



VNIVERSIDAD
D SALAMANCA



EC2U
Joint Masters
European Languages, Cultures
and Societies in Contact

TRABAJO FIN DE MÁSTER

MÁSTER UNIVERSITARIO EN LENGUAS, CULTURAS Y
SOCIEDADES EUROPEAS EN CONTACTO

*The Role Of Prior User Interactions In
Shaping Chatgpt's Response Patterns*

*El Rol De Las Interacciones Previas Del Usuario En La
Formación De Los Patrones De Respuesta De Chatgpt*

Autora: Sofya Kruglikova

Tutor: Dr. Raúl Sanchez Prieto

En Salamanca a 9 de julio de 2024



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TRABAJO DE FIN DE MÁSTER

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Abstract

The study explores the role of prior user interactions in shaping ChatGPT's response patterns. The main focus of the research is how the model's responses vary depending on the user's account history and previous interactions. The study uses a mixed-methods approach, combining qualitative semi-structured interviews with quantitative experiments to test the initial assumption. The qualitative phase consists of interviewing 24 participants from diverse backgrounds to gather insights on their usage patterns, language preferences, and understanding of ChatGPT. The quantitative phase tests the hypothesis that ChatGPT's responses are influenced by previous interactions with the same account through controlled experiments. In the experiment phase 24 participants from qualitative phase are divided into two groups, that ask the model three identical questions in Russian and in English. They interview the model according to the instructions, and share the result for the further analysis. The findings aim to gain a deeper understanding of ChatGPT's response generation and improve user experience and the model's performance. It provides valuable insights into the usage patterns and serves as a starting point for further exploration.

Keywords

ChatGPT, User Interactions, ChatGPT's Response Patterns, Mixed-Methods Research, Large Language Models, Natural Language Processing, Qualitative Semi-Structured Interviews, Readability Metrics, Keyword Frequency Analysis, Thematic Analysis, Quantitative Experiments, ChatGPT Usability

Resumen

El estudio explora el rol de las interacciones previas del usuario en la formación de los patrones de respuesta de ChatGPT. La investigación se centra en cómo varían las respuestas del modelo en función del historial de la cuenta del usuario y de sus interacciones previas. El estudio utiliza los métodos mixtos, combinando entrevistas cualitativas semiestructuradas con experimentos cuantitativos para probar la hipótesis inicial. La fase cualitativa consiste en entrevistar a 24 participantes de diversas procedencias para conocer sus pautas de uso, preferencias lingüísticas y conocimiento de ChatGPT. La fase cuantitativa pone a prueba la hipótesis de que las respuestas de ChatGPT están influidas por interacciones previas con la misma cuenta mediante experimentos controlados. En la fase experimental, 24 participantes de la fase cualitativa son divididos en dos grupos, que formulan al modelo tres preguntas idénticas en ruso y en inglés. Entrevistan al modelo siguiendo las instrucciones y comunican los resultados para análisis posterior. El objetivo de los resultados es conocer en detalle cómo ChatGPT genera las respuestas y mejorar la experiencia del usuario y el funcionamiento del modelo. Ofrece información útil sobre los patrones de uso y sirve como punto de partida para futuras exploraciones.

Palabras clave

ChatGPT, Interacciones de Usuario, Patrones de Respuesta de ChatGPT, Investigación con Métodos Mixtos, Modelos de Lenguaje Extenso, Procesamiento del Lenguaje Natural, Entrevistas Cualitativas Semiestructuradas, Métricas de Legibilidad, Análisis de Frecuencia de Palabras Clave, Análisis Temático, Experimentos Cuantitativos, Usabilidad de ChatGPT

Contents:

Abstract	4
Keywords	4
Resumen	4
Palabras clave	5
Contents:	6
Introduction	8
1. Research Questions/Objectives.	9
2. Research Design.	10
2.1. Research Method.	10
2.2. Initial assumption.	14
2.3. Semi-structured interviews.	15
2.4. Researched phenomena.	21
2.5. Participant recruitment and interviewing.	22
2.6. Interview guidelines and validation	24
2.7. Qualitative and quantitative interviewing	24
3. Theoretical background on ChatGPT.	26
4. Qualitative phase. Semi-structured qualitative interviews.	28
4.1 Research Design and Methodology.	28
4.2. Data Analysis and Findings.	37
4.2.1. Demographic Information.	37
4.2.2. Perceptions and Understanding of ChatGPT.	39
4.2.3. Frequency of ChatGPT Use.	41
4.2.4. Duration.	42
4.2.5 Language Use.	43
4.2.6 Usefulness of the model.	45
4.2.7. Purposes of ChatGPT usage.	47
4.2.8. Prompting and questioning style.	49
4.2.9. Account used with ChatGPT.	50
4.2.10 General observations and conclusions.	51
5. Quantitative experiment.	53
5.1. Research Design and Method.	53
5.2 Readability analysis of ChatGPT responses.	68
5.2.1. Responses in Russian.	68
5.2.2. Responses in English.	70
5.2.3. Observations and conclusions.	72
5.3 Keyword analysis of ChatGPT responses.	73
5.3.1. Responses in Russian.	73
5.3.2. Responses in English.	74
5.3.3. Observations and conclusions.	74

5.4 Thematic analysis of ChatGPT responses.	75
5.4.1. Responses in Russian.	75
5.4.2. Responses in English.	88
5.4.3. Observations and conclusions.	105
6. Discussion of Research Findings.	107
7. Conclusions.	109
References.	110

Introduction

The current research aims to explore how the responses of a large language model, ChatGPT, depend on the account and its previous interactions with ChatGPT. The study tests the assumption that ChatGPT not only considers the context of the current session but also remembers all previous interactions with the same account and adjusts the responses accordingly. This research seeks to deepen our understanding of how ChatGPT works and identify the factors influencing the model's responses.

In today's digital age, artificial intelligence (AI) and machine learning (ML) technologies, such as ChatGPT, influence various domains of our lives, including education, research, and content creation. Understanding how prior user interactions shape the model's responses is essential for two reasons: enhancing user experience and protecting the personal data of users.

This research addresses a significant gap in the literature on the impact of previous interactions on ChatGPT's responses, offering valuable insights drawn from empirically collected data for both ChatGPT developers and users.

The launch of ChatGPT-3 in November 2022 marked a new era in the history of Generative AI, with the model reaching 100 million monthly users by January 2023. This milestone demonstrates that AI-driven tools have become an indispensable part of our lives, making it necessary not only to use them effectively but also to understand their capabilities and limitations. Such understanding should lead to a balance between the effectiveness of technology and the potential threats it can pose.

By introducing a mixed-methods approach that combines qualitative semi-structured interviews and a quantitative experiment, this research provides a comprehensive overview of the factors that shape ChatGPT's performance.

1. Research Questions/Objectives.

AI and Generative AI in particular diffuse more and more in various fields of human life, including education, research, businesses, healthcare, psychology, etc. The growing popularity and computational power of AI tools raise concerns among the general public, academic institutions, and other stakeholders.

