travels to 2015 and sees his son, Martin, get arrested. Since the movie is written in English and actors star and act in English, the newspaper that Marty holds is dense of details – thus being an example of a well-thought prop newspaper – so there is plenty of information giving context to what has happened and to how people live in 2015. To an Italian audience those added details are superfluous, because whether they are translated or not, what matters is the headline, not the gutter or the sub-heading. The headline says:

Youth Jailed

Martin McFly Junior Arrested for Theft

Youth Gang Denies Complicity



Figure 3. USA Today's 2015 headline - original, *Back To The Future, part II* (1989)

which has been rendered with the Italian

Giovane in Prigione

Martin McFly arrestato per furto

Banda giovanile nega complicità

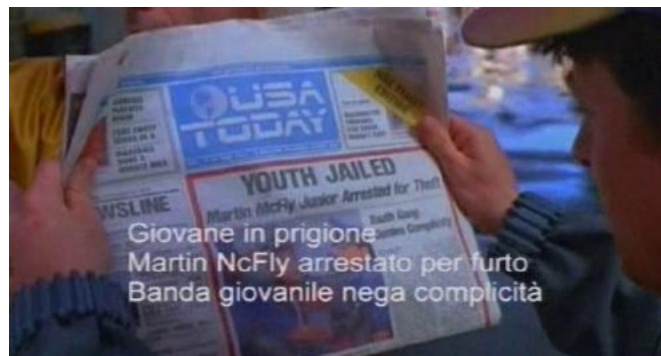


Figure 4. USA Today's 2015 headline – Italian subtitles, *Back To The Future, part II* (1989)⁷

This detail is the only relevant to the plot. If that headline were not translated, viewers may had had issues in understanding parts of the movie. The headline is self-explanatory, Marty's son is arrested: he then prevents this from happening later in the scene.

Superfluous details are, for example: “Washington prepares for Queen Diana’s visit”, or “President says she’s tired”. They serve to give some context to the reality in

⁷ These subtitles refer to an early version of the Italian adaptation of the movie, distributed in VHS. Subtitles are poorly written as they feature three lines and Martin McFly’s name is wrong, as it appears to be “NcFly”

which people live in the fictitious 2015 described in *Back To The Future II*. The newspaper is relevant for its headline and it is shown for no more than a couple seconds – the right time to make viewers read just the first words of the newspaper. All the surrounding details are not necessary to the understanding of the plot and, to grasp all of the references, the movie must be paused in order to read through all of them. That is the main reason why this information did not need a translation.

2.3.3 Subtitles as an artwork

When text is presented through captions and not display, it features one or two lines of – generally – white text with black outline that are superposed to the image. Those lines mimic the dialogues between the characters, their thoughts, the narrator's voice and all of those elements that are spoken. When subtitling, one must be aware of the space that is available, which is extremely limited. Two lines must resume one concept, because the viewer, being unable or partially able to understand the source language, cannot process the information through aural channels. Reading requires a greater effort because it is a slower, active process. The viewer needs to read and understand what is written, whereas listening is a passive process through which information passes directly from the movie to the listener, who can focus on the actual frames of the movie without being distracted by or focused on subtitles.

While it may be true that subtitles are distracting, sometimes a nuisance, because they prevent the viewer to appreciate the original artwork in its entirety. This may distract the audience with elements that need to be read and understood before seeing what the actual scene is about and, therefore, understanding the plot through text before understanding through images – they are extremely useful in cross-cultural contexts, in the sense that subtitling is an art that is – first of all – part of translation studies.

New York Times's Rawsthorn (2007) provides an example of subtitles as an art form: Timur Bekmambetov's horror movie *Night Watch* (Ernst, Maksimov and Bekmambetov, 2004) is an example of how captions can become display when used accordingly and with specific purposes. About standard subtitles she argues that

Subtitles are almost always badly designed. Illegible typefaces drift on- and off-screen at the wrong moments, lurking so low that the bottoms of the letters are chopped off, and obstructing the audience's view of gripping twists in the plot, or especially beautiful scenes.

Rawsthorn, on the contrary, praises Bekmambetov's work by analyzing some of his subtitles:

The result was sensational. Most of the subtitles in "Night Watch" are in clear, white sans serif lettering, but others adopt different guises to reflect the mood and action of the film. [...] Another, uttered when a character heard voices in his head while swimming, dissolves like blood in the water of the pool.

To put these subtitles in context, Zdenek (2015) provides a collection of .gifs from the movie, featuring Rawsthorn's example and describing other original subtitles: "Subtitles don't just sit on top of the movie frame like an afterthought or add-on but interact with the visual calculus of each scene." It is thanks to subtitles that a movie can be appreciated even when it is not dubbed. Subtitling or dubbing enable a movie to be distributed in a larger number of countries, thus creating more revenue and making a movie or an audiovisual product have a greater income at the box office.

2.4 Monetizing subtitles

2.4.1 Captions as a source of income

As subtitles in the movie industry serve as a valuable element for distributing an audiovisual product across the world, they are not only present in movies or tv-shows. They can also be helpful on everyday life context, such as YouTube videos. To underline the importance of subtitling and to connect this topic to the means through which the analysis of language will be portrayed in this dissertation, it is interesting to present Edelberg (2019) and Leduc's opinion (2019) on the relation between closed captioning and increased watchtime. Edelberg makes a list of benefits for the audience and for the author of subtitles deriving from closed captioning. Benefits may derive from "accessibility for Deaf or Hard of Hearing Viewers", in fact "71% of people with disabilities leave a website immediately if it is not accessible", as Edelberg reports in the same article.

As for comprehension, Edelberg also cites a "national research study conducted with Oregon State University", that had the aim – starting from data collected by more than 2000 university students – of showing that closed captions are beneficial for language learning, as 75% of that pool uses them as a learning aid. Engagement, retention, accuracy and comprehension are the main factors that have been reported to have greater importance, as more than half of the students uses closed captions to boost

comprehension, whereas a third prefers them for bettering their accuracy. A fifth of those students stated that captions helped them as a means of engagement towards specific topics. Lastly, about 15% of students thought that closed captions are helpful when retaining language, not only for what concerns comprehension. The general result from this study shows that “98,6% of students find captions helpful”. Edelberg also talks about accessibility in terms of “flexible viewing in sound-sensitive environments”, as videos that feature closed captions are extremely portable. Whenever dialogues are written text-to-speech or they are rendered in a manner that dubbing can become secondary, closed captions have proven to be useful, especially when watching videos “on a noisy train or on a crowded street”. Subtitled videos are now common practice. As Patel (2016) from Digiday – quoted in Edelberg’s article – reports:

As much as 85 percent of video views happen with the sound off, according to multiple publishers. [...] as Facebook has built a video ecosystem that does not require users to turn the volume up — and publishers have been more than happy to play ball. [...] When it comes to distributing branded content, advertisers for the most part have also come to terms with these quasi-silent videos as the de facto standard — non-live edition — for Facebook. And in these instances, the format works.

According to MEC North America, branded videos from its clients average 85-90 percent silent video views.

Although this data comes from 2016 it shows a social network that is polarized towards an user-friendly attitude: that not only takes into account difficulties for hard-of-hearing or deaf people, but it also exploits closed captions as a lucrative means to boost advertisements and sponsored videos on Facebook.

Edelberg also quotes translation as one of the advantages made possible by closed captioning: Enamorado (2019) explains that “80% of views on YouTube come from outside the United States. In fact, eight of the top 10 countries with the most YouTube users are non-English speaking countries”. She also adds that “implementing a solid translation SEO strategy” gives four main benefits:

Increased traffic: Helping Google and other search engines index your video translations will increase traffic to your site, expanding your audience globally and domestically.

Greater Authority: Duplicate content is not penalized across different languages. As a result, your site will have more pages, keyword rankings, and inbound links. [...]

Less Competition: [...] there is simply less competition across different languages.

User Experience: Your video content will become more engaging for non-English users, resulting in longer view times [...]

Those four factors are extremely relevant to this analysis. Subtitling for YouTube involves not only specific knowledge of subtitles and how they work, it also involves external factors such as advertising, utilizing Google's algorithms and boosting a video outside YouTube or – if inside the community – making it appear on recommendations so that it is available to broader audiences.

Although increased traffic is the first point of the list, it is also true that – in a primarily English-speaking context – there is less competition in translating, for instance, from English to Italian, as the quantity of videos in English and English-speaking users is far greater than the numbers grossed by Italian YouTube channels. This is also true when translating from English into Italian. It is more likely that an Italian video is translated into English – thus giving said video greater coverage – than vice-versa, as Italian does not represent a lingua franca, nor it is as widespread as Portuguese or Spanish are in the community and all over the world.

2.4.2 YouTube Rewind 2019

To put the value of internationalization into perspective, it may be helpful to analyze this year's YouTube Rewind. The annual Rewind features the highlights of the past year on the website by celebrating great events, creators, trends, memes and so on. It is a plethora of people that collaborate in a video, from YouTube and for YouTube.

2019's YouTube Rewind, entitled 'YouTube Rewind 2019: For the Record | #YouTubeRewind' is worth-mentioning in this dissertation because the video makes great use of statistics to show what users appreciated the most among the whole community. It is worth-mentioning for the statistics reported by YouTube itself, amongst which are international content creators:

- the third most-liked video in 2019 – with 3.4 million likes - was uploaded by Brazilian user and comedian Whindersson Nunes;
- an Indian music company, T-Series, is the most-subscribed channel;
- the second most-liked music video is BTS's Boy With Luv feat. Halsey; BTS are a South-Korean boyband based in Seoul;

- amongst the top ten new creators of 2019, seven of them are not from the US; three of them come from Brazil, another three from South Korea and one from Pakistan;

Those statistics demonstrate that YouTube has evolved from the times of the ‘Broadcast Yourself’ motto, it has transformed into a multinational icon users that can relate to when connecting to the internet. Since it has gained great popularity, but it cannot reach everyone on the platform, subtitles must act as bridges in order to cross the linguistic barrier.

2.4.3 Search Engine Optimization (SEO) and increased visibility through subtitles

With a constantly growing demand of internationalization on YouTube, since YouTubers outside English-speaking countries are emerging and taking their share of YouTube’s audience, it is extremely necessary that creators and users find a point of contact to cooperate and communicate together.

Dubbing is not conceivable because it would alter the original idea of a video, it would diminish the creator’s original scenic presence, cutting the sound track by superposing a translation with another person’s voice. Although dubbing would definitely facilitate a user’s comprehension by making the video extremely intelligible, it may also sound less genuine because altered by the dubber, who acts to convey the original message but will never be able to completely match it.

Subtitling offers a reasonable compromise in the sense that it does not alter in any means the original soundtrack, thus not changing the video or audio, which means that users can watch or listen the video in the most direct way possible, as conceived by the content creator. Moreover, subtitles on YouTube can be toggled on and off, according to what the user wants or needs. Subtitles are, therefore, a resource to be used wisely, not an unsurmountable hurdle. Their versatility is what makes them unique. They can appear or disappear based on the user’s will. If they are perceived as a nuisance they can be deactivated.

As Leduc (2019) boldly states “YouTubers all want one thing: more views on their videos [...] there is nothing a vlogger loves more than to see their YouTube views go up”. To do so, she explains that closed captions can help increase views on a video. Although the points “Captions Make Videos Accessible to a Wider Audience” – for hard-

of-hearing users, mainly – and “Captions Let Viewers Watch Videos In More Places” – Facebook’s videos are an example – have already been analyzed, there is another point that Leduc finds interesting, which is more technical and advertising-oriented: “Closed Captions Boost Video SEO”.

Search Engine Optimization (SEO) is responsible for the impact of a video on the platform. Leduc (2019) explains that

A study by Discovery Digital Networks measured a distinct increase in SEO for YouTube videos with captions, compared to videos without captions. They concluded that Google indexes closed captions uploaded to YouTube videos, which makes them more likely to rank higher in searches for relevant keywords.

The study also found that captioned YouTube videos saw a 13.48% increase in views within the first 14 days they were published. They measured the lifetime benefit of closed captioning videos to be 7.32% more views on YouTube than uncaptioned videos.

Not only subtitled videos are helpful in a broader sense – they make foreign users aware of the content of the video and words spoken in it – they also are indexed by Google so that their presence on the internet is boosted. Since they can help more people understand said content, they can subsequently be shared by a larger number of users. This means that ads on those videos not only are more valuable – as they may be viewed by thousands of people more than it may happen in the case of uncaptioned videos. They are also a carrier of content that may get users to subscribe to a specific channel whose videos are subtitled. It is by developing a relationship with the user, by ‘building customer loyalty’ through likes and subscription that a content creator can thrive on the platform. More specifically, in the context of YouTube videos captions are a primary resource – in the sense that they appear as transcripts or subtitled translation of spoken sound tracks – but they are not the only one.

2.4.4 Viewer distribution on YouTube

The basic concept of translation on YouTube can be broadened because it is not specifically confined in the context of subtitles or closed captions. Translating – thus not only subtitling – comes with the rendition of metadata in another language. A YouTube user can contribute in translations by transposing the description of a video from the source language to a target language. Also titles can be translated, as they appear on the home tab or as results of a query. Translated video titles can boost a channel’s watchtime,

as videos in the source language appear with the translated title in the recommended videos tab or in queries. YouTube takes into account the country in which videos are watched. A user can – by browsing or searching for content – come in contact with international content that is already translated, thus replacing the original title – in the source language – with the translated title – in the target language. The user is not immediately aware of the fact that the creator of said video uploaded it in their source language, at least before clicking on it.

YouTube provides some statistics about user interaction and subtitles as a translation tool:

On average, over two-thirds of a creator's audience watch time comes from outside of their home area. To grow your international audience, make your videos more accessible in other languages with our translation tools:

Translated metadata may increase a video's reach and discoverability. Translated video titles and descriptions can show up in YouTube search results for viewers who speak those other languages.

Viewers who speak other languages can also find and watch any of your videos with subtitles.

Same language captions make your videos available for hard-of-hearing or deaf viewers, non-native speakers, and viewers in loud environments.

It is interesting to notice that YouTube is also aware of issues concerning the fruition of videos by hard-of-hearing subjects, as it was previously mentioned in the case of Facebook. 'Two thirds of a creator's audience watch time' means that the creator needs either to rely on the fact that users outside their home country know the language videos are uploaded in – or, at least, to hope so - or to add subtitles to reach a greater number of people all over the world. Since videos can be translated in dozens of languages, from Afrikaans to Mandarin Chinese, a content creator is virtually able to reach worldwide audiences, thanks to community contribution. This is, of course, a feature that must be taken into account when uploading videos with the intent of creating a network of subscribers.

Although it may be true that English is a lingua franca and – as YouTube was born in the US and American YouTubers are generally known or easily watchable – this may not be true in the case of Brazilian Portuguese, for instance. Portuguese counts 229 million speakers – the ninth most-spoken language in the globe, as Julian (2019) reports English being the second, with 983 million speakers. It is more likely that a Brazilian

content creator needs to make use of closed captions and subtitles, when compared to an American, Canadian, Australian or British colleague whose videos are intelligible by a larger number of users.

2.5 Translation choices in Europe: dubbing and subtitling

2.5.1 Historical reasons behind audiovisual translation choices in Europe

Subtitles are a powerful tool even in countries that prefer dubbing over subtitling. Danan (1991:606) states that there is “a clear dichotomy in film translation practice [...] dubbing is generally used in France, Germany, Italy and Spain”. The dichotomy presented by Danan dates back to the 20th century, as totalitarian regimes imposed nationalism in all aspects of society, so that xenophobia was an excuse to push for translated content and rely less on external influences coming from abroad, as it may had happened in case an American movie was distributed, for instance in Italy. In that case, films were dubbed after the State exerted martial law on audiovisual products in fear of the other.

Danan (1991:610) makes some examples of how audiovisual products were perceived in the 30’s and 40’s of last century in countries that were under the control of totalitarian regimes:

The three fascist governments of Spain, Italy and Germany had similar language policies. They all insisted on having one standardized national language for the sake of national unity, and forbade minority groups to speak their own dialects or languages.

Danan also depicts the cultural setting in which those policies were the law, as “Castilian had failed to eradicate [...] Galician, Basque and Catalan” before Franco’s dictatorship. In Germany and Italy, Nazism and Fascism were based – on one side – on a “ruthless pangermanic policy [...] to recapture Germany’s past grandeur and unity” and – on the other side – on valorizing “the notion of national unity” which was undermined by “regional dialects (that) were still extremely strong” when Mussolini started leading Italy in the 1920’s.

As was previously said, subtitling exerts some power in terms of knowledge and language acquisition, in the sense that through captions and subtitles written in a target language it is possible to better understand the structures, grammar and vocabulary of a source language. This is an active process that stimulates one’s curiosity and helps gain cross-linguistic competences.

Dubbing, on the contrary, is a passive process, in the sense that the audiovisual product is already translated in the target language, it is adapted accordingly and is, therefore, masked as a product of the target culture. A dubbed video or film features actors that speak the target language, through a great effort of dialogue adaptation and lip-syncing so that there is a perfect – or almost perfect – match between the original soundtrack and the adapted version.

Since totalitarian regimes envisioned a concept of state sovereignty that was to be exerted through the control of the masses, it is evident that dubbing was the preferred choice and subtitling was seen as a threat to the very idea of national unity.

Danan (1992:612) thoroughly describes the role of translation in such regimes, by saying that “translation in a nationalistic environment must [...] be target-oriented in order to make foreign material conform as much as possible to the local standards”.

The dichotomy between dubbing and subtitling is better rendered in the following passage, describing the impact of dubbing:

Dubbing is an attempt to hide the foreign nature of a film by creating the illusion that actors are speaking the viewer’s language. Dubbed movies become, in a way, local productions. [...] Foreign utterances are forced to conform to the domestic norms and frame of reference. [...] Dubbing, in short, is an assertion of the supremacy of the national language and its unchallenged political, economic and cultural power within the nation’s boundaries

Subsequently, Danan describes the cultural implications of subtitling, stating that “Subtitling, on the other hand, is an extreme form of source-oriented translation.” Danan (1992:613) then cites Lambert, by quoting:

Subtitles rather correspond to an extreme strategy, in which the original is not deleted, but in which it is just supported, - second hand, in a subsidiary way – by a written summary [...] (Lambert:131)

She then adds that

Viewers (who can even stop reading subtitles if they make a conscious effort to do so) are constantly reminded of the foreignness of a film by the presence of the original soundtrack. Subtitling indirectly promotes the use of foreign language as an everyday function in addition to creating an interest in a foreign culture.

Danan (1992:613) concludes her point by underlining that nationalistic societies were against such policies in that they could endanger the structure of the state, in fact “no extreme nationalistic society could allow a foreign language to [...] compete with its national language”.

Foreign languages, as a matter of fact, represented the atavistic fear of the unknown, the other, the enemy who could strike at any time. Paranoia was a powerful tool that was able both to cheer the masses in virtue of the spirit of nationalism. The state was the only source of happiness, welfare and personal success – and through xenophobia, justified by the fact that any product that was not controlled by the state could be an attempt of the ‘other’ to threaten the solid bases of the state itself.

This kind of centralized control to prevent any menace was made through strict regulations, in fact “governments also established guidelines about the versions that could be distributed” and “Dubbing was often imposed by law”, with Mussolini “prohibit(ing) any non-dubbed version from entering his country”, as Danan (1992:611) writes.

To analyze the trends in audiovisual translation in European country it is interesting to quote Almeida and Costa (2014:1234), who state that “three main adaptation approaches for language transfer for audio-visual works coexist in Europe: subtitling, lip-sync dubbing [...] and voice-over”. A chart delineates the distribution of countries in which subtitling has been chosen over dubbing, although “subtitling is the practice used most widely in Europe”, as Almeida and Costa state by quoting Koolstra et al. (2002).

| | Cinema | Television |
|---|---|---|
| Subtitling countries | Portugal, Iceland, Ireland, UK, Belgium, Netherlands, Switzerland, Norway, Sweden, Finland, Estonia, Lithuania, Latvia, Poland, Czech Republic, Slovakia, Hungary, Slovenia, Romania, Bulgaria, Greece, Turkey, Cyprus, Malta, Luxembourg | Portugal, Iceland, Ireland, UK, Belgium, Netherlands, Romania, Greece, Slovenia, Hungary, Estonia |
| Dubbing countries | Spain, Germany, Austria, Italy | Spain, France, Switzerland, Italy, Hungary, Slovakia, Republic, Turkey Germany, Austria, Czech |
| Both versions (subtitling and dubbing) | France | Cyprus |
| Voice-over | -- | Bulgaria, Poland, Lithuania, Latvia, Estonia |
| Originals | -- | Luxembourg |

Table 1. Study on the use of subtitling, European Commission (2011)

On the contrary, “dubbing is the predominant language transfer practice in Spain, Italy, Germany and Austria [...] also used widely in France”, which means that subtitling takes the lion’s share of audiovisual translation across Europe.

2.5.2 Subtitling and dubbing: pros and cons

It is important to notice that dubbing is a far more expensive practice, that De Grazia (1989) defines a “more costly and time-consuming translation technique” which is “used in larger and wealthier countries, where the costs are repaid by the popularity of television programs and films”. It has been written that dubbing is common practice in Italy, as it is the result of twenty years of fascist regime that consolidated the role of dubbing in spite of subtitling. This dissertation, therefore, is also meant to be an attempt at making an active step in the direction of closed captions and subtitles, in general, in a country where subtitles are not the rule.

Subtitling, as has been said before, is an active form of language acquisition, requiring some effort from the viewer. It has its own relevance in Europe – being the preferred means of language transmission in audiovisual translation practice – and it is a source of linguistic enrichment for language acquisition. Almeida and Costa quote Koolstra & Beentjes (1999) and give several pros of choosing subtitling over dubbing in television:

- (i) [...] Story information in subtitled programs is presented in different means: in the visual images, spoken in the foreign language and in the subtitles in one’s own language. These presentation means will generally complement or support each other. [...]
- (ii) Viewers are generally well motivated to understand what is shown and said on television and cinema;
- (iii) Spectators generally have a positive attitude towards the English language, since it is considered to be an appreciated language for international contacts. Particularly young people find English a ‘cool’ language because it is the language of the most popular music and films (Koolstra & Beentjes, 1999).

Language learners may benefit from subtitled programmes because they “may learn the meaning of expressions or standard sentences, and in which situations these sentences may be used”, but also to enhance listening skills in the target language – by distinguishing accents, peculiar expressions and prosody (Almeida and Costa, 2014:1236).

Almeida and Costa (2014:1235) also cite *The Study on the use of subtitling* by the European Commission (2011), which is worth mentioning because in a study that “involved at least 150 people” it was observed that

subtitling helps to improve the mastery of foreign languages (ii) subtitling can raise awareness and provide motivation for language learning [...] creating an environment that encourages multilingualism, and (iii) knowledge of foreign languages and university studies encourage citizens to choose subtitling rather than dubbing.

Subtitling being from one point of view a type of translation activity and from another an aid to the comprehension of an audiovisual product, functions as a Janus-faced discipline that connects translation studies with language learning through video.

2.6 Conclusions

This chapter presented YouTube from a technical point of view, not as a platform owned by Google – thus a multimillion, established business – but as a bridge to connect people from different countries all over the world. Although YouTube offers its content creators and users the possibility to translate a video’s title, description and captions by exploiting metadata – specific data that give information about the video, including its content, tags and links – there is a downside to the use that can be made of such information. Users can abuse subtitles by self-advertising and translating words in a deceiving way: this is what happened with PewDiePie’s videos in August 2019 and users abusing his content.

Although the description of subtitles in this work started by the latest uses of this kind of translation, it has been shown that the subtitling practice began last century, when the ‘talkies’ featured intertitles to show between the frames of a scene in a silent film. In that case they gave context to the movie and helped the audience better understand the setting and dialogues involved. Intertitles then evolved into what we now call subtitles, that is plain text at the bottom of a scene in a video that captures the gist of an audio track. Subtitles have been demonstrated to be also a source of language learning and acquisition. Talavan talked about pedagogical application, along the lines of the European Commission’s regulations and objectives of valorizing languages in order to live in a Europe that is multilingual and united through diversity.

The final part of the chapter focused on technical features around subtitles, that is what is to be considered good subtitling practice, with pros and cons of this kind of audiovisual translation and why should be the preferred method of sharing videos, movies

or TV shows. Subtitles can become an artwork, as it is the case of Bekmambetov's *Night Watch* (2007), but they can also function as an aid for hard-of-hearing people – as closed captions - and as a source of monetization through SEO. This means that subtitled videos may benefit from a larger reach, thus being rewarded by Google's search engines and being, therefore, recommended to a greater number of online users.

The analysis then moved to the distinction between dubbing and subtitling, especially in the European Union. Whereas the majority of European countries chose subtitling as their preferred method of importing international content to be translated, some countries – such as Italy – make use of dubbing and less use of subtitling in their audiovisual translation practice. The reason why said countries chose dubbing as their primary technique is that totalitarian regimes during war exerted language control and adapted movies in order to maintain control and hold the power over the masses.

This attitude and habit creates a dichotomy between dubbing and subtitling, the latter being an active kind of language learning process, because it stimulates attention and curiosity. Thus hearing a soundtrack in a source language but reading text in a target language, which implicates a greater effort if compared to dubbing. This sounds more like a product of the target language and less like a product of the source language it derives from. Subtitling as a translation activity was analyzed by an ideological, pedagogical, linguistic and technical point of view – even when applied to the context of YouTube and video sharing in general. In the following chapter the analysis will be practical and based on videos translated *ad hoc* for this dissertation.

3. Subtitling analysis and translation: popular science from English into Italian and vice-versa

3.1 Introduction to subtitled videos

The following chapter will feature the analysis of all of the videos subtitled for this work. All videos, except for Dario Bressanini's "La Mousse al Cioccolato e acqua (vegana)" – which did not feature any transcription - will feature transcription of subtitles from YouTube. This video was subtitled manually through a subtitling software named AegiSub.

Other videos from Dario Bressanini were already translated into Italian. They will serve as a benchmark and as a term of comparison for the remaining subtitled videos in this work.

The content, analysis and context of all of these videos will be explained in detail in the next chapter, as it is the main topic of the fourth part of this work.

3.2 English videos translated into Italian

3.2.1 Mark Rober - Using Drones to Plant 20,000,000 Trees

AUTO-GENERATED ENGLISH SUBTITLES

Wrong transcript
Missing transcript
Correct transcript

02:24
have you ever thought
02:25
about where trees actually get their
02:27
mass from? // the knee-jerk reaction is to
02:29
think it comes from the soil but that
02:31
can't be true because if you have a tree
02:33
in a big pot // as the tree gets bigger the
02:35
soil level doesn't go down at all // the
02:37
answer as it turns out is that the mass
02:40
comes from thin air // the clues **is** if you
02:43
look at what the bulk of the tree is
02:44
actually made of it's almost entirely
02:46
carbon // pretend I'm a tree // basically a
02:49
tree sees a carbon dioxide molecule
02:52

ITALIAN SUBTITLES

02:24
Vi siete mai chiesti
02:25
da dove gli alberi prendono la loro massa?
02:27
Vi verrà subito da pensare
02:29
che viene dal terreno, ma non è così:
02:31
infatti anche piantando un albero in un vaso
02:33
il terriccio all'interno non diminuisce,
02:35
ma come mai?
02:37
È semplice:
02:40
gli alberi prendono la loro massa dall'aria,
02:43
e se osservate bene
02:44
potrete notare che è composta quasi interamente da
carbonio.
02:46
Immaginate che io sia un albero:
02:49
in sostanza, un albero prende

floating by then it powers up **your** with
02:54 energy from the Sun using photosynthesis
02:56 then it uses that energy to rip the
02:58 carbon from the oxygen and it takes that

03:00 carbon and slaps it on itself to get
03:03 more swoll // and the trees **are** like hey humans
03:05 here's some beautiful fresh oxygen you
03:07 can have **that back** I don't need it // so it
03:10 takes the **sea C** and leaves us with the O2
03:12 that's a sweet deal // and so trees start
03:15 really small but in order to get bigger
03:16 and bigger they're just sucking more and
03:18 carbon out of the air // so now you can see
03:20 a tree and appreciate the beauty in the
03:22 shade but also that they're just these
03:24 really massive vacuum bags completely
03:26 stuffed full of carbon // and so I was in
03:28 Washington to meet with some people who
03:30 had a crazy idea that just might be the
03:32 key to helping mr. beast and I plant
03:33 those twenty million carbon vacuums

02:52 una molecola di anidride carbonica dall'aria.
02:54 Poi, si ricarica con il sole tramite la fotosintesi
02:56 e usa questa carica per separare il carbonio dall'ossigeno,
02:58 prende il carbonio
03:00 e se lo tiene per aumentare la sua massa.
03:03 Se potesse parlare ci direbbe:
03:05 "Hey, persone! Ecco qua dell'ottimo ossigeno"
03:07 "È fresco fresco, a me non serve, tenete pure!"
03:10 E così si prende il carbonio, C e ci lascia con l'ossigeno, O2.
03:12 Sembra un affarone, no?
03:15 Quindi, per crescere,
03:16 gli alberi assorbono continuamente carbonio dall'aria
03:18 La prossima volta che vedrete un albero
03:20 potrete non solo apprezzarne la bellezza,
03:22 ma anche l'utilità, visto che gli alberi
03:24 sono praticamente delle enormi sacche
03:26 piene di carbonio.
03:28 Così, sono andato a Washington
03:30 ed ho incontrato qualcuno con un'idea talmente folle
03:32 che potrebbe aiutare me e Mr. Beast
03:33 a piantare 20 milioni di queste 'sacche'

3.2.2 The Action Lab - Can You Cook Pasta By Boiling Water in a Vacuum Chamber?

AUTO-GENERATED ENGLISH SUBTITLES

00:00 okay today I'm going to be seeing if you
00:02 can cook in a vacuum chamber so first
00:05 I'll just put the pasta in water
00:06 directly in the vacuum chamber reduce
00:08 the pressure until the water starts
00:10 boiling and see if we leave it in there
00:12 for the allotted amount of time see if
00:14 **the it** cooks the pasta enough that we can
00:16 eat it and then if that doesn't cook the
00:19 pasta I'll add a heat source to it so
00:21 I'll put it on a unit in the vacuum
00:23

ITALIAN SUBTITLES

00:00 Bene, oggi scopriremo se sia possibile
00:02 cucinare in una camera del vuoto
00:05 iniziamo col mettere la pasta nell'acqua
00:06 direttamente nella camera del vuoto
00:08 riducendo la pressione
00:10 fino a quando l'acqua non inizierà a bollire.
00:12 Vediamo se la pasta si cuocerà
00:14 abbastanza da poterla mangiare
00:16 entro il termine riportato sulla confezione.
00:19 Se la pasta non si cuocerà,
00:21 allora proverò a mettere una fonte di calore
00:23

chamber so that it does have a constant
00:25
heat source and see if then we can cook
00:27
the pasta in the vacuum chamber you
00:29
might be surprised by the results okay
00:32
we're gonna be cooking penne pasta today
00:35
[Applause]
00:37
okay first cooking pasta in a vacuum
00:40
chamber with no heat source three two
00:45
one
00:52
so you can see the dissolve they're there
00:54
starting to come out of it already it's
00:57
not quite boiling yet [see] it already looks
01:00
like it's on the stove about to boil
01:03
that white foam at the top we're at full
01:06
vacuum now we've got some pretty good
01:09
boiling going on in there now you can
01:12
see the sporadic bubbles that pop up
01:14
every once in a while so I've heard a
01:17
lot of people say in the comments
01:18
section that they don't think it's
01:20
actually boiling in the vacuum chamber
01:21
they think it's just releasing the
01:24
dissolved gases in the water and while
01:27
it is true that it does release
01:29
dissolved gases it is actually boiling
01:31
so boiling is defined as when the vapor
01:34
pressure of the liquid is greater than
01:36
the pressure around it and so once that
01:39
happens that's when it boils so when you
01:42
reduce the pressure around it even
01:44
room-temperature water has a vapor
01:47
pressure high enough to start boiling so
01:49
it is actually a defined thing what
01:51
boiling is it's not just when there's
01:53
bubbles in liquid okay we've got a
01:55
pretty good rolling boil going now so
01:57
I'm gonna leave it going for around
02:01
eleven minutes and see if our pasta is
02:05
cooked after this okay it's been about

all'interno della camera,
00:25
così da vedere se la pasta si cuoce
00:27
se sottoposta ad una fonte di calore costante.
00:29
Sono certo che rimarrete stupiti.
00:32
Bene, oggi cuoceremo delle penne.
00:35
[Applause]
00:37
Dunque, iniziamo con la cottura
00:40
nella camera senza fonti di calore.
00:45
tre, due, uno
00:52
possiamo vedere che delle bollicine
00:54
stanno già salendo in superficie,
00:57
ma non sta ancora bollendo.
01:00
È come quando facciamo bollire l'acqua sul fornello,
01:03
si è formata la schiuma in superficie.
01:06
L'ambiente all'interno della camera
01:09
è in condizione di vuoto e ora sta iniziando a bollire.
01:12
di tanto in tanto si intravedono
01:14
delle bollicine che salgono in superficie.
01:17
Ho letto molti commenti in cui mi avete scritto
01:18
che nella camera a vuoto non c'è bollore,
01:20
perché in realtà la pompa
01:21
rimuove i gas
01:24
che sono sciolti nell'acqua
01:27
ed è così.
01:29
Potete verificare però voi stessi
01:31
che l'acqua sta bollendo,
01:34
perché l'ebollizione avviene
01:36
quando la pressione di vapore di un liquido è maggiore
01:39
rispetto alla pressione circostante
01:42
quando ci sono queste condizioni, allora il liquido bolle.
01:44
Quindi riducendo la pressione circostante
01:47
persino la pressione di vapore dell'acqua a temperatura ambiente
01:49
è abbastanza alta da consentire l'ebollizione.
01:51
C'è una definizione ben precisa di ebollizione,
01:53
Solo perché un liquido presenta delle bolle
01:55
non significa che stia veramente bollendo.
01:57
Bene, ora sta davvero bollendo,
02:01
ora farò passare undici minuti.
02:05
Una volta trascorsi, vediamo se la pasta sarà cotta

02:07
eleven minutes let's let in the air and
02:10
see first let's see how cold that water
02:12
is
02:13
and then let's see if the pasta is
02:15
tender at all okay **living letting** in the air
02:18
three two one
02:21
[Music]
02:26
okay still cold and crunchy pasta so no
02:35
! **it** did not cook the pasta not even close
02:38
okay now let's try it when we add a heat
02:41
source so I'm gonna put it on the
02:43
equivalent of a stovetop and see if we
02:46
can get the pasta cook then so I
02:48
couldn't find an electric hot plate that
02:50
was small enough to fit in my vacuum
02:52
chamber but I could find an iron so I've
02:55
rigged up the iron to get some
02:56
electricity into there as long as I
02:59
don't touch these I'm fine I won't get
03:01
shocked so now let's see if we can cook
03:03
the pasta if we add a heat source to it
03:06
so can we get the temperature of the
03:07
water to raise enough to cook the pasta
03:09
if we add a heat source okay let's turn
03:12
on our iron **[three, two, one]** let's turn on the vacuum **pub**
pump
03:17
back in vacuum pump three two one
03:21
[Music]
03:32
okay that should start to boil pretty
03:34
rapidly because we have such a hot heat
03:36
source under it now in addition to the
03:39
low-pressure oh wow it's gonna boil a
03:42
lot once we get down we're **a at** point one
03:44
atmospheres okay we've got a rolling
03:47
boil in there now so I would say it's
03:50
time to start the timer and see we're
03:52
full-on boiling our pasta in there okay
03:55
so the question I have for you right now
03:57
is the water's boiling in there with a

02:07
Bene, sono passati circa undici minuti,
02:10
Iniziamo con l'introdurre un po' di aria.
02:12
Vediamo a che temperatura è l'acqua
02:13
and then let's see if the pasta is
02:15
e se la pasta è ancora dura
02:18
introduciamo l'aria: tre, due, uno
02:21
[Musica]
02:26
Ok, è ancora fredda e la pasta è croccante,
02:35
Quindi no, non si è cotta neanche un po'.
02:38
Proviamo ad aggiungere una fonte di calore,
02:41
Vediamo se la pasta si cuoce
02:43
sopra una piastra.
02:46
Purtroppo non sono riuscito a trovare
02:48
una piastra più piccola della camera a vuoto:
02:50
un ferro da stiro andrà più che bene.
02:52
Ho manomesso il ferro
02:55
in modo da poterlo accendere dall'esterno.
02:56
Finchè non tocco questi cavi
02:59
sono al sicuro da scariche elettriche.
03:01
Vediamo se ora, con una fonte di calore,
03:03
la pasta si cuocerà.
03:06
Riuscirà il ferro ad innalzare la temperatura dell'acqua
03:07
abbastanza da cucinare la pasta?
03:09
Accendiamo il ferro da stiro
03:12
tre, due, uno. Poi la pompa:

03:17
pompa in azione fra tre, due, uno
03:21
[Musica]
03:32
dovrebbe iniziare a bollire in fretta:
03:34
all'interno della camera ci sono
03:36
una fonte di calore e bassa pressione.
03:39
oh wow
03:42
Quando la lancetta arriverà a 0,1 atmosfere
03:44
il bollire aumenterà un bel po'.
03:47
Abbiamo portato l'acqua ad ebollizione,
03:50
Non resta che far partire il timer.
03:52
La pasta ora è nell'acqua, che sta bollendo.
03:55
Ho una domanda per voi:
03:57
l'acqua sta bollendo nella camera,

04:00
heat source so the question is is that
04:03
water hot right now go ahead and make
04:06
your guess in the comments section okay
04:10
so we're still boiling in there when it
04:13
drops on the hot iron it just splatters
04:15
because it instantly vaporizes okay it's
04:18
been about eleven minutes let's go ahead
04:20
and let the air back in **review** **I'll view** it from
04:22
this side **cuz** **because** we have some water on that
04:24
side blocking our view
04:25
okay first I'll turn off my electricity
04:27
to the iron okay let's let in the air
04:32
three two one
04:35
[Music]
04:41
iso you can see it's no longer boiling okay
04:47
so what do you think hot or cold should
04:49
I dip my hand in it there we go not even
04:55
close to being hot so the reason is
04:58
because of that low of pressure even
05:00
though you have a heat source the
05:02
evaporation increases so much that you
05:04
can't even heat the water so it's
05:06
boiling faster than it can heat up so
05:09
you could even get it so with a very
05:11
good vacuum you could even get it such
05:13
that you have this heat source in here
05:14
but the water is around freezing point
05:17
you just have to have a really good
05:19
vacuum that can keep the pressure low
05:21
enough with that high of evaporation you
05:23
can see the pasta definitely isn't
05:26
cooked still crunchy
05:31
so no you cannot cook pasta in a vacuum
05:34
chamber so the temperature of the water
05:37
is around 82 degrees Fahrenheit that's
05:39
about the temperature of the water that
05:41
I put in so you can see it did not get
05:44
hotter in the vacuum chamber it probably
05:46

04:00
c'è il ferro, che è una fonte di calore
04:03
quindi, l'acqua è calda in questo momento?
04:06
Rispondetemi nei commenti cosa ne pensate.
04:10
Ok, sta ancora bollendo.
04:13
L'acqua che vedete fuoriuscire dalla camera e finisce sul ferro
04:15
schizza perché si vaporizza all'istante.
04:18
Sono passati circa undici minuti,
04:20
proviamo a reintrodurre l'aria nella camera.
04:22
L'inquadratura è da questa parte
04:24
perché dall'altra dell'acqua ci blocca la visuale.
04:25
Prima spegniamo il ferro,
04:27
poi introduciamo l'aria.
04:32
tre, due, uno
04:35
[Musica]
04:41
Come potete notare, non bolle più.
04:47
Ok, che dite, è fredda o calda?
04:49
Dovrei immergerci le dita? Proviamo.
04:55
Non è per niente calda, ma perché?
04:58
Con una pressione così bassa,
05:00
nonostante ci sia una fonte di calore,
05:02
l'acqua evapora così in fretta
05:04
che non c'è modo di poterla scaldare abbastanza
05:06
da cuocere la pasta, perché bolle prima di riscaldarsi.
05:09
Quindi, anche in una camera più isolata di questa
05:11
e con una fonte di calore simile,
05:13
si potrebbe ripetere l'esperimento.
05:14
Tuttavia, la temperatura dell'acqua
05:17
sarebbe solo poco sopra il punto di fusione.
05:19
Perché l'esperimento riesca è necessaria
05:21
una condizione di vuoto tale per cui una bassa pressione si bilanci
05:23
con un'evaporazione così elevata.
05:26
la pasta in effetti è ancora cruda, croccante.
05:31
Quindi no, non si può cuocere la pasta
05:34
in una camera del vuoto: l'acqua è quasi a 38 gradi,
05:37
che è più o meno la stessa che avevamo all'inizio.
05:39
Osserviamo che non è aumentata
05:41
all'interno della camera,
05:44
anzi potrebbe anche essere diminuita.
05:46

cooled off a little bit so you could
05:49
however cook in a vacuum chamber if you
05:51
did not have the water so if you take
05:55
away the water then you get rid of the
05:57
problem of low boiling temperature so
06:00
for example if you wanted to cook a
06:01
steak you could just put it right on top
06:03
of the iron and it would heat up through
06:05
conduction from the iron and there
06:08
wouldn't be a lot of evaporation because
06:09
there's not a lot of fluids in it and so
06:11
you could heat up the steak so this kind
06:14
of answers the question is is there
06:16
anything special about boiling in almost
06:19
every recipe you have to get it to
06:21
boiling before things happen but there's
06:24
not really anything special about
06:26
boiling that's just the highest
06:28
temperature that the water can get to so
06:30
it's a good way to ensure that your
06:31
water is hot enough is to boil it so
06:34
when it's boiling you can be sure that
06:36
it's around a hundred degrees Celsius
06:38
it's a hundred degrees Celsius at
06:41
atmospheric pressure so if you're at sea
06:43
level then it boils at 100 degrees
06:45
Celsius
06:47
[and] another thing I wanted to mention is
06:49
when I had it in the vacuum chamber
06:51
without a heat source I said there was
06:53
no heat source but actually the glass
06:56
itself and the vacuum chamber bottom
06:59
does act as a heat source so as the
07:01
water boils it continues to cool down
07:04
because it loses a lot of kinetic energy
07:06
from the high-energy molecules if it
07:09
wasn't touching any heat source like the
07:11
chamber walls with the glass then the
07:13
water would just cool down pretty

Teoricamente è possibile
05:49
cucinare in una camera del vuoto,
05:51
ma senza l'acqua.
05:55
Infatti senza acqua non c'è da preoccuparsi
05:57
di un punto di ebollizione particolarmente basso:
06:00
ad esempio una bistecca potrebbe cuocere
06:01
sul ferro da stiro
06:03
per conduzione termica.
06:05
in quel caso l'evaporazione
06:08
non sarebbe un problema.
06:09
Essendo la bistecca un alimento
06:11
che contiene poca acqua
06:14
quindi si cuocerebbe normalmente.
06:16
L'esperimento permette di rispondere alla domanda:
06:19
"C'è qualcosa di speciale nell'ebollizione?"
06:21
Nella stragrande maggioranza delle ricette di questo tipo
06:24
l'ebollizione è fondamentale per la cottura.
06:26
In realtà non è nulla di speciale,
06:28
perché si verifica quando l'acqua
06:30
raggiunge la temperatura più alta possibile.
06:31
Per capire se l'acqua è abbastanza calda,
06:34
basta solo vedere se bolle.
06:36
Quando bolle quindi siamo sicuri
06:38
che la temperatura si aggira intorno ai 100 gradi
06:41
al livello della pressione atmosferica,
06:43
cioè a 100 gradi a livello del mare.
06:45
Celsius
06:47
un'altra cosa che vorrei sottolineare:
06:49
senza il ferro da stiro,
06:51
ho detto che nella camera del vuoto
06:53
non c'erano fonti di calore.
06:56
In realtà il vetro e la base della camera del vuoto
06:59
sono una piccola fonte di calore,
07:01
quindi mentre l'acqua bolle continua a raffreddarsi
07:04
perché perde una grande quantità di energia cinetica
07:06
derivata da composti ad alta energia.
07:09
Se l'acqua non fosse stata a contatto con nessuna fonte di calore,
07:11
come le pareti di vetro della camera,
07:13,
si sarebbe raffreddata molto in fretta,

07:15 quickly and it would eventually just
 07:16 freeze and you couldn't boil it anymore
 07:18 so these were kind of two versions of
 07:21 the same thing in one version I just had
 07:23 more heat going into a **it** meaning it boiled
 07:26 faster but it
 07:27 couldn't get to a **lower** temperature
 07:31 **Hey!** everyone thanks for watching this video
 07:33 I hope you liked it if you have any more
 07:35 questions about boiling or **you're** really
 07:37 confused by this video let me know in
 07:39 the comments section I'll try to answer
 07:40 your questions and if you're not
 07:42 subscribed yet hit that subscribe button
 07:43 and be notified when my latest video
 07:45 comes out by hitting the Bell button and
 07:47 I'll see you next time

07:15 sarebbe congelata
 07:16 e quindi impossibile da far bollire.
 07:18 In conclusione, questo esperimento
 07:21 è diviso in due parti simili,
 07:23 con la differenza che nella seconda la fonte di calore
 07:26 ha fatto bollire prima l'acqua
 07:27 ma senza alzare ulteriormente la temperatura.
 07:31 Vi ringrazio per aver guardato il video,
 07:33 se vi è piaciuto lasciate un like.
 07:35 Se avete altre domande
 07:37 o questo video vi ha confuso le idee,
 07:39 scrivetemelo nei commenti
 07:40 e cercherò di rispondere ai vostri dubbi.
 07:43 per seguirmi e ricevere le notifiche
 07:45 ogni volta che carico un video, cliccate su "iscriviti" e sulla campanella.
 07:47 Alla prossima!

