

University of Europe for Applied Sciences
Visual and Experience Design

Master Thesis

Languages and Emotions:
How Languages Impact Different Emotional
States for Bilingual People

(Contains thesis, project and project documentation)

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August, 2021

Abstract

Bilingualism is a term that is simply used to define individuals who can speak two languages. However, bilingualism is much more complex and impacts several spheres of an individual's existence and understanding. Bilingualism has become an increasingly common phenomenon amongst individuals and can actively affect their perceptions and emotions. The thesis is dedicated to understanding how bilingual people experience different emotions. Writers and researchers have investigated previously how numerous factors such as culture, society, politics, and more play an active role in the creation of language identity. These researches highlight the evidence related to how languages effect emotions and how individuals may also experience a change in personality when communicating in a different language. "Language Identity" project is an experience designed with the aim of making individuals more aware of their emotional states when they speak in different languages through a series of questions. The experience creates a visualization based on the data collected. The platform encourages the participants to recognize the link between their emotions in different languages through the visuals that can be 3D printed and used as an accessory. Although there is well-grounded evidence that using different languages can stimulate different levels of emotions it is evident that this experience is largely subjective and experiences of these emotions can vary. There is more scope of knowledge and study in the field of linguistics and psychology to have a more extensive understanding of how language effects emotions.

Acknowledgements

I would like to express my deepest gratitude to my supervisors Prof. Emily Smith and Tihana Romanic, who helped to make this research and design project possible. I'm very thankful for their support, their valuable questions, constructive comments and advices during the project.

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Introduction

Most people around the world speak more than one language because of digitalization, migration, globalisation and other reasons. The term bilingualism is becoming a more popular topic of discussion nowadays. Some people claim they experience change in personalities when they speak different languages. Bilinguals feel different levels of emotions when they speak their first language as compared to their secondary languages. A well-grounded research exists that suggests, people feel they can express themselves better by speaking in one language than another or they find it comfortable to speak a certain language in a given situation.

People use languages every day to express their emotions. Studies of different emotional reactions of bilingual people are rare but important. There are many factors that can affect emotional levels while speaking different languages. Researchers try to find reasons why people experience different levels of emotions, change ways of expressing themselves and even make different decisions when they use different languages. It can depend on culture, personal background, events that person experiences. The experiences of a bilingual individual are quite subjective in nature and deserves a deeper exploration.

The present paper aims to understand how bilingual people experience different levels of emotions in languages they speak, which is affected by culture and forms their identity. It's important for bilingual people to self-identify themselves by languages as it affects the way one feels, thinks and behaves. This language identity could be an alternative to national identities that are related to the social norms and politics of a country. Languages we speak effect the way we feel, think and behave. The project "Language identity" is created to help people understand themselves better and their emotions through languages.

This paper is divided into three chapters. The first chapter covers background information related to the topic. The first section of the chapter includes a brief overview of the term "bilingualism" and its meaning in society nowadays. The second section begins by analyzing assertion of bilinguals about experiencing split of personalities while speaking different languages and stronger emotional level in

their first language and how this effect on ways of thinking in a language. It is discussed how emotional phrases and taboo words induce stronger emotional connection in first language. Lastly the second section analyses how events are perceived by a language in cognition. The third section investigates impact of culture and society on language that is triggered by different cultural characteristics. This section looks at how the culture and language of a country effects an individuals' self-identity.

The second chapter gives a brief overview of the project and a comparative analysis with main features of similar platforms and technology that are recommended to use for the project.

The third chapter presents the concept for the "Language identity" project, project documentation and features of the project. The paper will conclude with a summary and discussion of future development and usage of this product.

Chapter 1. Background information

1.1 Bilingualism

1.1.1 Bilingualism: meanings and definitions

There are people in the world who use two and more than two languages in everyday life. These people are called bilingual and multilingual, respectively. Related terms to bilingualism are multilingualism – using more than one language, and code-switching – process of mixing one linguistic code with another¹.

The term “bilingualism” is hard to define by researches in only one way. “Bilingualism as a term has open-ended semantics” – professor and scholar in the field of bilingualism Baetens-Beardsmore claims².

To define what bilingualism is it's important to understand what parameters and conditions bilingual people should have to be called bilingual. If we take into consideration people, who know a foreign language (for example, learnt it at school) and now occasionally use it, the number of people would be larger than monolingual people³. Term bilingualism can't only include people, who are fluent in both languages, but they rarely use one of them. A professor of Psychology at McGill University MacNamara (1967) suggests that speakers, who have minimal fluency at speaking a language, should be also called as bilingual⁴. Speakers, who use a language worse than their native language, should also be considered, if they use both languages with the same frequency. The term can't be related to age, when people started learning a language, because they might use two languages later or forget a language. That brings us to a conclusion that, bilingual people are people who use two languages with same frequency⁵.

There are many types of bilingual people, that depends on age of learning a second language, level of proficiency, fluency in languages, ways of usage (only

¹ Morrison, C. D. (2017, May 30). *Code-switching | linguistics*. Encyclopedia Britannica. <https://www.britannica.com/topic/code-switching>

² Beardsmore, H. B. (1986). [*Bilingualism: Basic Principles (Multilingual Matters)*] [Author: Beardsmore, Hugo Baetens] [November, 1986]. Multilingual Matters.

³ Wei, L. (2007). *The Bilingualism Reader* (2nd ed.). Routledge.

⁴ Macnamara in Lanvers, U., Hamers, J. F., & Blanc, M. (2000). *Bilinguality and Bilingualism*. *The Modern Language Review*, 96(4), 1172. <https://doi.org/10.2307/3735982>

⁵ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

speaking or writing form), etc. Li Wei, a British linguist, Dean of the UCL Institute of Education, suggests considering different parameters for defining a bilingual speaker: age of learning, proficiency level, spheres of a language use, self-identification².

To sum up, bilingual or multilingual people are those, who use languages with similar frequency, not necessarily fluently or depending on the age of learning a language.

1.1.2 Bilingualism in our society.

There are 7,000 languages spoken, each of them linked to distinct identities, cultures and knowledge systems. More people become bilingual, because of globalization, digitalization and increasing mobility.⁶

Migrants are a big part of population and they adapt to the country they are moving to and learn new languages. By “International Migration Report” in 2017 by the United Nations Department of Economics and Social Affairs “there are now an estimated 258 million people living in a country other than their country of birth – an increase of 49% since 2000”.⁷

Assistant Director-General for Education, Ms. Stefania Giannini on UNESCO conference about multilingualism noticed paradoxical relationship between globalization, digitalization and languages. On the one hand, because of rising mobility people discover new cultures, learn and use many languages. Two in three children grow up in multilingual contexts. On another hand, globalization is threatening diversity, consequences language death.

Because of globalization people stop speaking their native languages and many of languages are going extinct. The languages have changed during all human history, but nowadays they change in a different way. A professor in the Department of Communication at the University of Washington Nancy Rivenburgh

⁶ *Multilingualism in focus at UNESCO International Literacy Day conference*. (2019, September 11). UNESCO. <https://en.unesco.org/news/multilingualism-focus-unesco-international-literacy-day-conference>

⁷ Kellman, S. G. (2020). *Nimble Tongues: Studies in Literary Translingualism (Comparative Cultural Studies)*. Purdue University Press.

explained that earlier languages were replaced by new, more modern languages, like for example, Latin or Ancient Greek. For the past 500 years, there are no newborn languages, that would replace with old languages. Instead, dominant languages expand and replace other less popular languages.⁸

Among all 7,000 languages, there are only 7% of all world's languages are used and published on the Internet, according to Whose knowledge. Researchers claim that nearly 43% of the world's languages and dialects are unwritten.⁹ Participants on UNESCO conference highlighted: "A mere 5 percent of the world's languages are present on the Internet, 2,680 spoken languages are in danger of disappearing, and 40 percent of the world's population lack access to education in the language they speak or understand, affecting the quality of education and learning throughout life. These challenges put risk the quality of people's lives as well as linguistic and cultural diversity."¹⁰ The quantity of present languages on the Internet has an effect on linguistic and cultural diversity nowadays.

Some leaders of countries think that one dominant language over others in a country will make a country more united. Language speakers need to realize what a situation of languages nowadays and their cultures. "Understanding how a language played a unique role in history and its underlining importance is one of the first things we start to lose when a language starts dying. Once a language's inherent importance is gone, other aspects are let go as well." – points out writer Trevor English (2019). In other words, first of all, it's important to realize the problem of dying languages along with losing cultures, unique knowledge, and perspectives of the world.