The main idea behind the development of Artificial Intelligence is to replicate human cognitive functions, that allow us to solve problems, make decisions and, most importantly, learn (Jermakowicz, 2023, 1). AI includes various algorithms, technologies and tools, such as Natural Language Processing, Computer Vision, or Voice Assistants. However, one of the most rapidly evolving types of AI is Large Language Models (LLMs). LLMs are designed to understand and generate human language, and their development in the last few years is impressive — besides the OpenAI's ChatGPT, there are also Google's Bard, Anthropic's Claude, Meta's LLaMA, and etc.

Our research objective is, therefore, to gain a better understanding of the large language model that has significantly shifted the history of technology since its launch in November 2022—ChatGPT. OpenAI was the first to introduce a user-friendly chatbot interface, and the model now has over 180 million users (Exploding Topics, June 2024). Although the majority of people have at least heard about ChatGPT, there is a lack of understanding regarding how the model works, as well as its advantages and limitations.

Donata Columbro, in her book "Dentro L'algoritmo" (Italian for "Inside the Algorithm") (2022), argues that people perceive algorithms as a kind of magic power that works autonomously. She states that this perception is dangerous because there are always people behind the algorithms, and these technologies merely replicate our capabilities, along with our mistakes.

There are many technical articles about the architecture of large language models (LLMs), as well as articles dedicated to the use of ChatGPT in various specific domains. Nevertheless, there is a lack of literature that explores the model from the user's perspective: how people tend to use ChatGPT, what they think about it, and, most importantly, what OpenAI might be concealing behind complex privacy regulations and technical terms.

In this master's thesis, we will explore to what extent ChatGPT responses depend on the model's previous interactions with the same account. The research aims to demonstrate that these responses do depend on the account's previous interactions and to understand how these interactions influence subsequent responses.

Such understanding might help us uncover another mystery behind AI technologies and their developers.

2. Research Design.

2.1. Research Method.

After considering various methods and approaches, we decided to conduct the current research in a mixed-methods approach that combines both qualitative and quantitative methods, used sequentially. This type of approach integrates the advantages of both qualitative and quantitative analysis. It enhances a deeper understanding of the researched phenomena, i.e., the understanding of how ChatGPT responses depend on the previous interactions of the user with the model.

Firstly, it is necessary to explain what is understood by the mixed-method approach and why we decided to choose it for this research. Guest and Fleming (2015, p. 581) argue that the mixed-method approach was already used by John Snow in 1854 to find the cause of cholera epidemics, even though it wasn't yet called a mixed-method approach or perceived as such by the scientific community. According to the authors, it became broadly recognised only in the late 1980s.

There are several definitions of the mixed-method approach, for example, Bergman (2008, p.1) refers to it as “the combination of at least one qualitative and at least one quantitative component in a single research project or program”. This definition is the one we will be implying while using the term. Hamed Taherdoost (2022, p. 53) states that qualitative and quantitative methods inside the mixed-method approach can be equally distributed, or one can prevail over another. In our research, quantitative methods will be implemented to prove or disprove the initial assumption, using the insights collected in the qualitative phase.

To understand why this approach was chosen for the research, we explored the literature on its advantages and disadvantages. Among the advantages, Creswell and Plano Clark (2011, p. 12) define the following:

- The two approaches (qualitative and quantitative) together can balance each other's strengths and weaknesses;
- When used properly, a mixed approach can provide a deeper understanding of the phenomena and stronger evidence;
- Mixing two methods allows for answering the questions that a single method cannot answer;
- The mixed-method approach enhances interdisciplinarity;
- The mixed-method approach includes different paradigms and worldviews;
- The mixed-method approach is more ‘practical’, as it allows the researcher to use different techniques that fit best to the research question.

Using a compound of qualitative and quantitative approaches, we need to explore their definitions and particularities to understand better the mixed-method approach.

As for the quantitative approach, Thatherdoost (2022, p.54) among its main characteristics mentions that it uses numerical values collected from observations, empirical statements, methods and evaluations, and analyses numerical data using mathematical methods. Quantitative research gathers this numerical data to answer specific questions about phenomena. Besides, Thatherdoost argues that non-numerical data can be also used in a quantitative approach when certain instruments are designed to transform non-numerical data into numerical values.

Mohajan (2020, p. 54) writes that quantitative research aims to test a hypothesis, and can be experimental and non-experimental (2020, p.58). In our case, the initial research hypothesis — that the responses of ChatGPT depend on the account used for the interaction — will be tested through the experiment in the quantitative phase after collecting additional background data in the qualitative phase. The experiment will consist of participants' interactions with ChatGPT, held according to previously formulated guidelines. Throughout the experiment, participants will ask ChatGPT three pre-established questions, the same for all of the participants, and send them to the researcher for further comparison and analysis.

Mohajan (2020, p. 54) mentions three types of variables in the quantitative research:

1. Dependent;
2. Independent;
3. Extraneous or confounding.

Experiments in quantitative research are used to understand the relationships between dependent and independent variables (Mohajan, 2020, p. 58). In our research, we will consider the purpose of ChatGPT use as a main dependent variable, and the responses we get from the model as independent variables. Among other possible dependent variables, we will observe how age, language proficiency, familiarity with ChatGPT prompting and the understanding of the model influence the independent variable, or if these variables are extraneous.

The qualitative approach, on the other hand, uses people's experiences in the form of case studies, personal stories, testimonies etc. to explore the research question in-depth and to answer two main questions: how things are done and what is the outcome of the task (Thatherdoost, 2022, p.54). Qualitative data is collected in textual form and then interpreted by the researcher. Qualitative approaches generate insights, new ideas and theories. Furthermore, a researcher gathering qualitative data should be self-reflective and considerate of the context, as this research method depends significantly on the information drawn from the circumstances, and other specifics, such as time frame, personal experience, relationship with the interviewee, etc. (Tracy 2020, p.15-16)

Tracy in her book “Qualitative Research Methods” (2020) refers to the term “qualitative research” as an umbrella term for interviews, participant observations and textual analysis. She mentions that this type of research can be held both in person and online, through different instruments, with various numbers of people. She claims that in general qualitative methods don’t concentrate on exploring the cultural phenomena deeply or from all the possible perspectives, as some of the studies can be finished in one day (Tracy 2020, p. 16).

Becker (1966, p.55) claims that while the goals of both research approaches in question are the same — to understand the world — their methodology is different by nature. The quantitative approach deals with phenomena that can be measured, and the qualitative, on the contrary, is interested in the phenomena that can’t be measured (Aspers & Corte, 2019, pp. 139-160).

Another significant difference between qualitative and quantitative research is connected to the role of the researcher. While in quantitative research the instrument is separated from the researcher that controls the instrument, in qualitative research the researcher is the instrument, as all the observations are registered through them (Tracy 2020, p. 16).

It is only possible to argue about the advantages of the mixed-method approach when there are obvious benefits of implementing it over qualitative and quantitative approaches used separately.