3.2.3 The Action Lab - Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient!

AUTO-GENERATED ENGLISH SUBTITLES

00:00 okay today I'm going to be doing the
 00:01 impossible and showing you how to mix
 00:03 oil and water without any other added
 00:07 ingredients I'm going to show you how
 00:08 you can actually mix them together and
 00:10 not separate // so we've always been taught
 00:13 **The that** oil and water do not mix together in
 00:16 fact it's such a famous mantra that
 00:18 whenever we have two things that don't
 00:19 go together we often compare them to oil
 00:22 and water but is that actually true **?** well
 00:25 today I'm going to show you a method
 00:26 that you can actually mix oil and water
 00:28 together without any other ingredient
 00:30 and not have them separate let me show
 00:33 you // so we've all seen what happens when

ITALIAN SUBTITLES

00:00 Bene, oggi farò l'impossibile:
 00:01 vi mostrerò come mescolare l'olio e l'acqua.
 00:03 Lo farò senza aggiungere altri ingredienti.
 00:07 Vi mostrerò che è possibile mescolarli
 00:08 senza che si separino
 00:10 Dunque, ci hanno sempre insegnato
 00:13 che l'acqua e l'olio non si mescolano,
 00:16 infatti è risaputo che, provando a metterli insieme
 00:18 tendono a separarsi
 00:19 a causa della loro composizione.
 00:22 Ma è sempre così?
 00:25 Oggi vi mostrerò un metodo
 00:26 per unire uno e l'altro
 00:28 con nessun altro ingrediente
 00:30 evitando che si separino:
 00:33 abbiamo visto cosa succede

00:34
you pour oil and water so I have here
00:37
just some regular tap water and then
00:38
some canola oil some vegetable oil here
00:41
you can see when I pour it on top here //
00:45
the oil just floats to the top so you
00:48
can see that this clearly forms **to two**
00:50
liquid layers here so there's two phases
00:52
of liquid **and an** oil rich phase and a water
00:55
rich phase and even if you shake this up //
01:01
at first it looks like you mixed them //
01:03
but if you let it sit for a little bit //
01:16
but now watch what happens if I add a
01:19
little mustard to this // and give it a
01:24
Shake // so now let's see if this separates //
01:37
so you can see that now the water and
01:40
oil don't mix out // now the reason this
01:46
happens is because when you shake up oil
01:48
and water oil is hydrophobic and so they
01:51
form tiny little balls that don't want
01:53
to be attracted to the water but **at as**
01:55
those tiny little droplets of oil come
01:57
near each other then they will now be
01:59
attracted to each other because they're
02:01
more attracted to each other than the
02:02
water around them so they'll form one
02:04
big drop of oil // but if you add an
02:07
ingredient like mustard, mustard has some
02:09
chemicals in it that are called
02:11
surfactants or emulsifiers // and what an
02:14
emulsifier means is it's a chemical that
02:17
has a hydrophobic end and a hydrophilic
02:19
end so the hydrophilic end is attracted
02:22
to the water and the hydrophobic end is
02:24
attracted to the oil so it sticks these
02:27
little tails down into the oil and the
02:29
heads of them surround the oil so now
02:32
when these two droplets come together
02:33
these hydrophilic ends they repel each
02:36

00:34
versando l'olio nell'acqua.
00:37
Questa è acqua del rubinetto
00:38
e questo è dell'olio per friggere.
00:41
Vedete come, versando l'olio nell'acqua,
00:45
l'olio rimanga a galla.
00:48
In questo modo si formano due strati,
00:50
con due fasi per ogni liquido:
00:52
una oleosa e l'altra acquosa.
00:55
Anche provando ad agitare i due liquidi,
01:01
inizialmente sembrano unirsi,
01:03
ma dopo qualche minuto tornano come prima.
01:16
Guardate invece cosa accade
01:19
se aggiungo della senape ed agito la provetta:
01:24
si separerà?
01:37
Ora l'acqua e l'olio non si sono separati:
01:40
questo accade perché l'olio è idrofobico.
01:46
Provando ad agitarli insieme
01:48
si formano piccole bolle
01:51
che non vogliono mescolarsi con l'acqua.
01:53
Tuttavia, se le gocce d'olio
01:55
si avvicinano all'interno del liquido
01:57
in quel caso si attraggono.
01:59
Le gocce d'olio infatti si attraggono
02:01
perché sono più affini rispetto all'acqua.
02:02
Unendosi formano una massa di olio.
02:04
Ma tutto cambia aggiungendo della senape:
02:07
la senape infatti è composta
02:09
da alcune componenti chimiche chiamate
02:11
tensioattivi, od emulsionanti.
02:14
Un emulsionante è una sostanza
02:17
con una coda idrofobica e una testa idrofila.
02:19
La testa è attratta dall'acqua,
02:22
mentre la coda è attratta dall'olio.
02:24
Le code si inseriscono nell'olio,
02:27
mentre le teste lo circondano.
02:29
In questo modo,
02:32
quando le due gocce entrano in contatto
02:33
le teste idrofile si repellono.

other and the two droplets can't
02:38
coalesce together to form one bigger
02:40
droplet so it keeps these droplets all
02:42
stable and they never come together and
02:44
separate out from the water you can also
02:47
even use egg yolks as an emulsifier // so
02:51
egg yolks have something in them called
02:53
lecithin and the lecithin acts as an
02:55
emulsifier and keeps the oil separated
02:58
in the water //
03:03
so that's why eggs help out **and in** baking
03:06
things with oil in them because the eggs
03:08
can actually help the oil mix in with
03:10
the water // but here's the question in
03:12
these two examples we actually had to
03:15
add an emulsifier to the water so that's
03:17
kind of cheating a little bit because
03:19
it's not actually mixing oil and water
03:21
it's mixing oil water and an emulsifier
03:24
together to get a mixture that stays
03:26
stable but is it actually possible to
03:29
just mix oil with water ? // well according
03:32
to a chemist at the Australian National
03:34
University he says that it is actually
03:36
possible to mix oil and water without
03:39
any other added emulsifier let me show
03:41
you how to do it // now in order to
03:44
understand how to do this without an
03:45
emulsifier let me go back to the example
03:48
where we have two oil droplets that come
03:50
Together // so one reason the oil droplets
03:53
are attracted together is because
03:55
actually in water there's tiny little
03:58
molecules of dissolved gas so there's
04:00
tiny little nitrogen and oxygen
04:02
molecules // and when enough of those
04:06
dissolved gas molecules form on the
04:08
outside of the oil it forms a tiny tiny
04:11
tiny little air pocket around it // and

02:36
Così, le due gocce non possono unirsi
02:38
per formare una goccia più grande.
02:40
Queste gocce sono quindi meno instabili,
02:42
non si uniscono e rimangono lontane dall'acqua.
02:44
Anche le uova possono essere usate
02:47
come emulsionante:
02:51
i tuorli possiedono una sostanza
02:53
che si chiama lecitina e che mantiene l'olio
02:55
separato all'interno dell'acqua,
02:58
funzionando da emulsionante.
03:03
È per questo che le uova sono utili in forno
03:06
quando cuociamo qualcosa con dell'olio:
03:08
le uova aiutano ad unire l'olio all'acqua.
03:10
In questi due esempi abbiamo visto
03:12
come fosse necessario aggiungere
03:15
un emulsionante all'acqua:
03:17
è come barare se non mischiamo
03:19
olio e acqua solamente.
03:21
Si tratta di mischiarli con un emulsionante
03:24
ed ottenere quindi una miscela stabile.
03:26
Ma ho una domanda per voi: è possibile
03:29
mischiare solo olio e acqua, da soli?
03:32
Un chimico all'Australian National University
03:34
direbbe di sì, cioè che è possibile
03:36
mescolare acqua e olio
03:39
senza altri emulsionanti: ora ve lo mostro.
03:41
Prima di iniziare, però
03:44
torniamo all'esempio di prima,
03:45
quello con le due gocce d'olio
03:48
che si uniscono.
03:50
Per prima cosa,
03:53
le gocce si attraggono perché nell'acqua
03:55
ci sono delle molecole di gas disciolto nell'acqua,
03:58
quindi abbiamo delle piccolissime
04:00
molecole di azoto ed ossigeno.
04:02
Quando si formano abbastanza molecole
04:06
di gas disciolto all'esterno dell'olio
04:08
allora si forma anche
04:11

04:14 because of the surface tension of the
04:16 air pocket around it it actually makes
04:18 those tiny little oil droplets more
04:21 likely to come together and attract each
04:23 other because the surface tension pushes
04:25 them together when they come close so it
04:27 takes a lot less energy for these oil
04:29 droplets to come together to form one
04:31 big droplet if there's dissolved air in
04:34 the water basically what it means is
04:36 that you'll be able to have a stable
04:37 mixture of oil and water that won't join
04:40 back together no matter how long you
04:42 leave it // the same thing that I got when
04:44 I mixed my egg or my mustard together
04:46 but I didn't have to add a third
04:48 ingredient // so here's how I'm going to
04:50 test this I have two beakers of water
04:51 here and I'm going to **D-gas de-gas** one of them
04:54 meaning I'm just gonna stick it in my
04:55 vacuum chamber and let all the dissolved
04:58 gases come out of it // and then I just
05:00 have a normal beaker of water here and
05:02 I'm gonna put a drop of oil in this one
05:04 and a drop of oil in this one and shake
05:06 them up and see which one looks cloudier //
05:08 and the cloudier one means that there's
05:11 still tiny droplets of oil in **it**
05:13 and so the cloudier one means that it
05:16 was able to actually mix the oil and
05:17 water together // so let's **de-gas de-gas** this
05:20 water first
05:26 okay so I now have my degassed water
05:29 right here // here try not to introduce too
05:33 much air into it // okay now I'm going to
05:38 put three drops of oil in each // and shake
05:47 shake shake shake shake shake shake
05:49 shake shake shake shake //
05:50

una bollicina d'aria attorno.
04:14 Grazie alla tensione superficiale
04:16 della bolla d'aria, quindi,
04:18 le gocce d'olio si uniscono più facilmente,
04:21 si attraggono perché questa tensione
04:23 le fa avvicinare sempre più.
04:25 In questo modo ci vuole molta meno energia
04:27 perché queste gocce si uniscano:
04:29 una bolla si forma più facilmente se c'è
04:31 del gas disciolto nell'acqua.
04:34 Ciò implica che la miscela sia più stabile,
04:36 cioè che provando a mescolare olio e acqua
04:37 non torneranno allo stato precedente,
04:40 nemmeno dopo molto tempo.
04:42 La stessa cosa è successa
04:44 quando ho aggiunto l'uovo o la senape,
04:46 ma senza l'aggiunta di un terzo ingrediente.
04:48 Ora vi farò una dimostrazione pratica:
04:50 ho queste due provette
04:51 e andrò a degasarne una:
04:54 la metterò cioè nella mia camera del vuoto
04:55 e lascerò fuoriuscire tutti i gas disciolti.
04:58 Avrò quindi una provetta
05:00 con della normale acqua
05:02 mentre in quest'altra metterò dell'olio.
05:04 Le agiterò entrambe
05:06 e osserveremo quale delle due
05:08 sarà più opaca: quella che avrà all'interno
05:11 delle gocce d'olio risulterà più opaca:
05:13 ciò significa che, in quella provetta,
05:16 l'olio e l'acqua si saranno mischiati correttamente.
05:17 Per prima cosa:
05:20 bisogna degasare l'acqua.
05:26 Ora che l'acqua è priva di gas,
05:29 cercherò di introdurre meno aria possibile.
05:33 Ora metto tre gocce d'olio in questa
05:38 e inizio ad agitare,
05:47 agito, agito, agito,
05:49 agito ed agito ancora.

let's add some more oil let's add 10
05:53
more drops //
05:55
[Music]
06:06
okay let's let these sit for a little
06:07
bit and look at the color in it and a look lit
06:10
that Li sit let's let these sit for about 10 minutes and
06:12
then look at the color of them // okay you
06:14
can see the difference in the colors now
06:16
this is the one that had the D-gas degassed water
06:18
and this is the one that had regular
06:20
water // so you can see how much more
06:22
cloudy this one is look at the blue
06:24
reflection in the background // and see how
06:27
clear it is in this one and how cloudy
06:30
it is in this one ?
06:31
so it's cloudier because that means that
06:34
those tiny little droplets of oil when I
06:36
shook it up
06:37
they're staying as tiny little drops of
06:39
oil // whereas these coalesce and all the
06:42
oil floated to the top // and so this will
06:44
actually stay as a stable mixture of oil
06:47
and water indefinitely it won't ever
06:49
separate again back into oil and water
06:52
so that means if you want to mix a lot
06:54
of oil and water together without any
06:56
other emulsifier or any other ingredient
06:59
in it // you just do it in a vacuum chamber
07:01
so see how there's separate layers now
07:04
put them in the vacuum chamber so now
07:07
we'll have the advantage of degassing
07:09
the water and the oil so we'll get all
07:12
of the gas out of it and so they should
07:13
mix together really well now //
07:20
okay so now that it's been completely de
07:22
Gas degassed # lei in the air // and look at this now
07:29
so cool //
07:30
so we've formed a pretty good emulsified
07:33
mixture of oil and water just by mixing

05:50
Ora aggiungo altre 10 gocce di olio
05:53
a questa provetta.
05:55
[Music]
06:06
Bene, adesso basta attendere un po',
06:07
giusto una decina di minuti.
06:10
dopodiché osserveremo
06:12
il colore della provetta.
06:14
Vedete? Le provette hanno cambiato colore.
06:16
Questa è quella degasata,
06:18
mentre questa è quella
06:20
con l'acqua non trattata.
06:22
Questa a destra è molto più opaca:
06:24
vedete come il riflesso blu è più chiaro
06:27
in quella a sinistra,
06:30
rispetto a quella a destra?
06:31
Quella a destra è più opaca
06:34
perché le goccioline di olio restano separate,
06:36
anche dopo averle mescolate.
06:37
Nella provetta più chiara, invece,
06:39
le gocce d'olio si sono unite
06:42
e l'olio è salito in superficie.
06:44
La miscela a destra quindi rimane stabile,
06:47
l'olio non si separerà più dall'acqua.
06:49
Ciò significa che è possibile
06:52
anche grandi quantità di olio ed acqua.
06:54
Non servono emulsionanti,
06:56
o altri ingredienti:
06:59
è solo necessaria una camera del vuoto.
07:01
Notate come ci siano due strati ora:
07:04
basta mettere tutto nella camera del vuoto
07:07
per togliere il gas dall'acqua
07:09
e dall'olio:
07:12
poi si mischieranno insieme
07:13
e non si separeranno più.
07:20
Bene, ora che l'acqua è degassata,
07:22
reintroduciamo l'aria.
07:29
Sorpriendente, vero?
07:30
Adesso abbiamo una miscela di olio e acqua
07:33

07:35
it in a vacuum chamber // now after a while
07:38
this does still separate out the oil
07:40
will float to the top because I had a
07:42
lot of oil in there but you can see at
07:44
the bottom this kind of white layer // now
07:47
that's the cloudy emulsified layer and
07:49
so because we did it in a vacuum it's
07:52
able to keep those tiny little bubbles
07:54
of emulsified oil in the water just by
07:57
simply not having air around it // and so
08:00
we were able to show that just by taking
08:01
the air out of water you're actually
08:04
able to form this emulsified mixture of
08:06
oil and water that doesn't separate over
08:09
time even when you reintroduce it back
08:11
to air it doesn't separate out it's
08:14
pretty cool // so this is actually a really
08:16
cool discovery and it has some really
08:18
cool implications basically it means
08:20
that degassed water can act the same as
08:23
soapy water so this has some really cool
08:25
implications basically it means that you
08:27
can use degassed water the same as you
08:30
use soapy water it should be able to
08:32
clean grease off similar to soapy water
08:35
now the scientists that discovered this
08:38
they're not exactly sure the mechanism
08:40
behind it // one of their hypothesis is the
08:42
one that I explained earlier about the
08:45
air around the oil bubbles // but there
08:48
could be other things going on and
08:50
they're not exactly sure why **D-gas degassed** water
08:52
works so well in making emulsifications
08:55
z like this // but they're doing a lot of
08:57
research into it because basically it
08:59
makes a clean source for cleaning up oil
09:02
spills or it could even be used in
09:04
industry to emulsify different oils in
09:07

emulsionata correttamente.
07:35
Anche nella camera del vuoto
07:38
è normale che un po' di olio si separi:
07:40
tornerà a galla perché ne ho messo molto.
07:42
C'è uno strato bianco
07:44
sul fondo del becher:
07:47
è la parte emulsionata.
07:49
Grazie alla camera del vuoto
07:52
le bollicine di olio emulsionato
07:54
si conservano nell'acqua,
07:57
non avendo aria attorno.
08:00
Abbiamo quindi dimostrato
08:01
come togliendo l'aria dall'acqua
08:04
sia possibile avere una miscela
08:06
di olio e acqua che non si separa col tempo.
08:09
Anche aprendo la camera del vuoto,
08:11
la miscela resta coesa.
08:14
Interessante, vero?
08:16
È una scoperta sorprendente,
08:18
che potrebbe avere risvolti pratici.
08:20
l'acqua degasata è simile alla miscela
08:23
di acqua e sapone:
08:25
si potrebbe usare l'acqua degasata, appunto,
08:27
nello stesso modo in cui si usano
08:30
acqua e sapone.
08:32
Si potrebbe usare, ad esempio,
08:35
per rimuovere macchie di olio.
08:38
Gli scienziati che hanno fatto
08:40
questa scoperta non sono sicuri
08:42
del meccanismo che ci sta dietro:
08:45
pensano, come me, che si verifichi
08:48
grazie all'aria attorno alle bolle d'olio,
08:50
ma potrebbe essere dell'altro.
08:52
Non sanno come l'acqua degasata funzioni
08:55
così bene, ma stanno conducendo ricerche:
08:57
in sostanza, è una risorsa pura
08:59
per pulire le macchie d'olio.
09:02
Potrebbe anche essere impiegata
09:04
nelle industrie, per emulsionare

water just by using D-gas degassed water // I'll put
 09:10
 a link to some of the articles that talk
 09:12
 about this method of emulsification by
 09:14
 using degassed water I'll put it in my
 09:16
 Description // and if you haven't checked
 09:18
 out the action lab subscription box head
 09:20
 over to [the action lab comm](https://theactionlab.com) theactionlab.com // I'm getting
 09:22
 a lot of great feedback about the first
 09:24
 action lab subscription box the vacuum
 09:27
 chamber people love it I've seen a lot
 09:29
 of unboxing videos people have sent me
 09:31
 they've shown me their
 09:33
 kids doing experiments with the vacuum
 09:34
 chamber putting different things in it //
 09:36
 it's really cool so if you haven't
 09:38
 checked it out head over to [the action lab comm](https://theactionlab.com)
theactionlab.com
 09:39
 and I'll also put some links if
 09:42
 you want to see some unboxing of the
 09:44
 vacuum chamber one that I've done and
 09:46
 one that other people have posted and
 09:48
 done so // I'll put those in my description
 09:50
 also // and thanks for watching another
 09:52
 episode of the action lab I hope you
 09:54
 enjoyed it if you did enjoy it hit the
 09:56
 subscribe button and hit the bell to be
 09:57
 notified with my latest videos out //
 09:59
 thanks for watching and I'll see you
 10:01
 next time

09:07
 degli oli particolari utilizzando acqua degasata.
 09:10
 Vi metto un link in descrizione
 09:12
 con alcuni articoli che parlano
 09:14
 di questo metodo.
 09:16
 Andate su theactionlab.com
 09:18
 e prendete la mia scatola in abbonamento,
 09:20
 se non l'avete già fatto!
 09:22
 Sto ricevendo ottimi responsi sulla prima
 09:24
 scatola che ho distribuito,
 09:27
 quella con la camera del vuoto.
 09:29
 In tanti mi avete mandato video
 09:31
 in cui la aprite
 09:33
 in alcuni dei bambini fanno degli esperimenti
 09:34
 con la camera a vuoto,
 09:36
 mettendoci le cose più disparate.
 09:38
 È divertente, se siete curiosi andate su theactionlab.com
 09:39
 Ho messo anche dei link ai video
 09:42
 della scatola della camera a vuoto
 09:44
 e delle persone che l'hanno ricevuta
 09:46
 e mi hanno inviato il video.
 09:48
 Metto tutto in descrizione
 09:50
 e vi ringrazio per aver seguito
 09:52
 anche questo episodio di The Action Lab!
 09:54
 Se vi è piaciuto, vi chiedo di mettere un like,
 09:56
 iscrivervi al canale e cliccare sulla campanella,
 09:57
 così non perderete un solo video.
 09:59
 Grazie per avermi seguito,
 10:01
 alla prossima!

3.2.4 Wayne Breslyn - What is boiling? An introduction

AUTO-GENERATED ENGLISH SUBTITLES

00:00
 so as we add heat to water the water
 00:02
 molecules begin moving faster and some
 00:04
 of them spread out and form a gas we
 00:06
 call that gas water vapor and that's
 00:09
 what's inside the bubbles you see these
 00:11
 bubbles rise to the surface and this is
 00:13

ITALIAN SUBTITLES

00:00
 Se innalziamo la temperatura dell'acqua
 00:02
 le molecole d'acqua iniziano a muoversi più velocemente:
 00:04
 alcune molecole si disperdono e formano un gas,
 00:06
 chiamato vapore acqueo.
 00:09
 Il vapore acqueo è quello che vedete nelle bolle
 00:11
 che salgono in superficie.
 00:13

what we call boiling so we'll start with
 00:16
 the water molecule the red is oxygen and
 00:18
 the two white atoms are hydrogen that's
 00:21
 h2o water molecules are always moving
 00:25
 when we add heat they move faster and if
 00:28
 we add enough heat they'll spread out
 00:30
 and they'll form a gas we call that gas
 00:33
 water vapor note that there's nothing
 00:36
 between the atoms here the black is
 00:38
 empty space to understand why bubbles
 00:41
 form during boiling imagine a group of
 00:44
 water molecules and as you add heat some
 00:47
 of them spread out **in** and form a gas water
 00:49
 vapor when they spread out they push the
 00:52
 molecules around them away and that
 00:54
 forms the bubble that you see that
 00:56
 bubble rises to the surface that's
 00:58
 boiling remember there are only water
 01:01
 molecules in those bubbles they're very
 01:03
 energetic water molecules in the form of
 01:05
 a gas which we call water vapor

Questo è il fenomeno che chiamiamo bollore dell'acqua.
 00:16
 Iniziamo col parlare della molecola dell'acqua:
 00:18
 in rosso, l'ossigeno, in bianco i due atomi di idrogeno.
 00:21
 Le molecole di acqua, H₂O, continuano a muoversi,
 00:25
 ma aumentando la temperatura si muovono più veloci.
 00:28
 Quando l'acqua è abbastanza calda
 00:30
 le molecole si disperdono e formano un gas,
 00:33
 che chiamiamo vapore acqueo.
 00:36
 Notate come non ci sia nulla tra gli atomi,
 00:38
 il nero rappresenta lo spazio vuoto.
 00:41
 Per capire perché le bolle si formano
 00:44
 proviamo ad immaginare un gruppo di molecole d'acqua:
 00:47
 aumentando la temperatura alcune si disperdono
 00:49
 e formano il vapore acqueo.
 00:52
 Disperdendosi spingono via le molecole circostanti
 00:54
 e ciò provoca la comparsa delle bolle.
 00:56
 Quando le bolle salgono in superficie,
 00:58
 allora l'acqua bolle.
 01:01
 Ricordiamo che ci sono solo molecole d'acqua in queste bolle:
 01:03
 sono molecole cariche d'energia, instabili,
 01:05
 che assumono la forma del vapore acqueo.

3.2.5 Vsauce – Water is Amazing – World Water Day!

ENGLISH SUBTITLES MADE BY A YOUTUBE USER

00:00
 Hey, Vsauce. Michael here. And today, we're going to talk about
 water.
 00:05
 Because today is World Water Day. A day about raising awareness
 of the fact
 00:10
 that, even though, here on Earth, there is enough clean, safe,
 drinking water for everybody
 00:15
 to have enough, they don't. In fact, a billion of them don't.
 00:21
 But it doesn't have to be that way. Now first, I wanna cover how
 water is not
 00:26
 just vital and amazing, but to this day, continues to surprise us.
 00:32
 For instance, the Mpemba effect. The effect has been observed
 many many many
 00:37
 times, but has never been explained. In fact, it is so famously anti-
 common sense,
 00:44
 whenever people throughout history have observed it, they've tended
 to think that they just
 00:47
 did something wrong. Which is why even though Aristotle himself

ITALIAN SUBTITLES

00:00
 Hey, Vsauce. Qui Michael. Oggi vi parlerò dell'acqua.
 00:05
 Eh sì, perché oggi è la giornata mondiale dell'acqua, un giorno per
 sensibilizzare
 00:10
 sul fatto che qui, sulla Terra, c'è abbastanza acqua per tutti, pulita e
 potabile,
 00:15
 acqua a cui però un miliardo di persone non ha accesso.
 00:21
 Ma non deve andare così. Per prima cosa, vorrei parlarvi
 00:26
 di come l'acqua non sia solo vitale e fantastica, ma del fatto che
 continui a sorprenderci
 00:32
 Ad esempio: l'effetto Mpemba. Questo effetto è stato osservato
 moltissime volte
 00:37
 ma non è mai stato spiegato. Forse perché sembra insensato.
 00:44
 nelle volte in cui è stato osservato, è sempre stato considerato come
 un errore.
 00:47
 È per questo che, sebbene già Aristotele ne avesse parlato,

00:51 wrote about it, it wasn't until the 20th century that it got its name.
00:56 Simply put, the Mpemba effect is the observation that under the right circumstances a glass
01:01 of boiling hot water inside a freezer can turn to ice more quickly than a glass of cold
01:08 water. It doesn't make a lot of sense, but it can
01:11 happen. A few possible causes have been thrown out.
01:14 For instance, if you heat up or boil water, you remove some of the dissolved gas.
01:20 And having less stuff dissolved in it may be what makes hot water easier to freeze.
01:25 It's the opposite of why we throw down salt during wintery weather.
01:28 The salt dissolves into the water, putting more stuff in it, making it more difficult
01:33 to freeze. But does that account for the entire effect?
01:36 Well, some other possible explanations involve convection currents.
01:41 A glass of warm water will contain more cycling convection currents, meaning that the top
01:46 of that glass of water is warmer. And a glass of warm water will tend to freeze
01:51 from the sides in, whereas the glass of cold water will tend to freeze all across the top
01:57 down. But once that top layer is frozen, it acts
02:01 as an insulator, so all the water below it freezes more slowly.
02:06 The point is that we still do not have a complete explanation of the effect.
02:11 Part of the problem is how difficult it is to control every single variable.
02:15 Should we be using equal masses of water or equal volumes?
02:20 Should they be in the same freezer or in separate freezers?
02:23 And what about evaporation? The warm water will be evaporating faster
02:26 and evaporations into thermosis, it's losing heat more quickly than the cold water.
02:31 It's tough. But here's what we do know.
02:33 Earth has a lot of water. 70% of Earth's surface is covered in it.
02:39 And, interestingly enough, excluding fat, the human body is about 70% water.
02:47 But when you were born you were a big old sack of water.
02:50 That's right. A new baby is 78% water.
02:55 Now, that number drops to 65% by the time that baby is 1 year old.
03:00 And it'll drop even further to about 60% when you're an adult... man.
03:07 Adult women are only about 55% water. This is because women's physiology on average
03:13 contains more fat, which doesn't hold as much water as lean tissue.
03:17

00:51 l'effetto Mpemba ha iniziato a chiamarsi tale solo il secolo scorso.
00:56 In sostanza, secondo questo effetto, nelle giuste circostanze un bicchiere d'acqua bollente
01:01 all'interno di un freezer si trasforma in ghiaccio più velocemente rispetto ad un bicchiere di acqua fredda.
01:08 Sembra una follia, ma può succedere.
01:11 Sono state avanzate delle ipotesi:
01:14 Ad esempio, riscaldando o facendo bollire l'acqua, si rimuove parte dei gas disciolti.
01:20 Dunque, avendo il liquido meno componenti disciolte al suo interno, potrebbe ghiacciarsi più in fretta.
01:25 È l'esatto opposto di quando si butta il sale a terra dopo la neve.
01:28 Il sale si scioglie in acqua, quindi c'è una componente aggiuntiva che ritarda il congelamento dell'acqua.
01:33 Ma questa spiegazione è abbastanza per spiegare l'effetto?
01:36 Beh, ci sono altre spiegazioni, tra cui le correnti convettive.
01:41 Un bicchiere d'acqua calda ha al suo interno più correnti convettive che ruotano, il che significa
01:46 che la parte superiore del bicchiere è più calda. Un bicchiere di acqua calda tende a congelarsi
01:51 dai lati all'interno, mentre quello di acqua fredda dall'alto verso il basso
01:57 Ma quando lo strato superiore si congela, funge da isolante.
02:01 Quindi, l'acqua al di sotto si congela più lentamente.
02:06 In realtà non abbiamo una spiegazione completa dell'effetto.
02:11 La difficoltà nel controllare ogni singola variabile è parte del problema:
02:15 cosa fare? Prendere la stessa massa o lo stesso volume?
02:20 Mettere i bicchieri nello stesso freezer o in due freezer diversi?
02:23 E per quanto riguarda l'evaporazione? L'acqua calda evaporerà più in fretta
02:26 rispetto a quella fredda, perdendo quindi più calore.
02:31 Sembra strano, è vero. Ma ecco quello che sappiamo:
02:33 La Terra è piena d'acqua, ne è ricoperta per il 70%.
02:39 È curioso come anche il corpo umano sia composto di acqua all'incirca per il 70%.
02:47 Tuttavia, i bambini appena nati hanno più acqua in corpo:
02:50 un neonato è composto al 78% di acqua.
02:55 La percentuale scende al 65% nel primo anno di vita,
03:00 e un uomo in età adulta scende al 60%.
03:07 Le donne, al contrario, sono fatte di acqua per il 55%. Questo si spiega con la fisiologia del corpo femminile,
03:13 che contiene più grassi, meno ricchi di acqua rispetto al tessuto magro.
03:17

In fact, fat people, regardless of gender, contain less water than thin people.
03:23
Earth has a lot of water, but it's almost all salty.
03:28
96.5% of the water on Earth is in the oceans. Another 3.4% of Earth's water can be found
03:36
in other large bodies of water or frozen inside glaciers or ice caps.
03:41
But you, me, all the other animals we see, other manufactured products?
03:46
They all contain water. About 0.0003% of Earth's total water.
03:54
And all of the storms and clouds and rain and thunderstorms happening contain only about
03:59
0.0001% of all the water Earth has. That's a lot of water, but despite that fact,
04:09
almost a billion people on Earth don't have access to potable water.
04:15
Potable comes from the Latin for "to drink," which means clean, safe water free from disease
04:21
and contamination. The number of people on Earth who do not have
04:25
sustainable access to potable water is equivalent to the number of people living inside the
04:31
United States. Except multiplied by three.
04:36
And every year 3.5 million people die because of non-potable water-related diseases.
04:44
That's equivalent to the entire population of Los Angeles.
04:48
So every year, Earth, our planet, loses an entire city of Los Angeles because people
04:56
don't have access to clean water. So today, on World Water Day, it's worth talking
05:03
about organisations that are making a difference, because things don't have to be the way that
05:07
they are. Organisations like Water.org help local communities
05:11
build sustainable clean water solutions that the community itself will own.
05:17
Now, they gave me a chance to go out to India to see this in action, along with WheezyWaiter and Strawberry17.
05:24
Unfortunately, I wasn't able to go, but those
05:26
other two people were and they've got videos over on their channels about their experiences.
05:31
So go check those out and if you wanna learn more, got water.org/vsauce to see how you
05:35
can help.
05:36
And as always,
05:38
thanks for watching.

03:17
È per questo che chi ha più massa grassa ha una percentuale inferiore di acqua in corpo.
03:23
La Terra è piena d'acqua, quasi tutta salata.
03:28
Il 96,5% dell'acqua si trova negli oceani. Il 3,4% si trova in bacini idrici,
03:36
in ghiacciai o cappe di ghiaccio.
03:41
E noi invece? Io, gli altri animali e prodotti vari?
03:46
Tutti siamo fatti d'acqua: siamo circa lo 0,0003% dell'acqua totale.
03:54
Tutte le tempeste, le nuvole, la pioggia e gli agenti atmosferici
03:59
sono solo lo 0,0001%: è comunque molta acqua.
04:09
Tuttavia, circa un miliardo di persone non ha accesso all'acqua potabile.
04:15
La parola potabile viene dal latino 'bere', il che vuol dire acqua pulita,
04:21
non contaminata e bevibile. Il numero di persone
04:25
che non hanno accesso ad acqua potabile equivale alle persone
04:31
che abitano negli Stati Uniti, ma moltiplicato per tre.
04:36
Ogni anno 3,5 milioni di persone muoiono a causa di malattie trasmesse tramite acqua non potabile.
04:44
3,5 milioni sono le persone che vivono a Los Angeles.
04:48
Dunque, ogni anno, viene a mancare un numero di persone uguale al numero di abitanti a Los Angeles,
04:56
tutto perché non hanno accesso ad acqua potabile. E così, oggi più che mai, nella giornata mondiale dell'acqua,
05:03
vale la pena di parlare delle organizzazioni che fanno la differenza, perché la situazione possa cambiare.
05:07
Organizzazioni come Water.org aiutano le comunità locali
05:11
a mettere in atto soluzioni sostenibili a vantaggio delle comunità per un'acqua potabile per tutti.
05:17
Water.org mi ha dato l'opportunità di osservare da vicino queste soluzioni: insieme a WheezyWaiter e Strawberry17.
05:24
Mi è stata offerta l'opportunità di andare in India,
05:26
ma anche se io non ho potuto accompagnarli, potete fare un salto sul loro canale e vedere la loro esperienza.
05:31
Vi consiglio di vedere i loro video al riguardo e, se volete saperne di più, visitate il sito water.org/vsauce,
05:35
per capire come potete dare una mano.
05:36
E, come sempre,
05:38
grazie per avermi seguito.