Some leaders of countries think that one dominant language over others in a country will make the country more united. On another hand, language is a part of

⁸ Eschner, K. (2017, February 21). *Four Things That Happen When a Language Dies*. Smithsonian Magazine. <https://www.smithsonianmag.com/smart-news/four-things-happen-when-language-dies-and-one-thing-you-can-do-help-180962188/>

⁹ Trevino, M. T. (2020, August 15). *The many languages missing from the internet*. BBC Future. <https://www.bbc.com/future/article/20200414-the-many-languages-still-missing-from-the-internet>

¹⁰ *Multilingualism in focus at UNESCO International Literacy Day conference*. (2019, September 11). UNESCO. <https://en.unesco.org/news/multilingualism-focus-unesco-international-literacy-day-conference>

culture, so when a language dies, a part of a culture dies, and a unique way of seeing the world dies. When a language dies, we lose many stories of the past. “Each language is a key that can unlock local knowledge about medicinal secrets, ecological wisdom, weather and climate patterns, spiritual attitudes and artistic and mythological histories.” – assumes Paroma Basu (2009) reporter from National Geographics. Every language can offer unique wisdom that gets lost with the death of the language.

1.2 Languages and emotions

1.2.1 Personalities and languages.

Ervin-Tripp states bilingual people have different mindsets for each of languages, that makes them feel like a different person, when they speak different languages¹¹.

Many bilingual people experience split of personalities, when they speak different languages. Professor and author Rosario Ferré says “a bilingual writer is really two different writers, has two very different voices, writes in two different styles, and, most important, looks at the world through two different sets of glasses.”¹² One of the extremest examples of seeing the world in different ways while speaking different languages is Luis Wolfson, a translingual writer, who has schizophrenia. He writes in French, Hebrew, Russian and German, but doesn’t write in his first language English, because of the relationship with his mother¹³.

In psychology the first language or mother tongue is represented as a language of unconscious and a second language is a language of rationality. While

¹¹ Vince, G. (2016, August 12). *The amazing benefits of being bilingual*. BBC Future.

<https://www.bbc.com/future/article/20160811-the-amazing-benefits-of-being-bilingual>

¹² Rosario Ferré, “Bilingual in Puerto Rico,” in Schulte, R., & Kellman, S. G. (2003). *Switching Languages: Translingual Writers Reflect on Their Craft*. *World Literature Today*, 77(3/4), 158.

<https://doi.org/10.2307/40158342>

¹³ Kellman, S. G. (2020). *Nimble Tongues: Studies in Literary Translingualism (Comparative Cultural Studies)*. Purdue University Press.

therapies individuals, who have schizophrenia, use a language that doesn't provoke anxiety so usually they avoid their first language¹⁴.

Bilingual writers experience different emotional states when they write their books in their first or second languages. For example, Anton Shammas, an Arab, who lived in Israel, wrote his novel in Hebrew, even though he used to write in Arabic, his first language. Writing in his first language is too emotional for him: "You cannot write about the people whom you love in a language that they understand; you can't write freely. In order not to feel my heroes breathing down my neck all the time, I used Hebrew"¹⁵.

Bond and Lai (1986) confirm that bilingual people can use second language to have some emotional distance from, which allows them to express emotions better, than in the first language. Javier and Marcos (1986) also say a second language can help to avoid anxiety situations. A study shows that anxiety situations can be caused by using special words, "taboo words" in first language (language researcher Gonzalez-Reigosa 1976; psycholinguist Javier 1989)¹⁶.

People feel more emotional while expressing themselves in their first or dominant language than in second languages. Albert Costa in his book "The Bilingual Brain" gives an example from his bilingual family. He had a conversation with his son in Catalan and during the argument, when it started being tense, switched to Spanish, which is his dominant language. He could express himself in more emotional way in his first language (Spanish) and he could use second language (Catalan) to talk in more rational way¹⁷.

A Polish writer Jerzy Kosinski, who mostly used second-language English for writing, said "when I began speaking English, I felt freer to express myself, not only

¹⁴ Seeman, M. V. (2016). Bilingualism and schizophrenia. *World Journal of Psychiatry*, 6(2), 192. <https://doi.org/10.5498/wjp.v6.i2.192>

¹⁵ *The Translingual Imagination by Dr. Steven G. Kellman Ph.D (2000-06-01)*. (2000). University of Nebraska Press.

¹⁶ Pavlenko, A. (2002). Bilingualism and emotions. *Multilingua - Journal of Cross-Cultural and Interlanguage Communication*, 21(1), 45-78. <https://doi.org/10.1515/mult.2002.004>

¹⁷ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

my views, but my personal history, my quite private drives, all the thoughts that I would have found difficult to reveal in my native tongue”¹⁸.

Level of knowing a language does not affect emotional state while speaking a language. For example, Thomas Mann despite on knowing French not well, preferred to speak it more than his first language, German, because “speaking in French is like speaking without saying anything somehow – with no responsibilities, the way we speak in a dream”¹⁹.

A Japanese-American bilingual man, who was born in the US and educated in Japan, was participating in a study of Ervin-Tripp (1954), where he needed to describe pictures. He had more emotional responses in Japanese, that included family issues, love, lose and unfaithfulness. English responses were more cold, formal and less emotional²⁰.

Even though bilingual people claim their second languages are less emotional than first language, sometimes bilingual people find it easier to express their emotions in their second language. For example, an English-French bilingual woman, whose first language was French, had experienced traumatizing events in childhood and a lack of love, she found it easier to express her love in English²¹.

As bilingual people feel themselves and the world around in a different way while speaking different languages, they can also analyze the same events in different ways. Linguist, psycholinguistic researcher Susan Ervin did a research using Thematic Apperception Test cards and tested French-English bilingualists in two sessions divided by a language. She discovered significant effects of language on three parameters: verbal aggression toward peers, withdrawal-autonomy, and achievement. For example, while giving a feedback for the same card a participant

¹⁸ Kellman, S. G. (2020). *Nimble Tongues: Studies in Literary Translingualism (Comparative Cultural Studies)*. Purdue University Press.

¹⁹ Thomas Mann, *Zauberberg* (Berlin: S. Fischer, 1924), 407; Thomas Mann, *The Magic Mountain*, trans. John E. Woods (New York: Knopf, 2005), 401 in Kellman, S. G. (2020). *Nimble Tongues: Studies in Literary Translingualism (Comparative Cultural Studies)*. Purdue University Press.

²⁰ Pavlenko, A. (2002). Bilingualism and emotions. *Multilingua - Journal of Cross-Cultural and Interlanguage Communication*, 21(1), 45–78. <https://doi.org/10.1515/mult.2002.004>

²¹ Grosjean, F. (2011, August 18). *Emotions in More than One Language. The language(s) of emotions in bilinguals*. Psychology Today. <https://www.psychologytoday.com/intl/blog/life-bilingual/201108/emotions-in-more-one-language>

said in the French session: “I think he [the husband] wants to leave her because he’s found another woman, he loves more . . . I don’t know whose fault it is, but they certainly seem angry.” And in the English session he said: “He’s decided to get a good education . . . he keeps on working and going to college at night some of the time . . . He’ll . . . get a better job and they will be much happier . . . his wife will have helped him along.”²²

1.2.2 Different perceptions of emotional phrases.

People experience different emotional state of themselves and the world around while speaking different languages. Bilinguals can have different levels of reaction to emotional phrases in each language they speak. By emotional phrases I refer to linguistic utterances.

Dylman and Bjärtå (2018) researched emotional levels of distressing and neutral texts in English and Swedish. Participants experienced stronger emotions in their first language Swedish²³. The term that confirms this study is reduced emotional resonance of language.

A research by Catherine Caldwell-Harris at Boston University shows people experience more emotional reaction to some emotional phrases as “shame on you” or “go to your room!” comparing to neutral phrases. This emotional reaction of participants works only in their first language and called “emotion-memory effects”²⁴. It’s a different thing to know a language from a young age and to learn it by being an adult, because when people learn a language during childhood, they have more emotions connected to a language. People, who learned a language in an academic context while using it in a little social way, don’t experience a language

²² Grosjean, F. (2010). *Bilingual: Life and Reality (Reprint ed.)*. Harvard University Press.

²³ Dylman, A. S., & Bjärtå, A. (2018). When your heart is in your mouth: the effect of second language use on negative emotions. *Cognition and Emotion*, 33(6), 1284–1290. <https://doi.org/10.1080/02699931.2018.1540403>

²⁴ Ayçiçeği-Dinn, A., & CALDWELL-HARRIS, C. L. (2009). Emotion-memory effects in bilingual speakers: A levels-of-processing approach*. *Bilingualism: Language and Cognition*, 12(03), 291. <https://doi.org/10.1017/s1366728909990125>

in an emotional way. Humour, swear words, emotional phrases like “I love you” or “aren’t you ashamed” don’t sound the same in first and second language²⁵.