To prove that we will first observe the disadvantages of the qualitative approach, according to Thatherdoost (2022, p.59):

- it focuses more on experiences and meanings, rather than on contextual particularities;
- it relies on phenomenological methods;
- its credibility is low;
- due to the broader data collected about each participant, it uses smaller sample sizes and, as a result, it is harder to generalise the outcomes;
- the outcomes are also harder to compare, interpret and analyse;
- the analysis itself time-consuming;

For quantitative research, Thatherdoost (2022, p.59) mentions the following disadvantages:

- the numerical data is limited as it doesn’t reflect the hidden reasons and motivations behind the data;
- the process of sampling is time-consuming;
- the numerical is limited and does not provide an in-detail explanation;
- it doesn’t allow us to explain social phenomena.

Quantitative researchers believe that the social world consists of concrete and unchangeable reality which can be quantified objectively. Whereas, qualitative researchers oppose the positivistic belief of reality; and argue that, instead, reality is socially constructed by humans and can be changed and understood subjectively

(Corbetta, 2003; Marcon & Gopal, 2005; Kroeze, 2012). While the main paradigm of qualitative research presumes that there are multiple views on reality and the research is driven by the subjectivity of the researcher, quantitative research is assumed to be as objective as possible, providing insight into absolute reality (Bryman, 2012; Smith & Sparkes, 2016; Timans et al., 2019).

Indeed, there's been a long debate on which of the two methods is better. While some researchers claim that qualitative methods are essentially unscientific because their findings are often impossible to generalise (Bailey, White, and Pain, 1999; Jovanović, 2011, p.19) or that they are of an inferior quality (Groth, 2010), others argue that non-statistical research can provide more accurate results if conducted carefully and according to the established rules, as humans construct reality and thus it can be explored subjectively (Becker, 1966, p. 59; King et. al., 1994; Kroeze, 2012). On the other hand, the mixed-method approach design provides a better and deeper understanding of the research phenomena and allows us to see the fuller picture (Creswell, 2017).

Mixed-method approach implies that more than one approach is incorporated into the research design. Undoubtedly, there are weaknesses and limitations of the mixed-method approach as well, such as the complexity of data analysis and data collecting, as it doubles (O'Cathain et. al, 2007, pp. 1-11). Or the increase in costs and resources as well as in time. Besides, the choice of the method per se does not guarantee the improvement in the quality of research. Nevertheless, this method seems to be the most appropriate for our research questions and goals.

To understand what we precisely mean by the mixed-method approach, we will use the work of David L. Morgan "Paradigms Lost and Pragmatism Regained. Methodological Implications of Combining Qualitative and Quantitative Methods" (2007). In this work, Morgan introduces the definition of "pragmatic method" which is aimed at eliminating a rigid opposition between "positivism" and "metaphysical paradigm", and allows the idea of mixing both qualitative and quantitative methods. In his work, he refers to the quantitative approach as a positivist paradigm and opposes it to a metaphysical paradigm, or a qualitative approach. Morgan sees a third approach, a paradigmatic or mixed method, as one that can counterbalance the drawbacks of its predecessors. According to Morgan, the key differences between them can be described as follows: the qualitative approach is characterised by induction, subjectivity and context; the quantitative approach — is by deduction, objectivity and generality; while pragmatic, or mixed-method, the approach is based on the abduction, intersubjectivity and transferability (2007, p.48-57).

Thatherdoost (2022, p.59) distinguishes several types of mixed-methods approaches, including the sequential exploratory technique, which we will employ in our research. This technique is defined by Edmonds and Kennedy (2017, pp.196-200) as a progressive strategy, where the concept is explored in the qualitative phase and then validated in the quantitative.

Almeida (2018, p.144-146) mentions the following characteristics of the sequential exploratory mixed methods design:

- Exploration and identification in the qualitative phase, as it is particularly suitable for exploring a phenomenon which lacks pre-existing knowledge. The outcomes of such exploration help to formulate a hypothesis and identify variables for the subsequent quantitative phase.
- Sequential nature, where the quantitative results are located in the context provided by the qualitative phase.

Almeida also mentions that the advantages of this design are high efficiency in the exploration of new research areas and the selection of relevant variables. As for the limitations, she writes that it is time-consuming, requires a lot of resources and might have issues due to the small sample of qualitative data.

Thatherdoost (2022, p.61) then describes the phases of the sequential exploratory process as follows:

- Qualitative data collection;
- Qualitative data analysis;
- Quantitative data collection;
- Quantitative data analysis;
- Reporting the entire analysis.

A mixed-method approach will allow us to verify the initial assumption by the background information collected during the qualitative phase and test it in the quantitative phase. We will establish the relevant variables after the semi-structured interview analysis for the quantitative experiment. We will then analyse the findings of both phases to draw conclusions about the researched phenomenon.

2.2. Initial assumption.

The initial assumption that ChatGPT answers depend on the user's account and their previous interactions with the model was developed during the hands-on project in digital linguistics. The assumption that ChatGPT answers differ through time was tested to understand how significant those differences are. The answers of the model were observed through two main parameters: a) how they differ across various sessions within the same account; and b) how they differ across different accounts. Three accounts were used in the experiment: the Google account used with ChatGPT for different purposes (account "A"), a university Gmail account used to write academic papers with the help of ChatGPT (account "B"), and a newly made Apple account that has never been used with ChatGPT before (account "C"). The test question asked ChatGPT to define the term "racism" to identify possible response variations depending on the account or other factors.

In the first part of the project, ChatGPT was accessed four times from each of the three accounts and with a time difference to see how the same prompt can lead to different outcomes. The selected prompt question was "What is racism?" — a general question to get a definition of the term. The experiment was made on the ChatGPT 3.5

version, the latest free version available for general use. Three accounts — “A”, “B” and “C” — were used to generate responses to the question “What is racism” across 4 sessions for each account, initiated over two days with time intervals. Account “A” showed variations in emphasis across the responses and word choice. Account “B”, used for academic purposes, received longer responses divided into paragraphs, typical for academic writing (Figure 1). Account “C”, created right before the experiment, produced brief and concise responses significantly shorter than the responses of the other two accounts (Figure 2). The outcomes of the experiment showed a connection between the previous interactions of ChatGPT with the users and the responses it gives to the new questions. The current research aims to test this assumption to draw a hypothesis and test if it stands with more variables and accounts.

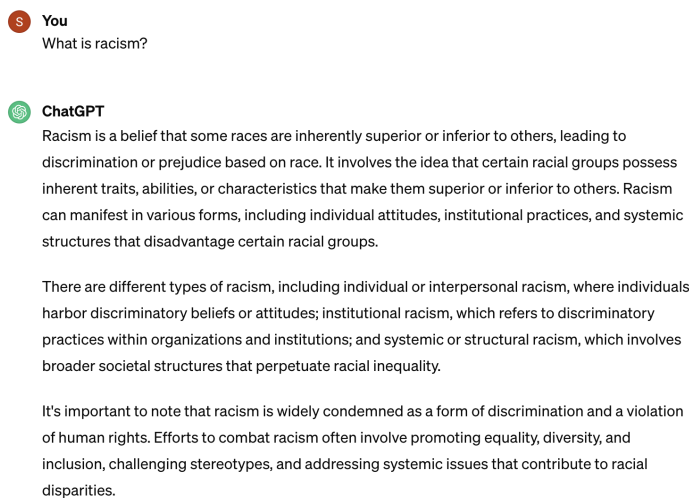


Figure 1.