3.3 Italian videos translated into English

3.3.1 Dario Bressanini - PASTA SENZA FUOCO (1) – Perché continuare a far bollire l'acqua è inutile

NO BOILING PASTA (1) – Why continuing to boil water is useless

| ITALIAN TRANSCRIPT | ENGLISH SUBTITLES WRITTEN BY A YOUTUBE USER |
|--|---|
| 00:00 Gli Italiani pensano di sapere tutto sulla cottura della pasta, | 00:00 Italians think they know everything about cooking pasta, |
| 00:03 ma non è così, e ora ve lo dimostro. | 00:03 but it's not true, and I will prove it. |
| 00:05 Qui abbiamo dell'acqua che sta bollendo... | 00:05 Here we have some boiling water... |
| 00:07 che ci vuole per cucinare la pasta? | 00:07 what do we need to cook pasta? |
| 00:09 Un po' di sale... | 00:09 A pinch of salt... |
| 00:10 qui c'è la pasta, la butto dentro, gli dò una mescolatina... | 00:10 here's the pasta, I put it inside, stir a bit... |
| 00:13 copro e... spengo il fuoco! | 00:13 I cover and...turn off the stove! |
| 00:17 Esattamente: spengo il fuoco! | 00:17 Exactly: I turn off the heat! |
| 00:19 Non ve l'aspettavate, vero? | 00:19 You didn't expect that, did you? |
| 00:21 Beh, ora non mi resta altro che aspettare | 00:21 Well, now I simply need to wait for |
| 00:23 il tempo segnato sulla confezione della pasta, | 00:23 the cooking time as marked on the package, |
| 00:26 e magari preparare un condimento | 00:26 and maybe prepare some seasoning |
| 00:28 io l'ho già preparato | 00:28 I already have it |
| 00:29 perché oggi fa caldo, | 00:29 since today it is warm, |
| 00:30 ho preparato un condimento freddo. | 00:30 I prepared a cold seasoning. |
| 00:32 Bentornati sul canale | 00:32 Welcome back on the channel |
| 00:33 del vostro amichevole chimico di quartiere. | 00:33 of your friendly neighbourhood chemist. |
| 00:35 Ebbene sì, per cuocere la pasta | 00:35 Right, in order to cook pasta |
| 00:37 non è necessario che si mantenga l'acqua a bollire. | 00:37 it is not necessary to keep the water boiling. |
| 00:42 non è il bollire dell'acqua che fa cuocere la pasta | 00:42 it is not the boiling that cooks the pasta |
| 00:46 o qualsiasi altro alimento | 00:46 or any other food |
| 00:47 ma è il calore che si trasferisce | 00:47 but it's the heat transferred |
| 00:50 da un corpo caldo, cioè l'acqua | 00:50 from a warm object, i.e. water |
| 00:52 a un corpo che è più freddo, cioè la pasta. | 00:52 to a colder object, i.e. pasta. |
| 00:54 Per cuocere la pasta è quindi sufficiente | 00:54 To cook pasta we only need |
| 00:56 l'energia termica che è già contenuta dentro l'acqua | 00:56 the thermal energy already trapped in the water |
| 01:00 che io ho portato all'ebollizione. | 01:00 that I brought to a boiling point. |
| 01:01 Non è una mia invenzione né quella di altri chef | 01:01 It was not invented by me, nor by other chefs |
| 01:05 anche se questa tecnica, questo accorgimento | 01:05 even if this technique, this peculiarity |
| 01:07 periodicamente viene riscoperto | 01:07 gets periodically rediscovered |
| 01:09 da cuochi e chef in giro per il mondo. | 01:09 by cooks and chefs all over the world. |

01:13
In realtà è qualche cosa che si sa da almeno 200 anni
01:17
ma che fatica a diffondersi perché c'è l'idea sbagliata
01:21
che l'acqua debba bollire
01:23
per far cuocere quello che immergiamo dentro.
01:26
Non è una nuova tecnica di cottura
01:29
sembra diverso solamente perché noi
01:30
attribuiamo spesso erroneamente
01:32
al bollore, all'ebollizione dell'acqua
01:34
la capacità di cuocere la pasta, ma non è così
01:37
è semplicemente la temperatura raggiunta dall'acqua.
01:40
I motivi scientifici del perché funziona
01:41
ve li faccio vedere nel prossimo video.
01:43
In questo mi concentro sulla domanda
01:46
che molti di voi si stanno facendo, e cioè:
01:48
"Ma perché dovrei farlo?"
01:49
Vi offro almeno tre motivi:
01:51
il primo è non sprecare gas.
01:53
quando cuociamo col gas, si spera almeno al minimo,
01:57
facciamo andare l'acqua per almeno 10 minuti,
02:00
12, 13, 15, dipende un po' dal grado di cottura che volete.
02:03
In questo caso quindi io posso risparmiare
02:06
10 minuti di gas.
02:08
Uno dice, vabbè se faccio i conti
02:10
non sono poi tanti soldi.
02:11
È vero, però moltipicatelò
02:13
per tutte le volte che voi cucinate la pasta
02:16
e moltipicatelò per i milioni di italiani
02:18
che ogni giorno cucinano la pasta
02:20
quindi dal punto di vista finanziario
02:22
anche dal punto di vista ambientale
02:23
non è una cosa trascurabile.
02:25
Il secondo motivo, molto più pratico,
02:27
è che facendo così io posso liberare un fornello
02:30
io posso spostare la mia pentola
02:32
e utilizzare il fornello, magari ho già gli altri pieni
02:36
oppure sono in campeggio
02:37
e ho un piccolo fornellino unico
02:39
dove magari la bombola si sta quasi esaurendo.
02:42

01:13
Actually we have known this since at least 200 years
01:17
but it never really spreads because of the misconception
01:21
that water must boil
01:23
to cook whatever is inside.
01:26
It is not a novel cooking technique
01:29
it looks different simply because
01:30
we often erroneously attribute
01:32
to boiling, to water boiling
01:34
the ability to cook pasta, but it's not true
01:37
it is merely the temperature reached by the water.
01:40
The scientific reasons behind this
01:41
will be shown in the next video.
01:43
In this one I will focus on the question
01:46
that many of you are thinking about, and that is:
01:48
"But why should I do this?"
01:49
I am offering at least three reasons:
01:51
the first is saving gas.
01:53
When we cook on the gas stove, I hope at least on the
minimum setting,
01:57
we keep the water there for at least 10 minutes
02:00
12, 13, 15, depending on the degree of cooking you want.
02:03
In this case I can save
02:06
10 minutes of gas.
02:08
You might say, well if I make a quick calculation
02:10
it's not a lot of money.
02:11
True, but multiply that
02:13
for all the times you prepare some pasta
02:16
and multiply that for the millions of Italians
02:18
that cook pasta each day
02:20
therefore from a financial point of view
02:22
and even environmentally-speaking
02:23
it is not negligible.
02:25
The second reason, much more practical,
02:27
is that I can free up one stove
02:30
I can move my pot
02:32
and use the stove, maybe the others are occupied
02:36
or I am out camping
02:37
and I have one tiny stove
02:39
and maybe my gas tank is about to run out.

Il motivo però che io preferisco è il terzo, e cioè:
 02:46 ma perché dovrei fare qualcosa di inutile
 02:49 solo perché si è sempre fatto così?
 02:51 Bisogna sempre nella scienza come nella cucina
 02:53 porsi delle domande e cercare di capire
 02:56 perché si fanno certi gesti.
 02:58 Noi certi gesti li facciamo
 02:59 in modo ormai talmente automatico
 03:01 che ci dimentichiamo spesso di chiederci
 03:04 "Ma perché li facciamo?"
 03:06 e magari vedere se ci sono delle alternative.
 03:08 Ed ecco che dopo 12 minuti la pasta è cotta
 03:11 quindi la scolo e la condisco con i pomodorini
 03:17 che avevo preparato prima.
 03:21 Perfetto, cotto a puntino!
 03:23 Lo so che siete scettici, ma non vi dovete fidare di me
 03:26 provate
 03:27 magari dovete aggiustare un po' i tempi di cottura
 03:29 specialmente se la vostra pentola
 03:31 perde calore velocemente
 03:33 provate il vostro formato di pasta preferito
 03:35 e scrivetemelo nei commenti.
 03:37 Nel prossimo video: "La scienza coinvolta".
 03:40 Per ora buon appetito
 03:42 dal vostro amichevole chimico di quartiere.

02:42 The reason I prefer is actually the third, and that is:
 02:46 but why should I do a pointless gesture
 02:49 just because that is what we always did?
 02:51 We should always, in science and in the kitchen alike,
 02:53 asking questions and trying to understand
 02:56 why we do something.
 02:58 Some things we do
 02:59 in a fully automatic way
 03:01 and therefore we often forget to wonder
 03:04 "But why do we do that?"
 03:06 and perhaps look for alternatives.
 03:08 And voila, after 12 minutes the pasta is ready
 03:11 I drain it and season it with the cherry tomatoes
 03:17 that I prepared beforehand.
 03:21 Perfect, cooked to perfection!
 03:23 I know you are skeptical, but you should not just trust me
 03:26 try it
 03:27 you may need to adjust the cooking times slightly
 03:29 especially if your pot
 03:31 loses heat quickly.
 03:33 Try your favourite pasta type
 03:35 and let me know in the comments.
 03:37 In the next video: the science behind it.
 03:40 For now, "buon appetito"
 03:42 from your friendly neighbourhood chemist.

3.3.2 Dario Bressanini - La Scienza della Pasta senza fuoco (2) perché si può spegnere il fuoco dopo aver buttato la pasta

No boiling water pasta (2) – the science behind

ITALIAN TRANSCRIPT

00:00 ciao a tutti avete visto il mio video
 00:02 dove spiego come è possibile cuocere la pasta spegnendo il
 fuoco
 00:07 "Pasta senza fuoco", no?
 00:10 Beh, andatelo a vedere e poi tornate qui
 00:12 perché adesso vi spiego la scienza coinvolta.
 00:15

ENGLISH SUBTITLES WRITTEN BY A YOUTUBE USER

00:00 Hello everybody, you have seen my video
 00:02 where I explain how it is possible to cook pasta while turning
 off the stove
 00:07 "Pasta without heat", right?
 00:10 Well, watch it and then come back
 00:12 because now I'll explain the science behind it.
 00:15

E ora la scienza coinvolta perché posso fare una cosa del genere
00:20
perché posso cuocere la pasta senza fuoco.
00:22
Beh, in realtà è abbastanza semplice. Come vi dicevo non l'ho inventato io
00:26
ma si sa da almeno 200 anni. Voi sapete che l'acqua bolle a 100 gradi, vero?
00:32
giusto? sbagliato! l'acqua bolle a 100 gradi solamente al livello del mare
00:38
più aumenta l'altitudine e più è bassa la temperatura di ebollizione dell'acqua.
00:44
Io in questo momento sono in montagna e qui l'acqua bolle a circa 98 gradi.
00:50
Ora immaginate di essere a 2000 metri, a Sestriere
00:53
beh lì l'acqua bolle a 93 gradi, non arriverà mai a 100 gradi
00:57
non importa quanto alziate il fuoco, ma la pasta cuoce lo stesso
01:01
cosa c'entra questo? beh, pensateci: se a 2000 metri
01:06
93 gradi, la temperatura che può al massimo raggiungere l'acqua,
01:10
sono sufficienti per cuocere la pasta, beh allora questi stessi 93 gradi
01:16
saranno anche sufficienti per cuocere la pasta, per esempio in pianura a livello del mare
01:22
dove però a 93 gradi l'acqua non bolle
01:24
quindi non è necessario far bollire l'acqua per cuocere la pasta.
01:30
Che non serva far bollire l'acqua per cuocere le cose, la pasta
01:35
ma la stessa cosa vale anche per gli ortaggi, la carne e così via,
01:38
è un'osservazione che risale almeno al 1799
01:41
quando Benjamin Thompson, che divenne poi noto come "Conte Rumford"
01:45
uno degli scienziati fondatori della nascente scienza della termodinamica
01:50
scrisse un saggio analizzando scientificamente i processi che i cuochi
01:56
osservavano nelle cucine dell'epoca ogni giorno, e Thompson si stupiva di come
02:01
questi processi fossero così poco compresi scientificamente proprio dalle
02:06
persone, i cuochi dell'epoca, che li avevano però sott'occhio tutti i giorni
02:10
ma non si ponevano mai le domande giuste.
02:13
Porsi le domande giuste è l'essenza della scienza:
02:16
ricordatevi che non ci sono mai domande stupide,
02:19
casomai sono le risposte che possono essere stupide ma abituatevi a

And now the science of why I can do this
00:20
why I am able to cook pasta with no heat.
00:22
Well, it's actually rather easy. As I said I did not invent this
00:26
but we have known for at least 200 years. You know that water boils at 100 degrees, right?
00:32
Right? Wrong! Water boils at 100 degrees only at sea level
00:38
the higher the altitude, the lower the boiling temperature of water.
00:44
I am now on the mountains and here water boils at about 98 degrees.
00:50
So picture yourself at 2000 meters, in Sestriere
00:53
well over there water boils at 93 degrees, it will never reach 100
00:57
no matter how much you raise the heat, but pasta is cooked anyway
01:01
how is this relevant? Well, think about it: if at 2000 meters
01:06
93 degrees, the maximum temperature water can reach,
01:10
are enough to cook pasta, well then the same 93 degrees
01:16
will also be sufficient to cook pasta, for instance on flat terrain at sea level
01:22
where however water is not boiling at 93 degrees
01:24
so it is not required to have boiling water to cook pasta.
01:30
That you don't need boiling water to cook food, pasta
01:35
but the same applies to vegetables, meat and so on,
01:38
is an observation that was first made in 1799
01:41
when Benjamin Thompson, who was later known as "Count Rumford"
01:45
one of the founding scientist of the new thermodynamics field
01:50
wrote an essay that scientifically analyzed the processes that cooks
01:56
would observe every day in their kitchens, and Thompson was surprised to see
02:01
how these processes were not well understood from a scientific point of view
02:06
by the people, the cooks of the time, who however observed them every day
02:10
but never asked the right questions.
02:13
Asking the right questions is the essence of science:
02:16
remember that there are no stupid questions,
02:19
the answers might be stupid sometime, but get into the habit of
02:22

02:22 fare domande ai vostri professori o a voi stessi,
02:26 chiedetevi il perché delle cose, anche in cucina.
02:28 Scriveva Thomson: "tutto il combustibile
02:30 che viene utilizzato nel farla bollire vigorosamente è
sprecato, senza
02:35 aggiungere un singolo grado al calore dell'acqua, nè
velocizzarla o accorciare
02:40 il processo della cottura di un solo secondo, perché è dal
calore, dalla sua
02:45 intensità e dalla sua durata che il cibo viene cotto e non
dall'ebollizione
02:50 dell'acqua che non ha alcun ruolo in quella operazione".
02:55 Thompson non parlava di pasta, ma parlava di carne e di
verdura
02:59 ma il fenomeno e l'osservazione è del tutto generale:
03:02 non è l'ebollizione dell'acqua che cuoce
03:05 ma è il trasferimento di calore che dipende dalla temperatura
che ha l'acqua in quel momento
03:10 e quindi vediamo quali sono le temperature che si devono
raggiungere per cuocere la pasta.
03:15 I fenomeni che avvengono quando cuociamo la pasta sono
tre, sostanzialmente:
03:20 Il primo è la diffusione dell'acqua dall'esterno verso l'interno
03:26 altrimenti la pasta rimane cruda all'interno.
03:29 Il secondo è il processo che si chiama gelatinizzazione
dell'amido
03:33 in pratica i granuli di amido assorbono acqua e si gonfiano.
03:37 Il terzo fenomeno è la denaturazione e conseguente
coagulazione del glutine.
03:44 tutti questi processi dipendono dalla temperatura.
03:47 In primo, la velocità di diffusione dell'acqua all'interno della
pasta
03:51 avviene a qualsiasi temperatura, anche ad acqua fredda
03:54 infatti posso prendere dalla pasta, metterla nell'acqua fredda
03:56 e lasciarla lì tutta notte e la mattina vedrete che è molliccia
04:00 però non è cotta, non è cotta nella maniera corretta
04:03 perché il secondo fenomeno, che è la gelatinizzazione degli
amidi,
04:07 invece avviene solamente, diciamo, al di sopra dei 60 gradi,
grossolanamente.
04:12 Il terzo fenomeno, che è la denaturazione e la coagulazione
del glutine,
04:16 avviene invece tra i 70 e gli 80 gradi.
04:19 Notate che sono tutte temperature ampiamente al di sotto
della temperatura di ebollizione
04:23 che normalmente raggiungiamo nelle cucine di casa nostra.

asking questions to your teachers or to yourselves,
02:26 wonder the reason behind something, in the kitchen too.
02:28 Thomson wrote: "all the fuel
02:30 used to make it boil is wasted, without
02:35 adding one single degree to the water heat, nor making it
boil faster nor reducing
02:40 the cooking time by even one second, because it is from the
heat, from its
02:45 intensity and its duration that food is cooked, and not from
the boiling
02:50 of water which has no role in such operation".
02:55 Thompson was not talking about pasta, but rather about
meat and vegetables
02:59 but the phenomenon and the observation is generic:
03:02 it is not the boiling of water that cooks
03:05 but it is the transfer of heat that depends on the water
temperature at that moment
03:10 and so, let's see what temperatures we should reach to cook
pasta.
03:15 The phenomena that occur when we cook pasta are three,
essentially:
03:20 the first is diffusion of water from the outside to the inside
03:26 otherwise pasta stays uncooked inside.
03:29 The second is the process called starch gelatinization
03:33 in practice the starch grains absorb water and swell.
03:37 The third one is the denaturation and subsequent
coagulation of gluten.
03:44 All these processes depend on temperature.
03:47 First, the speed of the water diffusion inside pasta
03:51 happens at any temperature, even with cold water
03:54 indeed I could take water, put it in cold water
03:56 leave it all night, at morning you'll see it's soggy
04:00 but it's not cooked, it is not properly cooked
04:03 because the second phenomenon, the starch gelatinization
04:07 only occurs, more or less, above 60 degrees.
04:12 The third phenomenon, that is the denaturation and
coagulation of gluten,
04:16 happens instead between 70 and 80 degrees.
04:19 Note that these temperatures are all well below the boiling
temperature
04:23 that we normally reach in our home kitchens.
04:26 This is why I am able to cook
04:29 simply by turning off the heat and leaving the lid on,

04:26
Ecco quindi perché posso cuocere
04:29
semplicemente spegnendo il fuoco e tenendo il coperchio,
04:33
perché l'acqua alla fine dei miei 10, 12, 15 minuti necessari
per la cottura della pasta
04:40
è ancora ben al di sopra degli 80 gradi che sono
grossolanamente
04:45
la temperatura minima che mi serve per cuocere la pasta.
04:48
Certo, può cuocere un pochino più lentamente e quindi
magari
04:51
dovrete aggiungere un minuto in più ai vostri tempi di cottura
04:55
o magari dovrete mescolare un pochettino qualche decina di
secondi in più all'inizio
05:00
perché alcuni tipi di pasta hanno la tendenza a rilasciare più
di altre velocemente l'amido
05:05
che all'inizio può portare a incollare i vari pezzi.
05:08
So che siete ancora scettici, vi posso solo dire di provare
05:11
provate, provate, provate: la scienza anche fatta con una
pentola e in cucina
05:17
è fatta di esperimenti e tentativi, ipotesi, quindi fate le vostre
ipotesi
05:23
fate i vostri tentativi, vedrete quale pasta per voi cuoce nel
modo corretto
05:31
e... buon appetito dal vostro amichevole chimico di quartiere
in trasferta in montagna.
05:37
Ciao a tutti!

04:33
because water at the end of the 10,12, 15 minutes required
to cook pasta
04:40
it is still well above the 80 degrees that is more or less
04:45
the minimal temperature I need to have cooked pasta.
04:48
Sure, it might be a bit slower and maybe you will need
04:51
to add one extra minute to your cooking times
04:55
or maybe you need to stir for extra 10 seconds at the
beginning

05:00
because some types of pasta tend to release their starch
more quickly than others
05:05
which in the beginning might lead some pieces to stick
together.
05:08
I know you are still skeptical, I can only ask you to try
05:11
try, try, try: science even with a pot in the kitchen
05:17
is made of experiments and tries, hypotheses, so make your
own hypotheses
05:23
and your own experiments, notice which pasta cooks in the
right way for you
05:31
and..."buon appetito" from your friendly neighbourhood
chemist transferred on the mountains.
05:37
Bye everybody!

3.3.3 Dario Bressanini - PASTA SENZA FUOCO (3) – Ho commesso due errori

PASTA WITHOUT HEAT (3) – I made two mistakes

ITALIAN TRANSCRIPT

00:00
Ciao a tutti e bentornati sul canale del vostro amichevole
chimico di quartiere. Vi devo delle spiegazioni
00:04
per quel che riguarda il video, anzi due video, che ho fatto
sulla cosiddetta pasta senza fuoco. Ho commesso due
errori.
00:12
Il primo errore è stato quello di voler dividere
00:17
il video in due video più piccoli: uno in cui raccontavo
solamente il metodo di cottura e il secondo
00:23
in cui andavo a spiegare il perché e il percome, le
temperature coinvolte, la scienza coinvolta. Il risultato è
stato che
00:30
moltissimi di quelli che hanno visto il primo video non hanno
visto il secondo e quindi
00:34
si sono persi una serie di informazioni in più. Per esempio,
avrebbero scoperto - e questo lo dico quelli che mi hanno
scritto
00:41

ENGLISH SUBTITLES WRITTEN BY A YOUTUBE USER

00:00
Hello everybody and welcome back on the channel of your
friendly neighbourhood chemist. I owe you explanations
00:04
concerning the video, actually two videos, I made on the so-
called "pasta without heat". I made two mistakes.
00:12
The first mistake was to separate
00:17
the video in two smaller ones: one where I simply talked
about the cooking method and a second one
00:23
where I explained the why and how, the temperatures, the
science behind it. The result was that
00:30
many people who saw the first video missed the second one
and therefore
00:34
missed several extra information. For instance, they would
have found out - and I say this for those who wrote me
00:41
ah, this is crap, such pasta is good only for the dog, or this is
how
00:45

ah, ma che schifo, la dò al cane la pasta fatta così, oppure
00:45
cucinano in Norvegia e non so - beh loro avrebbero scoperto per esempio che questa è
00:50
una cottura che molti chef e cuochi utilizzano. Gente del calibro di Davide Scabin,
00:57
Ducassee,
00:59
Marchesi, Sironi... anche cuochi stellati, quindi, non proprio gli ultimi picci che passano per la strada!
01:05
Quindi è un metodo di cottura utilizzabile in pratica e che non mi sono inventato
01:09
io come ho ribadito più volte nel secondo video. Il secondo errore è stato quello di non fornire
01:13
neanche nel secondo video tutte le informazioni necessarie
01:17
per far comprendere in quali condizioni questo tipo di cottura
01:21
può avvenire allora tutto il ragionamento che vi ho fatto se non avete visto il video vi consiglio di andare a
01:27
vederlo cliccate qui e andate a vederlo
01:30
Il punto chiave è quello del raffreddamento ma avrei dovuto dirlo esplicitamente
01:34
Questi chef è anche altri utilizzano questo metodo o alcune piccole variazioni
01:39
Ma che si basano sempre sullo stesso principio per esempio qualcuno aspetta che l'acqua torni a bollire prima di
01:46
Chiuderla con un coperchio ermetico e spegnere il gas
01:49
il punto cruciale
01:50
E mi spiace non averlo messo in evidenza
01:53
Esplicitamente è ovviamente la velocità di raffreddamento dell'acqua è ovvio che se l'acqua si raffredda troppo velocemente
02:00
beh, allora non c'è speranza di poter utilizzare questo metodo è l'acqua si può raffreddare molto velocemente per una miriade di motivi per esempio se
02:08
Non tenete la pentola sempre chiusa non dovete ogni tanto come
02:11
A qualcuno di voi è venuta voglia aprire il coperchio e per mescolare la pasta dovete sempre lasciarla chiusa e il coperchio ovviamente deve essere
02:19
Ermetico non deve permettere il passaggio e la fuoriuscita del vapore. Io ho usato se vedete il vecchio video un
02:26
Coperchio di vetro di quelli abbastanza pesanti si può perdere calore velocemente perché magari la pentola è
02:32
Troppo sottile oppure perché ho messo poca acqua e tanta pasta oppure perché l'ambiente in cui sono
02:38
è molto freddo ci si possono essere tantissimi motivi a caso ovviamente ho
02:43
Fatto tutte le mie misure e ho visto che nel mio caso vi faccio vedere il grafico dopo aver buttato la pasta è
02:49
Spento il fuoco
02:51
they cook in Norway or whatever - well these people would have discovered for example that this
00:50
is a cooking process used by many chefs and professional cooks. People like Davide Scabin,
00:57
Ducassee,
00:59
Marchesi, Sironi ... renowned chefs too, so, not really random idiots on the street!
01:05
So it is a process you can use in practice and that I did not make up
01:09
myself as I said multiple times in the second video. The second mistake was not to provide
01:13
not even in the second video, all the necessary information
01:17
to make you understand under which conditions this cooking method
01:21
can work, so all the reasoning I made, if you didn't watch the video I recommend you go and
01:27
watch it, click here to watch it,
01:30
the key point is the cooling down but I should have been explicit about that
01:34
These chefs and others too use this method or other small variations on it
01:39
but always based on the same principle; for instance some wait for the water to boil again before
01:46
closing with a hermetic lid and turning off the stove
01:49
the key point
01:50
and I am sorry I did not highlight this
01:53
explicitly, is of course the speed at which water cools down. Obviously if water cools down too quickly
02:00
well, then there is no hope of ever using this method, and water can cool down quickly for a variety of reasons, for example
02:08
not keeping the pot always closed. You should not from time to time
02:11
as somebody might have wished to do, open the lid to stir the pasta, you should always keep it closed and the lid must of course be
02:19
hermetic, it should not allow the vapour to pass through and exit. If you watch the old video I used
02:26
a glass lid, one of those heavy ones. You can lose heat fast perhaps because your pot is
02:32
too thin or because there is not enough water and too much pasta or because the environment you are in
02:38
is rather cold, there can be many reasons, of course at home
02:43
I made my measurements and I saw that in my case, I'll show the graph later, after putting the pasta to boil and
02:49
turning off the stove
02:51

La temperatura dell'acqua che ho misurato con un termometro
02:54
Scende, ma molto lentamente per cui alla fine del periodo di cottura è ancora ben al di sopra degli 80 gradi che vi dicevo
03:01
servono come temperatura minima di cottura per la pasta può essere che per quelli di voi che ci hanno provato e
03:08
Hanno ottenuto un risultato non soddisfacente
03:11
Che la temperatura nel nel vostro caso sia scesa troppo velocemente
03:16
Ringrazio Comunque tutti quelli che ci hanno provato ho visto nei commenti che ci sono tantissime persone che pur scettiche ci hanno provato
03:23
E mi hanno scritto nei commenti che con loro stupore la cosa funziona in realtà la cosa non mi stupisce
03:29
Perché come dicevo teoricamente è una cosa assolutamente possibile?
03:33
A coloro che hanno provato e che hanno dovuto buttare via la pasta e magari darla il cane
03:39
Mi dispiace come vi dicevo avrei dovuto essere più preciso il punto del mio video però era un altro era quello di
03:46
Farsi delle domande di abituarci a non dare niente per scontato e chiedere sempre il perché delle cose
03:52
Quindi magari qualcuno di voi a cui non è non è venuta potrà così provare magari con un termometro e capire facendo delle misure
04:00
Il perché non gli è venuta un altro problema che qualcuno ha riscontrato è quello che la pasta si può attaccare come vi dicevo
04:08
Questo dipende unicamente dalla qualità della pasta ci sono delle paste magari anche artigianale che però non hanno una grandissima qualità
04:15
Rilasciano tantissimo amido
04:17
Inizialmente per cui c'è bisogno di mescolare nelle fasi iniziali della cottura
04:22
Perché altrimenti l'amilosio che esce dall' amido dei granuli della pasta rischia di incollare in questo caso magari può essere
04:31
Sufficiente aspettare che l'acqua torni a ebollizione
04:34
continuare a mescolare l'amilosio a questo effetto diciamo da collante nelle nei primi solamente nei primi minuti e poi
04:40
Spegnere in casi come questo magari oltre che magari cambiare la marca della pasta può essere anche sufficiente
04:47
mescolare per magari un minuto in più come vi dicevo alcuni cuochi usano questa tecnica ma spengono il fornello solamente dopo che
04:55
L'acqua è ritornata a ebollizione quindi magari ci può mettere un minuto 2 minuti
04:58
Comunque veramente ringrazio tutti quelli che ci hanno provato perché lo scopo del mio video era quello di
05:04
Farvi pensare
05:05
Abituiamoci a ragionare sulle cose che ci hanno sempre detto ma senza darci una spiegazione
05:11
the water temperature I measured with a thermometer
02:54
decreases, but very slowly so at the end of the cooking time is still well above the 80 degrees that, as I mentioned,
03:01
are the required minimal temperature to boil pasta, this could be why some of you who tried
03:08
and got an unsatisfactory result
03:11
i.e. the temperature in your case decreased too fast
03:16
Anyway, thanks to everybody who tried, I saw in the comments that many people tried even if they were skeptical
03:23
and wrote surprised in the comments that this worked. Actually it does not surprise me,
03:29
because as I said theoretically this is completely possible
03:33
To those who tried and had to throw the pasta away or give it to their dog
03:39
I am sorry, as I said I should have been more precise, the purpose of my video however was different, it was of
03:46
asking questions, getting used to take nothing for granted and always ask "why" for everything
03:52
So maybe some of you that failed could try with a thermometer and through the measurements understand
04:00
why it did not go well. Another problem somebody found is that the pasta might get sticky, as I said
04:08
this depends entirely on the quality of the pasta, some pasta even artisanal brands are not of great quality
04:15
and release a lot of starch
04:17
initially, so in the first phases of cooking it needs to be stirred
04:22
Otherwise the amylose released from the starch granules of pasta might stick it, in this case it could be sufficient
04:31
to wait for the water to boil again
04:34
and keep stirring. Amylose has this, let's say, glue-like effect but just in the first minutes and then
04:40
you can turn the stove off, maybe beside changing your pasta brand it might be enough
04:47
to stir for an extra minute or so, as I said some chefs use this technique but turn off the stove only after
04:55
the water boils again, so maybe it can take one or two more minutes.
04:58
Anyway I really thank everybody who tried because the goal of my video was to
05:04
make you think
05:05
Let's get used to think about things they always told us but without giving us an explanation
05:11
to question all the different
05:13

A mettere in dubbio tutti i vari
05:13
Dogmi che esistono nella cucina come nella scienza è in qualsiasi altro campo e cercare di capire sempre qual è il significato il motivo dei
05:20
Gesti che in questo caso le ricette ci dicono di fare quindi grazie ancora a tutti e arrivederci
05:27
Per il prossimo video qui sul canale del vostro amichevole chimico di quartiere. Ciao

dogmas that exist in the kitchen as well as in science, and in every other field, and always try to understand what is the reason behind

05:20
the gestures that recipes here tell us to perform, so again thanks everybody and see you again

05:27
for the next video here on the channel of your friendly neighbourhood chemist. Bye!

3.3.4 Dario Bressanini – La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina

ITALIAN TRANSCRIPT

1
00:00:01,000 --> 00:00:02,600
-Come l'Acqua per il Cioccolato

2
00:00:02,600 --> 00:00:05,600
è il titolo di un film
che racconta di un amore devastante

3
00:00:05,600 --> 00:00:09,200
come lo è l'acqua
per il cioccolato

4
00:00:09,200 --> 00:00:10,560
ma come mai?

5
00:00:10,570 --> 00:00:12,000
Dario!

6
00:00:19,720 --> 00:00:21,560
-Ciao Sara
-Benvenuto Dario

7
00:00:21,560 --> 00:00:23,720
sai che le casalinghe
sono molto golose di cioccolato?

8
00:00:23,720 --> 00:00:24,800
-Sì, anch'io

9
00:00:24,800 --> 00:00:29,360
per capire perché
il cioccolato non si mescola con l'acqua

10
00:00:29,360 --> 00:00:32,200
dobbiamo dire
due parole sulla materia prima

11
00:00:32,200 --> 00:00:34,760
questo è il frutto
della pianta del cacao

12
00:00:35,160 --> 00:00:37,380

ENGLISH TRANSLATION

1
00:00:01,000 --> 00:00:02,600
-Like Water for Chocolate,

2
00:00:02,600 --> 00:00:05,600
is a movie about an overwhelming love.
Do you know what else is overwhelming?

3
00:00:05,600 --> 00:00:09,200
Water for chocolate.

4
00:00:09,200 --> 00:00:10,560
How come?

5
00:00:10,570 --> 00:00:12,000
Dario!

6
00:00:19,720 --> 00:00:21,560
-Hello, Sara
-Welcome, Dario

7
00:00:21,560 --> 00:00:23,720
did you know that housewives
are very fond of chocolate?

8
00:00:23,720 --> 00:00:24,800
-So am I

9
00:00:24,800 --> 00:00:29,360
to better understand
why water and chocolate don't mix

10
00:00:29,360 --> 00:00:32,200
we first need to talk
about cocoa

11
00:00:32,200 --> 00:00:34,760
this is a cocoa bean

12
00:00:35,160 --> 00:00:37,380

e contiene questi semi

13
00:00:37,500 --> 00:00:39,080
che vengono chiamati fave

14
00:00:39,080 --> 00:00:42,020
Queste fave all'interno
si schiacciano

15
00:00:42,020 --> 00:00:44,080
e contengono la materia prima,

16
00:00:44,080 --> 00:00:46,020
con cui poi andremo
a fare il cacao

17
00:00:46,020 --> 00:00:48,300
Questa materia prima
viene schiacciata,

18
00:00:48,300 --> 00:00:51,300
messa in apposite macchine

19
00:00:51,300 --> 00:00:53,300
e alla fine si produce
la massa di cacao

20
00:00:53,300 --> 00:00:55,300
chiamata anche liquore di cacao

21
00:00:55,300 --> 00:00:57,600
perchè durante la lavorazione
è liquida.

22
00:00:57,600 --> 00:01:03,680
Questa massa di cacao grezzo
contiene circa il 55% di grassi

23
00:01:03,680 --> 00:01:05,480
e questo è il motivo per cui

24
00:01:05,480 --> 00:01:07,720
il cioccolato non si mescola
con l'acqua:

25
00:01:07,720 --> 00:01:11,500
grasso e acqua
non hanno intenzione di mescolarsi.

26
00:01:11,500 --> 00:01:13,000
Vogliamo fare un esperimento?

27
00:01:13,000 --> 00:01:13,640
-D'accordo

28
00:01:13,640 --> 00:01:16,640
-Allora Sara, adesso
sciogliamo del cioccolato.

29
00:01:16,640 --> 00:01:18,940

and it contains these seeds.

13
00:00:37,500 --> 00:00:39,080
che vengono chiamati fave

14
00:00:39,080 --> 00:00:42,020
These seeds are then ground

15
00:00:42,020 --> 00:00:44,080
into smaller pieces

16
00:00:44,080 --> 00:00:46,020
to make cocoa powder.

17
00:00:46,020 --> 00:00:48,300
This product is then processed

18
00:00:48,300 --> 00:00:51,300
by a crushing machine

19
00:00:51,300 --> 00:00:53,300
and the result is chocolate liquor,

20
00:00:53,300 --> 00:00:55,300
which is also called cocoa liquor:

21
00:00:55,300 --> 00:00:57,600
it is called liquor because of the
liquid texture it has at this stage.

22
00:00:57,600 --> 00:01:03,680
The liquor contains
about 55% of fat:

23
00:01:03,680 --> 00:01:05,480
this is the reason why

24
00:01:05,480 --> 00:01:07,720
chocolate and water don't mix.

25
00:01:07,720 --> 00:01:11,500
Fat and water hardly combine.

26
00:01:11,500 --> 00:01:13,000
Shall we try an experiment?

27
00:01:13,000 --> 00:01:13,640
Let's do it!

28
00:01:13,640 --> 00:01:16,640
-Well. Let's melt
some chocolate, Sara.

29
00:01:16,640 --> 00:01:18,940

Quando si scioglie del cioccolato

30

00:01:18,940 --> 00:01:21,760

è importante mantenere temperature abbastanza basse,

31

00:01:21,760 --> 00:01:23,760

ecco perché è preferibile

32

00:01:23,760 --> 00:01:25,760

scioglierlo in quello che si chiama

33

00:01:25,760 --> 00:01:27,760

un doppio bagnomaria.

34

00:01:27,760 --> 00:01:30,500

È il vapore che si solleva dalla pentola

35

00:01:30,500 --> 00:01:33,500

che deve sciogliere *lentamente* il cioccolato.

36

00:01:34,500 --> 00:01:36,520

A 40 gradi è già sciolto

37

00:01:36,520 --> 00:01:37,800

Bisogna stare attenti

38

00:01:37,800 --> 00:01:40,500

a non arrivare a temperature troppo elevate

39

00:01:40,500 --> 00:01:42,800

perché altrimenti il cioccolato brucia,

40

00:01:43,520 --> 00:01:46,400

diventa amaro, acido e immangiabile.

41

00:01:46,900 --> 00:01:50,400

-Utilizziamo cioccolato fondente per quest'operazione

42

00:01:50,400 --> 00:01:54,400

-Sì, usiamo cioccolato fondente per fare i nostri esperimenti

43

00:01:54,400 --> 00:01:58,200

perché il cioccolato fondente è più ricco di grassi.

44

00:01:58,200 --> 00:02:01,280

Nonostante molti pensino che sia più dietetico,

45

00:02:01,280 --> 00:02:04,200

in realtà il cioccolato fondente è più ricco di grassi,

When melting chocolate,

30

00:01:18,940 --> 00:01:21,760

keeping low temperatures is of the utmost importance:

31

00:01:21,760 --> 00:01:23,760

this is why chocolate should be melted

32

00:01:23,760 --> 00:01:25,760

with a double boiler

33

00:01:25,760 --> 00:01:27,760

un doppio bagnomaria.

34

00:01:27,760 --> 00:01:30,500

The steam produced by the water in the pot

35

00:01:30,500 --> 00:01:33,500

slowly melts the chocolate.

36

00:01:34,500 --> 00:01:36,520

It melts at 40 °C.

37

00:01:36,520 --> 00:01:37,800

Be careful not to overheat the chocolate

38

00:01:37,800 --> 00:01:40,500

if temperature is too high

39

00:01:40,500 --> 00:01:42,800

chocolate may burn:

40

00:01:43,520 --> 00:01:46,400

if it burns, it becomes bitter, sour and it won't taste good.

41

00:01:46,900 --> 00:01:50,400

-This experiment requires dark chocolate

42

00:01:50,400 --> 00:01:54,400

-Yes, we are using dark chocolate,

43

00:01:54,400 --> 00:01:58,200

because it is richer in fat.

44

00:01:58,200 --> 00:02:01,280

Although many people think that dark chocolate is more dietetic

45

00:02:01,280 --> 00:02:04,200

than regular chocolate it is not: as we said, it is richer in fat

46
00:02:04,200 --> 00:02:05,920
più calorico di quello al latte.

47
00:02:05,920 --> 00:02:08,720
Adesso possiamo procedere
con il nostro esperimento

48
00:02:08,720 --> 00:02:10,000
e rovinarlo aggiungendoci
un po' d'acqua

49
00:02:10,000 --> 00:02:11,000
-Sicuro?

50
00:02:11,010 --> 00:02:11,500
-Sicuro

51
00:02:12,000 --> 00:02:14,000
-Che sarà mai una goccia d'acqua?

52
00:02:15,280 --> 00:02:17,300
-In realtà è abbastanza per rovinare

53
00:02:17,300 --> 00:02:18,840
quello che abbiamo fatto

54
00:02:18,840 --> 00:02:21,500
Vedi? Si sta rapprendendo,
diventa più scuro

55
00:02:21,500 --> 00:02:24,000
ci sono dei grumi
che si formano

56
00:02:24,800 --> 00:02:27,480
Sembrerebbe una cosa immangiabile

57
00:02:27,480 --> 00:02:28,200
-È da buttare!

58
00:02:28,200 --> 00:02:29,900
-Eh no, succede
quel che succede

59
00:02:29,900 --> 00:02:32,200
quando facciamo cadere
una goccia di caffè

60
00:02:32,200 --> 00:02:33,300
in una zuccheriera.

61
00:02:33,300 --> 00:02:36,900
La goccia d'acqua,
poca rispetto allo zucchero presente,

62
00:02:36,900 --> 00:02:39,800
attira lo zucchero intorno
e forma un grumo.

63

46
00:02:04,200 --> 00:02:05,920
and it has more calories
than milk chocolate.

47
00:02:05,920 --> 00:02:08,720
Now let's try this experiment:

48
00:02:08,720 --> 00:02:10,000
first, let's ruin it by adding some water

49
00:02:10,000 --> 00:02:11,000
-Are you sure?

50
00:02:11,010 --> 00:02:11,500
-Of course I am

51
00:02:12,000 --> 00:02:14,000
-What can some water do to ruin it?

52
00:02:15,280 --> 00:02:17,300
-Actually, 'some' is enough

53
00:02:17,300 --> 00:02:18,840
to ruin our chocolate.

54
00:02:18,840 --> 00:02:21,500
See? It's curdling,
it became darker

55
00:02:21,500 --> 00:02:24,000
and there are some lumps.

56
00:02:24,800 --> 00:02:27,480
It looks like it is inedible

57
00:02:27,480 --> 00:02:28,200
-Put it in the trash!

58
00:02:28,200 --> 00:02:29,900
-Well, this is normal:
it also happens

59
00:02:29,900 --> 00:02:32,200
when we spill
a few drops of coffee

60
00:02:32,200 --> 00:02:33,300
in a sugar bowl.

61
00:02:33,300 --> 00:02:36,900
The water droplet,
which is smaller in quantity,

62
00:02:36,900 --> 00:02:39,800
attracts the sugar,
thus causing it to form lumps.

63

00:02:39,800 --> 00:02:45,600
Paradossalmente, poca acqua
rovina lo zucchero e il cioccolato,

64
00:02:45,600 --> 00:02:50,000
ma aggiungendo un liquido acquoso
riusciamo a riscogliere i grumi.