Because of “emotion-memory effect” bilingual people experience emotional phrases with higher emotional level in their first language, because phrases are connected to their memories. Despite this, Arabic-English bilinguals feel stronger emotions of shame and guilt in their second language (English), than in their first language. Researchers explain these results like a cultural difference between individualist English-speaking and collectivist Arabic-speaking cultures²⁶.

Dewaele (2008) in his research about words “I love you” suggests that level of proficiency in a language is connected to emotional response in a language. “According to the theory, this relationship between fluency and emotion reduced need for cognitive resources used to interpret and communicate in the language in which that individual had a fluent competency.” Reaction on emotion in a first language is processing faster and gives stronger emotional reaction²⁷.

One of hardest challenges for people, who learn a new language, is understanding humour. People often use sarcastic, indirect phrases to express their emotions better. Often people hear a joke, understand all words in a foreign language, but don’t find anything funny. It’s because humour includes indirect meaning of words, which can be learnt by social interaction with people in that language²⁸.

Many bilinguals feel less emotional in their second language. “I grew up feeling very uncomfortable using swear words. Or, at least, so I thought – when I first moved to Scotland, I noticed that it was actually very easy to swear in English.

²⁵ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

²⁶ el Alaoui, K., Pilotti, M. A. E., Mulhem, H., Tallouzi, E. A., & al Mqbas, M. M. A. (2017). The Role of Language and Cultural Orientation in Guilt and Shame Experienced by Bilingual Female Speakers. *Journal of Muslim Mental Health*, 11(2). <https://doi.org/10.3998/jmmh.10381607.0011.202>

²⁷ Dewaele, J. M. (2008). The emotional weight of I love you in multilinguals’ languages. *Journal of Pragmatics*, 40(10), 1753–1780. <https://doi.org/10.1016/j.pragma.2008.03.002>

²⁸ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

Interestingly enough, I also found it easy to talk to my flatmates about topics that felt too intimate to discuss in my native tongue.”²⁹

Swear words in a foreign language don't have a big emotional context and sound not that bad as in a first language. While learning a new language, people usually memorise swear words fast and easy. The problem is to understand when to use those “bad” words in a conversation. It's hard even for native speakers to explain why they use a certain word in that situation, but not another. Translation of those words doesn't help much, because for some words there is no translation as it's a cultural way of forming the words. Sometimes while using a swear word in a foreign language it doesn't sound right. It happens because emotional experience while saying those words is not same in that language as in native language. As a result, there is an emotional gap between languages. That's why when a person says swear words in a foreign language it sounds like a person doesn't feel a meaning of words and it can be surprising or even offensive for native speakers³⁰.

In Jean-Marc Dewaele's research about swear words bilingualists experienced higher emotional perception. Estela, whose first language is Romanian, second – German, said: “Romanian is more appropriate for hurting and insulting because it carries more weight, and I can distinguish more nuances”. Nicole (English – first language, German – second): “My parents were quite strict, and I still have the phrase ‘I'll wash your mouth out with soap and water’ in my head! I'd never swear in English, but it's easier in German!”³¹

“When bilinguals are angry, excited, tired or stressed, their accent in a language can reappear or increase in strength.” Also, bilinguals prefer to express their emotions in a language, in which they feel more emotional. “I was once bitten by a stingray in California and I recall clearly switching back and forth between

²⁹ Reporter, G. S. (2018, February 14). *Bad language: why being bilingual makes swearing easier*. The Guardian. <https://www.theguardian.com/science/blog/2017/mar/27/bad-language-why-being-bilingual-makes-swearing-easier>

³⁰ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

³¹ Dewaele, J. M. (2004). The Emotional Force of Swearwords and Taboo Words in the Speech of Multilinguals. *Journal of Multilingual and Multicultural Development*, 25(2–3), 204–222. <https://doi.org/10.1080/01434630408666529>

English and French. I used English to ask the English-speaking friends I was with to take me to see a doctor and I cursed in French to help me ease the pain.”³²

For many bilinguals first language has a lot of emotional power, and second languages are more rational and are easier to use and share with others, this confirmed by Emotion-Related Language Choice theory. In one experiment Polish-English bilinguals, whose first language is Polish translated text with swear words from one language to another. Translated English text was more emotional and stronger and with Polish it happened opposite – the text became weaker, with less strong swear words. It also can depend on social and cultural norms³³.

Another research was made by Free University of Berlin that played spells from Harry Potter in a first and second language for participants. The research showed people had more emotional connection to spells in their first language³⁴.

Catherine L. Caldwell-Harris, Ayşe Ayçiçeği-Dinn (Prof Istanbul Commerce University) had a research of Turkish-English bilinguals, who needed to complete phrases with the truth and a lie. Result of the study is that participants lied easily in their second language (English). It also can be explained as experiencing less emotions in their second language comparing to first. Participants have analyzed their emotions: “People may not understand if I am telling a lie. When they realize my English level is poor they may forgive me.”; “I prefer to tell a lie in English because I do not have as many feelings when I speak in English.”; “Since Turkish is my native language, my face may become red if I lie in Turkish.”³⁵

³² Grosjean, F. (2021). *Life as a Bilingual*. Cambridge University Press.

³³ Gawinkowska, M., Paradowski, M. B., & Bilewicz, M. (2013). Second Language as an Exemptor from Sociocultural Norms. Emotion-Related Language Choice Revisited. *PLoS ONE*, 8(12), e81225. <https://doi.org/10.1371/journal.pone.0081225>

³⁴ Chun-Ting, H., Jacobs, A. M., & Conradad, M. (2014). Can Harry Potter still put a spell on us in a second language? An fMRI study on reading emotion-laden literature in late bilinguals. *Cortex*, 282–295. <https://doi.org/10.1016/j.cortex.2014.09.002>

³⁵ Caldwell-Harris, C. L., & Ayçiçeği-Dinn, A. (2009). Emotion and lying in a non-native language. *International Journal of Psychophysiology*, 71(3), 193–204. <https://doi.org/10.1016/j.ijpsycho.2008.09.006>

1.2.3 Emotions and cognition.

Emotions are individual reactions on a situation they find significant. There are three components of expression emotions: a subjective experience, a physiological response and a behavioral or expressive response.³⁶ People use languages to express their needs and emotions. After revolutionary work of Darwin (1873), scientists started to think that emotions developed with the development of evolution³⁷.

Aristotle in his writings says emotions have definite functions, they can be understood in cognitive and social terms. Emotions are connected to culture and judgements of society³⁸. Shame and guilt are also social emotions. Society makes people compare with each other and judge them about not fitting to their image of the world. That's why embarrassment is an "emotion of social control"³⁹.

Linguist Chomsky started discussion in 20th century about separation of language from cognition, because they are controlled by different mechanisms of the brain. Nowadays some linguistics and psychologists disagree with this theory, because they support evolutionary way of creation of a language in the human brain⁴⁰. Prof Norwegian University of Science and Technology Vulchanova claims that a language and perception are two central cognitive systems. The interaction between systems is examined only partly.⁴¹

Professor at Northeastern University Leonid Perlovsky created a dual model with cognition and language, showing both are very connected to each other and

³⁶ *The Science of Emotion: Exploring the Basics of Emotional Psychology*. (2020, June 22). UWA Online. <https://online.uwa.edu/news/emotional-psychology/>

³⁷ Harre, R., & Parrott, G. W. (1996). *The Emotions: Social, Cultural and Biological Dimensions* (1st ed.). SAGE Publications Ltd.

³⁸ Harre, R., & Parrott, G. W. (1996). *The Emotions: Social, Cultural and Biological Dimensions* (1st ed.). SAGE Publications Ltd.

³⁹ Harre, R., & Parrott, G. W. (1996). *The Emotions: Social, Cultural and Biological Dimensions* (1st ed.). SAGE Publications Ltd.

⁴⁰ Perlovsky, L. (2017, February 25). *Music, Passion, and Cognitive Function*. Google Books.