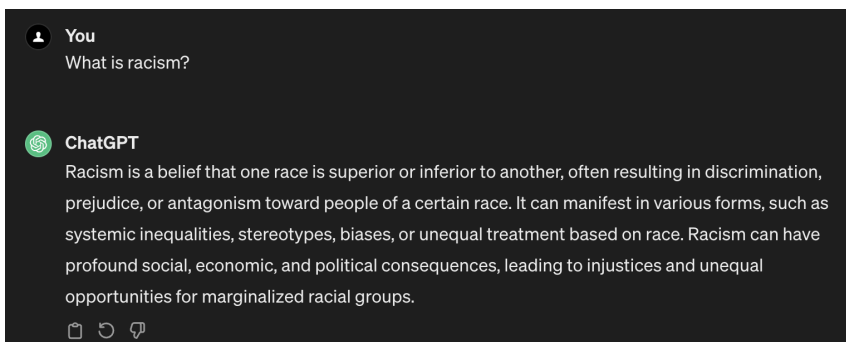


Figure 2.

2.3. Semi-structured interviews.

Interviews as a data collection method were introduced at the beginning of the 20th century when they were separated from questionnaires, which participants could fill in on their own. In contrast, interviews require the presence of the interviewer. Petros Karatsareas claims that in the 40-50s interviews became more recognised in the qualitative research methods (2022, p.99). Edley and Litosseliti define an interview as a means of data collection, which enables the interviewer to extract information that can't

be collected from direct observation (2010, p. 157). Jennifer Mason (2018) and Creswell and Poth (2016) consider interviews the most prevalent mode of data collection in qualitative research. In the current research, we are going to use an interview in both qualitative and quantitative phases.

As for the qualitative phase, Adeoye-Olatunde and Olenik mention three main ways of data collection in qualitative research: observations, semi-structured interviews and focus groups (2021, p.1358). Semi-structured interviews are located in the middle of the interview typology continuum between structured and unstructured interviews (Karatsareas 2022, p.100). Karatsareas points out that structured interviews tend to have yes/no types of questions or questions with multiple choice (2022, p.100). Such interviews are often used for quantitative research as they allow to compare data from different participants, as it is uniform. Structured interviews rarely have open-ended questions, and if they do, the answers to these questions are usually brief. Alternatively, unstructured interviews allow participants to answer in any way and with any degree of depth, they give more space for liberty and changing of the subject, and they usually don't have a precise order, which makes them more similar to a usual conversation. Subsequently, semi-structured interviews are located between these two types on the continuum, and they might be structured to a different extent (2022, p. 100).

Semi-structured interviews are often held according to guidelines prepared in advance, and they consist mostly of open-ended questions. If semi-structured interviews have yes or no questions, these questions are usually followed by open-ended questions aimed at developing previously expressed ideas and providing more specific information. Magaldi and Berler (2020) define a semi-structured interview as an exploratory interview, that is aimed at understanding complex social phenomena. The creation of a detailed protocol or guidelines helps an interviewer to maintain focus on the research question and keep in mind what else is needed to be asked while allowing to adjust the protocol to a situation. The protocol helps the interviewer to realign with the research design in case the conversation deviates from the planned course. Karatsareas writes that semi-structured interviews can both be used to help fine-tune research questions and define the following steps in the early stages of research and as a sole research method (2022, p. 101).

Among the limitations of the method, the following can be mentioned: semi-structured interviews are contextually and socially determined (Heller et al., 2017, p. 87–89); the relationship between the interviewer and interviewee may affect the outcome, as they may have or have not previous interactions and relations of power imbalance. Furthermore, the personality of the interviewer may affect the way the interviewee answers. In that case, Edley and Litosseliti (2010) mention the concept of “the degree of familiarity” that includes the differences or similarities in the cultural contexts and socio-economic backgrounds of the interviewer and the interviewees. Besides, informants may produce social desirability bias, when they say what they think the interviewer is expecting from them, or agree with anything the interviewer states and thus produce acquiescence bias. (Garrett et al., 2003, p. 411–414; Krug & Schlüter,

2013, p. 75). Karatsareas claims that both types of bias are particularly common in face-to-face interactions (2022, p. 102).

Jennifer Mason in her book “Qualitative Researching” (2002) mentions among the core characteristics of semi-structured interviews: the dialogical interaction between the interviewer and the interviewee, a rather informal style close to a conversation, a particular theme or topic covered by the questions, the interviewer tries to situate an interview in a context relevant for the research question.

Mason gives nine reasons to use a qualitative interview as a research method, and these reasons are going to be listed to explain why we chose this method for our research. Firstly, we assume that the social reality we’re going to explore consists of different realities of participants, that are hidden from us and need to be explored. This research will explore the purposes of ChatGPT use by certain people to draw from the purposes of ChatGPT use in general, as well as the ways these purposes affect the model’s answers.

Secondly, according to Mason (2002), the outcomes of the interviews cannot be perceived as direct representations of phenomena already existing outside of the interview. There are several reasons for that: the way the interview is formed and held, the personality and experience of both the interviewer and the interviewee, and their speaking and reasoning abilities. For that purpose, the current research will be transparent about the researcher’s views and experiences and the interview questions will be validated by two supervisors before the interviews.

Furthermore, assuming that knowledge is “contextual, situational and interactional” (Mason, 2002), it is important to have predefined interview guidelines that can be modified throughout the conversation to get more adequate information for the research question. The same assumption leads to the understanding that it is necessary to avoid abstract questions and concentrate on the actual experiences of the respondents.

In addition, Mason suggests that the idea of bias in semi-structured interviews is wrongful, as the information gathered through the open-ended question of semi-structured interviews is determined by the context and cannot be separated from it. In that case, it is important to acknowledge the complexity of this type of interaction and try to understand, how the context and the situation affect the findings (2002).

The particular interview guide that is going to be used in the current research will have a rather unalterable set of questions due to the specifics of the research, which is aimed not at gaining a deeper understanding of social phenomena, but at providing a piece of background information about the previous interactions of the users with ChatGPT. Nevertheless, the flexibility of semi-structured interviews will allow the interviewer to adjust the guidelines to the needs of a given context and situation.

Besides, it is crucial to acknowledge the active and reflective role of the researcher in the interview and in the research itself, where it is necessary to reflect also on the role of the researcher in the research process.

Another important reason to choose an interview is simply the lack of data of this kind in any other resources. The ways people use ChatGPT and their purposes are

supposed to be private information, so holding semi-structured interviews with their consent to use this data in the research is the only way of getting this data.

Also, as mentioned above, while a semi-structured interview seems the best approach to collecting qualitative data for current research, it is not the only approach that is going to be applied. The data gathered during the interview will create a basis for the following quantitative experiment and its analysis to provide additional perspectives on the ways the model interacts with users.

Finally, semi-structured qualitative interviews give space to the assumption that the researcher cannot think in advance of all possible ways the respondents can answer the given questions, which makes the researcher and the research itself more open to possible unexpected insights (Mason 2002).