65
00:02:50,000 --> 00:02:52,120
Questo è quello
che andiamo a fare ora

66
00:02:52,120 --> 00:02:56,360
per eliminare i grumi
che si erano formati nel cioccolato

67
00:02:56,360 --> 00:02:59,800
Aggiungiamo dell'acqua tiepida

68
00:02:59,800 --> 00:03:02,680
in modo tale da non creare
shock termici al cioccolato

69
00:03:02,680 --> 00:03:05,600
piano piano, poco alla volta
e cominciamo a mescolare.

70
00:03:05,600 --> 00:03:08,600
In questa maniera
l'acqua cercherà di sciogliere

71
00:03:08,600 --> 00:03:11,700
i grumi di zucchero
che si sono formati

72
00:03:11,700 --> 00:03:15,800
e che rendono così viscoso
e denso il cioccolato

73
00:03:15,800 --> 00:03:21,120
Chiaramente, questo cioccolato fluido
non indurisce più,

74
00:03:21,120 --> 00:03:24,200
però possiamo utilizzarlo
per fare tante altre cose.

75
00:03:24,200 --> 00:03:27,200
Visto che abbiamo
molte tavolette di cioccolato fondente,

76
00:03:27,200 --> 00:03:28,440
ci facciamo una mousse?

77
00:03:28,440 --> 00:03:30,440
D'accordo, guardo se ho un po' di panna

78
00:03:30,800 --> 00:03:33,360
Non serve la panna,
è sufficiente un po' d'acqua

79

00:02:39,800 --> 00:02:45,600
Strangely enough, a small quantity
of water spoils sugar and chocolate,

64
00:02:45,600 --> 00:02:50,000
but by adding more liquid
the lumps dissolve.

65
00:02:50,000 --> 00:02:52,120
This is what we are about to do:

66
00:02:52,120 --> 00:02:56,360
to dissolve the lumps in the chocolate

67
00:02:56,360 --> 00:02:59,800
All it takes
is some lukewarm water,

68
00:02:59,800 --> 00:03:02,680
so that there is no
thermal shock in the chocolate

69
00:03:02,680 --> 00:03:05,600
we must pour the water slowly
and then we can start mixing

70
00:03:05,600 --> 00:03:08,600
The water here is trying to melt

71
00:03:08,600 --> 00:03:11,700
the curdled sugar

72
00:03:11,700 --> 00:03:15,800
which made the chocolate
become dense and viscous.

73
00:03:15,800 --> 00:03:21,120
Clearly, chocolate is now fluid
and won't harden again,

74
00:03:21,120 --> 00:03:24,200
we can use it to prepare
something else.

75
00:03:24,200 --> 00:03:27,200
Since we have many other
dark chocolate bars,

76
00:03:27,200 --> 00:03:28,440
what about a mousse?

77
00:03:28,440 --> 00:03:30,440
Why not? Let me see if there is
some whipping cream in the fridge.

78
00:03:30,800 --> 00:03:33,360
We do not need cream,
all it takes is some water.

00:03:33,680 --> 00:03:35,480
-Ho sentito, ti basta solo acqua?

80
00:03:35,480 --> 00:03:37,500
-Sì, la ricetta base prevede:

81
00:03:37,500 --> 00:03:40,500
una tavoletta al 70%
di cioccolato fondente

82
00:03:40,500 --> 00:03:42,300
e 100g di acqua,

83
00:03:42,300 --> 00:03:44,500
misurati al grammo,
mi raccomando.

84
00:03:44,500 --> 00:03:45,240
Prendi

85
00:03:45,240 --> 00:03:45,800
-Grazie

86
00:03:45,800 --> 00:03:48,000
Iniziamo.
Spezza pure il cioccolato, Sara

87
00:03:50,280 --> 00:03:52,240
Possiamo aggiungere
i 100g d'acqua,

88
00:03:52,240 --> 00:03:53,680
tutti in un colpo solo.

89
00:03:55,240 --> 00:03:57,240
E cominciamo a scaldare
piano piano.

90
00:03:58,240 --> 00:04:06,080
L'acqua si mescola al cioccolato
anche grazie all'aiuto della lecitina di soia,

91
00:04:06,080 --> 00:04:11,880
spesso aggiunta al cioccolato fondente
durante la lavorazione

92
00:04:11,880 --> 00:04:16,760
per migliorare la dispersione dello zucchero
di cui abbiamo parlato prima

93
00:04:16,760 --> 00:04:20,120
Quindi questa è una ricetta
che funziona bene,

94
00:04:20,120 --> 00:04:23,680
con un cioccolato che contiene
la lecitina di soia.

95
00:04:23,680 --> 00:04:28,400
Usando un cioccolato
con un maggior quantitativo di grassi

79
00:03:33,680 --> 00:03:35,480
-I see, so you only need water, right?

80
00:03:35,480 --> 00:03:37,500
-Yes, what we need is:

81
00:03:37,500 --> 00:03:40,500
a 70% dark chocolate bar

82
00:03:40,500 --> 00:03:42,300
and 100g of water.

83
00:03:42,300 --> 00:03:44,500
All ingredients must be
weighed accurately

84
00:03:44,500 --> 00:03:45,240
Here you go

85
00:03:45,240 --> 00:03:45,800
-Thanks

86
00:03:45,800 --> 00:03:48,000
Let's start.
You can break the chocolate into pieces, Sara.

87
00:03:50,280 --> 00:03:52,240
Then, let's add the water

88
00:03:52,240 --> 00:03:53,680
all together.

89
00:03:55,240 --> 00:03:57,240
Then, we can turn on the stove
and slowly heat chocolate and water.

90
00:03:58,240 --> 00:04:06,080
Water mixes with chocolate thanks to
soy lecithin,

91
00:04:06,080 --> 00:04:11,880
which is usually an ingredient
added while preparing chocolate,

92
00:04:11,880 --> 00:04:16,760
to help dissolve sugar, as we said before.

93
00:04:16,760 --> 00:04:20,120
This recipe works fine,

94
00:04:20,120 --> 00:04:23,680
for the chocolate contains
soy lecithin.

95
00:04:23,680 --> 00:04:28,400
If we were to use some other kind
of chocolate, richer in fat,

96
00:04:28,400 --> 00:04:30,500
dovremmo utilizzare
un po' più d'acqua.

97
00:04:30,500 --> 00:04:34,920
Se ci sono meno grassi
dovremmo utilizzare meno acqua.

98
00:04:34,920 --> 00:04:38,240
-Quindi la quantità di acqua
va aggiunta in base ai grassi

99
00:04:38,240 --> 00:04:40,280
e non alla percentuale di cacao.

100
00:04:40,280 --> 00:04:40,700
-Esatto

101
00:04:40,700 --> 00:04:42,700
-La consistenza va bene?

102
00:04:42,700 --> 00:04:44,700
-Sì, direi che è perfetta.

103
00:04:44,700 --> 00:04:51,400
Ora abbiamo una miscela di grassi
al sapore di cacao, sciolti in acqua

104
00:04:51,520 --> 00:04:56,240
E quindi è come se fosse
della panna fresca da montare.

105
00:04:56,240 --> 00:04:59,320
Quindi avremo bisogno di raffreddarla
con del ghiaccio

106
00:04:59,320 --> 00:05:04,200
e usare un frullatore per ottenere una mousse
solamente al cioccolato fondente.

107
00:05:05,440 --> 00:05:09,800
Vi accorgete quando inizierà a montare
dal cambiamento di colore,

108
00:05:09,800 --> 00:05:11,800
diventerà leggermente più chiara.

109
00:05:13,280 --> 00:05:15,240
Attenzione a non montarla troppo

110
00:05:15,240 --> 00:05:19,300
perché altrimenti rischiamo di fare
esattamente come per la panna montata,

111
00:05:19,300 --> 00:05:23,520
cioè separiamo il grasso,
che volevamo invece mantenere.

112
00:05:23,520 --> 00:05:25,520

96
00:04:28,400 --> 00:04:30,500
we should have used more water.

97
00:04:30,500 --> 00:04:34,920
The lesser the fats,
the smaller the quantity of water.

98
00:04:34,920 --> 00:04:38,240
-So we should add water based on
fats in the chocolate,

99
00:04:38,240 --> 00:04:40,280
and not on the quantity of cocoa in the bar.

100
00:04:40,280 --> 00:04:40,700
-Correct

101
00:04:40,700 --> 00:04:42,700
-Is it dense enough?

102
00:04:42,700 --> 00:04:44,700
-Yes, I think it is.

103
00:04:44,700 --> 00:04:51,400
What we have here is a mixture of
cocoa-flavored fat, melted in water.

104
00:04:51,520 --> 00:04:56,240
It is like whipping cream.

105
00:04:56,240 --> 00:04:59,320
Now we need to lower the temperature
by using some ice.

106
00:04:59,320 --> 00:05:04,200
We also need an electric mixer
to get a cream-free dark chocolate mousse

107
00:05:05,440 --> 00:05:09,800
When it starts whipping it changes color,

108
00:05:09,800 --> 00:05:11,800
turning lighter.

109
00:05:13,280 --> 00:05:15,240
Be careful not to whip it too much:

110
00:05:15,240 --> 00:05:19,300
this mixture, in fact, behaves
like normal whipping cream.

111
00:05:19,300 --> 00:05:23,520
we risk of separating the fat,
not keeping it.

112
00:05:23,520 --> 00:05:25,520

Ora è pronta per essere assaggiata.

113
00:05:26,320 --> 00:05:30,600
-Quindi finalmente una <i>mousse au chocolat</i>
per i veri amanti del fondente

114
00:05:30,600 --> 00:05:32,920
-Sì, questa è la preparazione di base,

115
00:05:32,920 --> 00:05:37,600
però possiamo aromatizzarla
con liquidi sempre a base d'acqua

116
00:05:37,600 --> 00:05:40,000
che si sposino bene con il cioccolato:

117
00:05:40,000 --> 00:05:44,000
ad esempio possiamo utilizzare del caffè
invece dell'acqua,

118
00:05:44,000 --> 00:05:47,280
o del succo d'arancia,
del succo di fragola,

119
00:05:47,280 --> 00:05:49,440
o anche, perché no? Un po' di liquore

120
00:05:49,440 --> 00:05:50,800
-Proviamola anche così

121
00:05:50,800 --> 00:05:51,800
-Proviamola

122
00:05:52,320 --> 00:05:53,800
-E buon divertimento a voi!

Now let's taste it

113
00:05:26,320 --> 00:05:30,600
-Here's a *mousse au chocolat*
for real dark chocolate lovers

114
00:05:30,600 --> 00:05:32,920
-Well, this is the basic recipe,

115
00:05:32,920 --> 00:05:37,600
but there are plenty of liquids we can use

116
00:05:37,600 --> 00:05:40,000
that taste good when mixed with chocolate:

117
00:05:40,000 --> 00:05:44,000
for instance, we could use coffee
instead of water,

118
00:05:44,000 --> 00:05:47,280
or some orange or strawberry juice

119
00:05:47,280 --> 00:05:49,440
or even some liquor.

120
00:05:49,440 --> 00:05:50,800
-We can try

121
00:05:50,800 --> 00:05:51,800
-Yes, I agree

122
00:05:52,320 --> 00:05:53,800
-Have fun!

3.3.5 fisica in video - Pompa a vuoto

AUTO-GENERATED ITALIAN SUBTITLES

00:01
[Musica]
00:11
la pressione è una grandezza che viene
00:16
misurata con una varietà di unità di
00:20
misura per esempio c'è il **torr** il bar i
00:24
centimetri di mercurio ma l'unità
00:26
standard è il **pascal** //
00:28
per avere un'idea di quanto sia piccola
00:32
rispetto alle nostre abitudini
00:33
la pressione di un pascal andremo **al** suo
00:36
significato // un pascal significa un
00:39
newton quindi il peso corrispondente
00:42

ENGLISH TRANSLATION

00:01
[Music]
00:11
Pressure is a physical quantity.
00:16
Although there are various unit
00:20
for pressure measurement, for instance
00:24
the torr, the bar, or mercury centimeters,
00:26
the standard unit is the Pascal.
00:28
To get an idea of the pressure levels
00:32
in a Pascal, when compared to our standards,
00:33
we first need to understand what a Pascal is.
00:36
A Pascal is equivalent to one Newton,
00:39
which means the weight corresponding
00:42

alla massa di un etto circa ogni metro
00:45
quadro // allora prenderemo circa un etto
00:48
di questa sabbia fine e la distribuiremo
00:51
su un metro quadro per avere l'idea di
00:55
quanto leggera sia la pressione di un
00:57
pascal proviamo
01:06
[Musica]
01:22
per capire il concetto di pressione
01:25
utilizzeremo questa campana appoggiata
01:29
su un piatto collegato a una pompa a
01:32
vuoto proviamo a immaginare la pressione
01:36
innanzitutto come prodotta dagli urti
01:39
delle particelle per esempio dell'area
01:43
contro le pareti di questa campana
01:46
se gli urti avvengono sia esternamente
01:49
sia internamente noi possiamo prendere
01:52
questa campana e sollevarla senza
01:54
problemi ma se noi cominciamo a togliere
01:58
aria all'interno della campana
02:00
accendendo la pompa ci accorgiamo che in
02:05
un certo senso vincono le molecole
02:07
esterne per cui la pressione esterna si
02:11
manifesta come una impossibilità a
02:13
togliere questa campana che è diventata
02:15
una ventosa sarà sufficiente però
02:18
spegnere la pompa permettere all'area-aria di
02:21
tornare all'interno per riequilibrare la
02:26
pressione esterna e quella interna e
02:28
togliere tranquillamente la campana
02:30
senza nessuno sforzo // ora metteremo in
02:34
evidenza questo fatto da un altro punto
02:36
di vista
02:37
prenderemo innanzitutto una retina che
02:42
impedirà a un palloncino che gonfiare mo gonfieremo
02:45
di essere risucchiato dal buco della
02:48
pompa a vuoto
02:51
prendiamo questo palloncino e gonfiato
02:54
parzialmente vuol dire che l'aria
02:56
contenuta all'interno è fatta da

to the mass of an hectogram per square meter.
00:45
We will now take an hectogram
00:48
of this fine grain sand and we will spread it
00:51
on a square meter.
00:55
By doing so, we will prove that
00:57
the pressure of a Pascal is pretty light.
01:06
[Music]
01:22
To understand the concept of pressure
01:25
we will use this bell jar, which stands
01:29
on a plate connected to a vacuum pump.
01:32
We should think about pressure
01:36
as a consequence of molecules clashing
01:39
against, for instance,
01:43
the sides of this bell.
01:46
If molecules clash both externally
01:49
and internally, we can lift this bell:
01:52
we could do it effortlessly.
01:54
However, if we remove the air
01:58
that is inside the bell and we turn on
02:00
the vacuum pump this happens:
02:05
external molecules are stronger,
02:07
so external pressure makes it impossible
02:11
to lift the bell from the plate.
02:13
The bell is now a suction cup.
02:15
To return to the previous state,
02:18
all it takes is to switch the pump off,
02:21
so that air flows back in the jar:
02:26
external and internal pressure
02:28
will now be balanced and we will be able
02:30
to remove the jar, again, effortlessly.
02:34
Now we will see the same concept,
02:36
but from a different perspective.
02:37
Here is a net:
02:42
it will stop this balloon
02:45
from being sucked in the hole
02:48
of the vacuum pump.
02:51
This balloon has not completely been blown:
02:54
this means that the air inside the balloon
02:56
is made of molecules

02:58
molecole che spingono urtando la parete
03:01
interna ed hanno questa configurazione
03:04
quasi sferica che ha e mantengono in
03:06
equilibrio dagli urti dalle molecole
03:08
all'esterno
03:09
se noi tramite la pompa a vuoto togliamo
03:12
le molecole esterne alla superficie del
03:15
palloncino in un certo senso vincono
03:17
quella all'interno e il palloncino si
03:20
gonfia ma nessuno sta introducendo nuove
03:24
molecole
03:25
sono le stesse molecole che erano già
03:27
contenute che hanno più libertà di
03:30
espandere la membrana elastica // ci
03:35
aspettavamo che il palloncino scoppiasse
03:37
è infatti è scoppiato spegniamo la pompa
03:42
possiamo comprendere utilizzando
03:45
l'analogia del palloncino // questo
03:47
fenomeno curioso prenderemo dalla
03:49
schiuma da barba e ne metteremo un po'
03:52
all'interno di questo becker metteremo
03:56
il becker qui al centro del nostro
03:59
piatto e lo scopriremo con la campana di
04:02
vetro azione remo azioneremo la pompa a vuoto e e
04:05
se arriveremo osserveremo
04:07
[Applauso]
04:09
la schiuma si gonfia ci chiediamo
04:12
innanzitutto ma per che che motivo si gonfia
04:14
qualcuno dirà perché c'è aria dentro la
04:17
schiuma spegniamo la pompa possiamo
04:21
osservare che la schiuma assume ora una
04:25
configurazione molto più liquida
04:27
potremmo dire con meno aria eppure se
04:31
noi rimettiamo in azione alla pompa la
04:34
schiuma si può fiera gonfiera ancora
04:38
[Applauso]
04:40
allora ci chiediamo dove si trova questa
04:43
aria in grado di gonfiare la schiuma
04:45

02:58
that are pushing towards the sides of the balloon.
03:01
They are kind of sphere-shaped.
03:04
The external molecules help maintain
03:06
this shape balanced.
03:08
If we remove the molecules
03:09
outside the balloon with the pump
03:12
the external molecules are stronger:
03:15
they become, in fact, stronger than
03:17
the molecules inside the balloon.
03:20
The balloon increases in size,
03:24
however, there aren't any new molecules:
03:25
they are the same as before.
03:27
The difference is that now they have
03:30
more space to expand the balloon membrane.
03:35
We knew the balloon would blow up:
03:37
let's turn off the pump now.
03:42
We can use the same analogy
03:45
for another experiment.
03:47
Let's take some shaving foam:
03:49
we'll put some inside this becker,
03:52
then we'll put the becker here,
03:56
at the center of our plate
03:59
and we'll cover it with our bell.
04:02
It's time to activate the pump:
04:05
as you can see,
04:07
[Applauso]
04:09
the foam expands.
04:12
But why?
04:14
It is because the foam is made out of air.
04:17
Let's turn off the pump.
04:21
Now the foam has more
04:25
of a liquid consistency.
04:27
It doesn't have less air than before,
04:31
in fact, by activating the pump a second time,
04:34
the foam expands again.
04:38
[Applauso]
04:40
So, the question is:
04:43
where is the air that makes the foam expand?
04:45

dobbiamo supporre che la schiuma da
 04:48
 barba sia fatta da milioni e milioni di
 04:52
 piccole bolle di sapone
 04:54
 ciascuna delle quali si comporta come il
 04:56
 palloncino di gomma che in diminuzione
 04:59
 della pressione esterna permette appunto
 05:03
 di essere gonfiato

We need to think that shaving foam
 04:48
 is made of millions and millions
 04:52
 of tiny little soap balls:
 04:54
 each one of them behaves like the balloon,
 04:56
 which, when external pressure
 04:59
 was lower, expanded more easily

3.3.6 Zanichelli editore S.p.A. - Ebollizione dell'acqua nel vuoto (tratto da L'Amaldi per i licei scientifici)

AUTO-GENERATED ITALIAN SUBTITLES

ENGLISH SUBTITLES

00:05
 in questo esperimento verifichiamo che
 00:09
 abbassando la pressione esterna l'acqua
 00:11
 raggiunge l'ebollizione anche a
 00:13
 temperatura ambiente //
 00:18
 abbiamo bisogno di una pompa per il
 00:20
 vuoto con la sua campana di vetro // un
 00:22
 becker riempito d'acqua è un termometro
 00:29
 verifichiamo con il termometro che
 00:31
 l'acqua sia a temperatura ambiente
 00:36
 appoggiamo il becker pieno d'acqua sul
 00:39
 piatto della pompa meccanica per il
 00:40
 vuoto
 00:41
 copriamo la campana con la campana di vetro e
 00:43
 accendiamo la pompa meccanica
 00:45
 dopo qualche decina di secondi
 00:47
 osserviamo la tipica turbolenza
 00:49
 dell'ebollizione facciamo rientrare
 00:58
 l'aria nella campana apriamola e
 01:02
 verifichiamo che l'acqua nel becker si
 01:05
 trova ancora circa a temperatura
 01:07
 ambiente
 01:14
 La pompa aspira via l'aria dalla campana e la
 01:16
 pressione all'interno di questo ambiente
 01:18
 sigillato diminuisce al passare del
 01:20
 tempo // fin quando la pressione sotto la
 01:24
 campana resta maggiore della pressione
 01:26

00:05
 In this experiment we will demonstrate
 00:09
 that water boils at ambient temperature
 00:11
 by lowering external pressure.
 00:13
 temperatura ambiente
 00:18
 We need a vacuum pump,
 00:20
 a bell jar, a becker full of water
 00:22
 and a thermometer.
 00:29
 We will use the thermometer
 00:31
 to make sure water is at ambient temperature.
 00:36
 We will now put the becker
 00:39
 on the vacuum pump plate.
 00:40
 vuoto
 00:41
 Now let's cover it with the bell
 00:43
 and turn on the vacuum pump.
 00:45
 After some time
 00:47
 we can see that water
 00:49
 is starting to boil:
 00:58
 now it's time to let the air back in.
 01:02
 Let's test the temperature of the water:
 01:05
 it should still be at ambient temperature.
 01:07
 ambiente
 01:14
 The pump removes the air from the bell
 01:16
 and pressure in this sealed environment
 01:18
 diminishes by the second.
 01:20
 As pressure under the bell is greater
 01:24
 than pressure inside the vapor bubbles
 01:26

| | |
|---|---|
| interna delle bollicine di vapore nel 01:28 | that are inside water, 01:28 |
| liquido queste non crescono e restano 01:31 | they do not increase in size 01:31 |
| invisibili a un certo punto però la 01:36 | and are not visible. 01:36 |
| pressione esterna raggiunge quella 01:38 | Then, external and internal pressure 01:38 |
| interna delle bollicine che crescono e 01:41 | become even and bubbles grow 01:41 |
| risalgono in alto per la spinta di 01:42 | and rise to the top, thanks to 01:42 |
| Archimede manifestando la tipica 01:45 | Archimedes' principle. 01:45 |
| turbolenza dell'ebollizione // si spiega 01:48 | This is the reason why 01:48 |
| così perché in montagna dove la 01:50 | at a higher altitude, where atmospheric pressure 01:50 |
| pressione atmosferica è minore di quella 01:52 | is lower than pressure at sea level, 01:52 |
| a livello del mare l'acqua bolle a una 01:55 | water boils at less than 100 degrees Celsius. |
| temperatura inferiore a 100 gradi 01:56 | |
| celsius | |

3.3.7 ImmediaTest – acqua presentato a Super Quark di Piero Angela

AUTO-GENERATED ITALIAN SUBTITLES

ENGLISH TRANSLATION

| | |
|---|---|
| 00:04 | 00:04 |
| l'italia è il paese in cui si consuma | Italy is the first country for mineral water usage. |
| 00:07 | 00:07 |
| più acqua minerale // generalmente l'acqua | Water provided by municipalities |
| 00:11 | 00:11 |
| del comune è molto buona anche perché | is usually clean and pure: |
| 00:14 | 00:14 |
| l'italia è un paese montagnoso con tante | in Italy, in fact, there is plenty of mountains, |
| 00:18 | 00:18 |
| fonti // molte persone però non si fidano | therefore there is a plethora of fresh water springs. |
| 00:21 | 00:21 |
| perché temono che lungo il percorso | However, many people are afraid |
| 00:23 | 00:23 |
| possano esserci infiltrazioni // | of infiltrations in the pipelines. |
| 00:26 | 00:26 |
| oggi c'è un modo per controllare | But now there is a method that may be helpful |
| 00:29 | 00:29 |
| controllare soprattutto se non c'è | to identify problems occurring in sewers: |
| 00:31 | 00:31 |
| qualche problema con le tubazioni | those problems may be identified |
| 00:34 | 00:34 |
| domestiche quelle che collegano | in the pipelines connecting aqueducts |
| 00:36 | 00:36 |
| l'acquedotto comunale alla propria | to households |
| 00:38 | 00:38 |
| abitazione | abitazione |
| 00:40 | 00:40 |
| il servizio che vede rete ora vedrete ora ci spiega | The following clip will feature |
| 00:42 | 00:42 |
| in cosa consiste questo metodo che | the aforementioned method. |
| 00:45 | 00:45 |
| consente di assicurarsi sulla bontà | It is used to both verify that |
| 00:47 | 00:47 |
| dell'acqua del rubinetto e diminuire | tap water is potable |
| 00:50 | 00:50 |
| così verticalmente la spesa sentiamo | and water bills cost less. |
| 00:53 | 00:53 |
| andrea pasquini | I will now give the floor to Andrea Pasquini |
| 01:01 | 01:01 |
| periodicamente sui media ma anche tra | There is an ongoing debate |
| 01:03 | 01:03 |
| conoscenti amici o in famiglia si | among friends and relatives, and in TV, |
| 01:06 | 01:06 |

discute se è preferibile bere le acque
01:08
minerali in bottiglia o quelle fornite
01:10
dai rubinetti di casa? // si stima che in
01:12
italia nello scorso anno siano stati
01:14
imbottigliati 12,5 miliardi di litri di
01:17
acqua per un consumo pro capite di 194
01:20
litri più del doppio della media europea
01:23
e americana // in italia l'acqua minerale
01:25
imbottigliata è prelevata da 189 fonti
01:28
da cui attingono 321 aziende
01:31
imbottigliatrici per un giro di affari
01:33
di oltre 2 miliardi di euro l'anno //
01:37
i prezzi alla fonte per queste aziende
01:39
sono stabiliti da regioni e comuni di
01:41
appartenenza ma in generale sono costi
01:44
decisamente bassi vista la mancanza di
01:46
parametri di riferimento non esiste
01:49
infatti una legge nazionale che
01:50
definisca gli importi dei canoni di
01:52
concessione per l'imbottigliamento delle
01:54
acque minerali ma è certo che in nessuna
01:57
regione il costo supera i 3 euro al
01:59
metro cubo cioè mille litri
02:04
l'acqua del rubinetto invece quella che
02:06
ci fornisce il nostro comune di
02:08
residenza anche attraverso le fontanelle
02:10
pubbliche ha un costo medio nazionale di
02:12
circa 1 euro al metro cubo è di solito
02:15
di buona qualità ma generalmente
02:17
consumata con diffidenza //
02:19
resta il fatto che non occorre
02:21
ricordarlo è necessario bere una
02:23
sufficiente quantità di acqua al giorno
02:25
per rimanere in vita e come ci hanno
02:27
insegnato quasi subito da bambini
02:29
l'acqua deve essere incolore insapore ed
02:32
inodore
02:33
ma è proprio così semplice? // è sufficiente
02:36
riscontrare questi tre parametri milari

about water:
01:08
is it better to drink bottled water
01:10
or tap water?
01:12
It is said that last year
01:14
12.5 billion liters of water were bottled;
01:17
that makes a per capita consumption of 194 liters of water,
01:20
which is more than double, when compared
01:23
to the European and American average consumption.
01:25
In Italy, water is gathered from 189 springs,
01:28
exploited by 321 companies:
01:31
the estimated turnover hovers
01:33
at 2 billion euros per year.
01:37
Costs are decided by Italian regions
01:39
and municipalities the springs belong to.
01:41
Those costs are generally low:
01:44
this happens because there are no
01:46
benchmarks, or specific rules
01:49
that discipline the concession fees
01:50
for the processing
01:52
and bottling of mineral water.
01:54
One thing is certain:
01:57
water costs no more than 3 euros
01:59
per cube meter, that is 1000 liters.
02:04
The cost of regular tap water is also similar:
02:06
it is provided by municipalities
02:08
also by means of public fountains,
02:10
and it usually costs 1 euro per cube meter.
02:12
It is potable, good-quality water,
02:15
but it is not as consumed
02:17
as bottled water.
02:19
It is obvious that
02:21
a sufficient dose of water
02:23
is to be consumed every day:
02:25
it is necessary for our survival.
02:27
Moreover, as we all know,
02:29
water needs to be colorless, tasteless
02:32
and odorless.
02:33
But is it that simple?
02:36
are those three features enough

| | | | |
|-------|---|-------|--|
| 02:39 | per poter bere tranquilli? // forse sì fino | 02:39 | to tell good water from bad water? |
| 02:41 | | 02:41 | Until recent times, maybe yes. |
| 02:44 | a qualche tempo fa ma oggi sembra che le | 02:44 | However, now there are other features |
| 02:46 | cose siano cambiate a causa di vari | 02:46 | to keep in mind, such as environment and pollution. |
| 02:49 | fattori ambientali e di inquinamento per | 02:49 | Bottled water comes with labels: |
| 02:51 | esempio su una bottiglia di acqua oltre | 02:51 | next to the brand name |
| 02:53 | il marchio possiamo leggere le varie | 02:53 | there usually is a chart, featuring |
| 02:55 | caratteristiche chimiche riportate e | 02:55 | certified chemical characteristics of water. |
| 02:57 | certificate solitamente dall'istituto | 02:57 | This chart is generally made by |
| 02:59 | biologico della più vicina università | 02:59 | universities' institutes of biological chemistry. |
| 03:01 | alla zona di provenienza | 03:01 | However, how can we be sure of the quality |
| 03:03 | ma quando apriamo il rubinetto di casa o | 03:03 | of tap water we drink in our home, in a hotel, |
| 03:05 | in un albergo o alla fontanella comunale | 03:05 | or at a public fountain? |
| 03:09 | che ci dice che cosa stiamo vedendo // di | 03:09 | Usually, aqueducts undergo many controls, |
| 03:10 | normati norma gli acquedotti sono ben controllati | 03:10 | made by local health authorities |
| 03:13 | dalle varie asp ASL e dalle agenzie | 03:13 | or Regional Environmental Protection Agencies: |
| 03:15 | regionali prevenzione e ambiente che | 03:15 | they run specific chemical, physical |
| 03:17 | eseguono accurate analisi chimiche | 03:17 | and microbiological analyses. |
| 03:20 | fisiche e microbiologiche ma | 03:20 | Pipelines and plumbing checks |
| 03:22 | generalmente i controlli sulla rete | 03:22 | are tendentially made at the expenses of the consumer. |
| 03:24 | domestica e quindi sui nostri tubi e | 03:24 | However, these checks |
| 03:26 | rubinetti sono a carico del consumatore | 03:26 | may not take place. |
| 03:29 | e non sempre questo accade // si può | 03:29 | It is possible to ask them to the water provider, |
| 03:30 | richiedere un controllo ma è abbastanza | 03:30 | but it may be expensive. |
| 03:35 | oneroso | 03:35 | Two researchers from the |
| 03:39 | alla bicocca di milano due ricercatori del | 03:39 | University of Milano-Bicocca's |
| 03:40 | dipartimento di biotecnologie e | 03:40 | Department of Biotechnology and Biosciences |
| 03:43 | bioscienze hanno brevettato un metodo | 03:43 | have patented a groundbreaking device: |
| 03:45 | poco dispendioso ed efficace per | 03:45 | it is cost-effective and it analyzes water |
| 03:48 | analizzare l'acqua del comune un kit che | 03:48 | in five steps. |
| 03:50 | permette in cinque mosse di sapere tutto | 03:50 | The device is made of |
| 03:51 | sul bicchiere d'acqua che stiamo per | 03:51 | five test tubes; in each tube |
| 03:55 | bere kit composto da cinque provette al | 03:55 | there is a strip |
| 03:57 | cui interno c'è per ogni provetta una | 03:57 | that functions |
| 03:59 | striscia indicatrice che ricorda la | 03:59 | like a litmus paper. |
| 04:00 | cartina tornasole // | 04:00 | The device also comes with a chart |
| 04:03 | altro elemento del kit è una scheda con | 04:03 | with benchmarks that help compare water values. |
| 04:05 | parametri di confronto per la lettura | 04:05 | Results shown on the strip can be compared |
| 04:08 | dei valori ottenuti parametri e valori | 04:08 | |

che rispettano **la** **una** normativa europea del
04:10
2001 **e** l'obiettivo del nostro lavoro non
04:13
è certamente quello di disincentivare
04:15
l'acquisto e il consumo delle acque
04:17
minerali ma è quello di valorizzare le
04:19
risorse idriche del nostro paese
04:21
l'Italia un paese particolarmente ricco
04:23
di acqua ben gestita ben controllata
04:26
l'acqua che viene distribuita **e** **è** di
04:28
ottimo livello e arriva nelle nostre
04:30
case di buona qualità // è sufficiente far
04:32
scorrere l'acqua fredda per due o tre
04:34
minuti riempire la provetta con l'acqua
04:37
del rubinetto immergervi la relativa
04:39
striscia e attendere due secondi si
04:42
estrae poi la striscia indicatrice e
04:44
infine si confronta la colorazione
04:46
assunta dalla striscia con la scheda che
04:48
riporta i parametri verremo così a
04:50
sapere il valore del pH che indica
04:53
l'acidità o l'alcalinità dell'acqua che
04:55
verremo **verremo** il valore della durezza che
04:58
esprime la quantità di calcio e magnesio
05:00
i valori dei nitrati e nitriti // composti
05:03
inorganici derivanti generalmente dalla
05:06
fertilizzazione e dall'allevamento poi i
05:08
valori dei cloruri dovuti generalmente
05:11
al naturale passaggio tra le rocce
05:12
dell'acqua o soprattutto in estate alla
05:16
clorazione fatta negli acquedotti per
05:18
eliminare i microorganismi **valeee** **van** infine
05:20
sapremo della presenza di solfati cioè
05:23
composti contenenti zolfo // anche questi
05:25
dovuti al normale scorrimento dell'acqua
05:27
nelle rocce si pensi alle acque termali
05:30
non sono **delusi** **dannosi** anzi a volte
05:32
conferiscono all'acqua proprietà
05:33
terapeutiche
05:37
il problema quindi non è l'acqua in

with standard values established by the EU in 2001.
04:10
With our device
04:13
we surely do not intend to disincentivize
04:15
the purchase nor consumption of mineral water.
04:17
On the contrary, our goal is to
04:19
give the right value to Italy's water resources.
04:21
Italy has plenty of water resources:
04:23
our water is treated and checked accordingly,
04:26
good-quality water is distributed
04:28
and it is the same we drink at home.
04:30
For a better use of our device,
04:32
it only takes a couple steps:
04:34
run water for two or three minutes,
04:37
fill the test tube with tap water,
04:39
dip the strip and wait for two seconds.
04:42
Then, lift up the strip
04:44
and compare the results
04:46
with the colors that are shown on the chart.
04:48
The strip next to the chart
04:50
will show the pH value,
04:53
which indicates the acidity
04:55
or alkalinity levels in water.
04:58
Water hardness is measured by analyzing
05:00
calcium, magnesium and nitrates and nitrites.
05:03
Then, the strip detects inorganic compounds,
05:06
that usually come from fertilization and breeding.
05:08
The strip also detects chlorides.
05:11
that derive from the erosion of rocks,
05:12
or from chlorination in aqueducts.
05:16
This chlorination is made
05:18
to eliminate microorganisms.
05:20
Finally, the strip also detects sulfates:
05:23
sulfates are sulfur compounds.
05:25
Similarly to chlorides, sulfates originate
05:27
from rock erosion: they can be found
05:30
even in thermal water.
05:32
They have a therapeutic effect,
05:33
in those waters.
05:37
Italy's water is not low-quality water.

05:39
generale in italia quanto quello che noi
05:42
chiamiamo l'ultimo miglio cioè il pezzo
05:45
di tubatura che arriva **dalla punta dall'appunto** rete
05:47
idrica in casa nostra che specialmente
05:49
in una casa vecchia potrebbe essere
05:51
appunto problematico e conferire i
05:54
problemi all'acqua che noi **vediamo beviamo**
05:56
vogliamo sottolineare che il nostro **che test**
05:58
non si vuole sostituire a delle analisi
05:59
approfondite che possono essere fatte in
06:01
enti certificati ma fornire a chiunque
06:04
in maniera molto facile
06:06
una idea qualitativa del valore della
06:08
sua acqua // insomma un facile ed economico
06:11
sistema per sapere se è meglio chiamare
06:13
l'idraulico per controllare le nostre
06:15
tubature e bere più volentieri l'acqua
06:17
del rubinetto di casa risparmiando somme
06:20
considerevoli

05:39
The problems lies in what is called
05:42
"the last mile", which is the last portion
05:45
of pipeline, that is connected to households.
05:47
This "last mile" may be problematic,
05:49
in fact the issues we analyzed
05:51
may take place in older houses,
05:54
thus decreasing the quality of water.
05:56
Our test
05:58
is not a substitute to analyses that
05:59
are more specific and run by
06:01
certified organizations.
06:04
The goal of our device is to give everyone
06:06
a general overview of the quality of water:
06:08
it is a cheap and easy-to-use test
06:11
to know whether there is any problem
06:13
with the pipes in our home,
06:15
or if they are fine and, therefore,
06:17
we can easily drink tap water,
06:20
which is also cheaper.

4. Transcript and Translation Analysis

The first part of this chapter will be based on the practical analysis of videos in their original version – which means in the source language – whereas the second part of the chapter will be focused on linguistic choices made during the translation process and on transcripts of videos in the target language. The goal of the following pages is to underline differences in presenting popular science on various levels, from basic concepts – as will be evident in Mark Rober’s video, in which he basically explains how photosynthesis works – to complex concepts field experts describe – as Vsauce tries to give an insight on cycling convection currents. To better analyze the work that was translated in the previous chapter, it is first necessary to give some context to the authors behind those videos.

4.1 Authors behind the videos

4.1.1 English-speaking authors

The first video, *Using Drones to Plant 20,000,000 Trees*, was made by Mark Rober who, in his YouTube channel description, briefly introduces himself:

Former NASA engineer. Current YouTuber and friend of science.[...]

1) I studied Mechanical Engineering in School. I did my undergrad at BYU and Masters at USC.

2) I worked for NASA JPL for 9 years, 7 of which were working on the Curiosity Rover (I made a video about it you should def totes watch cause it's probably my favorite of all my videos). I founded a company called Digital Dudz [...] and sold it to the guys who make Morphsuits in the UK. As part of the sale I quit my job at NASA and worked for them coming up with all their new costume ideas for 2 years. Recently, I was presented with an opportunity to return to my Engineering roots to come do some ideation type of work for a tech company near San Francisco.

The second and third videos, *Can You Cook Pasta By Boiling Water in a Vacuum Chamber?* and *Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient!* were shot by James J. Orgill, whose YouTube name is The Action Lab. Orgill provides a brief summary of his background and current life on his own website:

I currently work as a full-time engineer. However, when the sun goes down, I run my own YouTube channel "The Action Lab." On this channel I do simple to complex experiments to show you how amazing science can be. I keep things simple enough that you do not need a strong background in science to understand, but keep it interesting enough for even science veterans. [...]

I did my Bachelors and PhD in Chemical Engineering at Brigham Young University in Utah. My dissertation was entitled "Enhancement of Mass Transfer and Electron Usage for Syngas Fermentation." [...] I was looking into ways to make ethanol and butanol through fermentation that could be performed using gasses instead of sugars.

Dr. Wayne Breslyn uploaded the fourth video of this analysis, titled *What is boiling? An introduction*. A brief summary of his career is featured on Maryland and Delaware Climate Change Education Assessment and Research's website:

Dr. Breslyn is a Research Associate at the University of Maryland, College Park working with the Maryland and Delaware Climate Change Education, Assessment and Research (MADE-CLEAR) grant from the National Science Foundation. His research interests include disciplinary differences in secondary science instruction, inquiry-based teaching and learning, and technology in education. Dr. Breslyn is a National Board Certified Teacher with over ten years' science teaching experience.

Michael David Stevens is the mind behind Vsauce, the last English-speaking channel featured in this work. The video is *Water is Amazing – World Water Day!*. Stevens introduces himself in the bio of his own website:

Michael grew up in Stilwell, Kansas and attended the University of Chicago where he received a bachelor's degree in both Psychology and English Literature. While in college, Michael was active in theater and learned video production and editing.

[...] Michael created Vsauce1 in 2010 as a channel focused on video game comedy content, and it later evolved to focus on his passion for science and puzzling questions like, "Why Are Things Creepy?" and "What If You Were Born In Space?". Michael believes a silly or mundane topic can easily become mind-blowing if you take the time to look closer, research and let your curiosity run wild. In asking the right questions - however seemingly weird - you can make anything a profoundly effective lesson.

[...] Michael has been featured as a speaker at TEDActive 2013 and TEDxVienna 2013, and he regularly showcases scientific food magic on Jamie Oliver's YouTube series, FoodTube. [...]