<https://books.google.de/books?id=pvEbDQAAQBAI&lpg=PA25&dq=The%20dual%20hierarchy%20cognition%20and%20language&pg=PA25#v=onepage&q=The%20dual%20hierarchy%20cognition%20and%20language&f=false>

⁴¹ Vulchanova, M., Vulchanov, V., Fritz, I., & Milburn, E. A. (2019). Language and perception: Introduction to the Special Issue "Speakers and Listeners in the Visual World." *Journal of Cultural Cognitive Science*, 3(2), 103–112. <https://doi.org/10.1007/s41809-019-00047-z>

create a dual hierarchy. He says language is not directly connected to objects in the world, but it gives access to a culture and stores cultural knowledge in the world. “Events that are not described in language are likely not even noticed or perceived in cognition”⁴². Language helps brain to remember events and build a cultural image of an event. “If a concept doesn’t exist in a language, it is likely that it does not exist in cognition and corresponding events are not even noticed”⁴⁵. In other words, individuals analyze events in their thoughts using a language.

While experiencing some event, emotions can transform to nonverbal thinking or symbolic way of expressing thoughts. By cognitive theory of psychopathology, that was created by a psychiatrist Aaron T. Beck in 1960s, is actively used in psychotherapy and helps to find out negative thoughts and behavioral patterns. According to the theory thoughts are appearing in person’s brain as a reaction to situation and follow by reaction, which can be emotional, behavioral or psychological⁴⁴. Thought or interpretation of a situation works because of associative memory as automatic reaction. Author Daniel Kahneman in his book “Thinking, Fast and Slow” names this interpretation and reaction as fast thinking or System 1. It works as an intuitive conclusion and, opposite to System 2 (slow thinking), can be easily manipulated⁴⁵. So, while experiencing an event, sensors give a reaction to the brain and it gives a fast emotional reaction to the event. This reaction can transform into thoughts and then into behavior when a person can use an action or a language to react. Linguistic and non-linguistic emotional reactions involve common, but also different brain areas. Language (written or spoken) effects on emotions of people.

⁴² Perlovsky, L. (2006). Integrated Emotions, Cognition, and Language. *The 2006 IEEE International Joint Conference on Neural Network Proceedings*. Published. <https://doi.org/10.1109/IJCNN.2006.246620>

⁴³ Perlovsky, L. (2017, February 25). *Music, Passion, and Cognitive Function*. Google Books. <https://books.google.de/books?id=pvEbDQAAQBAI&lpg=PA25&dq=The%20dual%20hierarchy%20cognition%20and%20language&pg=PA25#v=onepage&q=The%20dual%20hierarchy%20cognition%20and%20language&f=false>

⁴⁴ Beck, J. S. (2010, January 30). *Cognitive Therapy*. Wiley Online Library. <https://onlinelibrary.wiley.com/doi/10.1002/9780470479216.corpsy0198>

⁴⁵ Kahneman, D. (2021). *Thinking, Fast and Slow* (Later prt. ed.). Farrar Straus Giroux.

Language researchers David Luna, Torsten Ringberg, and Laura A. Peracchio discovered in their study that bilingual people may unconsciously change their personalities when they switch languages. They have made a research about women listening to same advertisement in English and Spanish with an interval of 6 months. Those bilingual people changed their attitude towards people in the ad and themselves, this is called “frame-shifting”⁴⁶.

Culture affects language and therefore perception of a situation. Thoughts in form of language are formed in human cognition as a reaction to events, otherwise, information that is not connected to a language doesn’t exist in cognition. Because of different cultural representations of events individuals think and talk about the same situation differently in different languages.

1.3 Society, culture and languages.

1.3.1 Cultural imprint on a language.

Language is connected to culture, so while speaking a language people feel they belong to a social group. There are a lot of parallels between language and culture in history, it has developed together and had an effect on each other. “Language and culture developed together, influencing the lives of people just as much as one another. In order to understand one, you must understand the other” – says a writer Elisa Abbot⁴⁷.

Children learn a language from an early age, they learn to communicate in a language, using grammar structures before they learn it at school. Similar to it, culture is learned by children since childhood on an unconscious level⁴⁸.

Susan Ervin-Tripp had the research on Japanese-English bilinguals, who finished their sentences differently, depending on the language they used. For

⁴⁶ *Switching languages can also switch personality: Study.* (2008, June 24). Reuters Life!

<https://www.reuters.com/article/us-languages-personalities-idUSSP4652020080624>

⁴⁷ Magazine, B. E. (2019, September 26). *What Is The Relationship Between Language And Culture?* Medium.

<https://medium.com/@beyonDEXclamation/what-is-the-relationship-between-language-and-culture-9d43ad83aeea>

⁴⁸ Ibid

example, “When my wishes conflict with my family...” was completed in Japanese as “it is a time of great unhappiness”; in English, as “I do what I want”. Another example was “Real friends should...”, which was completed as “help each other” in Japanese and “be frank” in English⁴⁹.

Research of English and German bilinguals confirm that language grammar affects language speaking. English has the -ing ending, that uses to describe actions when German is more focused on goal actions. Participants, who participated in research in Germany, were goal-focused, in England – action-focused, no matter which language was used. It shows how language and culture changes a person’s view⁵⁰.

Language and accent are important aspects of defining a social group for people. Paralanguage, a non-verbal way of communication by speech, that includes intonation, speed of speaking, gestures, facial expressions. Paralanguage depends on the culture, where a person grew up because it depends on the expressions of surrounding people. Bilingual people experience voice changing in different languages⁵¹. “Language can be a cue that activates different culture-specific frames”⁵².

A study, where 5-year-old English-speaking children needed to choose those kids, with whom they wanted to have friends. Children preferred other English-speaking kids, because they could understand them better than French-speaking kids. Interestingly, kids preferred those, who would speak English with their accent, not kids who would speak English with a French accent. That means they don’t choose kids who don’t belong to their social group, because they speak a language with an accent. Another study showed that kids prefer talking to others who have

⁴⁹ Vince, G. (2016a, August 12). *The amazing benefits of being bilingual*. BBC Future.

<https://www.bbc.com/future/article/20160811-the-amazing-benefits-of-being-bilingual>

⁵⁰ Vince, G. (2016a, August 12). *The amazing benefits of being bilingual*. BBC Future.

<https://www.bbc.com/future/article/20160811-the-amazing-benefits-of-being-bilingual>

⁵¹ Magazine, B. E. (2019, September 26). *What Is The Relationship Between Language And Culture?* Medium.

<https://medium.com/@beyonDEXclamation/what-is-the-relationship-between-language-and-culture-9d43ad83aeea>

⁵² *Switching languages can also switch personality: Study*. (2008, June 24). Reuters Life!

<https://www.reuters.com/article/us-languages-personalities-idUSSP4652020080624>

the same accent in their native language and different skin color than those, who have the same skin color, but a foreign language accent.⁵³

Emotions have an effect on culture. Understanding emotions is not only based on knowing a language but knowing cultural characteristics. As an example, an American scholar, who lived in Japan and knows well Japanese culture, on a trip to France with her husband. She suddenly started apologizing in Japanese, which was shocked her husband and herself. She explains it: “And in France, I realized that my language for cultural embarrassment, for not quite knowing just how I should act, is Japanese. If I were blindfolded and tossed into absolutely any foreign country, I’m positive that within two minutes I’d be bowing, apologizing, and exclaiming, ‘Hazukashii!’”⁵⁴

Language forms a different perspective on the world. For example, most languages have words left and right and these words don’t exist in the Australian language Kuuk Thaayorre. Instead, they use cardinal directions: north, south, east, and west⁵⁵. To communicate with each other, even to greet, they always need to know cardinals, about what speakers of other languages don’t pay much attention to. Some of the Slavic group languages have 2 different names of “blue” color. For example, light blue is “goluboy” (in Russian), “blakytnyy” (in Ukrainian), “błękitny” (in Polish); and dark blue – “siniy” (in Russian), “syniy” (in Ukrainian), “granatowy” (in Polish). Eskimo languages have around 50 variations of types of snow. The Sami people (from northern Scandinavia and Russia) use at least 180 different words of snow and ice, which is even more than Eskimo people⁵⁶.

In some languages, gender and articles of words change. For example, in Italian many words ended on -o are masculine and others on -a are feminine. Participants unconsciously gave stereotyped masculine properties to words that

⁵³ Costa, A. (2021). *The Bilingual Brain: And What It Tells Us about the Science of Language*. Penguin.

⁵⁴ Pavlenko, A. (2002). Bilingualism and emotions. *Multilingua - Journal of Cross-Cultural and Interlanguage Communication*, 21(1), 45–78. <https://doi.org/10.1515/mult.2002.004>

⁵⁵ Gaby, A. (2012). The Thaayorre think of Time Like They Talk of Space. *Frontiers in Psychology*, 3. <https://doi.org/10.3389/fpsyg.2012.00300>

⁵⁶ Magga, O. H. (2006). Diversity in Saami terminology for reindeer, snow, and ice. *International Social Science Journal*, 58(187), 25–34. <https://doi.org/10.1111/j.1468-2451.2006.00594.x>

ended on -o (strong, big, ugly) and feminine properties to words that end on -a (weak, pretty, little). Gender of words changes people's view of subjects in each language⁵⁷.