In the current research, we will use semi-structured interviews for both the qualitative and quantitative parts. While there are multiple types of research about semi-structured interviews used for qualitative research, there is a lack of literature on the use of the same method in the quantitative approach. However, we chose a semi-structured interview for the quantitative phase of the research for several reasons. The first and the main reason is that, unlike the interviews with human beings, interviews with large language models, such as ChatGPT, can be quantified. The model is trained on large volumes of data, but these volumes are finite and can be measured. Even though there are countless numbers of variations in the ChatGPT responses, the model will always structure them according to the training examples. Besides, the model is less affected by the contextual data and doesn't have the personality or subjectivity of the actual human being. We assume that contextual information that might influence and alter the answers of the model can be quantified as well — the age and occupation of the user, previous interactions with the same account, knowledge in prompting, the email address or other accounts used to access the model, etc. Thus, the semi-structured interview in the quantitative phase seems the best way to test the assumptions of the current research.

The qualitative phase of the research will consist of semi-structured interviews with respondents of different ages and occupations who use ChatGPT for different purposes. These semi-structured interviews will be held in a mixed format — through face-to-face interactions and via video conferences online. The online video conferences, as well as face-to-face interviews, will be recorded with the consent of the interviewees for the subsequent transcription. The transcribed interview will then be analysed intending to define various factors that might influence the variability of ChatGPT responses.

A semi-structured interview is the best kind of data gathering for our research questions, as it allows a certain degree of flexibility within the preestablished protocol while maintaining a rigid structure. The guidelines of the qualitative semi-structured interview consist of 14 open-ended questions that are equal for all the participants,

allowing the researcher to compare the answers in the future. The 14 questions will be divided into 8 segments, dedicated to basic personal information, questions about the awareness and understanding of ChatGPT, questions about the occupation, ChatGPT usage patterns, details about the account used for ChatGPT interactions and the purposes of use, and, finally, questions regarding language and style choices.

All interviews will be held face-to-face or online through video calls, depending on the location of the researcher and the participants. In the period of interviewing the researcher is going to live in the university town of Salamanca, Spain, which is known for its number of international students, and, thus, the face-to-face interviews are going to be mostly held with other university students who use ChatGPT for educational purposes, while online video interviewing will have a larger variability.

We decided to hold both face-to-face and online video interviews as it will allow us to reach a broader variety of participants and will possibly make the researched sample more representative. While face-to-face interviews are considered the best way of collecting information about complex phenomena (Horsfall et al., 2021, p.1) and the gold standard of qualitative research (Saarijärvi & Bratt, 2021, p.392), there is still a need to justify the reliability of online video interviewing.

Since COVID-19, video calls and conferences have become a crucial and indispensable way of communication, both in private and in business. An independent market research platform Gitnux claims that 78% of corporate companies use video conferences for their team cooperation, and their usage grew by 62% during COVID-19 (2023). Besides, most educational institutions were obligated to adopt video conference technologies to continue the education process during the lockdown. De Villers et al. claim that it is likely that in the future more and more research interviews are going to be held through video conferences (2022, p. 2).

Among the advantages of video conferences, Reda Chouffani in his article for TechTarget mentions increased savings on travelling, as the online video format of the meetings allows reducing travel costs while still being able to keep in touch with colleagues in different cities, countries and even continents (2021). Besides, he mentions the software innovations that allow recording and transcribing meetings in real-time. Both these advantages are working for the current research, as the video conference format of interviewing allows us to interview people from different parts of the world, while the recording of the interview is already included in the software used for the call (e.g. Zoom meetings recording). Additionally, people can participate in video interviews from spaces where they feel comfortable, safe and more relaxed, which may positively contribute to the outcomes of the interview (De Villers et al., 2022, p. 12) Moreover, Keen et al. (2022, p. 4) claim that data richness of video interviews is comparable to the face-to-face ones. Finally, Rahman et al. in their research on adapting qualitative research to the realities of COVID-19 conclude, that online qualitative research methods provide access to the researchers to the participants from areas “otherwise difficult or impossible to reach without travel” (2021, p. 10).

There are some disadvantages to this method of conducting interviews as well. Firstly, the lack of face-to-face contact and the non-verbal and extralinguistic information, which is, nevertheless, possible to fix with new interface features such as raising a hand, reactions, screen-sharing, etc. While some of the non-verbal communication signs are unavailable for video call communication (partly body language, the position in the space, the physical contact), others are still present (facial expressions, appearance, vocal qualities, movement) (Pumble, 2024). In addition, face-to-face interviews are considered better for establishing rapport between the interviewer and the interviewee, they allow the interviewer to take into consideration the spatial context and other particularities, that are not available for any other interview forms (Schober, 2018, p.291). Furthermore, several researchers (Krouwel et al., 2019, p. 1; Keen et al., 2022, p. 4; Rahman et al. 2021 p. 10) claim that video interviews allow time and cost savings and give access to groups of people that are more difficult to reach in case of face-to-face interactions, which counterbalances the modest differences in depth between online video interviews and face-to-face ones.

Among the challenges for the researchers using video communication technologies De Villers et al. mention the following: a) a need for greater concentration to notice non-verbal signs, b) a delay in sound and picture that can lead to disruptions in communication, c) silences and technical pauses that might cause anxiety, d) seeing themselves on the screen might cause stress of being self-conscious of one's appearance, gestures, facial expressions etc., e) misinterpretations of non-verbal clues due to the technical issues (2022, p. 14).

Moreover, virtual interviews can be challenging in building prior relationships between the interviewer and the interviewee, such as shaking hands, sharing food or drinks or chatting informally off the record. Fortunately, according to Rahman et al. (2021, p. 6), these challenges can be overcome by holding introductory conversations, where participants can establish a connection with the interviewer and get a comprehensive understanding of the research and various stages of the interview. The recruitment of the participants for the current research is going to be made through the open call in the Instagram post, which is expected to be shared by the followers of the researcher and the followers of the followers. This net of relatively familiar people is expected to facilitate the establishment of the connection with the interviewees.

Another point to consider is the access to a stable network connection and the Internet access in general. Although we're assuming that people who use ChatGPT a priori have access to the internet, there might be unexpected problems with the connection from both the interviewer and the interviewee side. Moreover, the issue of different time zones should be considered to establish the most appropriate schedule for the interview. Finally, some video conference platforms have a time limit for free usage, so the careful selection of the platform must be included in the planning of the interview (Digital Samba, 2022).

As mentioned above, network connection might be an issue in holding an online video interview, as it might affect the quality of the interaction and the outcome data. Video calls tend to require more internet data than regular calls, but we still chose that

format for the interview. In 2020, Forbes surveyed in collaboration with Zoom, and 71% of survey respondents claimed that video conferences are the closest to face-to-face communication and deliver the majority of its benefits. Besides, since COVID-19 affected all parts of human lives and temporarily made face-to-face interviews impossible due to the lockdowns, the researchers had to react to the circumstances and embrace new possibilities, adapting existing methods to the realities of the pandemic (Rahman et al., 2021, p. 1).