Vsauce1 received a 2014 Streamy Award for Best Science and Education Channel and the 2014 People's Voice Webby Award for Best News and Information Channel. [...]

4.1.2 Italian videos translated into English

As for the Italian counterparts of this work, featured authors are professors Dario Bressanini, Natale Castelli and Adriano Sandri from FISICA in VIDEO, Zanichelli publishing house and, finally, the famous Italian popular science programme *SuperQuark*, hosted by Piero Angela. Here is a brief summary of their background:

- for Dario Bressanini in his blog, featured in Italian newspaper *Il Fatto Quotidiano*:

Sono un chimico, insegno all'Università dell'Insubria, presso il dipartimento di Scienze Chimiche e Ambientali. Svolgo attività di divulgazione scientifica collaborando con la rivista *Le Scienze*, dove sono titolare della rubrica mensile "Pentole e provette" dedicata all'esplorazione scientifica del cibo e della gastronomia. Sono anche autore del popolare blog "Scienza in Cucina", dove tratto con taglio scientifico sia temi gastronomico-scientifici che altri dedicati alle biotecnologie agrarie, alla produzione agricola, alla percezione del rischio alimentare, alla chimica in cucina e altro. Sono un fan di Bach e dei Beatles, aspiro a cucinare sempre meglio e mi fido molto poco di quello che leggo sui giornali.

- for FISICA in VIDEO's Natale Castelli and Adriano Sandri, in their own web page:

Natale Castelli, docente di Fisica dal 1986, e Adriano Sandri, docente di Chimica e Scienze naturali dal 1965 nel Liceo Classico del Seminario Arcivescovile di Milano con sede in Venegono Inferiore, hanno promosso dal 2002 la visita di scuole medie e superiori ai laboratori scientifici (Fisica, Chimica, Exhibit, Museo di Scienze naturali). Da questa attività è nata l'idea di "FISICA in VIDEO".

- for Zanichelli in the space destined to their bio 'Chi Siamo – La Storia':

Il catalogo Zanichelli comprende circa 2500 opere, di cui 100 universitarie, 900 scolastiche e 250 giuridiche; i più diffusi vocabolari di lingua italiana, tra i quali il prestigioso Zingarelli, e numerosi dizionari di lingue straniere, tra i quali il Ragazzini di inglese; opere di consultazione quali atlanti e manuali; libri di alpinismo, nautica e sport, guide naturalistiche, di giardinaggio, testi di fotografia, di arte e di architettura, opere di divulgazione scientifica.

- lastly, an overview of SuperQuark, the tv programme featured in the last subtitle analysis, as indicated in RAI's official website:

In origine, nel 1981, era solo "Quark". Poi, nel 1995, è diventato "SuperQuark". E ora, con l'approdo sulla piattaforma digitale RaiPlay disponibile su pc smartphone, tablet e smart tv, diventa "SuperQuark+".

La trasmissione, ideata e condotta da quasi quattro decenni da Piero Angela, nasce il 18 marzo 1981 come rubrica scientifica in onda in seconda serata su Rai1.

Il titolo viene dalla fisica: le particelle subnucleari chiamate quarks, infatti, sarebbero i più piccoli mattoni della materia. Non a caso la filosofia del programma è andare in fondo alle cose, scoprendo dettagli nascosti e curiosi. [...]

Le serate di "SuperQuark" si dividono in due parti. La prima, di circa 40 minuti, ospita un documentario naturalistico, che veniva spesso seguito da un commento dell'etologo Danilo Mainardi. La seconda parte è invece composta da brevi servizi di approfondimento, con le rubriche storiche ed archeologiche a date ad Alberto Angela. Particolarmente apprezzate le strisce animate di Bruno Bozzetto e la rubrica "Scienza in cucina" con il professor Carlo Cannella.

4.1.3 Authors and their scientific background

The beginning of this chapter was a necessary introduction to better understand the context behind the videos and why those videos were chosen as the right portrait of this analysis. Rober is an aerospace engineer, Orgill a chemical engineer, whereas Breslyn is a researcher and teacher “in secondary science instruction, inquiry-based teaching and learning, and technology in education”. Stevens, on the contrary, started as an internet comedian and made a career out of YouTube by making of popular science his ‘calling card’. On the Italian side of those videos, Bressanini, Sandri and Castelli are university professors, the formers being chemists and the latter a physicist. Zanichelli is a publishing house whose main goal is to share superior quality knowledge, selling dictionaries that are examined minutely to give the public a high-end product. Great research comes with products sold by Zanichelli. SuperQuark offers another kind of service: it is one of the most renowned popular science tv programmes in Italy, with an average number of viewers that hovers at two million, as of August 2019 (Genna: 2019).

Concerning the practical work that I did in this dissertation, the following analysis in this first part of the chapter will be divided into two more parts:

- subtitling through YouTube and AegiSub;
- general problems before translating and while analyzing the source text.

4.2 Subtitling with YouTube and AegiSub

As for the pre-translation work, there exists a distinction among subtitled videos, non-subtitled videos and videos that feature automatically generated subtitles.

Out of 12 videos, 4 were already subtitled in their source language:

- Dario Bressanini’s *Pasta Senza Fuoco* trilogy;
- Vsauce’s *Water is Amazing – World Water Day!*

Videos by Bressanini have been chosen as a comparison with the remaining Italian videos, in that the rest of the videos feature automatically generated subtitles. Moreover, the video *La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina* was the only video out of 12 not to feature any subtitles, therefore making it possible to contrast the former with the latter. Vsauce’s *Water is Amazing – World Water Day!* also featured subtitles written by a YouTube user – only the transcript

was already made, as it did not feature any translation. Being this content already subtitled, it functioned as an English counterpart to Bressanini's videos.

4.2.1 Subtitling with YouTube

YouTube offers its creators the chance to use automatic captioning. Those subtitles are extremely helpful to give a general idea of the content of the video. Although there are numerous variables that affect the quality of such subtitles, which are going to be analysed, they can be toggled on to grasp the meaning of the video. The threshold of intelligibility of a video – or, at least, for what concerns the videos used in this analysis – is generally high, which means that captions are for the most part reliable, as will be better explained in the second part of this chapter. An introduction to auto-generated captioning can be read on Google's support page:

[...] YouTube can use speech recognition technology to automatically create captions for your videos. [...] generated by machine learning algorithms, so the quality of the captions may vary. [...] YouTube is constantly improving its speech recognition technology. However, automatic captions might misrepresent the spoken content due to mispronunciations, accents, dialects, or background noise.

Automatic captioning, therefore, is not to be considered as the best alternative for subtitling, as it is a tool to ameliorate general comprehension of what is being said in a video. Such subtitles should be taken for what they are, that is words put on screen through algorithms. Human review of such products is necessary and YouTube suggests that their creators “review automatic captions and edit any parts that haven't been properly transcribed”.

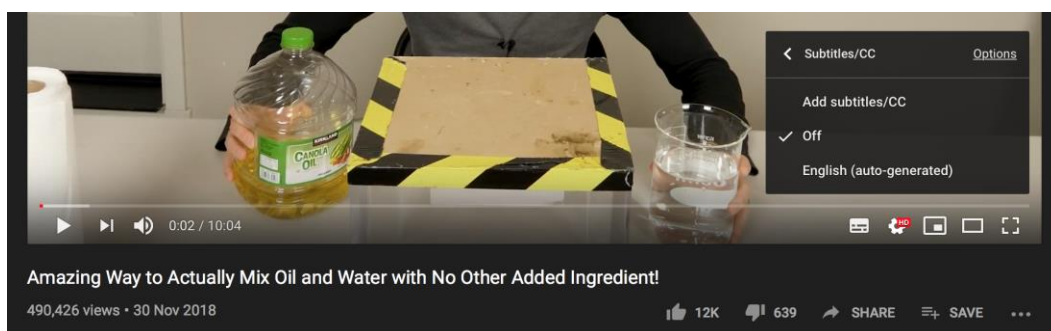


Figure 5. Subtitles/CC feature on a video.

Although YouTube allows their content creators to add subtitles or to have their videos subtitled by a machine-learning algorithm, that does not mean that every creator has enabled this feature nor wants it to be active.

Once again, Google’s support page offers some piece of advice for creators who want to make use of closed captions, by adding that the “community of viewers can help [the creator] reach a larger audience by adding title, description, subtitles, and closed captions to [...] videos”. The creator can then manage such subtitles, by performing a series of actions, such as “reviewing, editing, publishing, flagging, or rejecting” said subtitles.

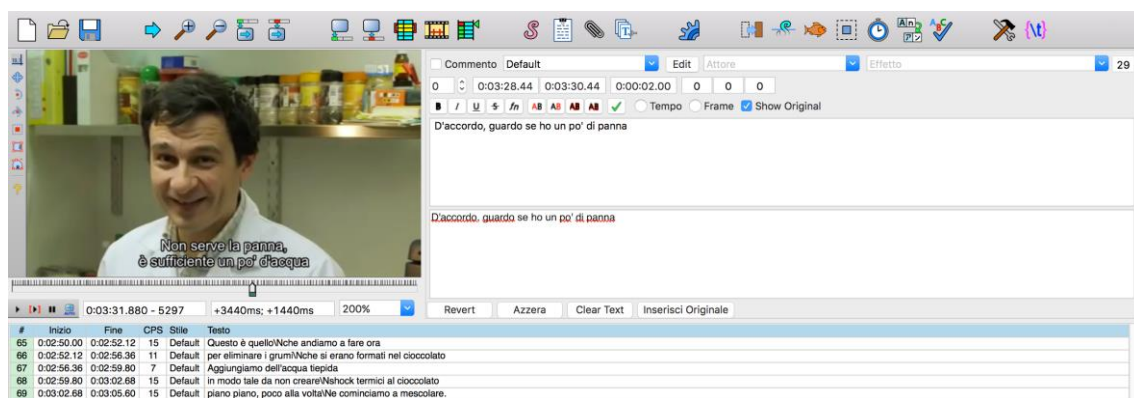
The downside of this method – from the point of view of both the community and users in general – is that contributions are not automatically enabled, which means that the creator has to toggle them on before. Subsequently, creators that are inactive or that do not want their videos to be subtitled leave settings unchanged, thus making it impossible to actively add even closed captions to a video. This was mainly an issue for Bressanini’s *La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato* which was the only video that required the use of an external software to add subtitles. As for the rest of the videos that could not be modified by adding closed captions, they came with a transcript featuring timestamps. That transcript was downloaded and used in this work.

4.2.2 Subtitling with AegiSub

As outlined before, there was only one occurrence of a video that did not feature any subtitles. Subtitling software AegiSub was used to add captions to that video.

Figure 6. AegiSub – User interface

Bressanini’s video was the only that did not feature any subtitles, which implied that



subtitles were not auto-generated but needed to be written one by one. This task proved to be extremely time-consuming, as for each subtitle there needs to be a starting point and

an ending point. The main issue concerning this kind of work revolves around time spent, in fact, the subtitling activity was divided into several parts:

- the first part was the basic transcription of everything that was said in the video, that is every intelligible word pronounced by the protagonists of the video; this activity was not harsh in any way, as the audio was clear enough to understand the whole track;
- the second part was based on dividing the parts spoken by Bressanini from the parts spoken by Sara, the co-host. Subsequently, those parts were divided into sense units, with a pause between every unit whenever necessary;
- the third part involved the practical work of adding subtitles, which meant taking into account that subtitles need to be written on two lines, with a CPS – character per second - ratio of no more than 15-16 and that subtitles need to start several frames before the actual line of dialogue, but they must remain some frames after, to give the viewer the time to read them properly.

Timing proved to be the most time-consuming activity, as Bressanini and Sara hardly do any pauses and there is a continuous flow of words spoken. This caused subtitles to be subsequent and whenever there was an overlay, the software colored the overlaid line in red. Unfortunately, overlays were necessary, but there were only three instances out of 122 subtitles made: every occurrence was a brief response – “Sì, anch’io” – or a confirmation request – “Sicuro?” “Sicuro”. Those overlays did not imply any difficulty in understanding the subtitles nor any distraction caused by the presence too much information written on screen. There is enough time to read through all the subtitles.

4.2.3 Transcripts on YouTube

Although Bressanini’s video was the only one that did not feature user subtitles nor auto-generated subtitles, only The Action Lab allowed community contribution, which implies that subtitles from other videos have been translated but will not be uploaded on YouTube. Subtitles that can be made or improved by the community can also be downloaded. In this case, transcripts come with frame-by-frame timestamps such as those provided by AegiSub. When subtitles can’t be downloaded, but there is at least an automatic transcription, they can be read as a transcript that appears to the right of the webpage, as is evident in figure 7.

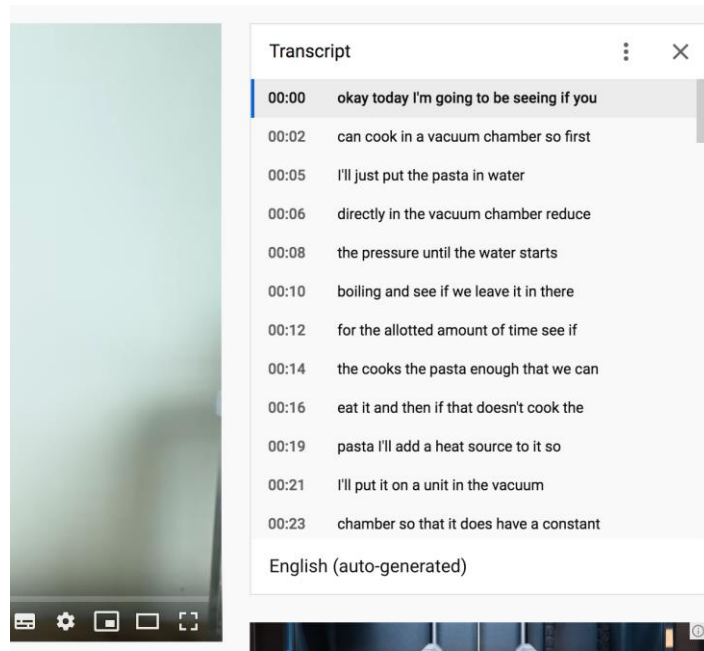


Figure 7. Transcript with simple timestamps

Transcripts were copied and pasted in order to work on subtitles. They served as a version to be corrected and then compared to the translation. Videos by The Action Lab were useful to this analysis because they could be subtitled online and translation could be added to the original transcript.

The software provided by YouTube is extremely user-friendly: all that is needed is a Google account – not even a YouTube channel. As previously mentioned, community contribution must be toggled on by the video’s author, which means that users may not have the chance to try and translate said video. The Action Lab did not block community contribution, thus making it possible to download subtitles and utilize YouTube’s subtitling system.

The user interface is intuitive and user-friendly. There is no knowledge needed to use them. Figures 8 and 9 will give some visual information to help understand why this system is easy to access to:

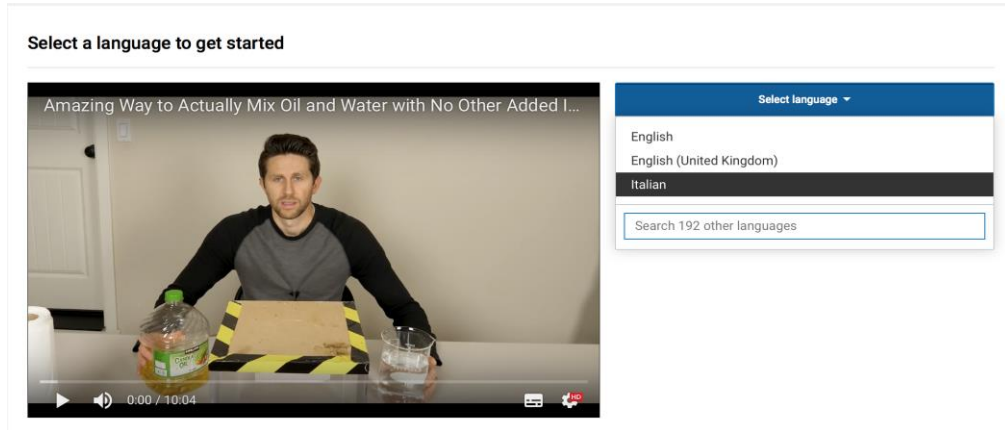


Figure 8. Subtitling interface– language choice

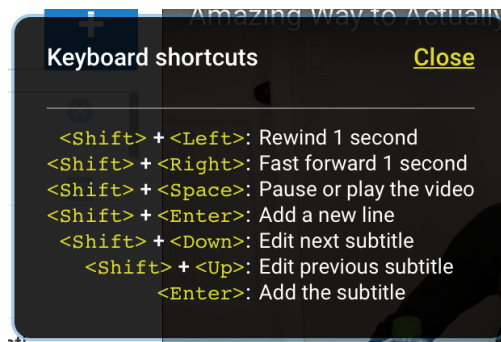


Figure 9. Keyboard shortcuts

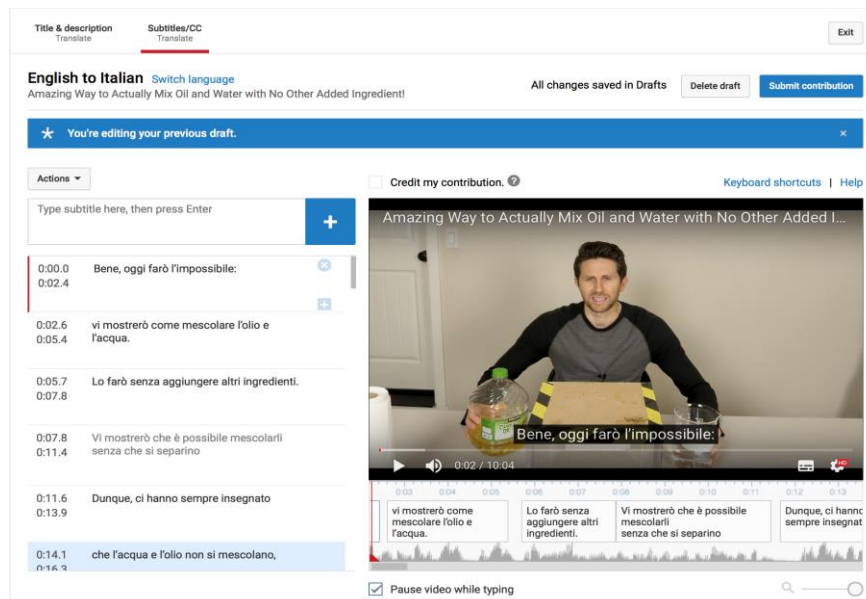


Figure 10. Subtitling interface – editing and timing

Now that the interface has been shown, its features can be presented:

- first, subtitling is less time-consuming, when compared to AegiSub: subtitles (figure 10) are inserted in rectangles that can be dragged and shortened – or lengthened – based on when they are supposed to start. The audio track at the bottom of figure 10 may be helpful in case there are any pauses during the video;
- second, YouTube automatically presents the user with the source language and possible target languages. In this case Italian is one of the choices because my account is Italian and YouTube recognizes that, thus suggesting Italian as one of the choices;
- third, timestamps update automatically when a subtitle is moved; to help better navigate the page, users can click on ‘help’, which will open a new tab leading to Google’s support page, or they can click on ‘keyboard shortcuts’ (figure 9) to get an overview of keyboard inputs that may help navigate through subtitles.
- fourth, YouTube continuously makes copies of the draft, saving it multiple times and thus enabling the user to restart from where they stopped.

The possibility not only to translate subtitles, but also to translate title and video description is worth-mentioning:

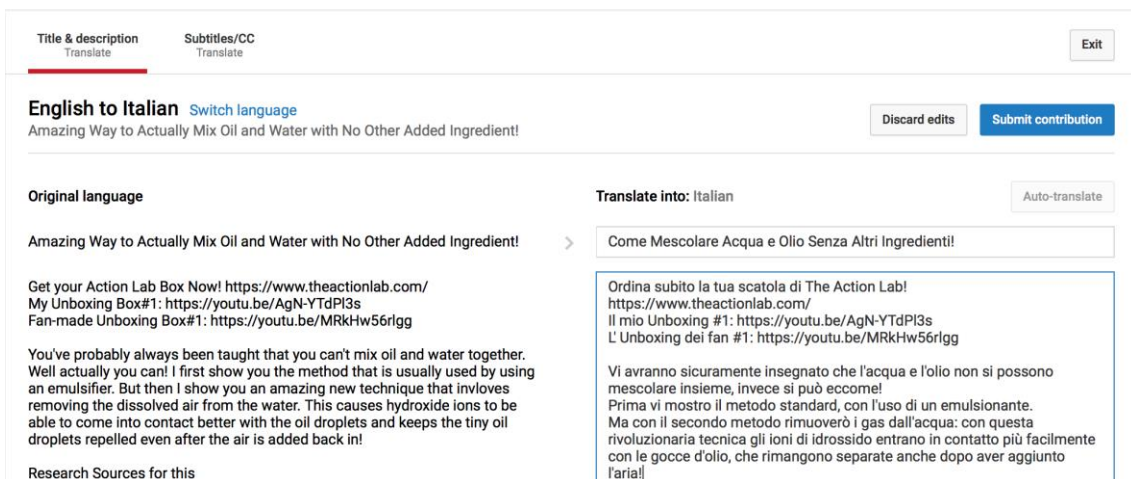


Figure 11. Editing Title and Description

Similarly to the subtitling process, the ‘Title & Description’ tab helps the user translate the source text, to the left, into the target text, to the right. The source text can also be copied and pasted into the right column, depending on the user’s preferences.

4.2.4 Translating from YouTube video transcripts

Various types of subtitles on YouTube have been analyzed. After explaining the method used - the programs which helped do the practical work of writing subtitles – there needs to be an explanation on the translation work. Before delving into translated videos, one at a time, it is necessary to give an overview of the problems encountered while translating.

Starting from issues that have already been tackled, subtitles are not the rule, on YouTube. They are an extremely helpful tool, however, content creators need to manually approve community contribution. When community contribution is not enabled, or it is deactivated for a specific video or set of videos, the difficulty lies in the fact that said video needs to be downloaded, to be then transcribed and subsequently divided into sense units to which the right timestamps and duration – in CPS – need to be added.

Since YouTube updated its subtitling policies during the summer of 2019, older videos may not be automatically transcribed, which may explain why Bressanini’s video did not feature any subtitles.

The following problem is a Janus-faced feature that YouTube subtitles have: audio-processing algorithms that generate subtitles. Automatic subtitles help grasp the meaning of a video, as has previously been pointed out. They are presented in a continuous flow of words. What happens is that the software analyzes the audio track and detects sounds that are then transformed into words. Since this software does not analyze linguistic structures to create ‘good’ subtitles, its goal is to put words on screen that are as close as possible to what the speaker says. The way subtitles are delivered is through this continuous flow which may even be distracting. Words appear on screen a few frames before they are actually articulated and then, word by word, they form long streaks of subtitles. This is, of course, a powerful tool, in the sense that it helps any people understand videos, with particular concern for hard-of-hearing or deaf people.

On the other hand, however, subtitles are not divided into sense units. Transcripts that can be copied and pasted do not feature the right timestamps, so that timing on subtitles is an average of the words that have appeared in a determined lapse of time. To prevent any misunderstanding transcripts will feature - in this work - a double slash (//) to separate sense units or to indicate pauses, especially in longer videos or videos that are denser with words or sentences.

Since this dissertation revolves around translation, transcripts remained nearly untouched: on the one hand, because the focus is translation, on the other hand because words that were omitted or mistaken by the software have been underlined or highlighted and then replaced with the right word or expression. Mistakes have therefore been kept in order to make a comparison between a wrong alternative and the right alternative.

There is also a difference between transcripts from auto-generated subtitles and standard, user-made subtitles: standard subtitles are longer and are written in two lines of space. This is more evident when comparing Vsauce's video and Bressanini's trilogy with the rest of videos. YouTube makes an average and adds timestamps in a transcript, by setting this average on one line of subtitles. When subtitles are already made, they are generally divided into sense units because they are made by humans and, therefore, they are evaluated and arranged accordingly to match the audio track.

Since automatic transcripts are not always reliable, translated subtitles in this work have been divided whenever it was possible. If a concept was expressed in several, or more than five subtitles, the Italian/English counterpart was written by using punctuation marks. Punctuation marks are absent in auto-generated transcripts – such as full stops, semi-colons or colons, so that subtitles can be followed more easily: this staccato rhythm helps close a concept or part of it before introducing the following, thus helping the audience absorb said concept to then assimilate the subtitle after.

To end this part of the analysis, one detail is worth-mentioning: display text cannot be subtitled. Written information is presented on the bottom of the screen – as canonic subtitles should be – but display text has to remain unchanged because there is no room for text translation – at least not without affecting the quality of subtitles made following audio and not video. For instance, at minute 6:51 of The Action Lab's *Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient!* there is a text on the top left corner of the screen saying '*due to hydroxide ions that stabilize the oil droplets that couldn't react when there was air.' This indication gives context to the experiment. Although it is not fundamental, as the meaning of the video can be grasped even by omitting this line, it is a detail to take into account. In this specific case, hydroxide ions are even mentioned in the video description, so that this information need not be subtitled, but in a different scenario that line may have been an important detail to translate. In this sense, YouTube subtitles are not completely flawless, as they need some adjustments to

give target culture users the same experience as users that speak the same language of the source video’s creator.

4.3 Video analysis in context

The second part of this chapter, which will also refer to issues and problems that were already presented in the previous pages, will be focused on each video singularly, to analyze both the language and the choices that were made, and problems encountered while transcribing and/or translating.

4.3.1 English videos translated into Italian

The difficulties that were presented in the first part of this chapter will now be repeated and analyzed in detail by underlining their presence in each video. Every video will have a chart with a brief description of some characteristics, such as duration, title, author and summary.

| | |
|---------------------------------|--|
| <i>Title</i> | Using Drones to Plant 20,000,000 Trees |
| <i>Author</i> | Mark Rober |
| <i>Duration</i> | 12 minutes, 43 seconds |
| <i>Upload date</i> | October 25th, 2019 |
| <i>Subtitled part</i> | 02:24 to 03:33 |
| <i>Description</i> | Mark Rober and Mr. Beast join forces to launch a fundraiser in collaboration with Arbor day Foundation that involves planting 20,000,000 trees by the end of 2022. |
| <i>Language register</i> | Informal – many colloquial expressions and basic explanations on how photosynthesis works. |

Table 2. Mark Rober – Using Drones to Plant 20,000,000 Trees

Mark Rober’s video is the first one in the series because it is mainly informal. Expressions are simple to understand, colloquial, which are often employed in spoken language. An example is “knee-jerk reaction”, that means, according to Cambridge Dictionary: “a quick reaction that does not allow you time to consider something carefully”. This is an idiomatic expression to indicate a quick response or an intuition, as expressed in the video. This is not used, of course, to indicate a patellar reflex, which is

the semantic meaning of ‘knee-jerk’. Another informal expression here is ‘a tree [...] takes that carbon and *slaps it on itself to get more swoll*’, which means ‘muscular’ as a slang, as indicated in The Online Slang Dictionary

In this video, a double slash has also been used to indicate the division between sentences, as to give a sense of distinction among units that are then to be translated. The software recognizes almost all the words that Rober says in the video and it is pretty accurate. More difficult expressions such as ‘carbon dioxide molecule’ (02:49) are rendered in the right way, letter by letter.

There are some instances in which words are added: ‘it powers up your energy’ instead of ‘it powers up with energy’ (03:07), or ‘you can have that’ instead of ‘you can have back’. In other cases words are missing, for instance at 03:03 Rober says ‘and the trees are like: “hey humans”’, in which ‘are’ is missing in the original transcript. Finally, words may be misinterpreted, as it happens when Rober describes a chemical reaction involving carbon (03:10) and the software understands ‘sea’ instead of C. As it was previously said, these transcripts are based on language recognition but they do not take into account the context behind what is being said. ‘Sea’ and ‘C’ share the same visual representation in the phonetic alphabet: si: . Similarly, ‘that’ and ‘back’ are pronounced nearly the same.

Punctuation marks and capital letters are absent, however, they were not modified in the original transcript as the general meaning of sentences is preserved even without such details. In translated texts capital letters and punctuation marks have been inserted to give a more refined and complete text to deal with.

Speaking of translation, now I will go into detail with all of the choices made in this video. In the beginning, ‘have you ever thought’ was replaced with ‘vi siete mai chiesti’, because it has a similar meaning but ‘chiedersi’ sounds more natural in this context. Alternatively, I could have written ‘avete mai pensato a come gli alberi ottengano la loro massa?’ but it would have sounded less natural than the actual translation written in chapter three. ‘The knee-jerk reaction’, as previously said, is an idiomatic expression which in Italian does not have a counterpart. In this sense, the better alternative was to paraphrase, thus writing ‘vi verrà subito da pensare che’, with ‘subito’ preserving the original meaning of an immediate reaction that comes into someone’s mind without thinking too much. Rober says a long sentence that starts from 02:27 and ends at 02:35.

In the Italian version the colon divides this sentence in two parts, the first being a question and the second an explanation. After the colon, the Italian subtitle says ‘infatti anche piantando un albero in un vaso’, which translates ‘because if you have a tree in a big pot’, as to indicate the same concept with a different structure. ‘Anche piantando’ introduces a concessive clause that has the meaning of an ‘if clause’, which may be rendered as ‘*anche se si piantasse un albero*’, but it would not fit in this context because Rober speaks to a general audience using the personal pronoun ‘you’. ‘Anche se’, in this sense would result in a more detached way of presenting such information, so ‘anche piantando’, was preferred over its explicit counterpart. The Italian text, similarly, features an use of ‘voi’, ‘vi’, which gives more an idea of a lesson or an explanation to a general audience. ‘It’s almost entirely carbon’ (02:46) was one of the few examples of English wording which needs to be rendered in a more discursive way in Italian: this subtitle is fairly longer than the others, in fact it has been rendered as ‘è composta quasi interamente da carbonio’, thus creating a two-line subtitle.

At 02:46 Rober uses a figurative expression not to be rendered with a semantic meaning: ‘basically a tree sees a carbon dioxide molecule floating by’: it has been rendered as ‘in sostanza, un albero *prende* una molecola di anidride carbonica dall’aria’, because trees do not actually ‘see’ molecules. ‘Carbon dioxide’ is an easy concept to render in Italian, ‘anidride carbonica’, it is one of the few science-related expressions. It cannot be translated as ‘diossido di carbonio’, as this is not the correct way to say it. Rober makes large use of phrasal verbs, which are usually employed in an informal speech: some occurrences are ‘the soil level doesn’t *go down*’, which means ‘decrease in size’ (02:35) and ‘it *powers up with*’, which means ‘charges itself’, rendered as ‘si ricarica con’. ‘The trees are like:’ introduces direct speech, in fact Rober then speaks as if he were a tree. In English it is common practice – again, in an informal context – to start a sentence with direct speech by using ‘like’. This must not be translated with adverbs such as ‘come’, ‘nella stessa maniera’, ‘in modo simile’. This is a phrase to indicate something that is to be pronounced. In Italian, this expression does not exist, therefore, the alternative was to paraphrase it, by using an ‘if clause’, ‘se potesse parlare ci direbbe:’. ‘Hey, persone!’ was, to me, a better alternative to ‘Hey, humans!’, as it sounded more intuitive.

‘Some beautiful fresh oxygen’ is a repetition of the fact that oxygen is pure, so ‘fresco fresco’ was used to underline that oxygen is new and, of course, fresh. ‘That’s a sweet deal’ cannot be rendered as ‘è un patto dolce’, with its semantic meaning. In this case, ‘Sembra un affarone, no?’ with a rhetoric question was a better alternative to ask the audience something and make them virtually participate in the discussion. Another instance indicating that Rober makes use of informal expressions is the verb ‘sucking’ (03:16) instead of ‘absorbing’. ‘the beauty *in the shade*⁸’ (03:20) was superfluous and, therefore, replaced with ‘anche l’utilità’, as the following sentence is about trees that are considered as ‘massive vacuum bags’ capable of storing a great deal of carbon. The last couple subtitles were kept to give context to the video, as Mr. Beast is one of the pioneers of the TeamTrees project.

This video is an example of how popular science need not be overly detailed to be effective. The video, as of January 2020, has almost 10 million views and it was uploaded in October 2019. This video is extremely informal but informative because it needs to spread a simple message: it is a fundraiser with the objective of giving a detailed description of what Arbor Day Foundation is and how they are planning on planting 20 million trees by the end of December 2022. If the message were overly saturated with notions and explanations, maybe it would have not reached so many people all over the world. This is an example of communication made simple with a compromise: to try and share knowledge on a certain topic. The topic, here, is planting trees and Rober basically explains how trees work. In the video he uses velcro and ‘slaps’ some balls that should resemble molecules ‘on himself’ to ‘pretend he’s a tree’. Not only he tries to convey his message by using few words, he also gives a visual representation the audience can relate to.

| | |
|---------------------------|--|
| <i>Title</i> | Can You Cook Pasta By Boiling Water in a Vacuum Chamber? |
| <i>Author</i> | The Action Lab |
| <i>Duration</i> | 7 minutes, 49 seconds |
| <i>Upload date</i> | September 7th, 2017 |

⁸ Lower-case letters after a full-stop, if put in single quotation marks, indicate the subtitle as it is displayed in the translation. Therefore, ‘the beauty in the shade’ is lower-case as it is not put at the beginning of a sentence in the translation. The same rule applies for similar instances in the following videos.

| | |
|---------------------------------|--|
| <i>Subtitled part</i> | All |
| <i>Description</i> | The Action Lab tries to boil water in a vacuum chamber. In the experiment he puts pasta in the recipient in a low-pressure environment, to prove if pasta can be cooked in vacuum. |
| <i>Language register</i> | Semi-formal – the first part of the experiment is pretty descriptive, whereas the second part is an explanation of the process and the chemical reactions involved. |

Table 3. *The Action Lab - Can You Cook Pasta By Boiling Water in a Vacuum Chamber?*

This video is less dense than Rober’s when it comes to colloquial expressions, it is more straightforward and the method used is scientific in the traditional sense of the term. There are some premises and a question: ‘can you cook pasta by boiling it in a vacuum chamber?’, followed by an experiment and then by an explanation of what has happened and why the experiment has or has not been successful.

Starting from the source text and the auto-generated subtitles, the transcript preserves the wording used by Orgill. There are some cases in which words are misinterpreted: ‘*the* cooks’ instead of ‘*it* cooks’ (00:14), ‘the dissolve *they’re* starting to come out’, instead of ‘the dissolve, *there*, starting to come out’ (00:52), ‘*living* in the air’, instead of ‘*letting* in the air’ (02:15), ‘vacuum *pub*’ and ‘*back in*’ when the right words are ‘vacuum pump’ (03:12 and 03:17), ‘a’ instead of ‘at’ (03:42) and ‘*review* it’ for ‘*I’ll* view it’ (04:20). A few words are to spend for other misunderstandings, such as ‘[Applause]’ (00:35), as the software does not recognize the noise of the vacuum pump in action and it completes the subtitle by adding a wrong noise indication, an applause – which is inexistent in the video. Another part which is worth-mentioning is at 04:22, as the software recognizes the word ‘because’ but it decides to use a more informal, slang-related term, ‘cuz’, which is completely wrong in this context. Words such as ‘they’re/there’, ‘living/letting’ or ‘vacuum pub/pump’ are an example of assonance that the algorithm translates by making mistakes, which means that the text needs to be manually reviewed, as it has been done here. Strangely enough, the more difficult the expression is, the more correct it is displayed in this transcript, as it will be analyzed further on.

There are also some instances of words that are omitted in the text, which have been written in square brackets in the text. They are not relevant to the comprehension of

the text, as words omitted are usually discourse markers – ‘hey’, ‘so’ – or conjunctions – ‘and’.

Before delving into the comparison between source text and target text, there needs to be an analysis of less common words that have been pronounced in the video, serving as terminology and sometimes recurring vocabulary that will be useful in the following video analyses.

Here is a list of terms and/or physical, water-related expressions:

- vacuum chamber;
- pressure / low-pressure / atmospheric pressure;
- heat source;
- dissolve (noun) / dissolved gases;
- sporadic bubbles;
- boiling;
- (it instantly) vaporizes / evaporation;
- freezing point;
- degrees Fahrenheit/Celsius;
- heat up through conduction;
- kinetic energy;
- high-energy molecules.

The video is intelligible and self-explanatory: The Action Lab tries to cook pasta in vacuum. His method involves putting a unit in a vacuum chamber through which he wants to cook pasta. Chemical reactions that are explained here will serve as a term of comparison with Dario Bressanini’s videos, which are heavily based on cooking pasta in a similar environment – with a difference based on the fact that Bressanini does not make use of vacuum in his demonstration.

From a linguistic point of view, The Action Lab explains his concepts in the most simple, yet scientific way possible. The video, which has more than 300,000 views as of January 2020, has the same premises of Rober’s video: explaining concepts that may be opaque to an uncultivated audience, or to an audience that does not have a background in science. It is a kind of basic, easier means of divulging concepts to larger audiences.

While the point of view is Orgill's in the video, as he personally conducts the experiment, the Italian translation has a more general approach and makes use of the personal pronoun 'noi' which means inclusivity of the audience in the experiment.

The video starts with 'Okay, today I'm going to be seeing if you can cook in a vacuum chamber': discourse markers have been rendered equally in the Italian or slightly adapted, in fact 'okay' is 'bene', although writing 'ok' would have been fine, in this case, as it does not alter the meaning of the sentence. 'I'm going to be seeing' has been translated as 'oggi scopriremo', which makes the audience participate in the experiment with Orgill. What follows is some research concerning the harsher term to translate in this work, that is 'vacuum chamber'. It is easy to understand, it is a recipient without air, in which there is vacuum. A simple definition can be found at definitions.net, in which it is stated that

A vacuum chamber is a rigid enclosure from which air and other gases are removed by a vacuum pump. This results in a low pressure environment within the chamber, commonly referred to as a vacuum.

Once the definition of vacuum chamber is given, translation is more difficult to perform, as there is not a clear-cut rendition of 'vacuum chamber' in Italian. Here are the alternatives, according to some research made through Google searches and occurrences throughout all the internet (as of January 2020):

- "modulo di degassificazione" 380 results: there are few pages and the definition is opaque, but by looking at Google images results are correct and as close as possible to what a vacuum chamber actually is;
- "camera del vuoto" 18,800 results: this is the closest alternative to the original and it matches the description with a simple query in inverted commas through Google images. Moreover, vacuum chambers are mainly sold on specialized websites and on Amazon under this name, which makes it easier to find them online;
- "camera di depressione" 52,700 results, although pictures are misleading and do not represent what a vacuum chamber is intended to be in this search; there is plenty of schematics and images referring to parts of car engines;
- "camera da vuoto" 21,600 results: this definition is pretty similar to 'camera del vuoto', however, various pages shown after this query make use of

‘pompa del vuoto’, ‘pompa a vuoto’, or they feature industrial machines that do not completely resemble the vacuum chamber seen in The Action Lab’s video;

- "macchina del vuoto" 32,500 results: ‘macchina’ refers to the pump and chamber *ensemble*, even showing images of household items to cook food *sous-vide*, which is a technique that involves food put in plastic bags: this machine removes the air from the plastic bag and then the food can be cooked inside the envelope. This definition, therefore, does not fit into this work;
- "macchina a vuoto" 92,400 results: similarly to “macchina del vuoto”, this query does not lead to the right definition;
- "camera a vuoto" 45,500 results: this definition is also similar to “camera del vuoto” and “camera da vuoto”, although it seems less intuitive than their counterparts;
- "disaeratore" 26,400 results: “disaeratore” mainly refers to pumps and valves used to control air flows. Once again, such definition does not fit into the idea of vacuum chamber presented in this and the following videos.

In this case, a semantic translation is preferable, as ‘vacuum’ means ‘vuoto’ and ‘chamber’ means ‘camera’. It is evident, through results online and searches through images, that a vacuum chamber can be translated by putting those two words together and linking them with a preposition. The alternative chosen in this work will be ‘camera del vuoto’, as ‘a vuoto’ may also give the idea of emptiness and, therefore, may not directly be linked with vacuuming and the process of removing air from an isolated system.

Going back to the translation, ‘the allotted amount of time’ (00:12) was rendered by explaining where the cooking time can be normally found, which is on the box containing pasta. The translation is, therefore ‘entro il termine riportato sulla confezione’, which is fairly longer but maintains the general idea. After this subtitle the sentence was split into two by means of a full stop, whereas in the original the two sentences are linked by the conjunction ‘and’, causing a much longer flow of spoken words.