1.3.2 Language and (self)-identity in society.

Identity is self-awareness of who a person is as an individual. There are many types of identities, for the project, it's important to identify people by languages they speak. Culture takes a big role in a person's identity, it defines ways of thinking, behaving.

People can identify themselves through self-awareness, analyzing who they are, and making a decision of how they see themselves, creating a "self-image". Though often they make this decision, comparing themselves to people around them. "To postmodern Theorists, the notion of the autonomous individual is largely a myth. The individual, like everything else, is a product of powerful discourses and culturally constructed knowledge."⁵⁸ In other words, individuals can't have self-identity that wouldn't be influenced by society and culture.

Alberto Melucci defined collective identity is "an interactive and shared definition produced by several individuals (or groups at a more complex level) and concerned with the orientations of action and the field of opportunities and constraints in which the action takes place."⁵⁹ Collective identity depends on the group, not one person, who influences ways of action that are accepted by them.

Francis Fukuyama claims that identity directly depends on politics. Each country tries to form national identities of people through education. Children learn about history of their country, traditions, celebrate historical holidays, learn a national language. Multiculturalism is also a part of political program, "that

⁵⁷ Deutscher, G. (2011). *Through the Language Glass*. Arrow Books.

⁵⁸ Pluckrose, H., & Lindsay, J. (2020). *Cynical Theories: How Activist Scholarship Made Everything about Race, Gender, and Identity—and Why This Harms Everybody* (None ed.). Pitchstone Publishing.

⁵⁹ Melucci, A. (1995). *Social Movements and Culture* (H. Johnston, B. Klandermans ed.). University of Minnesota Press.

sought to value each separate culture and each lived experience equally, and in particular those that had been invisible or undervalued in the past”.⁶⁰

People learn a language not only from friends and family, but from available recourses arounds, from TV programs, books etc., which effects person’s perspective of the world. When people start learning a new language, they can’t ignore their culture, they learn by movies, radio, books etc.

Identities of people, who have lived in colonized territories, are formed differently, than if they had lived in an independent country with independent culture and language. Bilingual people, who know two or more languages from childhood, because of politics, are familiar with both cultures and have two national identities. For example, people, who were born in USSR, learned different history, language, belong to both Russian and Ukrainian cultures. Opposite to people, who were born in independent Ukraine, learned another history and language, regularly sang Ukrainian anthem at school. Though the difference is not that noticeable, because people in USSR were more influenced by culture in a family and, more importantly, Russian influence on Ukrainian culture hasn’t disappeared after the Independence of Ukraine and has been always present on TV programs, music, social media, etc. It has a direct effect on languages, that people speak in a country. Nowadays most Ukrainians are bilingual since childhood. Many people in big cities prefer speaking Russian, even though they speak Ukrainian with their families in their hometowns. Some people explain it as they don’t know Ukrainian well and they don’t feel confident to speak it.

Another example is mixed Indian-English culture, which is still noticeable after occupation. There are many people, who judge others, who speak Hindi or other native languages, than English. Indian people share, there is a “language disparity” in the languages they speak. The English language is considered a “better, sophisticated” language, when people, who speak Indian national languages, are

⁶⁰ Fukuyama, F. (2018). *Identity: The Demand for Dignity and the Politics of Resentment* (1st Edition). Farrar, Straus and Giroux.

considered “uneducated”. They feel uncomfortable saying some personal emotional phrases, like “I love you” because it feels funny and not serious to them.

Bilingual people identify themselves as belonging to two or more cultures. Society compares them with the standards of their culture in their country. This often happens with immigrants in Europe nowadays. Their home country identifies them as emigrants, Europeans, and their “host nations” identify them as immigrants like their parents. Some people feel in between those two cultures and hide their bicultural identity.⁶¹

⁶¹ Grosjean, F. (2010). *Bilingual: Life and Reality* (Reprint ed.). Harvard University Press.

Chapter 2. Comparative analysis

2.1 Comparative analysis.

The project “Language identity” aims to create an educational and fun experience in order to help people to understand their self-identity. In order to find solution of designing experience that provides for individuals to understand themselves better, it’s important to analyze existing projects, that have similar philosophy, their concepts, features and technologies.

The first example is a mini-game on Ukrainian independent online-media texty.org. The game “Manipulator”⁶² is an educational experience that encourages the audience to “create the worst media and become popular” among readers online.

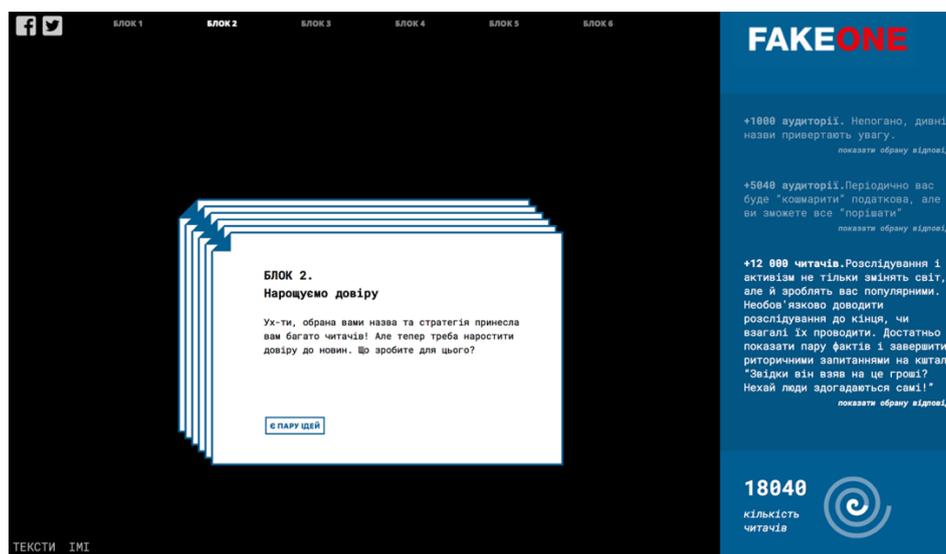


Fig 1. A game “Manipulator”: introduction to the block.

The short introduction to the platform is an interesting feature, that contributes to the intuitiveness of the user experience and triggers excitement for a user. The platform makes user choose from a series of questions and stimulates their experience by launching a dashboard that represents real-time information about the options they choose. A key-feature would be a data visualization, that represents the increasing or decreasing number of readers of the fake media, which gamifies the experience. In my opinion, the intensity of the experience and the

⁶² *Маніпулятор*. (n.d.). Тексти. Retrieved July 25, 2021, from <https://texty.org.ua/d/manipulator-game/>

gamification features motivate the users to go until the end of the game, which makes the platform successful.

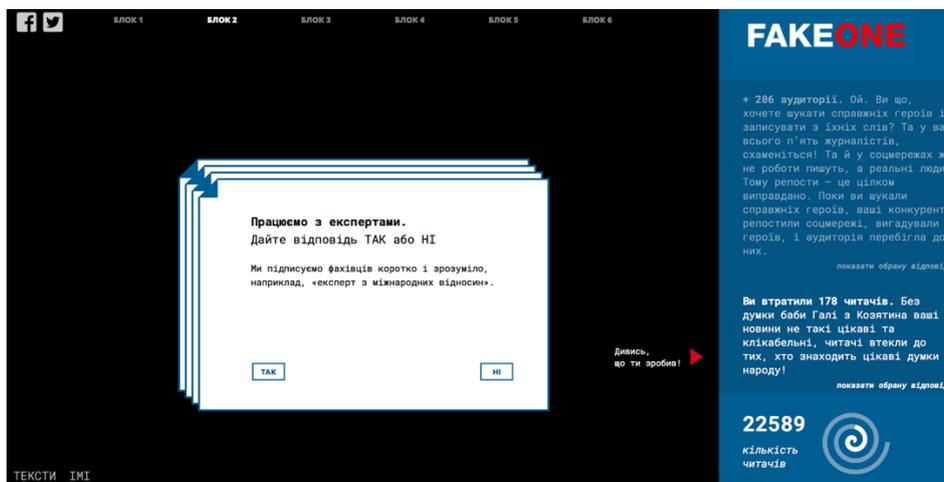


Fig 2. A game “Manipulator”: comments on the dashboard about losing audience because of chosen option.