Several studies conducted after COVID-19 observed the possibility of adapting digital methods in the research (Lourenco & Tasimi, 2020; Marhefka et al., 2020; Sevelius et al., 2020), while Lobe et al. (2020), Roberts et al. (2021) and Topping et al. (2021) have explored different software for video conferencing and implications of synchronous video interviewing. Among the video-conference platforms that allow better sound quality and useful features, such as screen-sharing, recording of both audio and video, transcription of the conference, reactions, emojis etc., Keen et al. (2022, p. 3) mention Zoom, Google Meet, Microsoft Teams and Skype.

The crucial aspects to be considered in the research design implying this interview method, are: considering the strengths and weaknesses of each video-call platform; the necessity of providing the interviewees with a consent form; the familiarity of the participants with the way the collected data and the recording of the interview will be used; suggestions on the possible technical choices to increase the quality of the video-call. While most of the literature on the matter emerged as a response to COVID-19, Keen et al. consider video interviewing an “opportunity for long-term methodological progress” (2022, p. 2).

2.4. Researched phenomena.

The research will be held on a particular large language model — ChatGPT, and it is necessary to explain why we chose this particular model among all the others. Large language models (LLMs) are a part of natural language processing (NLP) and Generative AI. The principal scope of NLP is to create artificial intelligence that is capable of understanding and generating human language, while Generative AI is a class of artificial intelligence models that can create new data based on the existing training data points (Ray, 2022, p. 121-122). LLMs, on the other hand, are a kind of pre-trained language models (PLM) that have been trained through machine learning on larger datasets and finetuned for downstream tasks (Naveed et al., 2023, p. 2).

As stated on the official website of the creator of the model, Open AI, ChatGPT is “trained to follow an instruction in a prompt and provide a detailed response”. Chat GPT, as an LLM, is trained on petabytes of data of various quality and content, which leads to possible drawbacks and limitations. To reduce the number of mistakes and bias, Open AI adds Reinforcement Learning from Human Feedback to the training — that means, that when the model is trained on the data, it undergoes supervised fine-tuning, where human trainers provide conversations from both sides of the communication: the model and the user. This fine-tuning and the interaction with the final model are performed in dialogic form. After that, the model goes through Proximal Policy

optimisation, where AI trainers rank alternative responses of the model by their quality throughout several iterations.

Chat GPT, like other LLMs, is capable of analysing, understanding and, most importantly, generating different types of content — summaries, agendas, texts, codes, etc., — and in terms of quality it is close to the human-generated content (Ray, 2022, p. 121). Our research will be focused on the textual content produced by ChatGPT. According to Ray, the creators of ChatGPT aimed to overcome the limitations of previous sequence-to-sequence language models, and for that purpose they were able to create an architecture that made OpenAI's GPT series the most successful language models (2022, p. 122).

The latest free version of ChatGPT is GPT-3.5, an adjusted version of the ChatGPT 3.0 model of 2020. It has 6.7 billion parameters and can perform various NLP tasks, such as understanding human-generated language, generation of texts, translation, etc. (Ray, 2022, p. 122). While at the moment of the research and improved version of the model — ChatGPT 4 — is already available for public use, we decided to focus on ChatGPT 3.5 performance, as this version is free. When deciding to use ChatGPT as the model for our research, we considered that it is the most popular model that acquired 1 million users in 5 days after launching in November 2022 (Hu, 2023) and that it has the greatest number of users (180 million) and in January 2024 it had 1.6 billion visits, with total growth of 1,6 billion users since November 2022 (Mortensen, 2024). Besides, the interest in the topic is always conditionalised by the personal interests and behavioural patterns of the research, and in this case, the only LLM that the researcher uses is also ChatGPT 3.5.

2.5. Participant recruitment and interviewing.

We assume that being the most popular LLM, it will be quite easy to recruit participants for the research. The information gathering through interviewing will be held in a mixed way: both face-to-face and through online video calls.

As for the face-to-face interviewing, the researcher is going to interview the colleagues of the EC2U joint master's degree in "European Languages, Cultures and Societies". They all come from different countries and have educational backgrounds from various universities in the world. Besides, it is crucial to mention that all of them are native speakers of different languages and speak at least two other languages, as is required by the Master's degree. At the moment of the research, all of them are studying in Salamanca, Spain, which makes it easy for the researcher to interview them face-to-face.

Alternatively, for the online interview, we are planning to launch an open call on the Instagram page of the researcher, asking people from all over the world with different mother tongues and from different educational backgrounds and professional fields who use ChatGPT to participate in the research. The open call will explain in general terms the research question, while more detailed information will be provided to the people willing to participate later in private communication.

We chose Instagram as a platform for open calls as it is the fourth most popular social media platform after Facebook, YouTube and WhatsApp. We didn't choose YouTube because the architecture of the platform is not appropriate for the current research, and we didn't choose WhatsApp due to the private nature of the communication in WhatsApp that doesn't allow for the open call to be truly open. Moreover, Instagram is considered the favourite social media platform in 2023 (Digital Report, 2023). Also, the largest number of users who post and share content 70.4% are Instagram users. We hope to reach a more diverse and random sample by asking the followers of the researcher to share the open-call post.

At the moment, the researcher has 1154 subscribers and is hoping to reach a total audience of about 1,500 people through reposts and shares. The portrait of the followers can be described as follows: 60,7% of people are 25-34 years old, 18,2% are 35-44 years old, and 13,8% are 18-24 years old. 64% of the followers are women and 35,9% are men, while the top locations are Russia, Italy, Turkey, Germany and Georgia. We consider this an appropriate way to gather data, as the portrait of a follower of the researcher coincides with a portrait of a ChatGPT user: 59,7% of its users are males, 40,3% are females, while the age range of the average user is from 18 to 34 years (64,53%) with the majority of people being between 25 to 34 years old (34,44%) and between 18 and 24 years old (30,09%) (Rohit Shewale, DemandSage, 2024).

The participants are expected to be people from different countries and different backgrounds who have access to the internet from their computers and mobile phones and presumably have a university degree. We also expect to find representatives of different mother tongues to explore which language they usually use with ChatGPT and how the responses to the same question differ in different languages, given the fact that 72,3% of conversations in ChatGPT are in English (Deng et al., 2023). The researcher can speak four languages: Russian (mother tongue), English, Italian and Spanish. These will be the main languages observed in the current research. Besides, these four languages are in the top 10 languages used for web content (We Are Social, Digital 2024 Global Overview report). In case the interviewees use other languages during their interactions with ChatGPT, the research is going to be extended, including the languages in question.

After making a private agreement to participate in the research, interviewees will receive a consent form, they will only be able to participate if they sign the form, guaranteeing voluntary participation in the research. The researcher will promise to provide the confidentiality of the data — that their name will be removed from the research. Then, the researcher and the participant will agree upon a date for the interview. On a given date, the participant will receive a link to a conference call. The participants will be also asked to be on the given date in a place where they have a stable internet connection, and where they feel comfortable and secure.