The following instances of vacuum chamber, although this expression is repeated in its entirety throughout the whole video, are sometimes rendered as just ‘camera’, as the audience already knows what a vacuum chamber is and there is no need to repeat the whole concept. ‘You might be surprised by the results’ (00:29) has been translated as

‘Sono certo che rimarrete stupiti’: Orgill already knows the result, that is pasta cannot be cooked in a low-pressure environment as it happens when air is removed from the chamber. This is why this is a certainty in the Italian version. ‘Penne pasta’ (00:32) is simply ‘penne’, as Italians never add the post-modifier ‘pasta’, they rather refer to ‘pasta’ in general or they call it by their shape – i.e. penne, fusilli⁹, bucatini, which may have a different equivalent in English.

At 00:52 Orgill uses the term ‘dissolve’ as a noun: nominalization of the verb ‘to dissolve’ is wrong, as the process of dissolving gases is called dissolution, or “the act or process of dissolving”, as defined by the Merriam-Webster dictionary. This made-up noun, therefore, has been translated by rendering the meaning of the sentence rather than turning the sentence around the word ‘dissolve’: ‘possiamo vedere che delle bollicine stanno già salendo in superficie’, that is, they are rising and thus dissolving as water continuously boils. ‘We’re at full vacuum now’ (01:03) could never be rendered as ‘siamo in una situazione di vuoto’, as it does not sound natural: the better alternative here is another paraphrase, ‘l’ambiente all’interno della camera è in condizione di vuoto’, which takes two subtitles to be expressed. To keep up with the original subtitles, the following lines have been condensed from ‘now we’ve got some pretty good boiling going on in there’ to ‘e ora sta iniziando a bollire’, as there is no such thing as ‘buon bollore’, making the intensifying ‘pretty good’ pointless in the Italian version.

The adjective ‘sporadic’ (01:12), put with the noun ‘bubbles’ has less than a thousand results on Google. ‘Sporadic’ is not a common word, as the Corpus of Contemporary American English, searching keywords in context, presents a frequency of 1704 words and none for ‘sporadic bubbles’. The translation chosen for this passage is an adverbial phrase of time, ‘di tanto in tanto’. ‘I’ve heard a lot of people say in the comments’ (01:17) is a factual mistake: comments written under a YouTube video cannot be ‘heard’. The sentence was changed, making ‘comments’ the direct object of the translation rather than an indirect object: ‘ho letto molti commenti’, as it is shorter and preserves the meaning of the original sentence. ‘It’s just releasing the dissolved gases in the water’ (01:20) is ‘(la pompa) rimuove i gas che si sono sciolti nell’acqua’, using the impersonal passive form ‘si sono sciolti’, meaning that the gases have been dissolved after the pump was activated.

⁹ Fusilli are not known under the name of ‘fusilli’ in America, Barilla sells them as ‘Rotini’.

‘boiling is defined as when the vapor pressure [...]’ (01:31) is ‘perchè l’ebollizione avviene quando [...]’: in this case the explanation is implicit, so there is no need to tell what boiling is as the following subtitles are already focused on this explanation.

‘room temperature’ (01:44) is an expression that has an Italian equivalent: ‘a temperature ambiente’. ‘it is actually a defined thing what boiling is’ (01:49) has been rendered as ‘C’è una definizione ben precisa di ebollizione’, with ‘ben’ being used as an adverb to underline this concept, translating ‘actually’. ‘let’s see how cold that water is’ (02:10) gives an indication of the temperature of the water, which will then be measured with a thermometer: in this case ‘cold’ is superfluous and the sentence has been translated as ‘Vediamo a che temperatura è l’acqua’. ‘and then see if the pasta is tender at all’ (02:15): since it is more likely to talk about pasta that is not cooked yet and therefore firm. The sentence to me made more sense if written from a different perspective, which means if the pasta is still raw rather than overcooked: ‘e se la pasta è ancora dura’ is the translation chosen here.

Subtitles displaying ‘[Music]’ were translated semantically, maintaining the square brackets to indicate that music is not part of the speech but part of the video’s background audio.

‘It did not cook the pasta’ (02:26) refers to the chamber removing air, thus causing bubbles to form and water to boil. Again, the impersonal form was used: ‘non si è cotta neanche un po’’. ‘So I couldn’t find an electric hot plate’ (02:48) is ‘Purtroppo non sono riuscito a trovare una piastra’, ‘purtroppo’ justifying the choice of using an alternative method for not finding a suitable unit. ‘as long as I don’t touch these I’m fine, I won’t get shocked’ (02:59) is more explicit in the Italian version: ‘Finchè non tocco questi cavi sono al sicuro da scariche elettriche’. ‘Questi cavi’ is complementary to Orgill indicating them in the video; ‘sono al sicuro da’ renders ‘I’m fine, I won’t get shocked’.

‘Can we get the temperature of the water to raise enough to cook the pasta if we add a heat source?’ (03:06) has been translated as ‘Riuscirà il ferro ad innalzare la temperatura dell’acqua abbastanza da cucinare la pasta?’, to underline that it is the iron that raises the temperature. This rendition is more explicit than the original.

‘once we’re at point one atmospheres’ (03:42) is, similarly to ‘questi cavi’, more clear, with the rendition ‘quando la lancetta arriverà a 0.1 atmosfere’, pointing to the vacuum pump’s clock, that raises as soon as air is pulled out of the chamber. Vacuum chambers,

in fact, have measures expressed in grams of mercury pulled out of a chamber, as mercury is the most dense liquid substance known, so it is the standard measurement unit for atmospheres in vacuum pumps.

Again, an explicit translation can be found at 04:20, as ‘I’ll view it from this side’ is ‘l’inquadratura è da questa parte’, because the shot is different in this part of the video – as Orgill explains, ‘some water’ is ‘blocking [the] view’. ‘Should I dip my hand in it?’ (04:49) is followed, in Italian, by ‘proviamo’, to give the idea of an experiment, although it is not fundamental for understanding the sense of that sentence. ‘with a very good vacuum’ (05:09) would not make much sense if rendered as ‘con un vuoto decente’, so the choice made has been to explain it a bit: ‘anche in una camera più isolata di questa’. At 05:14 Orgill talks about water’s ‘freezing point’, which has been inverted in the Italian rendition, thus translating it as ‘poco sopra il punto di fusione’, as the freezing point is the temperature at which water turns into ice, whereas ‘punto di fusione’ is when ice turns into water. The meaning here is the same: there is low pressure in the chamber, so water evaporates faster, closer to the freezing point than in normal conditions.

At 05:37 is was an adaptation: ‘82 degrees Fahrenheit’ is ‘quasi a 38 gradi’, because Fahrenheit is the standard measurement unit in America. Here in Italy Celsius degrees are the standard, so there is no need to specify that ‘38 gradi’ refers to Celsius. ‘Low boiling temperature’ (05:57) is ‘un punto di ebollizione particolarmente basso’, as it sounds more natural, compared to ‘temperatura di ebollizione’. ‘Conduction’ (06:05) needs to be explained by adding the adjective ‘termica’, as ‘conduzione’ alone would not be sufficient and for a non-expert audience may be opaque. ‘Conduzione termica’ is a specific collocation referring to the transfer of heat from a hot body to a cooler body.

At 06:36 Orgill says ‘a hundred degrees Celsius’, which has been kept in the Italian, again without the ‘Celsius’ remark.

‘Another thing I wanted to mention’ (06:47) has been translated as ‘un’altra cosa che vorrei sottolineare’, as ‘sottolineare’ has the meaning of ‘mentioning’ in this case.

‘high-energy molecules’ (07:06) are ‘composti ad alta energia’, as found on popular science articles and textbooks, such as Zanichelli’s *Percorsi di Biochimica*, mainly talking about adenosine triphosphate (ATP), which is one of the sources of energy that power cells.

‘these were kind of two versions of the same thing’ (07:18) is a pretty general sentence, the Italian version refers to it as an experiment.

The subtitle at 07:27 is wrong: Orgill says ‘lower temperature’ but displays the text ‘I meant higher temperature’ to correct his statement. Since subtitles are thought to be read by an audience that does not know English, the subtitle was changed into ‘senza alzare ulteriormente la temperatura’, to correct the transcript and translate the display text at once.

The final part of the video contains common catchphrases used by YouTubers, such as ‘let me know in the comments sections’, ‘hope you have liked it’, ‘hit the subscribe button’, ‘hit the bell button’, that are translated as ‘scrivetemelo nei commenti’, ‘se vi è piaciuto lasciate un like’, ‘cliccate su ‘iscriviti’ e sulla campanella’. There are several buttons to press on a YouTube page to show appreciation for a video, such as the ‘like/dislike’ button, the ‘subscribe’ button and the ‘bell’ button, which sends a notification to subscribers whenever a followed content creator uploads a video.

| | |
|---------------------------------|---|
| <i>Title</i> | Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient! |
| <i>Author</i> | The Action Lab |
| <i>Duration</i> | 10 minutes, 4 seconds |
| <i>Upload date</i> | November 30th, 2018 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | The Action Lab tries to demonstrate that mixing oil and water is possible: at first, he uses an emulsifier, to show the standard process of mixing them together with an added substance, then he uses external research to mix them alone. |
| <i>Language register</i> | Semi-formal/formal – the first part of the experiment is descriptive, whereas the second part is an explanation of the process and the chemical reactions involved. In this video there is a larger presence of special words with Greek derivation. |

Table 4. The Action Lab - Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient!

This video is fairly similar to the previous, as the host is the same and the storytelling remains nearly unchanged: there is an experiment with some premises, which are: 'can you mix water and oil, two unmixable substances, together in a stable compound?' Orgill starts the video with this question, then proceeds to mix them with an emulsifier and, in the end, he mixes them thanks to experiments made by other scholars – which he then quotes and links in the description of the video – to prove those theories right.

Starting with the transcript, it is once again extremely accurate, with a few imprecise renditions. Punctuation marks and capital letters are absent.

Parts that are wrong and needed to be fixed in the transcript are: 'the' instead of 'that' (00:13), 'to' instead of 'two' (00:48), 'at' instead of 'as' (01:53), 'and' instead of 'in' (03:03), 'emulsificationz' instead of 'emulsifications' (08:52) and, finally, 'D gas' instead of 'de-gas/degassed' (04:51, 05:17, 06:16, 07:22, 08:50, 09:07) and 'the action lab comm' instead of 'theactionlab.com' (09:20 and 09:38).

It is evident that the couple 'de-gas' and 'degassed' are the most frequent mistakes, as for what concerns the transcript. Those are systematic mistakes, they repeat themselves throughout the whole video.

Here is a list of terms and/or physical, water-related expressions – or oil-related expressions -, to be added to the ones said in the previous video:

- tap water;
- canola oil;
- oil-rich phase/water-rich phase;
- mix out;
- drop of oil;
- surfactants;
- emulsifiers/emulsified;
- hydrophobic;
- hydrophilic;
- lecithin;
- stable mixture;
- dissolved gas;
- surface tension;

- beaker;
- de-gas/degassed;
- coalesce;
- chemicals.

The video analyzed here, when compared to the previous video, is richer in words and expressions that are science-related and that need to be explained or rendered with their exact translation. Although the experiment is shown in a similar fashion, as the progression of events in the video is similar, premises/first experiment/result/second experiment/result/explanation/conclusions, this one features a great deal of terminology that needs to be decoded.

Here is the translation analysis of this video's transcript.

The first four subtitle lines have been divided into two separated sentences split by a full stop. 'whenever we have two things that don't go together we often compare them to oil and water' (00:18). This cannot be translated semantically in Italian, as its equivalent is 'è come essere cane e gatto', meaning that two things that are that different can't be put together. Oil tends to separate from water as it is lighter and less dense: therefore, the analogy is correct in English, but it is not in Italian. Here is a paraphrase of this sentence: 'è risaputo che, provando a metterli insieme tendono a separarsi a causa della loro composizione'.

'a method that you can actually mix oil and water together' (00:26) is 'un metodo per unire l'uno e l'altro', to avoid repetitions, since the words 'oil' and 'water' are repeated often in the video. 'and not have them separate' (00:30) is an expression that cannot be translated semantically, in fact the Italian features a gerund: 'evitando che si separino'. 'tap water' (00:37) is another way to define water that is available in houses through a faucet: in Italian the translation is 'acqua del rubinetto', which is longer but perfectly equivalent. 'canola oil' (00:38) is not of common use in Italy, as it is not sold in supermarkets and it is not as known as sunflower oil or corn oil, which are far more used. The alternative here is 'olio per friggere'. 'I pour it on top here' (00:41) is introduced by when, whereas in Italian 'come' introduces the sentence. The English uses an adverb of time, the translation features an adverb of manner. 'oil-rich phase' and 'water-rich phase' (00:52) could be rendered as 'fase apolare' and 'fase polare', as indicated in the definition of 'Emulsione' provided by Treccani. Although these definitions are correct, the choice

in this text has been to preserve ‘oleosa’ and ‘acquosa’ since they are equally right and similar to what is being said in the original video. ‘if you let it sit for a little bit’ (01:03) cannot be rendered in short, it would need a long periphrasis like ‘lasciando i due liquidi in uno stato di calma per qualche minuto’ or ‘smettendo di agitare i due liquidi e lasciando passare qualche minuto’. The better alternative has been to omit the verb ‘to sit’ to give the idea that, after shaking the becker, the compound will separate on its own: therefore, the translation is ‘inizialmente sembrano unirsi, ma dopo qualche minute tornano come prima’.

The noun ‘mustard’ is a false friend: there exist, in Italian, the term ‘mostarda’, but it is a dish made of candied fruit and mustard. In Italian, ‘mustard’ is ‘senape’. ‘and give it a shake’ (01:19), refers to the becker, that was translated as ‘provetta’, since it has not the shape of a becker, but resembles a vial. The same happens in the following occurrences of ‘becker’ in the text.

The word ‘droplet’ has been translated as ‘goccia’, whereas ‘drop’ (02:04) - which indicates a greater quantity of oil in the text - is ‘massa di olio’.

Subtitles starting from 01:53 to 02:04 have been split in the Italian translation to facilitate the reading process. ‘as those tiny little droplets of oil’ (01:55) indicates a consequence of the movement of oil to form larger drops: in Italian this sentence is introduced by an ‘if clause’, ‘se le gocce d’olio si avvicinano’. ‘but if you add an ingredient like mustard’ (02:04) in Italian is better introduced with ‘Ma tutto cambia aggiungendo della senape’, adding a little suspense to then talk about the chemical properties of mustard.

The words ‘chemical’, ‘surfactants’ and ‘emulsifiers’ are terms which were rendered with a correct translation. As ‘chemical’ is an adjective that is nominalized in this passage, it was translated as ‘componenti chimiche’, which has a clearer meaning.

‘Emulsifiers’ is rendered as ‘emulsionanti, whereas ‘surfactants’ is rendered as ‘tensioattivi’, that the Centro Nazionale Sostanze Chimiche prodotti Cosmetici e Protezione del Consumatore describes as

Qualsiasi sostanza organica e/o miscela utilizzato nei detergenti dotato di proprietà tensioattive. Consiste di uno o più gruppi idrofili e di uno o più gruppi idrofobi di natura e dimensioni tali da consentire la diminuzione della tensione superficiale dell’acqua, la formazione di monostrati di spandimento o di assorbimento all’interfaccia acqua/aria, la formazione di emulsioni e/o di microemulsioni e/o la formazione di micelle e l’assorbimento alle interfacce acqua/solido.

‘They’re more attracted to each other than the water around’ (02:02) is, in the Italian transcript ‘si attraggono perchè sono più affini rispetto all’acqua’, which is not exactly what was said in the video but has an equivalent meaning.

Whereas The Action Lab talks about ‘hydrophilic/hydrophobic end’ (02:19), the correct rendition of ‘end’ is ‘coda’ and ‘testa’, as emulsifiers have a round head with a tiny tail, in which one is attracted to water and the other repels it. Similarly, the verb ‘coalesce together (to form one bigger droplet)’ (02:38) was rendered as ‘unirsi (per formare una goccia più grande)’. ‘But is it actually possible to just mix oil with water?’ (03:29) is more inclusive and audience-directed in the translation: ‘ma ho una domanda per voi’. ‘Well, according to a chemist at the Australian National University’ (03:34) has a slightly different structure in the translated subtitles here: implying that water and oil cannot be mixed together, the question is supposed to give a negative answer – that no, they cannot be mixed together – but that an expert in the field may not say so. That is why ‘un chimico [...] direbbe di sì’ is used to start the sentence with a fact. ‘Australian National University’ was not translated as it is perfectly comprehensible and there is no Italian correlative for that term. ‘dissolved gas molecules’ (04:06) are ‘molecole di gas disciolto (nell’acqua)’ as gases cannot be ‘dissoluti’ – dissolute, referred to people - or ‘dissolti’ -vanished -, as the right collocation is ‘disciolti’. ‘Sciolti’ may also cause some misunderstandings, because it also means ‘molten’, which does not apply to gases. ‘dissolved air’ (04:31) is ‘gas disciolto’ because it is coherent with the rest of the text. At 04:40 the Action Lab says ‘no matter how long you leave it’, to indicate that the mixture won’t ‘join back together’. The translation says ‘nemmeno dopo molto tempo’, which also indicates that the mixture remains stable but it has a clearer indication of time, when compared to the more generic ‘no matter how long’ structure used in the original. ‘Degas’ can be rendered as ‘degasare’ or ‘degassare’, they are equivalent, as stated by Enciclopedia Treccani. In the text the translation will be ‘degasare’, with some flections, i.e. ‘degasata’.

The Action Lab, in several instances, refers to the recipients as ‘beaker(s)’, which has an Italian translation which is ‘becher’, pretty similar from a semantic and phonological point of view. However, beakers are typically ‘glass or plastic container(s) used in chemistry’ - as the Cambridge Dictionary describes them also providing an image – that have a flat bottom and measurements on the glass. The Action Lab uses containers

that resemble vials, which have a round bottom and have a smaller diameter. That is why ‘beaker’ was rendered as ‘provetta’. ‘Vacuum chamber’ (07:04) is, again, rendered as ‘camera del vuoto’. ‘(put them in the vacuum chamber) we’ll have the advantage of degassing the water and the oil’ (07:09) has been shortened as ‘(basta mettere tutto nella camera del vuoto) per togliere il gas dall’acqua e dall’olio’. ‘So cool’ (07:29) is a comment made by The Action Lab on the results: in the Italian translation, to involve the audience once again, the preferred alternative has been to transform this statement in a rhetoric question: ‘Sorpriendente, vero?’. ‘even when you reintroduce it back to air it doesn’t separate out’ (08:11) has a different wording in Italian: ‘anche aprendo la camera del vuoto, la miscela resta coesa’, explaining that air can be reintroduced only by opening the vacuum chamber. Similarly, ‘it doesn’t separate out’ is a negative form that is affirmative in Italian: ‘resta coesa’.

‘Soapy water’ (08:23) has been translated as ‘miscela di acqua e sapone’, as ‘acqua insaponata’ would not seem correct and the expression ‘acqua e sapone’ is of common use in Italian. ‘Emulsifications’ (08:52) is omitted in the Italian, as it is clear that usage of degassed water in emulsifications is the main topic. Therefore, it is not necessary to specify it again.

The ending of the video is quite similar to the previous, with some additions, like the ‘subscription box’ (09:18), which is ‘scatola in abbonamento’, but it is not common practice in Italy: the translation is quite semantic as it is a superfluous element that concerns subscribers and is not linked to the content of the video.

Since the explanatory part is over at this point, the register is less formal and less dense of special terms. ‘Putting different things in it’ (09:34), therefore, was rendered as ‘mettendoci le cose più disparate’, which is fairly informal.

Speaking of catchphrases, they are not completely equal, when compared to the previous video, to give a sense of variety to the two videos: in the previous video, ‘hit the subscribe button’ and ‘hit the bell’ were ‘cliccate su “iscriviti” e sulla campanella’, whereas here it is ‘(vi chiedo di) iscrivetevi al canale e cliccare sulla campanella’. One choice or the other make no difference, in this case.

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|----------------------|----------------------------------|
| <i>Title</i> | What is boiling? An introduction |
| <i>Author</i> | Wayne Breslyn |

| | |
|---------------------------------|---|
| <i>Duration</i> | 1 minute, 10 seconds |
| <i>Upload date</i> | March 9th, 2016 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | Breslyn describes water vapor and how water behaves while boiling. |
| <i>Language register</i> | Formal: the text has a scientific approach, it is extremely descriptive and condenses information about chemical reactions in 70 seconds of video. Catchphrases are absent. |

Table 5. Wayne Breslyn - What is boiling? An introduction

Breslyn's video is more formal, when compared to the previous. It is a brief lesson on boiling, therefore Breslyn is only a narrator, presenting the topic and describing the chemical reaction behind boiling. It is different than the approach intended by The Action Lab, as it goes straight to the point: whereas Orgill speaks as a YouTuber trying to make popular science accessible to larger audiences, Breslyn is a researcher, he does not act as a YouTuber, so he does not ask subscribers to participate in the experiment, involve them nor wants like or bell buttons to be pressed. This video is a lecture on water.

Speaking of the transcript, there is just one mistake: 'in' instead of 'and' at 00:47.

There is a repetition of terms in the text referring to water:

- water, (energetic) water molecules;
- water vapor;
- boiling/bubble(s);
- H₂O;

Although terms are straightforward and easy to understand, the video revolves around one concept and this is the only focus. Repetitions, therefore, are necessary to reiterate a concept to make it clearer.

The video features some text, that does not need to be subtitled, as everything that is visible on screen is already explained by Breslyn. Speaking of the translation activity, the term 'water vapor' (00:06) has been rendered as 'vapore acqueo', which is the only translation possible.

Subtitles at 00:06, 00:09 and 00:11 have been split in the translation. Since Breslyn articulates words in a clear way and does not speak fast, sense unities have been

split whenever that was possible, so that sentences end in two, no more than three subtitles.

The transcript is fairly shorter at 00:11, ‘and this is what we call boiling’. The previous sentences need to be explicitated in Italian: ‘Questo è il fenomeno che chiamiamo bollore dell’acqua’. This sentence is longer, in fact ‘boiling’ has not been rendered as ‘ebollizione’, which is the right term. ‘Bollore’ has been chosen, instead, to keep the subtitle shorter. Similarly, ‘we’ll start with’ (00:13) is ‘iniziamo col parlare (della molecola dell’acqua)’.

The following subtitles explain what is displayed on screen, that is the composition of a water molecule, ‘red is oxygen’ and ‘the two white atoms are hydrogen’. The colon after ‘molecola dell’acqua’ introduces what is being displayed. ‘When we add heat’ (00:25) is ‘aumentando la temperatura’, that has been translated also taking into account choices made in the first video: ‘let’s see how cold water is’, which is ‘vediamo a che temperatura è l’acqua’. In order not to repeat the term ‘temperature’, ‘if we add enough heat’ (00:28) is ‘quando l’acqua è abbastanza calda’.

At 00:33 Breslyn explains that there is empty space between molecules: he says ‘note that’. The translation was split again in order to end the previous sentence and start with a new one that begins Breslyn’s explanation: ‘notate come’.

As Breslyn makes the viewer imagine bubbles forming during boiling, he says ‘imagine a group of water molecules’ (00:44), that has been rendered as ‘proviamo ad immaginare un gruppo di molecole d’acqua’, as this was a lecture and the professor tried to make his students understand this concept.

From 00:54 to 00:56 Breslyn uses the term ‘bubble’, in his singular form. Although in the video there is a green circle indicating a bubble, the translation features the term ‘bolle’, which is plural. This form was chosen over the singular because this is a generic example of a bubble forming, but the meaning does not change if ‘bubble’ is singular or plural.

To sum up, Breslyn says ‘remember, there are only water molecules’ (00:58). To give a sense of ending and to resume the concept, to use the same analogy of a professor in front of a classroom, the Italian translation features ‘ricordiamo’, which is plural and involves both the professor and the classroom.

‘Very energetic water molecules’ (01:01) is not equal to ‘high-energy compounds’ said by The Action Lab. As that expression was specific, ‘they’re very energetic water molecules’ acts more as an explanation which has been, therefore, rendered as such: ‘sono molecole cariche d’energia’. ‘in the form of a gas which we call water vapor’ (01:05) could not be translated semantically in Italian, therefore it has been shortened in ‘che assumono la forma del vapore acqueo’, thus removing ‘which we call’, that is superfluous.

| | |
|---------------------------------|---|
| <i>Title</i> | Water is Amazing – World Water Day! |
| <i>Author</i> | Vsauce |
| <i>Duration</i> | 5 minutes, 54 seconds |
| <i>Upload date</i> | March 23rd, 2012 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | This video delves into some of water’s properties to then talk about the distribution of water on Earth, to demonstrate why it is so important that everyone have access potable water. |
| <i>Language register</i> | Formal/semi-formal: Vsauce starts with a fact concerning water to then connect it to other facts: while doing so, he has an informative approach through which he gives statistics, and also uses terminology when referring to topics such as the Mpemba Effect. Contracted forms are less used, although some expressions – as ‘big old sack of water’ are more direct and less formal. |

Table 6. Vsauce – Water is Amazing – World Water Day!

Vsauce’s video features subtitles made by a YouTube user. This is the only instance – if we exclude Bressanini’s videos which have been chosen on purpose, to make a contrastive analysis based on already made subtitles – in which subtitles are already given.

Although they are correct from a grammatical point of view, they have not always been properly divided. In some cases the natural progression of sentences is broken into two different subtitles, for instance:

- subtitles from 00:10 to 00:15: ‘even though, here on Earth, there is enough clean, safe, drinking water for everybody // to have enough, they don’t.’ here

lines could have been divided as ‘clean, safe // drinking water for everybody to have enough’ or even ‘clean, safe, drinking water // for everybody to have enough’. ‘To have enough’ follows the fact that water is for everybody, they should be written in the same line of text.

- subtitles from 00:32 to 00:37: ‘The effect has been observed many many many // times, but has never been explained’. Here, since ‘many’ has already been repeated twice, to save space one of them could have been omitted to fit ‘times’ and leave it in the previous subtitle, instead of removing it to write it in the following.
- another instance concerns subtitles from 01:01 to 01:11: ‘can turn to ice more quickly than a glass of cold // water.’ and ‘but it can // happen’. The natural progression of spoken words is broken once again, which is pointless, even because subtitles in the text are normally two lines long and at 01:11 only one line is present. The subtitler could have left ‘happen’, for example, in the previous subtitle, instead of splitting the two.

These were only some examples of how subtitles for this video are made. This work suggests that not only auto-generated subtitles can be made poorly – but this is justifiable because they are produced by a machine – but also that being a native language speaker is not enough if there is no subtitling practice or knowledge of rules behind a work like this. Subtitles are not wrong, of course, it is just that they lack precision in the making. The translation I made tried to take into account this division of sense units in order to separate them accordingly so not to distract the audience from the content of the video itself.

Terms concerning science and water-related vocabulary is featured in the following list:

- Mpemba effect;
- dissolved gas/dissolved;
- heat up/boil water;
- freeze;
- convection currents;
- insulator;
- evaporation;

- fat/lean tissue;
- storms/clouds/rain/thunderstorms;
- potable water/clean, safe water;
- water-related diseases;
- sustainable clean water solutions.

Speaking of translation, here is the analysis of the Italian transcript with parts that seem interesting to talk about.

At the beginning of the video, Vsauce starts with his usual catchphrase: ‘Hey, Vsauce, Michael here’: this is how he usually starts his videos. In Italian the inversion of ‘Michael’ and ‘here’ was preferred: ‘Qui Michael’.

Although the previous videos were intended to prove a point – an experiment concerning water and oil, for example – or to give some information in the form of a lecture – what is boiling? – this video has a different approach. In the video, Vsauce talks as if he were a divulgator telling facts that may be interesting for the audience. He does not want the public to participate in a discussion, he just focuses on a few points that he proceeds to explain. This is why the video revolves around Vsauce, featuring the first singular person. ‘And today, we’re going to talk about water’ has therefore been rendered as ‘Oggi vi parlerò dell’acqua’. ‘Because today is World Water Day’ is ‘Eh sì, perchè oggi è la giornata mondiale dell’acqua’. ‘Eh sì’ has been added as a discourse marker to introduce the topic, as ‘perchè’ here is intended as an adverb to start an explanation, rather than an adverb introducing a causal clause.

The concessive clause introduced at 00:15, ‘even though’, has been split into two sentences. It continues in the subtitle after, in Italian: ‘(sul fatto che qui, sulla Terra,) c’è abbastanza acqua per tutti, pulita e potabile, // acqua a cui però un miliardo (di persone non ha accesso’. The original transcript is fairly long and the risk is that of making people lose track of what has been said if a subtitle is too long and the sentence occupies four lines of dialogue.

The Mpemba effect is rendered semantically, as Mpemba is the name of the person who has discovered it – or at least, the one how gave it its name. ‘many many many’ would have been an unnecessary reiteration: ‘moltissime’ has been chosen instead, preferring a superlative adjective over a repetition of ‘molte’, also to reduce the length of the subtitle. ‘It is so famously anti-common sense // whenever people throughout [...]’

(00:37) was shortened: ‘Forse perchè sembra insensato’. This choice is justified by the fact that the English subtitle is not divided into two. The meaning is preserved in Italian even after splitting the two sentences.

The passive voice ‘nelle volte in cui è stato osservato, è sempre stato considerato’ was chosen over the active ‘whenever people [...] have observed it, they’ve tended to think that [...]’ to give a sense of detachment and a more formal cut to the subtitle.

‘the 20th century’ has been shortened: ‘il secolo scorso’, as ‘non prima del ventesimo secolo’ would have been too long. ‘It doesn’t make a lot of sense’ (01:08) is, in the Italian translation ‘Sembra una follia’. ‘Non ha molto senso’ was equally right, but the effect seems to be unexplicable and this translation is coherent with the previous subtitles in which is being said that for centuries ‘people have (been) observ(ing) it’ so they may have risked of being considered mad men. ‘Dissolved gas’ (01:14) is, again ‘gas disciolti’.

‘Stuff’ (01:20), for short that it may be, would not fit in the Italian translation as it was conceived: ‘(avendo il liquido) meno componenti (disciolte al suo interno)’ is fairly longer, although it fits in two lines.

Similarly, ‘of why we throw down salt’ was rendered as ‘quando si butta il sale’, which is an impersonal and more detached form.

‘Making it more difficult to freeze’ (01:28) is ‘ritarda il congelamento dell’acqua’, as ‘rendendo il congelamento dell’acqua più difficile’ would not sound as natural and would be too long. ‘Convection currents’ (01:36) has a direct correlative: ‘correnti convettive’. It cannot be translated in a different manner. ‘The point is that’ (02:06) could be omitted, as it has not particular semantic value and even without it the subtitle would still make sense. In Italian it is ‘in realtà’, which could also be omitted but serves as a discourse marker.

The word ‘thermosis’ at 02:26, which indicates “any change that takes place in an organism because of the effect of heat”, according to Encyclo.co.uk, has not an Italian correlate, so it has not been rendered in the translation as the sense is preserved through what is being said before and after the term ‘thermosis’. ‘It’s tough’ (02:31) is an acknowledgement of the fact that this explanation could be difficult to grasp because it seems not to make much sense – speaking of the Mpemba effect – so the translation tried to preserve this sense of surprise: ‘sembra strano, è vero’, with ‘è vero’ being the acknowledgement. ‘ne è’ at 02:33 is useful to avoid the repetition of Earth, thus

shortening the subtitle. ‘excluding fat’ (02:39) has been removed from the Italian subtitle as the focus of the sentence is the percentage shown – 70%. This part has been cut because fat is also mentioned further on by Vsauce, explaining that fat tissue retains less water and dividing male from female body in their composition, thus making the indication at 03:39 expendable.

The subtitle at 02:47 does not fit in a formal context: ‘when you were born you were a big old sack of water’, which is a pretty informal way to express the same concept that can be rendered in Italian as ‘I bambini appena nati hanno più acqua in corpo’, thus making it less specific and far more formal. ‘that number’ (02:55) is better rendered as ‘la percentuale’, as ‘il numero scende a’ sounds less natural, when compared to the translation used in this analysis.

Indications of quantity such as ‘and it’ll drop even further to about 60%’ can be resumed by indicating just the number: ‘(la percentuale di acqua) in un uomo in età adulta scende al 60%’.

To maintain a more formal register, ‘women’s physiology’ at 03:07 has been rendered as ‘la fisiologia del corpo femminile’, which seems more precise and scientific in this context.

At 03:46 Vsauce makes a list of living beings and objects containing water, which he then refers to by using the pronoun ‘they’. Since he also says ‘you, me, all the other animals’, the Italian rendition of this subtitle features the pronoun ‘tutti’ and ‘siamo fatti’, which is the first plural person.

English punctuation requires the use of points to indicate percentages: ‘0.0001%’ (03:59) must be translated as ‘0,0001%’, with a comma separating the numbers.

Similarly, ‘almost a billion people on Earth don’t have access to potable water’ requires the plural form – as the logical subject is ‘people’ – in English, whereas the focus in Italian is ‘un miliardo’, therefore it requires the singular form ‘un miliardo di persone non ha accesso all’acqua potabile’.

Water is ‘free from diseases’ (04:15) if it is not contaminated: that being said, ‘non contaminata’ has been chosen as ‘senza malattie’ or ‘libera da malattie’, because uncontaminated water, by definition, cannot ‘host’ diseases. From a logical point of view the sense is preserved, that is why ‘non contaminata’ is the alternative chosen. ‘Except’ at 04:31 is used as a conjunction followed by a clause: it may be explicitated with the

periphrasis ‘tranne per il fatto che’. The shorter version, used here, is ‘ma’, that preserves the same meaning. ‘3.5 million (people)’ (04:36) follows the aforementioned rule: it features a point in English and a comma in Italian. In the translation this element is repeated to underline the fact that 3.5 million people lack potable water is a topic to reflect on. Therefore, the reiteration of this huge number served as a way to raise awareness, instead of translating the more generic ‘that’s equivalent to’ (04:44). ‘our planet loses an entire city of Los Angeles’ (04:44) is a comparison that would not be as effective in Italian, if not paraphrased: ‘viene a mancare un numero di persone uguale al numero di abitanti a Los Angeles’. This alternative is slightly longer and repetitive because it is more explanatory: the planet does not lose any year *the actual city* of Los Angeles, but a number of people which is roughly the same as those inhabiting it. ‘making a difference’ (05:03) is a collocation that features an indefinite article. In Italian this has to be translated as ‘fanno la differenza’, as this is the right collocation. ‘sustainable clean water solutions that the community itself will own’ (05:11) implies the fact that those solutions will be an advantage to the community and that that community is going to exploit them for their own good: ‘a vantaggio della comunità’, therefore, is what has been written in the Italian translation. ‘They gave me a chance to go out to India’ (05:17) may cause a misunderstanding because it is unclear whether Water.org offered Vsauce to go to India or if ‘organizations like Water.org’ gave him this chance. The Italian rendition, therefore, features a passive voice structure: ‘mi è stata offerta l’opportunità di andare in India’. ‘They’ve got videos on their channels’ at 05:26 is less explicit in Italian: ‘potete fare un salto sul loro canale’ implies that Vsauce wants his audience to take a look at his friends’ videos. Moreover, in the following subtitle, in Italian, ‘vi consiglio di vedere i loro video’ explicitates the original subtitle’s ‘go check those out’ (05:31).

The video ends with Vsauce thanking his audience for following him, it is a different approach, when compared to The Action Lab. This difference is justified by the fact that Vsauce’s video is informative and wants to raise awareness, so asking for likes, comments and subscriptions would be a little out of context. This video, moreover, was uploaded in 2012, which was a different time for YouTube. The bell button was absent, so was the watchtime feature. People clicked on videos and subscribed because they actually liked the video, without the need, for the content creator, to ask for them.

Now that English videos have been analysed, what follows is the analysis of Italian videos translated into English, the first three videos serving as a term of comparison to the rest of the analysis.

4.3.2 Italian videos translated into English

The final part of this chapter will be heavily focused on videos that were originally uploaded to YouTube in Italian. Italian being the source language, English is the target language of those subtitles.

What follows is Bressanini's trilogy *Pasta Senza Fuoco*.

These three videos were not subtitled by me, as they were already made, both in Italian and in English.

The analysis will then be focused on another video by Bressanini, which did not feature any subtitles, neither in Italian nor in English, and on three other videos, one by *fisicainvideo*, one by *Zanichelli* and the last one is an excerpt from an episode of Italian TV show *SuperQuark*.

| | |
|---------------------------------|---|
| <i>Title</i> | PASTA SENZA FUOCO (1) – Perché continuare a far bollire l'acqua è inutile |
| <i>Author</i> | Dario Bressanini |
| <i>Duration</i> | 3 minutes, 46 seconds |
| <i>Upload date</i> | September 3rd, 2017 |
| <i>Subtitled part</i> | All – Subtitles were already made |
| <i>Description</i> | This first video serves as an introduction to the experiment: Bressanini explains the practical advantages of turning off the stove after water starts boiling to cook pasta. |
| <i>Language register</i> | Slightly informal: the video features just the experiment. While Bressanini cooks the pasta he gives general indications on why water should not be constantly heated after it starts boiling. This is just a general, less scientific introduction to the topic. |

Table 7. Dario Bressanini – *PASTA SENZA FUOCO (1) – Perché continuare a far bollire l'acqua è inutile*

The video starts with Bressanini performing the experiment in his kitchen: he wears a t-shirt and shows the steps that are to follow when cooking pasta, with the sole difference that he turns off the heat after water starts boiling.

This is an informal setting, as the first and second videos are, when compared to the third one.

Language used features common words and basic structures that are typical of spoken language, such as phrasal verbs like ‘la butto dentro’ (00:10), basic examples of dialogues that are informal ‘uno dice, vabbè se faccio I conti non sono poi tanti soldi’ (02:08), or terms of endearment ‘la butto dentro, gli do una mescolatina...’ (00:10), that do not take into account grammatical rules: ‘pasta’ is a feminine noun, whereas ‘gli’ is a masculine direct object pronoun.

Moreover, Bressanini uses a catchphrase – which is normally to be considered as informal but it is his way of introducing himself – that is ‘il vostro amichevole chimico di quartiere’ (00:33): he quotes Spider-Man in his trade-marked motto ‘Friendly Neighborhood Spider-Man’ that “Marvel have just registered (as) trademarks for Friendly Neighborhood Spider-Man for all manner of things”, as reported by Bleeding Cool’s Rick Johnston.

Speaking of the transcript made for the source text, it is professional and well-written, featuring a balanced distribution of sense units throughout the text, splitting subtitles when necessary and with a pondered usage of punctuation. This also applies to the translated text.

Since these three videos were already subtitled, I will not delve into all of the details of such translations: the goal of this part of analysis is to assess the quality of this work and to see how language was translated in a similar context to the topics chosen for this dissertation. Therefore, what follows is a general analysis concerning few instances of subtitles that were well-made or need to be modified.

‘Un po’ di sale...’ (00:09) has been translated as ‘a pinch of salt’, which is the right quantifying noun to collocate with salt.

‘un condimento’ (00:26) has been rendered as ‘some seasoning’, which is fairly right but, since Bressanini shows some sliced tomatoes and a few leaves of basil, maybe ‘dressing’ would have been a better alternative. Seasoning is usually used for spices, salt and elements that give more flavor to a dish, whereas in this case what Bressanini shows is more of a sauce for his dish of pasta. ‘non è una mia invenzione’ (01:01) is ‘It was not

invented by me'. This is a calque from the Italian, as inventing requires an act of creation, which is not what this case is about. 'Discovered' may have been a more correct way to render this concept, as this method derives from a long-term habit, rather than from an invention: boiling is a consequence of heated water, which already exists.

At 01:13 the subtitle is slightly imprecise: 'è qualche cosa che si sa da almeno 200 anni' is 'we have known this since at least 200 years'. '200 years' being an indefinite unit of time and not a precise date, 'for 200 years' is a more correct way to translate this passage. 'Nuova tecnica di cottura' (01:26) has been rendered as 'novel cooking technique'. Although 'novel' as a noun is a kind of book, it is a *finesse* in this context, as 'new' would have been equally fine but less appealing. Similarly, 'erroneamente' (01:30) as 'erroneously' could have been translated as 'wrongfully', although this latin derivation adds a more formal tone to the translation.

Water being an uncountable name, 'the' could have been omitted at 01:37 in the translation.

You cannot 'offer' reasons, as indicated at 01:49: 'I am giving you at least three reasons' would have fit better in this case. 'grado di cottura' (02:00) has been translated as 'degree of cooking': this is a semantic translation that does not take into account the meaning of 'degree'. It may be used as 'degree in culinary arts', for instance, or to give temperature. In this context an indirect question with a verb inversion would have been preferable: 'depending on how cooked you want pasta to be', to underline the fact that it is pasta that is being cooked, not water. 'Uno dice, vabbè (se faccio i conti)' (02:08) has perfectly been rendered as 'You might say, well, (If I make a quick calculation)', which sounds like something a native speaker would say.