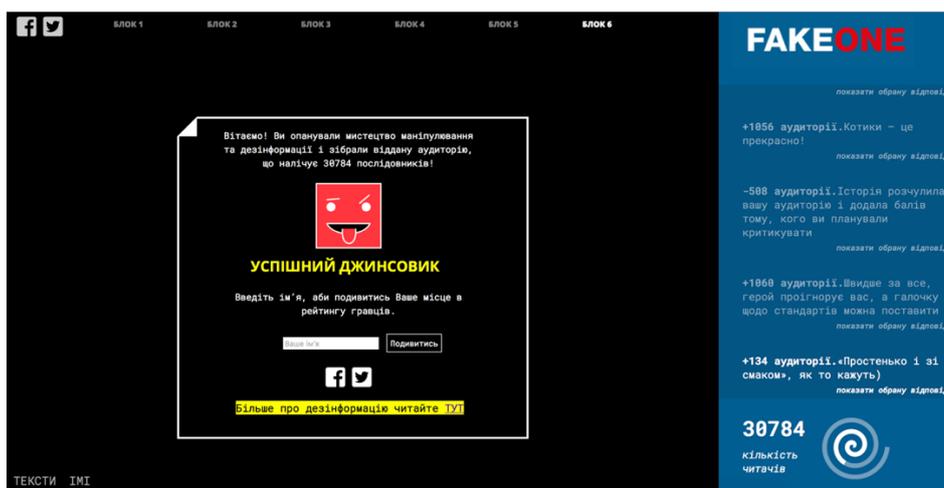


Fig 3. A game “Manipulator”: incomplete spiral suggesting the level of the participants popularity in the end of the game.

The second example is a data visualization project of “Mindworks: The Science of Thinking”. The idea of the project to visualize how and why people make decisions by fun and engaging experience design. “The space presents a one-of-a-kind experience where people can learn more about how their minds work, and at the same time, contribute to groundbreaking science as participants”⁶⁵.

⁶⁵ Pentagram. (n.d.). *Mindworks: The Science of Thinking* – Story. Retrieved July 25, 2021, from <https://www.pentagram.com/work/mindworks-the-science-of-thinking/story>



Fig 4. “Mindwork”

The participants need to answer to different questions about their way of making decisions by choosing figures with different shapes and colors. The physical interaction with the forms adds to the value of the experience as it gives the audience a direct control over the visual representation of how the mind works. By combining figures together people can create a unique figure that represents their identity of making decisions or “choice architecture”. The display of the figures on the wall makes participants aware of other possible combinations that represent other people’s decisions and can compare with theirs. The clear classification of what the forms represent provides a clear scope for participants to understand more about themselves and this data visualization can be considered as a key feature, that makes the experience engaging.

2.2 Usage of technologies.

In analyzed researches in chapter 1, for the understanding reaction of participants, there were used heart rate, eye tracker or only subjective rating of emotions by participants. It's important to find out the best method of measuring the emotional response of people for the project. There are few technologies, that can understand people's emotional reactions:

1. EEG headset.

Advantages – the brain's electrical activity is measured directly.

Disadvantages – needs laboratory setup and neurologist's decoding.

2. E4 wristband.

Advantages – real-time physiological signals; measures blood volume pulse, which is connected to heart rate, skin temperature, and electrodermal activity.

Disadvantages – BVP is easier to apply but is less specific than the ECG and subject to measurement errors.⁶⁴

3. Emotion recognition technology.

Advantages – emotion recognition technology indicates facial expression using a webcam and decodes it⁶⁵.

Disadvantages – algorithm can't effectively recognize what emotions a person experiences by only scanning face expression⁶⁶.

E4 wristband is the most suitable for the project's goal. The technology is portable, transfers data in real-time, and doesn't require the assistance of a specialist, at the same time, it measures BVP, which helps to effectively analyze emotions, unlike emotion recognition technology.

⁶⁴ Milstein, N., & Gordon, I. (2020). Validating Measures of Electrodermal Activity and Heart Rate Variability Derived From the Empatica E4 Utilized in Research Settings That Involve Interactive Dyadic States. *Frontiers in Behavioral Neuroscience*, 14. <https://doi.org/10.3389/fnbeh.2020.00148>

⁶⁵ *Facial Expression Analysis: Gain deeper insights into expressed facial emotions*. (n.d.). IMotions. Retrieved July 24, 2021, from <https://imotions.com/biosensor/fea-facial-expression-analysis/>

⁶⁶ Schwartz, O. (2019, March 6). *Don't look now: why you should be worried about machines reading your emotions*. The Guardian. <https://www.theguardian.com/technology/2019/mar/06/facial-recognition-software-emotional-science>

Chapter 3. Project “Language identity”

3.1 Product overview

“Language identity” is a product, which collects data of speaking language of bilingual people and analyses levels of their emotional reactions to different emotional phrases. Considering the fact that speaking different languages triggers changing their way of speaking or behaving, it is a primary goal of the product to help people understand themselves more, help them notice emotional and behavioral differences, when they speak different languages.

The analysis of background information helped to understand what emotional phrases can trigger different levels of emotions in bilingual people. The comparative analysis was useful to examine the ways of visualizing human data and interactions, that keep the user engaged while using the projects. Combining these findings, “Language identity” will provide an experiment including a test, that would collect data and would lead to the creation of visualization of individual’s spoken languages.

The project requires using E4 wristband technology in order to analyze the levels of emotions by measuring blood volume pulse, skin temperature, and electrodermal activity. The software will help to stream real data using Bluetooth and visualize it on the screen. The technology is portable and doesn’t require assistance, which could affect the user in answering questions and experiencing emotions. The product will be found in a booth, that would help the user to be isolated from others, who may affect answers.

3.2 Interface and usability

The project “Language identity” takes place in a booth with an interactive display where the user answers different types of questions.

Customized data visualization of languages in form of accessory.

The experience includes data collection, which leads to a visualization of personal emotional spectrum of each language the user speaks. Data collection is

visualised in the end of the experience to a user and it's possible to receive the visualisation in form of a pendant to create a lasting memory or share in social media with friends.

Landing page.

The first screen shows a logo of “Language identity” and visuals of previously created accessories by other users that gives an idea for the user about the final result of the project and motivates them to participate in the experiment. It follows with a short explanation of what users can expect from the following experience, that gives them better idea of the project and makes them more excited and ready to the test.

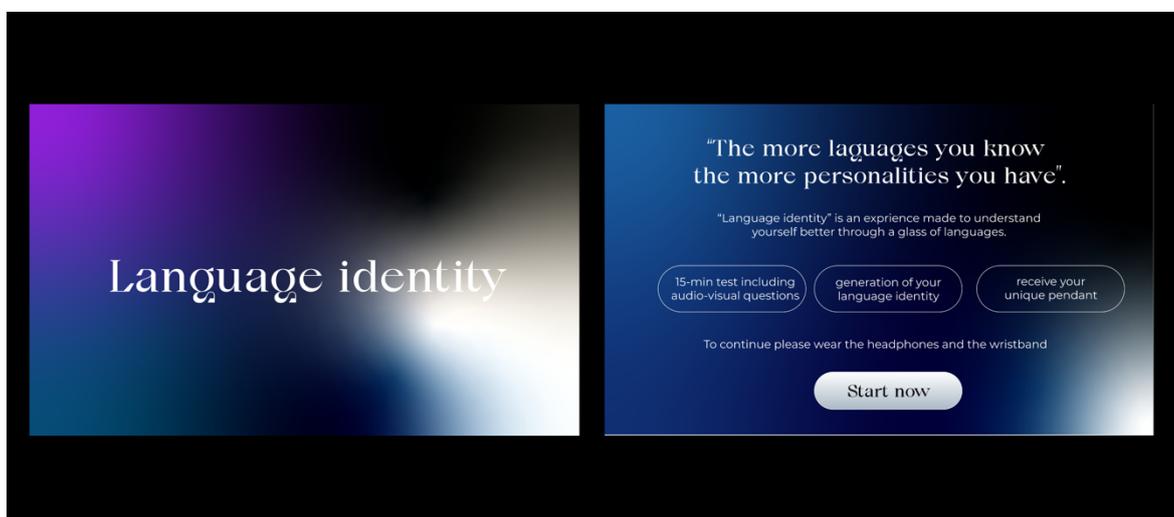


Fig 5. Landing screen and instructions.

Data visualization of language families and languages.

The user needs to choose their spoken languages for further experiment. There are two options for choosing a language (fig 5). The title text “Do you speak English?” is animated and switches between the top 10 languages by a number of speakers, so the user can choose popular languages faster. The display also presents different language families in circles, which size depends on the number of speakers. It leads to choosing branches of languages till the user reaches the spoken language.