A conference call will start with a short introduction to a research question and research objectives. The interviewee will be informed about the stages of the interview according to a brief, prepared by the researcher in advance, and validated by the colleagues. Then he will be again informed that the interview is going to be recorded for

the following transcription. If the participant agrees to be recorded with the following retrieval of his name out of research, the interview begins.

The interview will be held according to the guidelines made by the researcher in advance. The guidelines are based on research intent and contain the keywords and issues that need to be covered during the interview to answer research questions. In the case of our research, while keeping in mind the possibility of transforming some questions and adding additional questions to get a more complete picture, the list of questions will be rather homogenous for all the participants. The guide, therefore, will be as "open as possible, as structuring as necessary" (Helfferich, 2019, p. 670).

2.6. Interview guidelines and validation

The creation of the guidelines is a crucial part of the current research. We will first collect questions relevant to the research interest in an unstructured manner. Afterwards, these questions will be sorted according to their cohesiveness. Furthermore, the interview guide will be tested before conducting the first real interviews that ought to be analysed. During this pre-test, the guideline is refined. Finally, the most important part is the validation of the interview.

The validation of semi-structured qualitative interview guidelines is a challenging question, as there is a lack of consensus on the standards of qualitative research in general (Noble & Smith, 2015, p.34-35; Levitt et. al., 2018, p.7). Although the criteria typical for quantitative research, such as validity, generalisability and reliability, do not apply to the qualitative methods, Lincoln and Guba propose new criteria for qualitative research: truth value, consistency, neutrality and applicability (Noble & Smith, 2015, p.34-35).

Truth value criteria means that a researcher recognises that "reality" is subjective and provides their own experience that might have influenced the methodology and resulted in bias. Furthermore, they present the perspectives of interviewees clearly in the interview and the following analysis. Consistency means that the researcher's decisions are transparent and clear, and an independent researcher would arrive at similar conclusions. Neutrality means that the researcher explicitly acknowledges that his philosophical position and life experience are interlinked with the findings of the research and the method he chose. Finally, applicability means that the researcher should consider if the same findings can be applied to different contexts, settings or groups (Noble & Smith, 2015, p. 34-35).

Validation of the current qualitative interview guidelines is done by the tutor of this study, Dr Raúl Sánchez Prieto, and the correlator from the University of Pavia, Professor Alessandro Caliandro.

2.7. Qualitative and quantitative interviewing

The interview will consist of open-ended questions, encouraging participants to share their experiences, motivations and language preferences when interacting with ChatGPT.

After each interview, the researcher will have a recording of it in a digital form. The transcription will be performed with the help of special AI tools, and the texts transcribed by the AI will be consequently edited and fine-tuned by the researcher. The implementation of such tools will be useful in terms of time-saving. Each transcription will be put in a comparative table for the future analysis of the qualitative data.

The data from the analysis of the qualitative phase is expected to uncover new perspectives and insights on the patterns of ChatGPT usage. Based on the outcomes of the qualitative phase and the initial assumption, the hypothesis will be developed. This hypothesis is going to be tested during the quantitative phase of the research.

In the course of the quantitative phase, the same respondents will receive guidelines for interviewing the ChatGPT model. The guidelines will inform them on how to perform an interview so that the outcomes of all interviews will be uniform. Participants will be asked to initialise three different sessions through the accounts they mentioned in the qualitative phase and ask ChatGPT three questions, one question for one session. The questions we have chosen through an experimental preparative phase, by testing them on three different accounts of the researcher, are the following:

1. What is racism?
2. What is your opinion on the importance of privacy in the digital age?
3. Is happiness possible?

After each of the questions is asked and the response of the model is generated, participants are expected to press the “Copy” button and insert the model’s answer in a special table, prepared by the researcher in the guidelines. After the table is completed, they are expected to save the document and return it to the researcher. All the answers will be added to a comparative table for further qualitative analysis.

As mentioned in the section about the research methods, quantitative research has independent and dependent variables. In the current research, the information gathered through qualitative research, such as the purpose of usage, the language used with ChatGPT, and the awareness of the prompt design, will be perceived as independent variables. After the analysis of the quantitative interview outcomes, such as the length of the ChatGPT responses in a number of phrases, characters and characters per phrase, the presence or absence of particular structure and structural elements (such as transition words), the generality or particularity of the responses, possible differences or similarities across the accounts.

Furthermore, the additional variables will be taken into consideration, such as the frequency of ChatGPT usage, the age, gender and occupation of the user, the familiarity with how the model is designed and how it performs. After the quantitative analysis is complete, the conclusions on the whole research will be made. In this conclusive phase, the limitations of the outcomes and the enhancements for future research are going to be formulated.

3. Theoretical background on ChatGPT.

ChatGPT, developed by OpenAI, stands out among other Generative AI models due to its user-friendly interface and its ability to generate coherent, contextually relevant text. The model's full name, Chat Generative Pre-trained Transformer, reflects its dual nature: it is a chatbot interface built upon a powerful large language model (LLM). This combination enables users to interact with the model in a familiar conversational format, allowing for a wide range of applications from answering questions to generating creative content.

ChatGPT is based on the Transformer architecture, a deep learning architecture, which works particularly efficiently with Natural Language Processing (NLP) tasks (Singh, 2022, p. 112). Transformer architecture means that the model is pre-trained to predict the next token in a text, using both data published in open sources and data provided by licenced third parties (Open AI, 2023, p.2). The extensive training data includes websites, books, articles, and other textual sources.

The training process consists of two main stages: pre-training and fine-tuning. During the training, the Transformer model learns to weigh the importance of words in each sentence relative to each other. This allows the model to “understand” context and structure, and generate more human-like and relevant responses.

Fine-tuning consists of adjusting the model on a smaller dataset with feedback from human reviewers. This process of fine-tuning ChatGPT is called Reinforcement Learning from Human Feedback (RLHF) and it serves to improve the model's responses. Human trainers evaluate the inputs of the model, and this feedback helps to refine the performance of ChatGPT. On one hand, it makes the responses more aligned with human expectations. On the other hand, it helps to reduce bias and avoid inaccuracies or potential risks. After that, the model goes through Proximal Policy optimisation, where AI trainers rank alternative responses of the model by their quality throughout several iterations.

After being trained and fine-tuned, the Transformer is ready to produce a high-quality output to a given request (Singh, 2022, p. 112). To generate responses, ChatGPT uses autoregression, which consists of analysing the input message and then predicting the output word by word, until a complete thought is formed. The choice of words can be explained by the probability — ChatGPT predicts the most likely word to put next, considering the previous words. Sometimes, though, ChatGPT chooses words randomly to make more diverse and creative outputs (DataCamp, 2023).

The latest free version of ChatGPT is GPT-3.5, an adjusted version of the ChatGPT 3.0 model of 2020. It has 6.7 billion parameters and can perform various NLP tasks, such as understanding human-generated language, generation of texts, translation, etc. (Ray, 2023, p. 122). When we first started the research, the latest version of the model was ChatGPT-4 Turbo, which already had significant improvements over its predecessors. But in May 2024 a new version 4o was released, and it has even better performance than the previous one.