On the contrary, 'solo perchè si è sempre fatto così?' is 'because that is what we always did?' sounds more Italian than it sounds English: 'we've always been doing' would give a sense of reiteration of this act through time, although I would have shortened it by saying 'just because it is an old habit?' which preserves the sense intended in the source language.

At 03:08 the translation features 'and voila', which is correct, although 'et voila' would have maybe fit better in this context.

‘la scienza coinvolta’ (03:37) has rightfully been translated as ‘the science behind’, which is exactly what the source text means to say with ‘coinvolta’: ‘involved’ would have been a less appealing choice in this context.

Also choosing not to translate ‘buon appetito’ (03:40) is a *finesse*, as this is an element that cannot be omitted. Moreover, ‘buon appetito’ is a known formula, along the lines of expressions such as ‘arrivederci’, ‘ciao’ or ‘buongiorno’. These are typical – and stereotypical – Italian nouns, adverbs and adjectives that are known worldwide. Moreover, the video deals with pasta, which is one of the most representative dishes from Italy and Italian cuisine is renowned for its quality. This subtitle, therefore, may also be seen as a homage to this idea of tasteful, well-cooked Italian food.

In general, those subtitles have been well-executed and there are some parts which I think could not have been rendered in a better way. Although there are a few mistakes, subtitles here are not incorrect or poorly translated, as those remarks are often based on two or more alternatives which are equally correct or differ in just a tiny nuance.

| | |
|---------------------------------|--|
| <i>Title</i> | La Scienza della Pasta senza fuoco (2) perché si può spegnere il fuoco dopo aver buttato la pasta |
| <i>Author</i> | Dario Bressanini |
| <i>Duration</i> | 5 minutes, 46 seconds |
| <i>Upload date</i> | September 4th, 2017 |
| <i>Subtitled part</i> | All – Subtitles were already made |
| <i>Description</i> | Bressanini delves more into the scientific reactions and implications of this experiment, after a more introductive video. The second video is fairly more specific and narrative, as he also explains that this cooking method dates back to the 18 th century. |
| <i>Language register</i> | Semi-formal: Bressanini uses terminology to address this topic, as he talks about ‘denaturation’ and ‘coagulation’ of gluten. However, he also uses diminutive structures, such as ‘un pochettino’ and imperative structures that are typical of spoken language, like ‘beh, andatelo a vedere’. |

Table 8. Dario Bressanini – *La Scienza della Pasta senza fuoco (2) perché si può spegnere il fuoco dopo aver buttato la pasta*

The second video - apart from being fairly longer than the first - features a greater deal of terminology, as it is intended to be more precise and science-based: the setting is the same, although Bressanini explains the experiment and the science behind it.

As subtitles have been made by the same YouTube user for all three videos, their quality will not be assessed in detail, to avoid repetitions. Language used, instead, will be analyzed both in the source text and in the target text.

Before talking about structures used and their translation, here is a list of terms concerning science or water-related vocabulary that is featured in this video:

- bolle/ebollizione/temperatura di ebollizione;
- altitudine;
- livello del mare;
- termodinamica;
- combustibile;
- trasferimento di calore;
- velocità di diffusione dell'acqua;
- gelatinizzazione dell'amido/granuli di amido;
- denaturazione (del glutine);
- coagulazione (del glutine);
- rilasciare l'amido.

Subtitle analysis will be now presented. Translation from 00:00 to 00:07 is made up of three subtitles, whereas those sentences could have split: 'Hello everybody, in my last video / I explained how to cook pasta while turning off the stove: / "Pasta without heat", have you seen it?' following with 'if not, then watch it' at 00:10. This choice may quite alter the original wording, but it may make subtitles more accessible to non-native speakers.

Discourse markers such as 'beh' (00:10) are perfectly translated with similar discourse markers: 'Well', in this and other (01:01) parts of the transcript. Punctuation is not always effective, as some commas are missing: 'Come vi dicevo non l'ho inventato io' (00:22) lacks a comma in the translated version, after 'As I said' and before 'I did not invent this'. Similarly, at 01:22, commas before and after 'however' are absent. The tone of the sentence is lowered when 'however' is pronounced, therefore, it needs to be enclosed in two commas. 'ma si sa da almeno 200 anni' (00:26) is 'but we have known

for at least 200 years'. In this case, 'known' lacks an object, which may have been corrected as 'we have known that'. 'You know that water boils at 100, right?' (00:26) is a fairly informal question, as it does not follow the standard progression of tag questions or yes/no questions, since 'right' could have been replaced with 'don't you', that could make the subtitle more formal. 'Immagine di essere a 2000 metri' (00:50) has rightfully been rendered as 'picture yourself at 2000 meters', which follows the sense of the sentence and not the semantic words used. 'but' (00:57) should be omitted, as it is superfluous: the 'no matter how much' structure does not require 'but' to contrast the former statement to the latter. 'Cosa c'entra questo?' (01:01) is 'How is this relevant?', which, again, is based on sense and has not been rendered semantically. Communicative translation, in this text, is always effective.

At 01:30, the translator has chosen to translate 'cuocere le cose' with 'to cook food', which fits better in this context.

'new' at 01:45 is also superfluous, as Thompson is described as 'one of the founding scientist of thermodynamics', implying that 'thermodynamics' was not a field of study before he and other scholars talked about it.

At 02:22, 'ai vostri professori o a voi stessi' is 'to your teachers or to yourselves', which is right, although at 00:50 the translator has chosen to use the singular form 'picture yourself': therefore, to give more coherence to the text, here the singular form would have been preferable.

Subtitles from 02:28 to 02:50 feature a single quote, which is written in the space of six subtitles. Although under standard circumstances this choice would be wrong, this is a quote and, therefore, could be accepted. In these subtitles 'Thompson' is misspelled, it lacks a 'p'. 'The phenomena that occur when we cook pasta are three' (03:15) follows a structure which is typical of Italian language, separating the subject complement from the predicate. An improved version could be 'there are three phenomena that occur when we cook pasta'. 'the' at 03:47 should be omitted, as 'diffusion' is an abstract name that does not require the definite article. Similarly, 'starch gelatinization' at 04:03 and 'denaturation and coagulation' at 04:12 should not be introduced by a definite article. 'temperature' may be added to 'water' at 04:33, as it is not water that is 'above 80 degrees': temperature rises. 'The', again, is superfluous at 04:40, before 'degrees'.

The last subtitles are coherent to the previous videos, as ‘buon appetito’ has not been translated and ‘il vostro amichevole chimico di quartiere’ is still ‘your friendly neighbourhood chemist’.

In general, these subtitles are well-written, with some details that should be improved to give the translation some sense of resemblance to what a native speaker may say, the source language were English rather than Italian.

What matters to this analysis is the rendition of technical terms. There are some which derive from Latin or Greek, that have perfectly been translated by using their exact correlative, for instance ‘thermodynamics’, or ‘gelatinization’, which are extremely similar in Italian. The same happens with words that are different in English, as ‘combustibile’ is just ‘fuel’, which is rightfully translated as such.

| | |
|---------------------------------|---|
| <i>Title</i> | PASTA SENZA FUOCO (3) – Ho commesso due errori |
| <i>Author</i> | Dario Bressanini |
| <i>Duration</i> | 5 minutes, 32 seconds |
| <i>Upload date</i> | September 26th, 2017 |
| <i>Subtitled part</i> | All – Subtitles were already made |
| <i>Description</i> | Bressanini tries to correct imprecise or partial information given in the previous videos, as he explains how to better perform the experiment. |
| <i>Language register</i> | Informal: Bressanini makes examples of rants that he has seen in comments below his previous videos, using sometimes slang to get straight to the point: an example is the term ‘picciu’, used at 00:59, which is dialectal; ‘il perchè e il percome’ (00:23), similarly, is not used in formal settings, as it is an expression typically used in spoken language. |

Table 9. Dario Bressanini – PASTA SENZA FUOCO (3) – Ho commesso due errori

Bressanini’s ‘pasta senza fuoco’ trilogy ends with a video in which he apologizes for uploading two separate videos – one based on the method and one based on the science behind it – and for not giving more precise information on how the experiment was to carry out.

Subtitles are more precise and punctuation is generally correct, therefore they will not be a subject of analysis for this video: only translation choices will be presented in this part.

Scientific terms featured here are:

- (velocità di) raffreddamento;
- bollore;
- coperchio ermetico;
- temperatura dell’acqua;
- amilosisio.

As it is evident, terminology is nearly absent. The reason why this video has been chosen as part of the analysis, is that it gives context to the previous videos, as it is the third, necessary part and is connected to the remaining two. Being this video less dense of such structures, subtitles will be briefly analyzed, focusing on parts that are particularly worth of interest. ‘il perchè e il percome’ (00:23) has been rendered as ‘the why and how’, although the Collins Dictionary provides a better translation, that is ‘whys and wherefores’. This translation is more suitable, as it renders the meaning of the original. ‘gente del calibro di’ (00:50) has been omitted, as ‘people like’ is equally right and does not need additional information to be understood. ‘non proprio gli ultimi *piciu* che passano per la strada’ (00:59) is a colloquial sentence, in which ‘piciu’ is dialectal for ‘penis’, used as a swear-word, as stated by the website Guida Torino, featuring the 50 most-common swear-words in Piemonte dialect:

Letteralmente “piciu” in piemontese indica il sesso maschile. Per estensione del termine, in dialetto, si usa questa parola per definire una persona come una “testa di cazzo” o un “cazzone”.

‘Piciu’ being a swear-word, the translation ‘random idiots on the street’ maintains the same register and it is not, therefore, out of context. It has been slightly censured, as ‘idiots’ is not as strong as a term, when compared to the original meaning of ‘piciu’.

Names of chefs are not adapted to give names of chefs that may be more famous all over the world, as Gordon Ramsay could be. Although this choice may be arguable, in my opinion it makes sense, as it preserves the idea of Italian and French (Ducasse) chefs using this method. The fact that Scabin, Marchesi and Sironi are Italian makes more sense, since the topic is pasta and how to cook it. Another reason why Italian names

should not be adapted is that they have just been mentioned as an example: the video does not revolve around them, nor their careers, they are just used to make a list of experts whose opinion on this topic is reliable. ‘in quali condizioni’ (01:17) is rendered with the right preposition in English: ‘under which conditions’. ‘il vecchio video’ (02:19) should not be ‘the old video’, as this comparison does not concerns time: ‘vecchio’ is intended as ‘previous’ here.

Again, at 02:54, ‘the’ is to be removed before ‘80 degrees’, as the determiner for degrees is already present. ‘It was of asking questions’ (03:39) is a fairly Italian construction for ‘(il punto del mio video) [...] era quello di farsi domande’, that could be rendered with an infinitive form, ‘it was to ask questions’.

The original transcript has a mistake at 04:34, ‘l’amilosio a questo effetto’, whereas it should be ‘ha questo effetto’. In the same subtitle, ‘questo effetto diciamo da collante’ has been correctly translated as ‘amylose has this, let’s say, glue-like effect’, that takes into account the discourse marker ‘diciamo’. ‘Glue-like effect’ is a good translation that gives the idea intended in the original while being semantic.

This translation is well-executed, as it preserves the context and the sense of the original text while adapting sentences or words when necessary. It is as good as the translated subtitles featured in the two videos that were previously analyzed.

What follows is another video from Dario Bressanini, which did not feature any transcript nor translation and was, therefore, completely transcribed and translated by me.

| | |
|---------------------------------|--|
| <i>Title</i> | La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina |
| <i>Author</i> | Dario Bressanini |
| <i>Duration</i> | 5 minutes, 56 seconds |
| <i>Upload date</i> | April 12th, 2012 |
| <i>Subtitled part</i> | All – both Italian and English, transcript was not available |
| <i>Description</i> | Bressanini and his co-host Sara try to make a chocolate mousse without using cream or other dairy products, while explaining the science behind it. |
| <i>Language register</i> | Semi-formal: this video features an experiment which is explained in detail, with all the steps to follow and not to follow. Bressanini makes use of terminology such as ‘lecitina di soia’ while conducting the |

| | |
|--|---|
| | <p>experiment. The video is mainly formal, although interaction between Bressanini and Sara reminds that of a cuisine TV programme, which makes it less formal and more directed to general audiences, not being targeted to a specific or specialized one.</p> |
|--|---|

Table 10. Dario Bressanini – La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina

Starting from the transcript, this video has been treated in a different manner than the rest of them, as the main difficulty lies on the fact that there were no subtitles to begin with. For the translation process to begin, what was needed was a transcript with timestamps that could then be rendered from the source language to the target language. The first step has been to write down what was being said in the video, in a word-for-word transcript that features mistakes made by Bressanini during his explanation. Here is the transcript:

-Come l'acqua per il cioccolato è il titolo di un film che racconta di un amore devastante, devastante come lo è l'acqua per il cioccolato.
Ma come mai?
Dario!
-Ciao Sara
-Benvenuto Dario, sai che le casalinghe sono molto golose di cioccolato
Sì, anch'io, allora per capire perché il cioccolato non si mescola con l'acqua abbiamo bisogno di dire due parole sulla materia prima:
questo è il frutto della pianta del cacao.
Questo frutto contiene queste..., questi semi che vengono chiamate fave.
Queste fave all'interno si schiacciano e contengono la materia prima con cui noi poi andremo a fare il cacao.
Questa materia prima viene schiacciata, viene messa in apposite macchine e alla fine si produce la massa di cacao, chiamata anche liquore di cacao perché durante la lavorazione è liquida, ecco.
Questo cacao grezzo, questa massa di cacao grezzo contiene circa il 55% di grassi e questo è il motivo per cui il cioccolato non si mescola con l'acqua, perché grasso e acqua non hanno intenzione di mescolarsi.
Vogliamo fare un esperimento?
-D'accordo
-Allora Sara, adesso sciogliamo del cioccolato. Ecco è importante quando si scioglie il cioccolato mantenere le temperature abbastanza basse, ecco perché è preferibile scioglierlo in quello che si chiama un doppio bagnomaria. È il vapore che si solleva dalla pentola che deve lentamente e sottolineo lentamente sciogliere il cioccolato e a 40° è già sciolto.
Bisogna stare attenti a non arrivare a temperature troppo elevate perché altrimenti il cioccolato brucia, nel senso, diventa amaro, acido e diventa immangiabile.
-Utilizziamo cioccolato fondente per quest'operazione.
-Sì, utilizziamo cioccolato fondente per fare i nostri esperimenti perché il cioccolato fondente è più ricco di grassi.
Nonostante molte persone pensino che sia più dietetico, in realtà il cioccolato fondente è più ricco di grassi, è più calorico del cioccolato al latte. Adesso possiamo procedere con il nostro esperimento e rovinarlo aggiungendoci un po' d'acqua.
-Sicuro?
-Sicuro.
-Cosa sarà mai una goccia d'acqua?
-Eh, una goccia d'acqua in realtà è abbastanza per rovinare quello che abbiamo fatto. Vedi? Si sta rapprendendo, diventa più scuro, ci sono dei grumi che si formano. Eh, sembrerebbe una cosa immangiabile.
-È da buttare!
-Eh no, succede quel che succede quando noi facciamo cadere una goccia di caffè in una zuccheriera. La goccia d'acqua, che è poca rispetto allo zucchero presente, attira lo tutto lo zucchero che ci sta intorno e forma un grumo. Paradossalmente poca acqua rovina lo zucchero e il cioccolato, ma aggiungendo ancora un liquido acquoso riusciamo a riscogliere i grumi. Questo allora è quello che andiamo a fare ora per eliminare i grumi che si erano formati prima nel cioccolato.
Aggiungiamo dell'acqua tiepida, in modo tale da non creare shock termici al cioccolato, piano piano, poco alla volta e cominciamo a mescolare. In questa maniera l'acqua cercherà di sciogliere i grumi di zucchero che si sono formati e che rendono così viscoso e denso il cioccolato.

Chiaramente **questa**, questo cioccolato fluido non indurisce più, però possiamo utilizzarlo per fare tante altre cose. Visto che abbiamo molte tavolette di cioccolato fondente, ci facciamo una mousse?

-D'accordo, guardo se ho un po' di panna

-Non serve la panna, è sufficiente un po' d'acqua

-Ho sentito, ti basta solo acqua?

-Sì, la ricetta base prevede una tavoletta al 70% di cioccolato fondente e 100g di acqua, misurati al grammo, mi raccomando. Prendi

-Grazie

-Iniziamo. Spezza pure il cioccolato, Sara. Possiamo aggiungere i 100g d'acqua, tutti in un colpo solo. E cominciamo a scaldare piano piano. L'acqua si mescola **ora** al cioccolato anche grazie all'aiuto della lecitina di soia, **che viene** spesso aggiunta al cioccolato fondente durante **la lavoraz-** la lavorazione per migliorare la dispersione dello zucchero di cui abbiamo parlato prima. Quindi, questa è una ricetta che funziona bene, con un cioccolato che contiene la lecitina di soia. Usando un cioccolato con un maggior quantitativo di grassi dovremmo utilizzare un po' più di acqua. **Se c'è**, se ci sono meno grassi dovremmo utilizzare meno acqua.

-Quindi la quantità di acqua va aggiunta in base ai grassi e non alla percentuale di cacao.

-Esatto

-La consistenza va bene?

-Sì, direi che è perfetta. Ora abbiamo una miscela di grassi al sapore di cacao, sciolti in acqua. E quindi è come se fosse della panna fresca da montare. Quindi avremo bisogno di raffreddarla con del ghiaccio e **usr-** **utilizzare** un frullatore per ottenere una mousse solamente al cioccolato fondente.

Vi accorgete quando inizierà a montare dal cambiamento di colore. Diventerà leggermente più chiara. Attenzione a non montarla troppo perché altrimenti rischiamo di fare esattamente come per la panna montata, cioè separiamo **ancora una volta** il grasso che volevamo invece mantenere. Ora è pronta per essere assaggiata.

-Quindi, finalmente una mousse au chocolat per i veri amanti del fondente

-Sì, questa è la preparazione di base, però possiamo aromatizzarla con dei liquidi sempre a base d'acqua che, **diciamo**, si sposino bene con il cioccolato, ad esempio **il caffè**, possiamo utilizzare del caffè invece dell'acqua, o del succo d'arancia, del succo di fragola o anche, perché no? Un po' di liquore

-Proviamola anche così

-Proviamola

-E buon divertimento a voi

Table 11. La Mousse al cioccolato e acqua (vegana) – Original Transcript

The transcript has been highlighted with different colors:

- mistakes by Bressanini are yellow;
- removed parts are highlighted in blue;
- magenta has been used to underline those parts that were adapted in the final transcript.

Figure 6 shows AegiSub's user interface: this is the software used to subtitle Bressanini's video. It features a window displaying the video itself, whereas on the right is another window where timing and text of subtitles can be edited. The list of subtitles that have been already written is featured at the bottom of the image.

Subtitles can then be downloaded as a .txt file with all time indications, where minutes, seconds and milliseconds come with each subtitle, numbered in order of appearance. Whereas YouTube transcripts only have an indication of minutes and seconds, AegiSub provides the user with subtitles that follow standard rules – that is featuring timing and numbers.

Before delving into my translation, a few remarks on style are to be made: dashes are used to distinguish Bressanini from Sara, mainly whenever they speak together or if they are not in the shot – i.e. Bressanini speaks while chocolate is in the frame and he is

not. Subtitle 1 is written in italic, because ‘Like Water for Chocolate’ is a movie and names of artworks are to be written in italic. Also foreign names are to be written in italic, but subtitle 113 features a text formatting indication to display how text is divided or formatted in AegiSub: ‘<i>’ and ‘</i>’ are used to encase written text that will then be presented in italic.

Science-related or food-related vocabulary and terminology are featured in the following list:

- fave di cacao;
- liquore di cacao;
- massa di cacao;
- doppio bagnomaria;
- shock termici;
- viscoso;
- mousse;
- lecitina di soia;
- dispersione dello zucchero;
- montare/panna montata;
- aromatizzare.

What follows is the analysis of the target text and choices that have been made in this translation.

Discourse markers, in order to decrease the length of subtitles, are not featured in the original text, as their presence is superfluous. Also mistakes highlighted in yellow are absent.

Subtitle 2 is ‘è il titolo di un film’, whereas it has been rendered as ‘is a movie about’, thus making the movie – and not the title – the subject of this sentence.

Subtitle 3 is introduced by ‘Do you know what else is overwhelming?’ that is in subtitle 2, so that ‘water for chocolate’ is the key concept of this sentence and has its own subtitle.

Subtitle 6, as it was already said, features a dash for each speaker. ‘Golose di cioccolato’ (7) is ‘fond of chocolate’, as it translates the fact that housewives really like chocolate. ‘- Sì, anch’io’ (8) has been translated as ‘-So am I’ because the alternative was ‘Yes, I am too’ – which is fairly longer - and I tried to keep all subtitles as short as possible while preserving the meaning of the source text. ‘questo è il frutto // della pianta del cacao’ (11

and 12) has been shortened: since Bressanini shows the bean, the subtitle is ‘this is a cocoa bean’, as ‘cocoa’ with ‘bean’ already indicates that it is the plant that Bressanini is talking about. Subtitle 13 in Italian is not present as ‘seeds’ is both ‘fave’ and ‘semi’, therefore there is no need for the specification which is in the original text. In order to keep subtitles parallel – that is, a subtitle right next to its translation – whenever a subtitle is to be removed, here it is maintained but featuring a strikethrough, as to indicate that it is not part of the final text. Numbers will follow the natural progression for the same reason: subtitle 13 does not exist in the English text. ‘si schiacciano’ (14) is a passive clause that is rendered through pronominalization. Subtitle 14, therefore, has been translated by using the passive voice ‘are then ground’. ‘la materia prima’ (15) is simplified as ‘cocoa powder’ (16), as this is what ‘materia prima’ is intended to be in the text.

Although ‘materia prima’ (17) and ‘product’ may sound the opposite, as ‘materia prima’ are raw materials and ‘product’ is the outcome, ‘product’ was used in order to avoid the repetition of ‘cocoa’. ‘apposite macchine’ (18) is ‘a crushing machine’ because cocoa liquor is produced through crushing. ‘massa di cacao’ (19) is not to be rendered semantically, as it is a specific term which has its own translation: ‘chocolate liquor’ or ‘cocoa liquor’, as it is also mentioned in the Bean to Bar Italy website, in which a list of chocolate-related terminology is featured: “Liquore di Cacao: da Cocoa Liquor che nel mondo anglosassone designa la massa di cacao.” Subtitle 21 is fairly longer in English: reintroducing liquor is necessary to explicitate this concept, as ‘it is called liquor because at this stage it is liquid’ is a tautological remark. ‘Liquid texture’ better translates the Italian text. Similarly to subtitle 19, ‘questa massa di cacao grezzo’ is simply ‘liquor’. Subtitles 29 and 30 feature a rewording of the original speech, as sense units are better divided by writing ‘Quando si scioglie del cioccolato // è importante mantenere temperature abbastanza basse’, instead of ‘è importante quando si scioglie il cioccolato mantenere le temperature abbastanza basse’, in which ‘quando si scioglie il cioccolato’ is an incidental clause that would make it slightly more difficult to follow the entire sentence. Also subtitle 33 has been removed, due to summarization in the previous subtitles. ‘Lentamente e sottolineo lentamente’, which is featured in the original transcript but is not present in the Italian text, has simply been rendered with the use of italic: ‘*lentamente*’ (35). ‘per fare i nostri esperimenti’ (42) has been removed to avoid

repetition, as the experiment is already mentioned in subtitle 41. ‘ricco di grassi’ (43) cannot be translated semantically, as English requires the preposition ‘in’, so ‘richer in fat’ is a more suitable translation.

Although the verb ‘è’ is implicit in subtitle 46 (è più calorico), it needs to be explicitated in English, therefore it has been rendered as ‘and it has more calories’. ‘-Che sarà mai una goccia d’acqua?’ (51) implies ‘per rovinare questo esperimento’, which is absent in Italian but it has been added to the translation: ‘-What can some water do to ruin it?’.

‘-È da buttare!’ (57) has been adapted by using the exclamation ‘-Put it in the trash!’, which is slightly different as the Italian is more neutral and the translation features an imperative, but it implies that chocolate, in those conditions – that is, forming lumps - cannot be usable, therefore it needs to be put in the trash. ‘poca rispetto allo zucchero presente’ (61) focuses on what is around the droplet, whereas I chose to underline the ratio of coffee to sugar, thus translating it as ‘the water droplet, which is smaller in quantity’, thus removing ‘zucchero presente’, as it is mentioned in the previous subtitles. ‘Paradossalmente’ (63) is ‘Strangely enough’, which is a communicative translation that takes into account the meaning of ‘paradossalmente’, rather than a semantic rendering of it. ‘eliminare i grumi’ (66) is an action performed through dissolution, as pouring coffee makes sugar disintegrate: ‘dissolve the lumps’ has, therefore, been the translation chosen for this subtitle. ‘ci facciamo una mousse?’ (76) is an offer made by Bressanini to Sara, so in English it is ‘what about a mousse?’, that perfectly renders the sense of ‘che ne dici di/se [...]?’ ‘D’accordo’ (77) answers the previous question, that in English could also be answered with a rhetorical question, ‘why not?’. ‘-Ho sentito’ (79), in the sense of ‘I understood’ has been translated as ‘I see’, which sounds more natural to a native speaker. ‘al grammo’ (83) can be simply translated with an adverb of manner: ‘accurately’. ‘Usando un cioccolato’ (95) implies the use of an ‘if clause’, which could be rephrased as ‘se usassimo un cioccolato con un maggior quantitativo di grassi’, therefore the translated text is ‘If we were to use some other kind of chocolate, richer in fat’. The ‘if clause’ introduced in subtitle 97, ‘se ci sono meno grassi dovremmo utilizzare meno acqua’ is rendered, similarly to what the translator has done in the second video, with the construction ‘the higher the altitude, the lower the boiling temperature of water’ (00:38), which here is ‘the lesser [...], the smaller’. ‘-La consistenza va bene?’ (101) is rather

rendered as ‘-Is it dense enough?’, using a verb to express the concept, instead of keeping this nominalization, which is more frequent in Italian than in English.

Subtitle 110 is focused on who performs the act of whipping the mousse, ‘altrimenti rischiamo di fare esattamente come per la panna montata’, whereas in English the subject has been shifted, as the mixture is the subject: ‘this mixture behaves like normal whipping cream’. ‘preparazione’ (114) can be translated as ‘recipe’ as in recipes the steps to follow to prepare a dish are generally provided. ‘perchè no?’ (119) has been omitted, as ‘even’ is of the same use.

This video was particularly time-consuming as it needed three steps, the first being transcribing the audio track, the second taking care of timing, the third being the translation. Translation here is based on sense, I tried to make it less semantic and more focused on structures that may sound right to a native speaker. Although some mistakes could have been made – as there is no such thing as a perfect translation and translation studies are sometimes a matter of choosing among several valid alternatives – this work is intended as an effort to produce a target text that respects the source text while diverging from structures that are typical of Italian to render with an English structure.

| | |
|---------------------------------|--|
| <i>Title</i> | Pompa a vuoto |
| <i>Author</i> | fiscainvideo |
| <i>Duration</i> | 5 minutes, 12 seconds |
| <i>Upload date</i> | October 18th, 2017 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | Natale Castelli describes how pressure works and which are the forces exerted when pressure rises or decreases. He uses shaving foam and a balloon put in a vacuum chamber. |
| <i>Language register</i> | Formal: the text has terminology in the field of physics, featuring measurement units such as ‘torr’, ‘bar’ and ‘Pascal’, but also devices used in the experiment, like: ‘pompa a vuoto’, ‘becher’ and ‘campana’, which is a specific term in this context as it is more of a jar, not a bell in the common sense of the term. |

Table 12. fiscainvideo – Pompa a vuoto

Starting from the transcript, it is generally correct, as there are a few mistakes:

-at 00:20 the measurement unit ‘torr’ is rendered as ‘thor’. As this video does not deal with the proverbial God of Thunder of Norse mythology, this is clearly a case of assonance. It may be due to the fact that recent Marvel movies are known world-wide and represent a heavily discussed topic, Thor being a cinematic hero.

-‘è il’ (00:26) is not in the original transcript;

-there are some cases in which a word has a different suffix or it is split in half, as it happens for ‘piccola’ (00:28), ‘gonfiato’ (05:03), ‘gonfieremo’ (02:42), which is ‘gonfiare mo’, ‘azioneremo’ (04:02), which is ‘azione remo’;

-the noise of a vacuum pump is, again, rendered with ‘[applause]’, as it has already been analyzed in The Action Lab’s video.

Terminology that is science-related is featured in the following list:

- pressione;
- grandezza;
- unità di misura;
- Pascal, torr, bar, Newton;
- centimetri di mercurio;
- campana;
- particelle;
- pompa a vuoto;
- molecole;
- becher

As for translation, what follows is an analysis of choices made during this process. ‘grandezza’ (00:11), in this case, is terminology related to measurement units, therefore it needs to be translated as ‘physical quantity’, as it is the specific term to indicate it. ‘per avere un’idea’ (00:28) requires the verb ‘to get’ in English, therefore ‘to get an idea’. Since subtitles from 00:28 to 00:36 mention pressure and Pascal is a measurement unit, but the word pressure does not appear before 00:33, the translation starts with ‘to get an idea of the pressure levels in a Pascal’, thus making ‘pressure levels’ appear at 00:28, rather than postponing it as it happens in the original text. ‘per avere l’idea di quanto leggera sia la pressione di un Pascal’ (00:55) cannot be rendered semantically in English, as ‘di quanto’ is not to be translated as ‘of how much’ or ‘of how’, which is a typically Italian structure. The chosen translation for this part was ‘we will prove that the pressure

of a Pascal is pretty light’, where ‘pretty light’ implies the force of a Pascal which in Italian is ‘quanto leggera’, meaning that it is, indeed, light. ‘campana’ (01:25) is ‘bell jar’. Although this kind of device has already been indicated as ‘vacuum chamber’ in previous videos, in this one the recipient is shaped as a bell, therefore it is not a proper vacuum chamber, although it has the same use. ‘particelle’ (01:39) has been rendered as ‘molecules’: the two are used as synonyms and Castelli himself talks about ‘molecole che spingono urtando la parete’, later in the video. ‘se gli urti avvengono’ (01:46) is a sentence that puts ‘urti’ as a subject, where in the translated text ‘molecules clash’, thus making molecules the subject of this action. ‘again’ at 02:30 is an addition to the text, as the act of lifting the bell effortlessly is repeated throughout the video. ‘prenderemo innanzitutto una retina’ (02:37) is shortened: ‘Here is a net’. Similarly, ‘ed hanno questa configurazione quasi sferica’ is simplified as ‘they are kind of sphere-shaped’, in which ‘kind of’ translates ‘quasi’ and ‘questa configurazione’ is shortened as ‘they are’. ‘ci chiediamo innanzitutto ma per quale motivo si gonfia’ (04:09) can be simply rendered as ‘but why?’, as foam was already mentioned in the previous subtitle. ‘configurazione’ (04:25) is intended as a synonym of ‘consistency’, ‘thickness’, to indicate the texture of shaving foam after being treated in the vacuum chamber.

The subtitle at 04:48 is separated through a colon in the English from the following to better divide sentences and make the progression of subtitles more clear and homogeneous. The last subtitle is missing in the translation as all of the information that needed to be presented ended at 04:59. Since this is the last subtitle of the transcript, it has been directly omitted and it is not written with a strikethrough, differently from the last video.

| | |
|------------------------------|---|
| <i>Title</i> | Ebollizione dell'acqua nel vuoto (tratto da L'Amaldi per i licei scientifici) |
| <i>Author</i> | Zanichelli editore S.p.A. |
| <i>Duration</i> | 2 minutes, 12 seconds |
| <i>Upload date</i> | August 24th, 2015 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | This video, which comes from a textbook for highschool students, features water put under a bell jar: the main topic of the video is the behavior of water under pressure caused by vacuum. |

| | |
|--------------------------|---|
| Language register | Formal: this brief video is informative, as it is intended as a short lesson on vacuum and water under certain circumstances. Language used is specific and refers to scientific formulas and terms such as ‘spinta di Archimede’ or ‘turbolenza dell’ebollizione’. |
|--------------------------|---|

Table 13. Zanichelli editore S.p.A. - Ebollizione dell'acqua nel vuoto (tratto da L'Amaldi per i licei scientifici)

The transcript is nearly flawless, as the only few mistakes are ‘è’ instead of ‘e’ (00:22), ‘copriamo lo’ instead of ‘copriamolo’ (00:41) and some words or particles are missing: ‘a’ (00:31 and 01:52), and ‘la pompa’ (01:14).

Terms and science-related or water-related vocabulary will be now listed here:

- pressione esterna;
- ebollizione;
- temperatura ambiente;
- pompa per il vuoto/pompa meccanica;
- campana di vetro;
- becher;
- turbolenza dell’ebollizione;
- ambiente sigillato;
- spinta di Archimede;
- pressione atmosferica;
- gradi celsius.

Now translation will be analyzed: ‘verifichiamo’ (00:05) can be rendered as ‘we will demonstrate’ since the video wants to prove that water can boil faster if external pressure is lowered.

The subtitle at 00:13 has been removed as the sentence is already complete in the previous subtitle. ‘verifichiamo’ (00:29) here has a slightly different meaning: it is used to underline the fact that a thermometer will be used to measure the temperature of water. In this subtitle nothing is to be demonstrated or proven wrong or right, therefore the chosen alternative is ‘(we will use the thermometer) to make sure water is at ambient temperature’, in order to verify that water is under the right conditions to start conducting the experiment. ‘Dopo qualche decina di secondi’ (00:45) is not translated semantically:

as ‘decina di secondi’ is a small quantity of time, that may mean 30 to 60 seconds, the translation is ‘After some time’ which in this case is general but gives the idea of a short wait. ‘osserviamo la tipica turbolenza dell’ebollizione’ (00:47) is a long structure that can be put in a simpler way: ‘we can see that water is starting to boil’. ‘La tipica turbolenza’ does not need to be rendered in English, as boiling is an extremely common chemical reaction. ‘Turbolenza’ means that water is boiling, thus the subtitle is shorter.

‘La pompa aspira via l’aria’ (01:14) may have been translated as ‘the pump sucks out the air’, although the use of a phrasal verb would make the concept slightly less formal: ‘removes’ has been used instead. ‘la spinta di Archimede’ (01:42) is known in English as ‘Archimedes’ principle’, therefore it has been rendered as such. ‘in montagna’ (01:48) has been rendered with an equally general expression: ‘at a higher altitude’, which implies that high altitude is linked to mountains. ‘atmospheric’ (01:50) is not repeated as it is already written in the previous subtitle.

The last two subtitles have been removed in the English translation, similarly to what has been done at the end of the previous video.

| | |
|---------------------------------|---|
| <i>Title</i> | ImmediaTest – acqua presentato a Super Quark di Piero Angela |
| <i>Author</i> | kripto1978 (user who has uploaded the video on YouTube) – Rai Radiotelevisione Italiana (Italy’s public broadcasting company, that airs SuperQuark) – Piero Angela (host) |
| <i>Duration</i> | 6 minutes, 31 seconds |
| <i>Upload date</i> | August 4th, 2010 |
| <i>Subtitled part</i> | All |
| <i>Description</i> | This part of a SuperQuark episode gives a few statistics on water, also describing how it is treated to be distributed to families through pipelines. The second part of the video is focused on ImmediaTest, which is a test engineered by the University of Milano-Bicocca to check levels of cleanliness in water. |
| <i>Language register</i> | Formal: the video features statistics, specific language and it is presented in the form of a documentary, with an external speaker explaining the treatment of water and experts talking about ImmediaTest. Amongst the specific terms used in the text are ‘cartina tornasole’, ‘ASL’, ‘canoni di concessione’ and ‘nitrati e nitriti’. |

Table 14. ImmediaTest – acqua presentato a Super Quark di Piero Angela

The transcript for this video is generally correct, with several mistakes but no omissions. Amongst the mistakes are ‘vede rete oro’ instead of ‘vedrete ora’ (00:40), ‘e’ instead of ‘è’ (01:25), ‘di normati’ instead of ‘di norma gli’ (03:09), ‘verremo’ instead of ‘berremo’ (04:55) and ‘dalla punto’ instead of ‘dall’appunto’ (05:45). There are also other mistakes, but they are not relevant as they are mistakes of spelling or assonance.

A term – an acronym – which is wrong here is ‘asp’, when ‘ASL’ should be used instead. ‘ASL’ do not exist in English as this indication is used only in Italy.

Terms and science-related or water-related vocabulary is:

- acqua minerale;
- infiltrazioni;
- tubazioni domestiche;
- acquedotto comunale;
- acqua del rubinetto;
- imbottigliati/aziende imbottigliatrici;
- consumo pro capite;
- prezzi alla fonte;
- canoni di concessione;
- fontanelle pubbliche;
- incolore, insapore, inodore;
- caratteristiche chimiche;
- ASL;
- agenzie nazionali prevenzione e ambiente;
- analisi chimiche fisiche e microbiologiche;
- rete domestica/tubi;
- dipartimento di biotecnologie e bioscienze;
- provette;
- striscia indicatrice;
- cartina tornasole;
- parametri di confronto;

- risorse idriche;
- valore del ph;
- acidità, alcalinità, durezza;
- calcio, magnesio, zolfo;
- nitrati, nitriti;
- composti inorganici;
- fertilizzazione;
- cloruri;
- acque termali.

What follows is the analysis of the last video translated for this dissertation.

The first subtitle has been slightly changed to make a communicative translation: ‘L’Italia è il paese in cui si consuma più acqua minerale’ is ‘Italy is the first country for mineral water usage’. Although it is not specifically said that Italy is, indeed, the first country for water usage, it can be desumed from the context. ‘comune’ (00:07) is a public body which only exists in Italy, therefore the alternative here is generic, as to indicate a town or district, so the correlate is ‘municipality’.

To maintain a formal register, ‘tante fonti’ (00:14) has been rendered as ‘a plethora of fresh water springs’. ‘Lungo il percorso’ (00:21) implies that water flows in the pipelines, so the translation revolves around pipes: ‘(infiltrations) in the pipelines’. ‘tubazioni domestiche’ (00:31) are connected to sewers underground, therefore to avoid the repetition of ‘pipelines’ – which occurs again later on in the video – ‘sewers’ has been used. This is a communicative translation. ‘alla propria abitazione’ (00:36) is a term that does not indicate a specific household. In English the plural is preferable: ‘(connecting aqueducts) to households’.

The subtitle at 00:38 has been removed, as the sentence ends in the previous subtitle. As it is the case of previous videos, the text remains but features a strikethrough. ‘Il servizio che vedrete ora’ (00:40) has been shortened as ‘the following clip’, as it is a few-minute-long video featured during a programme that generally lasts a couple hours. Subtitles from 00:40 to 00:50 have been split and divided by a full stop in the target text, so ‘in cosa consiste questo metodo che consente di assicurarsi [...]’ is ‘[...] the aforementioned method //’. It is used to both verify that [...]. ‘diminuire così verticalmente la spesa’ (00:50) indicates that the amount of money spent for water

decreases, so it can be rendered as ‘water bills cost less’. ‘sentiamo Andrea Pasquini’ (00:53) is ‘I will now give the floor to Andrea Pasquini’. This translation choice is justified by the fact that this is an idiomatic expression featured in various fields and it is associated with law. Since Piero Angela introduces Pasquini, thus letting him talk – that is, the clip can start – ‘give the floor’ is the alternative chosen. The Collins dictionary, when presenting the various meaning of ‘floor’, also gives this definition: “the right to speak in a legislative or deliberative body (esp in the phrases get, have, or be given the floor)”. ‘Si stima che’ (01:10) does not specify who gives the statistics that follow in the text: the translation is, therefore, generic, featuring an impersonal construction: ‘It is said that’.

Since in English the subtitles at 01:20 and 01:23 would require an unnecessary long construction, as the Italian text is ‘12,5 miliardi di litri di acqua per un consumo pro capite di 194 litri, più del doppio della media europea e americana’, the translation features a division of this sentence: ‘that makes a per capita consumption which is more than double’, followed by ‘when compared to the European and American average consumption’. From a prosodic point of view, ‘when compared’ serves as an element that separates the first part of the sentence from the second. ‘exploited’ at 01:28 is intended in the sense of ‘gathered and treated’, as water is taken from the source to be then analyzed and purified in laboratories.