Fig 6. Choosing a language family

Using audio-questions.

After choosing a language the user has to answer how he/she feels in the chosen language, which tests the user’s ability to understand that language and immerses the user with interaction. It’s important to “break the ice” and let the user get used to answering the questions by voice for further questions.

Picking the year of spoken languages by scrolling.

The next step involves choosing the year the user started speaking the language by scrolling. After the user picks the year the timeline is transforming into a circle. The interaction leads to the creation of circles that represent how long the user speaks a language and are used for the resulting visualization (fig 6).

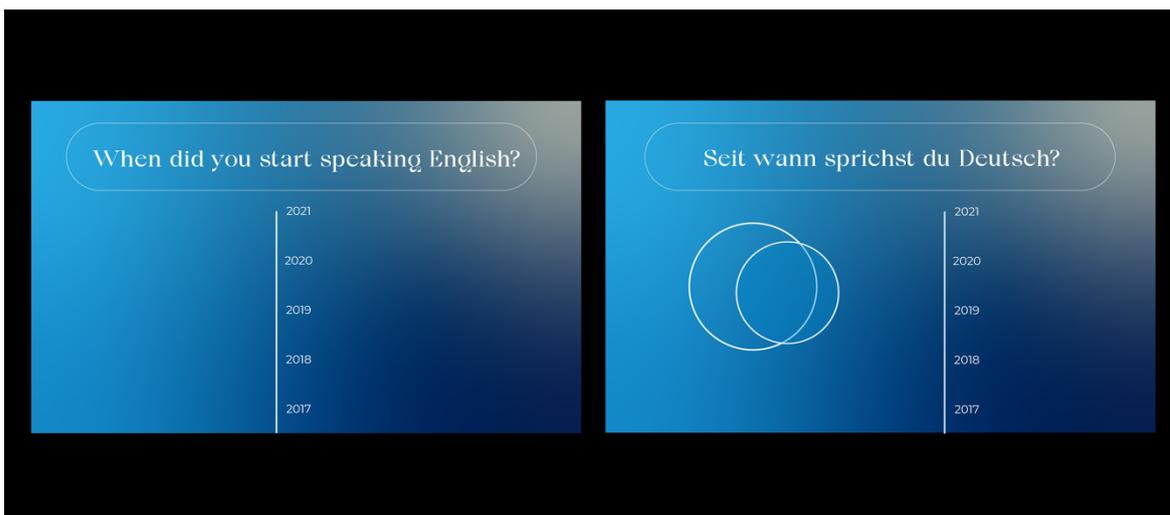


Fig 7. Language timeline

Changing background.

The following questions figure out who the user speaks different languages with (i.e., parents, romantic partner, friends, colleagues). The colour of the background changes depending on the chosen answer. The colour combination is used in the final visualization.



Fig 8. Choosing categories of people the user talks to in German

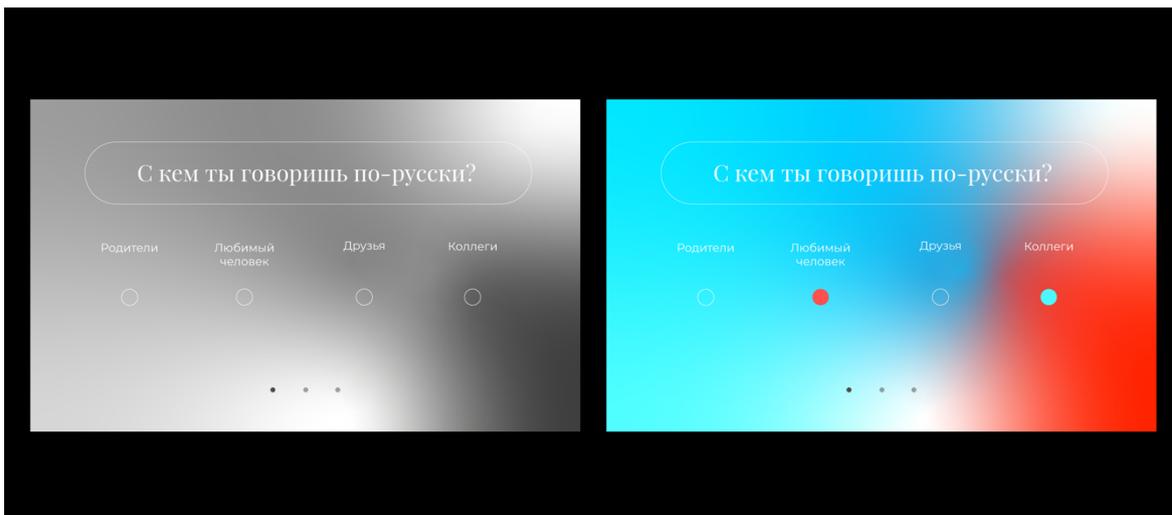


Fig 9. Choosing categories of people the user talks to in Russian

Creating emotional response.

The test continues with emotional phrases that are presented audio-visually to get emotional feedback of the user that is collected by the E4 wristband. Because of the previously analysed research some emotional phrases like “I love you”, “Aren’t you ashamed”, “Go to your room”, also swear words and lie trigger emotional reaction of people and depend on languages a speaker use. Together with audio that triggers user’s emotions background colours and location of the text effects on the perception of the information of bilinguals.



Fig 10. Emotional phrases of love and fear

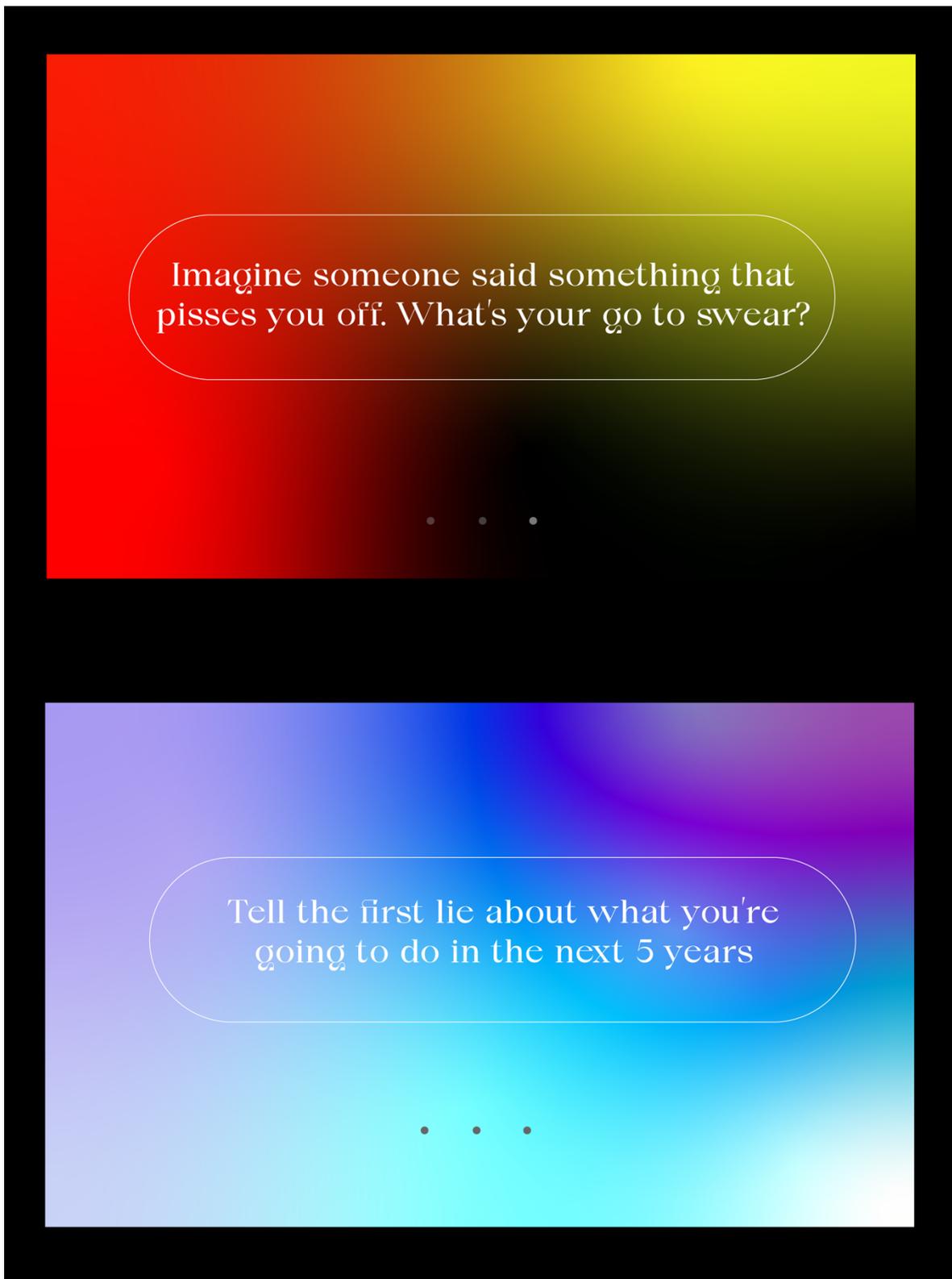


Fig 11. Emotional phrases of anger and lie

Navigation.