The subtitle at 01:28 has been divided from the subtitle at 01:31 by a colon, as the latter presents the turnover of companies that are presented in the former. ‘canoni di concessione’ (01:50) are fees that companies must pay to municipalities, so ‘canoni’ is simply ‘fees’. ‘consumata con diffidenza’ (02:17), referred to tap water, implies that bottled water is more consumed as tap water is generally not considered as good to drink. Therefore, the target text features a comparison: ‘it is not as consumed as bottled water’. ‘resta il fatto che, non occorre ricordarlo’ (02:19) can be simply translated as ‘It is obvious that’, as ‘resta il fatto che’ does not add much to what has been previously said. It is a piece of advice given in this context which – added to ‘non occorre ricordarlo’ – have been rendered as ‘It is obvious that’, implying that it is unnecessary to be reminded to drink water, as ‘it is necessary for our survival’ (02:25). ‘come ci hanno insegnato quasi subito da bambini’ (02:27) is, in the translation, ‘as we all know’. This choice is motivated by the fact that what we were told when we were younger is something that we should

remember, a truth to always keep in mind. Therefore, we ‘know’ something as basic as the fact that ‘water needs to be colorless, tasteless and odorless’ because we’ve always known that, it has been taught to us. ‘parametri miliari’ (02:36) is just ‘features’, as it perfectly renders what is being said in the Italian text. ‘fino a qualche tempo fa’ (02:41) implies that the three features of water described at 02:29 were to be looked into a few years ago, which means that standards to assess the quality of water have changed recently. This is why the English subtitle is slightly changed as ‘Until recent times’, to prove that standards have been modified just in the last few years. Again, at 02:55 ‘certificate solitamente dall’istituto biologico della più vicina università’ is general to indicate that each brand of bottled water comes with analyses made by the closest universities to the water spring. This translates to a construction that makes use of plural: ‘This chart is generally made by universities’ institutes of biological chemistry’. ‘che ci dice che cosa stiamo vedendo’ in the source text is said at the end of the sentence, at 03:05, after the premise ‘ma quando apriamo il rubinetto di casa, o in un albergo, o alla fontanella comunale’. The translation features ‘how can we be sure of the quality of tap water [...]’ at the beginning of the sentence, at 03:01, to make subtitles more accessible to non-native speakers.

As ‘ASL’ (03:10) - which is an acronym for Azienda Sanitaria Locale – is an Italian body and therefore it cannot be translated as an acronym, ‘local health authorities’, has been chosen to describe what an ASL is. Similarly, ‘agenzie regionali prevenzione e ambiente’ (03:10) could not be rendered semantically; however, an official translation provided by Veneto’s ARPA – Agenzia Regionale Prevenzione e Ambiente – justifies the translation choice ‘Regional Environmental Protection Agencies’, as displayed on ARPAV’s official website: “ARPAV - Regional Agency for Environmental Protection and Prevention of the Veneto”. ‘eseguono accurate analisi chimiche’ (03:15) is ‘they run specific [...] analyses’, as ‘analysis’ collocates with the verb ‘to run’. ‘controlli sulla rete domestica e quindi sui nostri tubi’ (03:20) has been rendered as ‘Pipelines and plumbing checks’, as ‘controlli sulla rete domestica’ implies that, for each water-related problem occurring in households, a plumber is to be called. Therefore, ‘plumbing checks’ is the translation for this subtitle. ‘Bicocca di Milano’ and ‘dipartimento di biotecnologie e bioscienze’ (03:35) feature a translation provided by their origin institution in their official website: <https://www.btbs.unimib.it/en>

‘metodo’ (03:40) is intended as ‘device’ and has been translated as such. Since those researchers have not patented a method but a physical object, with test tubes and litmus paper-like strips, ‘device’ is the word used. ‘cartina tornasole’ (03:59) has its own translation and cannot be rendered in a different manner: it is referred to as ‘litmus paper’. ‘valori che rispettano una normativa europea del 2001’ (04:08) has been translated as ‘standard values established by the EU in 2001’, because ‘normativa europea’ is not the focus of the sentence and ‘established’ already gives the idea that rules set by the EU are official and member countries need to uphold the rule of law set by the Union.

The subtitle at 04:15 has been divided from the subtitle at 04:17 by means of a full stop in the English text. Again, this operation has been done to give a more consistent flow to subtitles: if they are split accordingly they can be more intelligible, especially in a context that is fairly formal and dense of terminology.

Since the video gives indications on how to use the device, ‘For a better use of our device’ (04:30) has been added to the target text to separate the previous statement – that is, Italy is full of high-quality water – from the description of how to use the ImmediaTest device.

‘è sufficiente’ (04:30) is ‘it only takes a couple steps’, which equally indicates that the device is easy to use. In this case, the source text features an impersonal construction ‘è sufficiente’ + infinitive, which in English translates to ‘a couple steps’ followed by a colon and a list of imperatives that indicate what to do in order to perform the experiment. ‘si confronta con la colorazione’ (04:44) means that the result needs to be compared to a chart that comes with all the values that can be obtained while doing the experiment. Since the chart is visible in the video but it is not mentioned in subtitles, the target text features the translation ‘The strip next to the chart’.

Scientific terms such as ‘calcio e magnesio // I valori dei nitrati e nitriti’, have a straightforward translation, as they derive from Latin and Greek. ‘cloruri’ is slightly different, as its translation is ‘chlorides’. The same happens for ‘clorazione’ and ‘chlorination’. ‘quello che noi chiamiamo l’ultimo miglio’ (05:42), more specifically ‘l’ultimo miglio’ is used only in this specific context, therefore it has been rendered by making use of inverted commas: ‘in what is called “the last mile”’. The use of inverted commas is justified by the fact that what follows is an explanation of this expression.

‘conferire i problemi all’acqua’ (05:54) implies that pipelines in the last mile may corrode and release harmful substances, ‘thus decreasing the quality of water’, as it has been written in the translation.

In Italian, ‘il nostro test’ (05:56) is the subject of the verb ‘non si vuole sostituire’, which in English cannot be rendered as such, as it is not the test that performs the action: ‘Our test is not a substitute to analyses’ is the translation chosen for this subtitle.

‘ma fornire a chiunque’ (06:01) is directly linked to the previous subtitles. The English transcript features an addition: ‘The goal of our device’. This is a repetition made to divide the previous subtitles from this one, in order to make it more easy to follow. ‘per sapere se è meglio chiamare l’idraulico’ (06:11) is more broad as a definition in this translation: ‘to know whether there is any problem with the pipes in our home’. The English test features a cause, the Italian a consequence. They express, more or less, the same concept.

This chapter revolves around the analysis of the 11 videos chosen for this dissertation. Each video analysis has been divided into three or four parts, depending on the video, that are:

- a chart with general information about the video;
- an assessment of the transcript;
- a list of terms used in the video;
- a subtitle-per-subtitle analysis of each translated part that I thought was worth-mentioning.

The last chapter of this dissertation revolved around the analysis of translated videos. This analysis is mainly divided into three parts: videos that already feature a translated transcript – such as Bressanini’s trilogy – videos that do not feature any transcript at all – such as Bressanini’s *La Mousse al Cioccolato* – and, finally, videos that only feature a transcript in the source language. Automatically-generated transcripts are, indeed, helpful. They serve as a way to understand videos and grasp their general meaning. Reviewing them was not a time-consuming activity, they only featured a few mistakes based on assonance and sometimes words were missing, but they can be read even if small parts are wrong. As YouTube presents subtitles as a continuous flow of words, however, subtitles can be distracting. Luckily enough, transcripts can be uploaded in the form of ‘standard’ subtitles, that is text written in one or two lines. Translated texts mimic the shape of original transcripts, which means that if a downloaded subtitle –

subtitles for The Action Lab’s videos, for instance – features one line, then the translation is made trying to fit a sentence in one line.

Making subtitles for Bressanini’s *La Mousse al Cioccolato* has been the most time-consuming activity in the whole translation process, as it implied writing both the transcript for the source text and the translation for the target text. This transcript is written in the form of professional level subtitles, that is with exact timestamps – with seconds and milliseconds - and two lines for each subtitle that is being displayed. Videos that feature a human-made transcript have also been analysed: Vsauce’s video features subtitles consisting of two lines, which have been rendered equally – as closely as possible – in the Italian translation.

Terminology has been presented at the beginning of each video analysis after a brief chart gives an overview of the video. This chart served as a benchmark and as a general term of comparison to put videos in a similar context. Videos are presented by displaying the name of the clip, of the author, upload date and a summary of the text type with the language register used in the video.

Subtitling these videos has been challenging for what concerns summarization and communicative translation, as space is limited and semantic translation is hardly effective. The general approach chosen for this work has been based on summarizing concepts by avoiding repetitions and by rendering expressions or clauses in short, while trying not to lose the sense intended in the original text. Some terms proved to be particularly challenging to render in Italian, ‘vacuum chamber’ being one of them. In this case, I made some research in authoritative websites and dictionaries. Alternatively, I have displayed the results shown by Google by comparing pictures of products sold online and seen on Google Images. Whenever a term could be translated in more than a way – ‘camera a vuoto’ or ‘camera del vuoto’ being an example – I have chosen to use the translation that fit more in the context and that could sound more natural in Italian, while trying to keep subtitles as clear and as short as possible.

There are some instances in which translated subtitles did not match the timing of the original transcript. In order to help the reader navigate through subtitles and to better compare the source text and the target text, subtitles that have not been translated feature a strikethrough and are not to be considered as part of the analysis.

In general, this chapter is heavily focused on a video-per-video analysis that features clips – both in English and in Italian – that range from an informal register and more general terminology to a more formal register and a greater deal of specific vocabulary.

Conclusions

The main goal of this work was to show the utility of a well-written text. This mainly refers to good translation practice applied to subtitling. As simplistic as it may be, this is the fundamental basis of this dissertation, starting from the premise that proficiency in language and the comprehension of context around a video can help in various ways.

This work revolves around the basic idea that, to be a YouTuber, means to know how to share knowledge, entertain and monetize videos. In order to monetize videos and gain followers the quality of an audiovisual product must always be neat, well-pondered and it must meet the standards of the audience involved. To do so, a content creator needs not only to be enticing, to convey a message that is clear and accessible to – virtually – everyone: the message must also be transmitted through the right means. To be a content creator means to understand the trends, use algorithms, exploit metadata in order to boost a video that may then be recommended by YouTube itself. There are numerous ways in which this can be done: by lengthening a video to more than ten minutes - thus gaining more watch time – or by using the right amount of tags on a video that can help viewers search said video, or even asking the audience to like, share the video and subscribe. But what matters most in this dissertation, is how content creators use subtitles. This branch of translation studies focuses on dynamic text that is displayed on screen. It is versatile and adapts to the context it is put into: the subtitling process takes into account a series of constraints that have been analyzed in this work. As advertising is made through good video quality and conscious use of tags and metadata, subtitling is the final part of a video, concerning post-production as text is applied only after the video has been uploaded. What is relevant in this context, is that the content creator needs to be aware that to be known worldwide – or at least in a greater number of countries – dubbing is not a suitable option. This is mainly because it is not cost-effective, it is to be performed by professionals – as a poorly dubbed audiovisual product may cause the opposite, that is videos may be perceived as low-end products – and, most importantly, YouTube does not offer content creators any choice for dubbing. This leads to why subtitling is fundamental: it has been shown that subtitles can boost Search Engine Optimization (SEO), which is basically an algorithm that suggests a video based on interest shown by users and their source language, that is the main language in which they view videos.

Subtitling, therefore, is the only way YouTube videos can, at least for what concerns 2020, be translated and shared to a larger portion of users. To help increase SEO and visibility in general, the approach in this work is based on the quality of subtitles and on preserving the original sense intended by the author of a video. The way this work has been performed revolves around transcripts and their subsequent translation. Automatically generated transcript, it has been shown, are imperfect. They need to be corrected, reviewed, adapted, as they lack consistency in dividing sense units, they do not feature punctuation, capital letters, nor they are always precise. As a matter of fact, those subtitles are the product of complex algorithms which recognize spoken language that is then translated into a text that tries to mimic the original soundtrack. Human intervention is fundamental to deduce the right word to use in a determined context. An example has been made in the video *Pompa a vuoto*, where the torr, which is a physical quantity, has been wrongfully transcribed as Thor, which sounds right but it is not in this determined context.

Videos for this work have been chosen based on the background of their authors. Some authors some are scientists, some are not. My analysis focuses on language and how it changes from a specialized context. The YouTube video *Immediatest – acqua presentato a Super Quark di Piero Angela* is an example of a more informal context where what counts is not terminology, but the fact that a concept must be made simple to be understood by most – as happens in English in the excerpt translated from *Using Drones to Plant 20,000,000 Trees*.

The translation process in my dissertation has been based on rules that derive from subtitling practice, trying to express concepts through communicative translation but also keeping in mind that there is a set of terms for which equivalents have to be found in the target language. The compromise between communicative translation and semantic translation, in this sense, has driven this analysis with the sole goal of making the video accessible to all. To this end, subtitles can not only be understood by speakers of the target language, but are also subtitles that sound natural to a native speaker. This is important to tell a well-written translation from a translation that does not sound as such, thus blending in the context to appear as if it was not a translation, to begin with.

In conclusion, the objective of my dissertation is to investigate how to subtitle a video in a way that is comprehensible yet resembling the source text, while trying to make

reading as smooth as possible, as if subtitles were invisible, one and the same thing with the video they translate.

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Riassunto in Italiano

Il presente elaborato si basa, fondamentalmente, su due concetti chiave: la sottotitolazione e la piattaforma di streaming video YouTube.

Dal momento che YouTube è sempre stato, per me, non solo una fonte di ispirazione ma anche uno strumento per esercitare la lingua e migliorare le mie abilità di ascolto, nonché il mio lessico, ho deciso di coniugare la traduzione di sottotitoli, in virtù del mio percorso scolastico ed universitario, con le potenzialità offerte da questa piattaforma. L'obiettivo principale che questo elaborato si pone è quello di dimostrare le potenzialità dei sottotitoli non solo a partire da un'analisi linguistica, ma anche in relazione all'aiuto che possono dare i sottotitoli in un contesto più ampio come quello di internet e della fruizione di video. Il concetto chiave che si pone come ponte tra l'ambito delle pubblicità online e la traduzione è il fatto che i sottotitoli, se usati con cognizione di causa, rappresentano uno strumento che non solo può essere d'aiuto per la comprensione di un testo in una lingua inizialmente inaccessibile ad un pubblico più vasto, ma anche uno strumento che possa permettere di guadagnare somme considerevoli, in quanto un video tradotto e sottotitolato può essere una risorsa monetizzabile nel caso in cui, ad esempio, in una pagina web siano presenti delle pubblicità che accompagnino tale video. Questo concetto verrà meglio approfondito nell'arco della presentazione dell'elaborato.

L'elaborato si divide in 4 capitoli che riguardano, nell'ordine: la traduzione, la divulgazione scientifica, il *digital marketing* nell'ecosistema di Google (e Google AdSense) e YouTube, l'uso della sottotitolazione prima nell'industria cinematografica e poi nell'ambito di YouTube, fino ad arrivare all'attività di traduzione che è il punto chiave di tale elaborato, con una successiva analisi di quanto tradotto.

Il primo capitolo si apre con un'introduzione relativa alla traduzione inserita nell'ambito della disciplina traduttologica, cioè in quanto processo che comprende delle scelte necessarie tra un termine più corretto ed un termine meno corretto, a seconda del contesto. Questo concetto è poi applicato alla scienza ed all'uso che i divulgatori ne fanno per esprimere concetti, in un'ottica che prevede un linguaggio specializzato in un settore composto da esperti che comunicano tra loro utilizzando tale linguaggio. Il primo capitolo dell'elaborato si basa anche sulla comunicazione tra scienza e traduzione, come due ambiti apparentemente agli antipodi, che però possono stabilire connessioni intra ed

interlinguistiche. L'esempio che pone le basi per questo lavoro è un aforisma di Albert Einstein, la cui traduzione è, all'incirca: "Non hai veramente capito qualcosa finché non sei in grado di spiegarlo a tua nonna". Questo esempio costituisce sicuramente una premessa necessaria, nonché il *leitmotiv* del presente elaborato, che si pone come obiettivo la risposta alla domanda: "si può fare divulgazione scientifica a tutti?". Questo elaborato è un tentativo di rispondere a tale domanda, infatti i video tradotti sono stati scelti appositamente in quanto gli autori provengono da ambiti tra loro diversificati, chi dal mondo di YouTube, chi dal mondo universitario e chi da quello della fisica e della chimica.

Il primo capitolo procede con degli esempi di traduzione che dimostrano come una traduzione possa essere prodotta in modo esemplare, oppure come possa essere rovinata da un'eccessiva volontà di ricercare il senso artistico a discapito della comprensione di un testo. Gli esempi riportati sono due: il primo fa riferimento alla sit-com *How I Met Your Mother*, conosciuta in Italia come *E Alla Fine Arriva Mamma*. In una scena viene fatta menzione di un matrimonio e i futuri sposi, Barney e Robin, discutono sull'organizzazione: ad un certo punto Robin parla di un 'paggetto', che Barney riadatta in 'orsetto', che è la gag ricorrente nella scena. L'originale gioca sulla somiglianza tra 'bear', orsetto e 'bearer', paggetto. Questa traduzione è, per me, un esempio degno di nota in cui il significato del testo originale non è stravolto ma adattato alla perfezione a seconda del contesto. In maniera diametralmente opposta, il secondo esempio fa riferimento ad un episodio dell'*anime* Neon Genesis: Evangelion e dell'adattamento di Netflix ad opera di Gualtiero Cannarsi: la scena si apre con due personaggi, di cui uno dei due fa un discorso incoraggiante all'altro, che nella versione inglese è reso con: "but there is something that you can do, something can be done that you only have the power to do", reso come "quanto a te, quanto a quel che non puoi fare che tu, per te qualcosa da poter fare dovrebbe esserci". La traduzione di Cannarsi, per quanto elaborata e prodotta con l'intento di stimolare il pubblico con un prodotto che non sia tradotto letteralmente o adattato secondo le norme tradizionali, risulta invece essere astrusa, fin troppo ricercata e va ad intaccare proprio la comprensione, costringendo chi guarda l'episodio ad uno sforzo maggiore per cercare di capire il contenuto dei dialoghi.

Il punto successivo affrontato nel capitolo, quindi, riguarda la comprensione ed il modo di esporre concetti, che nell'ambito scientifico si traduce in pubblicazioni, libri,

conferenze e video. I video, in questo elaborato, sono il punto di contatto tra la divulgazione e la sottotitolazione.

Successivamente, il capitolo tratta della divulgazione e delle sue origini, a partire dal Seicento, secolo in cui autori ed esperti hanno iniziato a pubblicare scoperte e studi, talvolta criptati (come l'esempio di Galileo e Keplero, in cui il primo dei due aveva scritto un messaggio cifrato che avrebbe dimostrato il primato della sua scoperta nel caso in cui il secondo avesse deciso di pubblicare i suoi studi). Le pubblicazioni sono poi diventate, negli anni, una prerogativa delle *Royal Society*, organizzazioni sotto la cui egida gli esperti potevano fare divulgazione scientifica senza che le loro scoperte venissero copiate, rubate oppure adattate da altri studiosi.

Il capitolo prosegue con l'evoluzione dei mezzi a disposizione degli scienziati, a partire dai libri, che costituivano un investimento rischioso (talvolta i risparmi di una vita) senza nemmeno la garanzia di riuscire ad averne un ritorno economico. I giornali hanno poi soppiantato i libri, in quanto più brevi, pubblicati a cadenze più frequenti (settimanalmente, mensilmente) e sicuramente più economici. I giornali e le pubblicazioni di questo tipo si sono poi riadattate con l'evoluzione dei mezzi di comunicazione: nella fattispecie, con l'avvento di internet. Dalle pubblicazioni cartacee si è passati quindi a quelle online ma con la loro controparte stampata, fino ad arrivare a *paper* online considerati come uno standard. Ad oggi, i canali ufficiali per la pubblicazione sono siti di divulgazione specializzati, tuttavia in questa tesi il tentativo è quello di ricercare la divulgazione in ambiti non specializzati, per altri canali: YouTube quindi sembra il giusto compromesso tra l'ufficialità e la semplicità nell'espressione del concetto.

Fare della comunicazione su internet e su YouTube in particolare implica una conoscenza (e talvolta uno studio) degli algoritmi su cui si basa Google e senza i quali la pubblicità online sarebbe irrisoria. Google infatti, tramite il programma AdSense, fornisce pubblicità ai siti web per conto di finanziatori che, appunto, investono in tali pubblicità. Per poter avere visibilità online, chi desidera aprire un sito web deve tener conto di dati che non sono normalmente visibili all'utenza, tra cui i metadati e i tag. I metadati costituiscono le informazioni che ogni sito web possiede e che Google utilizza per analizzarli in modo che compaiano in una specifica posizione all'interno del motore di ricerca (l'esempio nell'elaborato prevede la ricerca della parola 'amazon', che riporta 10

pagine di risultati che rimandano al sito di vendita di prodotti online prima di presentare una pagina che parli dell'Amazzonia). I tag sono le informazioni assegnate da chi gestisce il sito web come parole chiave per ricercare quello specifico sito nel motore di ricerca e trovarlo con più facilità. Questi accorgimenti si basano sulla SEO, che sta per *Search Engine Optimization*, l'ottimizzazione dei motori di ricerca, in italiano. Questa sigla è fondamentale quando si parla di ricerca web e pubblicità, in quanto gli algoritmi di Google che analizzano le pagine web, i metadati e i tag, fanno uso di questa ottimizzazione per mettere in risalto pagine web oppure oscurarne altre, a seconda dell'algoritmo utilizzato. Ad esempio, aggiungere troppi tag ad una pagina comporta un carico di informazioni poco precise, molto generiche e sovrabbondanti, per cui Google penalizza la suddetta pagina web, rendendo meno probabile la sua presenza nelle prime pagine dei risultati del motore di ricerca. Altri concetti espressi nel capitolo sono il CPM e il CTR: *cost per mille* il primo e *click-through rate* il secondo. Mentre il CPM è, fondamentalmente, il tasso di clic su una pagina che si converte in denaro guadagnato sulla base del numero di clic, il CTR indica la percentuale di clic, cioè il numero di volte in cui un contenuto è visualizzato su una pagina web e quanti utenti, in percentuale, cliccano sul contenuto. Questi sono i fattori che stanno alla base della pubblicità online, che si applica soprattutto a YouTube (in quanto società di Google).

Il capitolo si conclude con la storia e l'evoluzione di YouTube, in quanto società fondata nel 2005 da tre ex impiegati di PayPal. Il primo video, *Me at the zoo* riporta semplicemente uno dei fondatori, Jawed Karim, allo zoo, in una clip di qualche secondo. La piattaforma video, nata con l'intento di dare a tutti uno spazio in cui raccontarsi e condividere momenti, un proto-social network, prima ancora dell'avvento di Facebook, Twitter od Instagram, aveva come motto "Broadcast Yourself", ad indicare che chiunque avrebbe potuto caricare contenuti, a seconda della provenienza, purché in possesso di una connessione internet.

Negli anni YouTube è diventato un colosso che, una volta venduto dai fondatori a Google, si è conquistato una fetta di mercato che, ad oggi, avrebbe un ricavo che si aggira tra i 10 e i 14 miliardi di dollari l'anno. Su YouTube i cosiddetti *content creator* sono persone, organizzazioni che possiedono un canale su cui caricare i video. Per dare un'idea dell'importanza di YouTube nel panorama internazionale, basti pensare al fatto che il video più visto ha quasi 7 miliardi di visualizzazioni e i due *creator* più seguiti hanno

oltre 100 milioni di iscritti. In questo contesto, ogni minuto vengono caricate 500 ore di video sulla piattaforma, per un totale di 30000 ore di contenuti l'ora. Con una simile portata, i creatori di contenuti possono sostenersi economicamente grazie anche alle pubblicità, le *ads*, quindi monetizzare il loro lavoro aggiungendo annunci prima, durante e/o dopo il loro video.

I concetti espressi all'interno del capitolo riguardanti la monetizzazione, il CPM, il CTR, si applicano in egual misura a YouTube, tramite i quali i *content creator* devono dimostrarsi accattivanti e cercare di incrementare il loro bacino d'utenza, guadagnando più iscritti e più clic che quindi implicano la visualizzazione non solo del video, ma anche delle pubblicità. La monetizzazione si attiva aderendo allo YouTube Partner Program, che è lo spazio dedicato a quei canali che intendono guadagnare tramite YouTube e non caricano video solamente per passatempo ma fanno di YouTube un lavoro vero e proprio, in quanto intrattenitori. In un canale, quindi, esistono strumenti a disposizione del *content creator* che consentono di vedere l'andamento di un video, tra cui la sezione *Analytics*, che mostra il numero di visualizzazioni, il tempo medio di visualizzazione, alcuni dati demografici e il guadagno derivante dal video. Il primo capitolo si conclude con queste considerazioni riguardanti la monetizzazione su YouTube, concetto che ritornerà nel secondo capitolo in relazione ai sottotitoli.

Il secondo capitolo si focalizza sui sottotitoli, sia come mezzo per veicolare un'informazione su YouTube, sia come tipologia di traduzione nell'industria cinematografica e, infine, anche come un modo per monetizzare un video. La chiusa del capitolo descrive le implicazioni socio-politiche che hanno portato all'affermarsi del doppiaggio o della sottotitolazione in Europa durante i regimi totalitaristi.

L'elaborato continua, dopo la fine del primo capitolo, con YouTube e spiega il funzionamento base della piattaforma dal punto di vista del *content creator*. Caricare contenuti su YouTube è un'azione intuitiva grazie al modo in cui la piattaforma è pensata, *user-friendly*. Quando un video viene caricato sul canale, può essere modificato prima di essere reso pubblico: ad esempio, si può aggiungere il titolo, una breve descrizione che accompagni il video, che riassume brevemente il contenuto oppure che possa essere utilizzata per pubblicizzare pagine di social network, integrare quanto detto nel video, oppure rimandare allo *store* ufficiale del *content creator*. Caricando un video si possono anche aggiungere i tag, che aiutano gli utenti a trovare più in fretta il video tramite parole

chiave (ma che, come già detto, possono rivelarsi un'arma a doppio taglio nel caso in cui il numero sia eccessivo) e caricare un'anteprima, cioè un'immagine che sia abbastanza accattivante, insieme al titolo, da indurre l'utente a cliccare su quel video.

A disposizione del *creator* ci sono anche altri strumenti, tra cui la possibilità di monetizzare il video, creare playlist e, a posteriori, vedere l'andamento del video. La caratteristica più interessante ai fini di questo elaborato è, tuttavia, la possibilità di caricare sottotitoli.

Il sistema attuale non consente di doppiare video e caricare una traccia audio che vada a sovrascrivere quella attuale, pertanto i sottotitoli oggi rimangono l'unico mezzo a disposizione per poter rendere un video veramente internazionale. YouTube, infatti, offre la possibilità di tradurre non solo la traccia audio a partire da una trascrizione (più o meno fedele, come si vedrà nel quarto capitolo) del video, ma anche di tradurre il titolo e la descrizione, dando l'impressione all'utente di stare guardando un video nella propria lingua, fatta eccezione per il parlato.

Per caricare sottotitoli è necessario che il creatore di contenuti dia l'approvazione alla *community* di intervenire sul video e modificarne la trascrizione o la traduzione. Le modifiche vengono poi approvate singolarmente da chi il video l'ha pubblicato. Queste modifiche appena esposte sono state apportate, principalmente, dall'estate del 2019, a seguito di controversie nate al riguardo. Come esposto nel secondo capitolo dell'elaborato, le controversie fanno riferimento ad un episodio di abuso del sistema dei sottotitoli. Nell'agosto del 2019 un utente ha iniziato a tradurre i video di PewDiePie, il secondo canale con più iscritti al mondo, pubblicizzando il proprio canale, quindi non traducendo il video ma usando il potere di correggere i sottotitoli per farsi pubblicità. Questo sistema ha indotto PewDiePie a disattivare il contributo degli iscritti e ha generato una reazione forte da parte di YouTube, che ha deciso di lasciare più spazio ai *content creator* dando loro la scelta di attivare o disattivare i sottotitoli; inoltre, pur tenendo attiva la contribuzione degli utenti, i sottotitoli vengono revisionati manualmente prima di essere approvati e, quindi, pubblicati.

Successivamente, il capitolo descrive la sottotitolazione come arte, nata nell'epoca dei film muti e consolidatasi come mezzo per aiutare il pubblico a comprendere o integrare quanto detto nei film. I sottotitoli, nati come elemento imprescindibile tra una scena e l'altra, chiamati intertitoli, in un'epoca in cui i film sonori non esistevano (si parla

dell'inizio del secolo scorso), sono poi diventati la norma per rendere un prodotto accessibile in più paesi in cui la lingua dell'opera originale non è parlata. In questo caso, cioè quando il doppiaggio non è il tipo di traduzione audiovisiva prediletto, i sottotitoli si presentano come una valida ed immediata alternativa per la condivisione dell'informazione.

I sottotitoli sono anche visti come un aiuto per lo sviluppo di competenze linguistiche trasversali: alcuni studi eseguiti su classi di studenti hanno dimostrato come un'alta esposizione ai sottotitoli abbia un forte impatto sull'apprendimento, in quanto la lettura automatica di scritte sullo schermo aiuta a concentrarsi meglio sulle strutture linguistiche usate sia nella traduzione, che nella lingua originale del prodotto audiovisivo, concentrandosi anche sulla traccia audio per confrontarla con la traduzione e quindi collegare audio e video per migliorare l'apprendimento di lessico e strutture sintattiche. Anche l'Unione Europea fa del multilinguismo un mezzo che possa connettere i vari stati dell'Europa. Dal momento che i sottotitoli facilitano questo scambio interculturale, sono una valida forma di traduzione nell'ottica di un'area di istruzione europea (European Education Area, in inglese).

I sottotitoli rappresentano anche un aiuto a quella fascia di pubblico che presenta disabilità uditive: pertanto, il televideo sotto forma di sottotitolo è un'aggiunta inclusiva per coloro che hanno difficoltà nell'ascoltare una trasmissione o che non possono sentirla del tutto.

Dal momento che la sottotitolazione è una forma di traduzione, deve rispettare principi chiave quali l'ascolto e la comprensione di ciò che viene detto nella lingua di partenza, tenendo conto del registro e della sintassi sia della lingua di partenza che della lingua d'arrivo, cercando di rispettare il più possibile le unità di senso senza stravolgere quanto inteso nell'opera originale.

Esistono, tuttavia, delle difficoltà riguardanti i sottotitoli: ci sono limiti di spazio e tempo dati dalla grandezza dello schermo e dai secondi necessari per leggere un sottotitolo. In linea di massima, un sottotitolo non può durare meno di un secondo e più di sette, deve essere quanto più conciso e semplice ed è necessario che sia sincronizzato con la traccia audio originale. Un sottotitolo deve saper riassumere quanto detto nell'originale, se il contesto lo richiede: per questo interiezioni, precisazioni e ripetizioni superflue sono da evitare, se non strettamente necessarie.

Alcuni esempi pratici di sottotitoli esposti nel secondo capitolo sono tratti dalla trilogia di *Ritorno al Futuro*, in cui il sottotitolo si trasforma in elemento necessario non per comprendere quanto detto dagli attori, ma per capire quanto visualizzato sullo schermo, ad esempio nel caso del cambio di scena tra il nome del parcheggio ‘Twin Pines Mall’ e ‘Lone Pine Mall’, che nel film è un elemento importante perché è un luogo che viene citato all’inizio del film, come vecchio terreno su cui erano stati piantati due pini. Nel film, il protagonista viaggia indietro nel tempo, distrugge un pino e cambia il presente, quindi in questo caso anche la scena cambia, in quanto l’insegna del parcheggio diventa ‘Lone Pine Mall’. Un altro esempio riguarda il film *Night Watch*, in cui i sottotitoli sono parte integrante del film e un’opera d’arte *per se*.

Il capitolo prosegue con la monetizzazione tramite i video. Prima di passare a YouTube, il focus è su un altro social network: Facebook. Dal momento che i sottotitoli intesi come trascrizione intralinguistica (*closed captions*, in inglese) costituiscono un aiuto per apprendere la lingua, in quanto sono una componente attiva nella comprensione perché implicano uno sforzo sia uditivo (per comprendere l’audio) che visivo (per collegare l’audio al testo), i video sottotitolati sono un elemento chiave su Facebook, dove l’85% (secondo statistiche del 2016) di essi è sottotitolato e spesso non hanno nemmeno bisogno di una traccia audio per essere compresi.

Analogamente, sottotitolare su YouTube significa incrementare il traffico su un video, cioè generare più clic anche da persone che non sono madrelingua, dare un aspetto più professionale al proprio canale, conferendo ai video un contesto multilingue, ma anche per il fatto che, per video come quelli analizzati in questo elaborato, i contenuti espressi in altre lingue possono essere divulgativi ed insegnare un concetto.

La scelta di YouTube è giustificata non solo per il fatto che rende monetizzabili i contenuti caricati sulla piattaforma, ma anche grazie al peso che ha su internet in generale. Le statistiche descritte nell’annuale YouTube Rewind riportano milioni di ‘mi piace’ e milioni di visualizzazioni, da *content creator* in tutto il mondo. È interessante notare come il terzo video più apprezzato nel 2019 sia stato caricato da uno YouTuber brasiliano: con 18 milioni di visualizzazioni e 3,5 milioni di ‘mi piace’, non presenta sottotitoli, se non quelli generati automaticamente in portoghese. Sottotitolare un video di questa rilevanza avrebbe potuto, magari, far aumentare considerevolmente entrambi i numeri.

I sottotitoli sono rilevanti anche in virtù del fatto che, secondo YouTube, all'incirca due terzi degli utenti che visualizzano i video di uno YouTuber non provengono dalla stessa area dello YouTuber. I sottotitoli potrebbero essere un valido aiuto per diffondere tali video.

Il capitolo si conclude con un excursus storico sulle motivazioni che hanno favorito il doppiaggio piuttosto che la sottotitolazione in Europa. La ragione per cui il doppiaggio è il mezzo di trasmissione audiovisiva prediletto in Italia, Spagna e Germania, è legata ai regimi totalitaristi instauratisi a cavallo tra le due Guerre Mondiali. In questo caso, la paura dell'altro, il rifiuto dello straniero, hanno causato un meccanismo per cui, in preda alla paranoia di essere invasi dalla cultura del diverso, ogni prodotto era tradotto ed adattato, soprattutto quelli provenienti dall'estero. Questa tradizione, che si è instaurata negli stati dominati da tali regimi, non ha attecchito nel resto dell'Unione Europea, sia per il fatto che il doppiaggio è una pratica altamente professionale che trascende la semplice traduzione (per doppiare bene è necessario essere prima di tutto bravi attori ed avere una dizione corretta) sia per un discorso economico, legato al fatto che il doppiaggio è una pratica dispendiosa che, in paesi più poveri, non è stata considerata in favore della sottotitolazione, che è più economica. L'ultima parte del capitolo si focalizza sui benefici della sottotitolazione come lettura attiva di un contenuto, che porta ad una comprensione più profonda della lingua rispetto al doppiaggio. Il doppiaggio, infatti, è un metodo di adattamento passivo, in quanto il video è adattato per sembrare un video originale, tratto dalla cultura di arrivo. Non c'è un senso di distacco tra la lingua di partenza e la lingua di arrivo in quanto è tutto già dato, già tradotto. Per contro, con i sottotitoli questa distinzione è presente e caratterizzata da un apprendimento più attivo, in cui la lingua di partenza non è adattata, ma resa comprensibile tramite testo. Per imparare la lingua i sottotitoli sono un mezzo più efficace in quanto modo per apprendere strutture e lessico a partire dalla lingua dei sottotitoli, grazie ai quali si può capire la lingua della traccia audio originale.

Il terzo capitolo presenta la traduzione dei video scelti per questa analisi, tradotti dall'inglese all'italiano e viceversa. I video analizzati sono, in ordine:

- *Using Drones to Plant 20,000,000 Trees*, di Mark Rober;
- *Can You Cook Pasta By Boiling Water in a Vacuum Chamber e Amazing Way to Actually Mix Oil and Water with No Other Added Ingredient!*, di The Action Lab;
- *What is boiling? An introduction*, di Wayne Breslyn;

- *Water is Amazing – World Water Day!*, di Vsauce;
- *PASTA SENZA FUOCO (1) – Perché continuare a far bollire l'acqua è inutile, La Scienza della Pasta senza fuoco (2) perché si può spegnere il fuoco dopo aver buttato la pasta, PASTA SENZA FUOCO (3) – Ho commesso due errori e La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina*, di Dario Bressanini;
- *Pompa a vuoto*, di *fisicainvideo*;
- *Ebollizione dell'acqua nel vuoto (tratto da L'Amaldi per i licei scientifici)*, di Zanichelli editore S.p.A.;
- *ImmediaTest – acqua presentato a SuperQuark di Piero Angela*.

Il quarto ed ultimo capitolo presenta un'introduzione degli autori dei video analizzati in questo elaborato, a partire da Rober, che è un ex ingegnere aerospaziale della Nasa; Orgill, conosciuto con il nome di The Action Lab, è un ingegnere chimico, mentre Breslyn è un ricercatore dell'Università del Maryland; Stevens, conosciuto come Vsauce, è uno YouTuber; nato come comico, è poi diventato un divulgatore sulla piattaforma.

Quanto ai video in italiano, Bressanini è un chimico, professore dell'Università dell'Insubria, mentre Castelli e Sandri di *fisicainvideo* sono docenti rispettivamente di fisica e chimica al liceo. Zanichelli è una casa editrice e SuperQuark è un programma televisivo di divulgazione scientifica condotto da Piero Angela.

Il capitolo prosegue poi spiegando il processo di traduzione dal punto di vista dei software utilizzati: i video di The Action Lab sono stati sottotitolati tramite l'editor video di YouTube, in quanto Orgill consente l'aggiunta di sottotitoli sia in inglese che in altre lingue. Il video *La Mousse al cioccolato e acqua (vegana) – La Casalinga e lo Scienziato – Scienza in Cucina* di Bressanini invece è stato sottotitolato utilizzando AegiSub, un software di sottotitolazione che permette di modificare il testo, adattarlo, allungare od accorciare la durata dei sottotitoli e sincronizzare il testo con il video.

L'ultima parte del capitolo riguarda l'analisi della traduzione dei sottotitoli. Mentre gli altri tre video di Bressanini erano già stati sottotitolati e tradotti (e quindi sono stati valutati dal punto di vista della qualità della traduzione) e messi a confronto con gli altri video, i restanti sono stati sottotitolati da me.

L'analisi traduttologica ha seguito una progressione standard per tutti i video: ogni video è stato accompagnato da una tabella con alcune indicazioni quali durata, nome del video

e dell'autore, breve riassunto e tipo di testo (formale, informale, semi-formale). Successivamente, l'analisi si è focalizzata sugli eventuali errori presentati dai sottotitoli generati automaticamente da YouTube (mancanza di segni di interpunzione, di lettere maiuscole, presenza di errori nella trascrizione dovuti all'assonanza con altre parole, mancanza di una divisione tra unità di senso e quindi delle regole generali sulla buona sottotitolazione). L'ultima parte dell'analisi si è basata sulla ricerca di parole chiave, spesso comuni tra i video, per poi concludere ogni video analizzato con una spiegazione delle scelte nella traduzione o con proposte alternative di traduzione, tenendo conto sia del tempo, che dei limiti spaziali dei sottotitoli. È stato fatto un tentativo di adattamento per suddividere le unità di senso tra loro incasellandole in un sottotitolo o due, in modo da non rendere i sottotitoli eccessivamente lunghi e quindi difficili da seguire. L'analisi della traduzione ha tenuto conto della divulgazione scientifica effettuata dagli autori dei video in modo differente per spiegare vari concetti: la divulgazione fatta su YouTube è risultata meno specifica ma più accessibile, in un compromesso che vede il linguaggio altamente specializzato entrare in contatto con un mezzo più semplice per trasmettere un messaggio: un video di YouTube che possa essere accessibile e comprensibile anche da chi non ha tutte le conoscenze per comprenderlo. In questi casi sta allo YouTuber capire che linguaggio utilizzare per rendere il video più fruibile.

Questo elaborato, dunque, si è basato sull'importanza dei sottotitoli su più livelli, principalmente focalizzandosi sulla portata dei sottotitoli: didattica (nel senso di mezzo di apprendimento migliore, rispetto al doppiaggio), inclusiva (sottotitoli visti come aiuto per persone con disabilità uditive), artistica (in quanto parte integrante di film ed elemento talvolta imprescindibile) ed economica, sia per la possibilità di monetizzare contenuti sottotitolati, sia in virtù di una volontà di divulgazione scientifica che sia accessibile ai più e non indirizzata verso un pubblico particolare, specializzato.

Ringraziamenti

*“Best, you’ve got to be the best
You’ve got to change the world
And use this chance to be heard
Your time is now”*

-Matthew Bellamy, *Butterflies and Hurricanes*

Desidero dedicare il lavoro appena terminato alle persone che hanno arricchito le mie giornate in questo meraviglioso percorso che si conclude con la presente tesi di laurea.

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