The navigation in form of dots on the bottom leads to different languages. It helps the user understand the tasks and motivates them to continue participating in the experience.

Data visualisation of emotional levels in languages.

After each phrase, the user has to draw a line that changes to a wave that represents different levels of emotions the user experiences by completing the task. Emotional levels are collected by the E4 wristband and influences the form of waves. The recorded lines are combined to a visual representation of an individual emotional spectrum that is related to the chosen language. The user can see the final visuals that are based on data collection during the experiment.

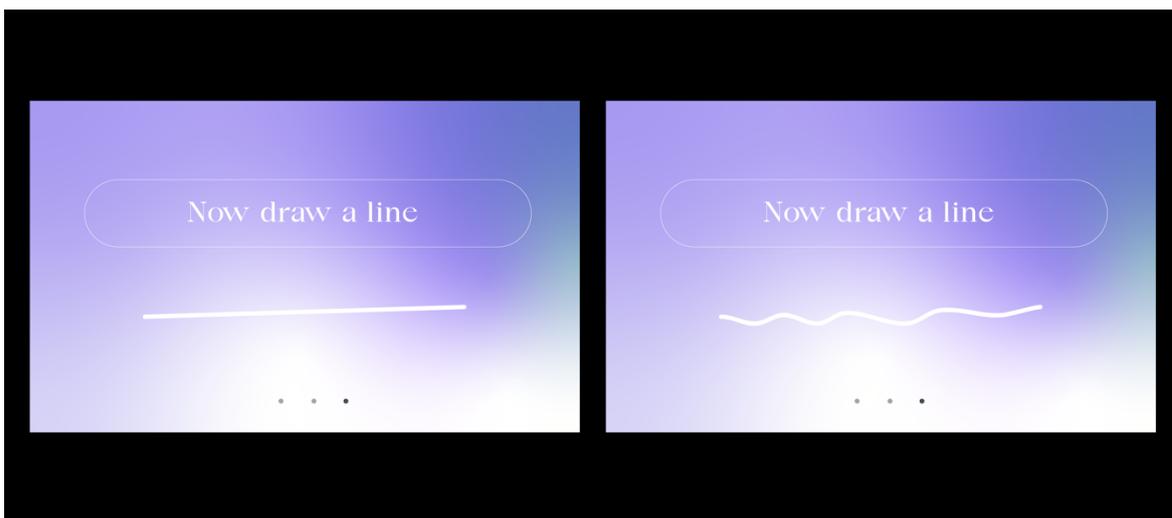


Fig 12. Drawing a line



Fig 13. Drawing a line

Modifying shades of colours.

Before receiving the final pendant, it is possible to modify the shades of colours for the user. The colours are perceived subjectively for every individual, so there is an option of customization.

Data visualisation of spoken languages.

As a result of combining the collected data, a pendant is created. Each circle represents a language. The unique letter, combination of letters or character of each language, that's shown in the middle of the circle, gives a hint what language that is. The radius of the circle gets bigger the more years the user speaks a language. The gradient of colours inside the circle shows the categories of people the user talks to. The borders of the circle show the emotional spectrum as an individual's feedback to listening and speaking phrases.

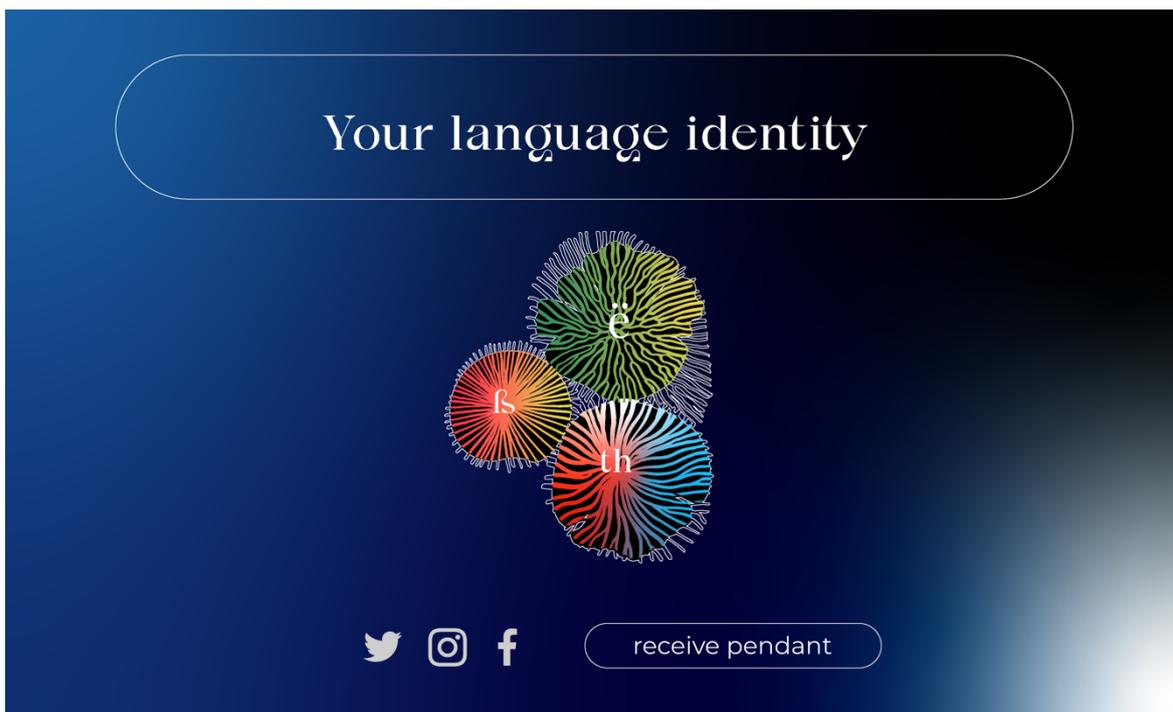


Fig 14. Generated visualization of language identity

Conclusions

The purpose of this study investigated how different languages impact emotional states of bilingual people. Given an account that there are various factors that effect this. The findings of the research indicated: firstly, how culture effects language and, as a result, effects perception of a situation. This implies that language is formed in cognition. Secondly, the study also implies that culture and society go hand in hand with language and can change people's image of themselves and their identity. This implies that bilingualism is a consequence of factors like relocation, colonization, globalization. These factors have direct effects on the absorption of different cultures, which influences forming self-identity of bilingual people.

The evidence from this research suggests that diversity of identity of bilingual people is complex in nature. This thesis aims to develop a platform that encourages individuals to have a better understanding of themselves in terms of languages they speak. The concept of "Language identity" project follows from the fact that previously executed studies that intended to understand emotions in different languages were not effective. Hence, there is a requirement for a more effective and accurate method of data collection accompanied with visualization of this data. "Language identity" is designed to better communicate how different languages effect different levels of emotions amongst bilingual people.

Although, "Language identity" aims to create a more accurate and experiential knowledge about self-identity in different languages. The current study was limited by a number of factors. Firstly, the lack of knowledge in the sphere of cognition and language that requires more comprehensive understanding of psychology and linguistics. Secondly, there is a requirement for more accurate technology, that can not only identify emotions, but also create authentic categories of emotions. Thirdly, due to the complex diversity of individual perception, the project requires a deeper research and testing to create a better understanding of self-identity of bilingual people.

There are future implementations of this project in terms of creating a possibility for bilingual people to connect based on similarities of language identity and this may motivate people to explore other languages and cultures more.

Language is an integral part of life, that forms self-identity of individuals. The project helps bilingual people to have a better understanding of how they perceive languages, which effect their way of thinking, speaking and even making decisions.

Prototype link

<https://www.figma.com/proto/N0UBtdWHYjWpPnYXGi26Wd/Language-identity?page-id=177%3A80&node-id=177%3A81&viewport=-423%2C-324%2C0.25091078877449036&scaling=min-zoom&starting-point-node-id=177%3A81&show-proto-sidebar=1>

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