According to the information on the OpenAI official website (<https://openai.com/index/hello-gpt-4o/>), the “o” in 4o stands for “omni” (from Latin “all”). Among the main characteristics, the model’s creators mention its ability to receive inputs in the forms of text, audio, video and image, and generate back textual, audio and visual outputs. Its performance in English and programming languages is compatible with the performance of GPT-4 Turbo, whereas it is significantly better with other languages. It is also claimed to be cheaper, faster and more efficient with audio and vision understanding.

Since its launch, all users have limited access to the 4o version, which after several interactions switches back to the 3.5 version. Initially, we wanted to explore only the responses of this free version, as it was the most popular one among the users. However, we had to adapt to the innovations and introduce two test accounts to evaluate the performance of ChatGPT in two different versions as well.

As a part of NLP, ChatGPT uses various NLP approaches. Among them:

- Tokenisation: The model divides the input into discrete tokens, and then processes these tokens for different tasks.
- Part-of-speech tagging: The model can determine the grammatical function of each word inside of the text.
- Named Entity Recognition (NER): The model uses NER to identify named entities inside of the input text, such as personal names, countries, companies, etc.
- Dependency parsing: ChatGPT uses this approach to establish connections between the words.
- Sentiment Analysis: The model can identify the tone or sentiment of the text (Singh, 2022, p. 112).

Furthermore, as a NLP instrument, ChatGPT has various features:

- Contextual understanding;
- Language generation capabilities: ChatGPT can produce coherent and clear responses;
- Task adaptability: The model can be adapted to multiple tasks across various domains;
- Multilingual proficiency: The model can understand and generate text in over 50 languages, however, the proficiency varies across the languages;
- Scalability: ChatGPT can be equally used with tasks of various complexity and volume;
- Zero-Shot and Few-Shot Learning: The model can understand new tasks without prior training, but also can improve the outcome through examples.
- Fine-Tuning: Developers can adapt ChatGPT to specific tasks (Ray, 2023, p. 125-126).

LLMs, such as ChatGPT, are used for multiple purposes, among them: text generation, language translation, question answering, explaining complex subjects, text summarisation, and multimodal capabilities (Adiguzel et al., 2023, p.3). According to the OpenAI Technical Report on ChatGPT-4, it outperforms humans in all most popular academic and professional exams and tests (2023, p. 6) and exceeds the vast majority of state-of-art systems (2023, p. 14). Among ChatGPT's benefits, Deng & Lin (2023 p. 82) mention that it increases efficiency by helping to save time and resources, cost savings and improved accuracy, compared to previous versions of chatbots.

Nevertheless, the model has its limitations as well. The OpenAI in their Technical Report (2023, p. 10) admit that the model is still not fully reliable, as it "hallucinates" facts and makes errors in reasoning. They suggest that users should review the outputs if the accuracy of the responses is highly important. In addition, ChatGPT has limited knowledge of the events that happened after September 2021, as most part of its training data was created before. Furthermore, the model doesn't learn from its own experience. Besides, ChatGPT still has a bias in its outputs, and it will take significant time to fully eliminate them (2023, p.10-11). Finally, privacy and security are still an issue, as OpenAI collects various types of data.

This research explores how prior interactions with the same account influence ChatGPT's performance. Understanding the model's architecture, its benefits and limitations, features, and capabilities provides a solid foundation for future exploration of its performance. By analysing the variations in the model's responses across different users, we aim to determine if previous interactions with a user shape its future responses. This study will contribute to a deeper understanding of ChatGPT and may help improve the model.

4. Qualitative phase. Semi-structured qualitative interviews.

This chapter aims to provide an overview of the qualitative phase, consisting of semi-structured interviews with 24 participants — 12 of them are native speakers of Russian language, and 12 of them are international students from different backgrounds whom the researcher met during her semesters in the University of Pavia, University of Turku and University of Salamanca.

This chapter provides detailed information about participants' perceptions of the model, their usage patterns and the languages they use with ChatGPT. Furthermore, it contains demographic information, that can also be useful for the following analysis of the differences between ChatGPT responses and their connection to the account.

4.1. Research Design and Methodology.

Semi-structured interviews are a common qualitative research method designed to explore phenomena in depth using a pre-prepared interview guide that addresses the research questions (Magaldi & Berler, 2020).

One of the main advantages of semi-structured interviews is their flexibility, allowing for the incorporation of interviewees' perspectives and the adaptation of the interview to each individual while maintaining an overall structure. This structure is particularly necessary for this research, as it facilitates the comparison of interview outcomes. Nonetheless, the flexible nature of the interviews enabled us to adjust questions according to the situation, providing a deeper understanding of the participants' perceptions and usage patterns.

Firstly, the interview guidelines were prepared in English. The guidelines consisted of the introduction and warm-up part, where the researcher introduced herself and explained the researched question and the purposes of the interview. It was necessary to create a safe atmosphere between the researcher and the interviewees, hence guidelines included an explicit explanation of what is expected from the interviewee: there were no right or wrong answers, and the information they were willing to share was significant as it could allow the researcher to get a deeper insight on each participant experience with ChatGPT.

Moreover, interviewees were informed that the interviews were recorded both using Zoom software (in case of online video interviewing) and an iPhone voice recorder (both for online and face-to-face interviews). The respondents were reassured that their names would be eliminated from the research and served exclusively for identification of the interview. Afterwards, they were asked to confirm their consent to the interview. If everything was clear to the interviewees, the part with the questioning started.

There were eight different categories of questions, including:

1. Basic information about name, age, occupation, place of origin place of current residency, the level of education.
2. Awareness and understanding of what ChatGPT is and how it works.
3. The questions about the current occupation.
4. Usage patterns questions: ChatGPT usage duration, the frequency of use, the perception of the usefulness and trustworthiness of ChatGPT answers.
5. The account used with ChatGPT and the version of ChatGPT.
6. Purposes of ChatGPT use.
7. Language questions: the mother tongue and the ability to speak other languages, which languages are used for work/study/personal communication, and what languages are used with ChatGPT.
8. Questioning style and the knowledge about prompting.

After all questions from the guidelines were asked in a flexible order, the interviewer invited participants to express their overall thoughts about ChatGPT and the surrounding discourse. This step aimed to elicit any additional insights that might have been overlooked in the main interview questions. Finally, the researcher thanked the participants for their time and willingness to participate, concluding the interview.

The guidelines were evaluated by both the thesis coordinator at the University of Salamanca, Raúl Sanchez Prieto, and the correlator from the University of Pavia, Alessandro Caliandro.

After the evaluation, the guidelines were translated into English and Italian, as these are the three languages most comfortable for the researcher and the respondents. Additionally, a standard consent form, explaining how the data collected during the interviews would be handled, was prepared in both Russian and English. This form was sent to each participant to be signed and returned, ensuring the safety and ethical compliance of both parties involved in the research.

The guidelines were necessary during the interviews as they allowed the interviewer to adapt to the flow of each conversation while maintaining focus on important points. (Lindlof & Taylor, 2002, p.194). Kvale (1994, p.19) and Mason (2018, p.6) claim that semi-structured interviews involve knowledge construction and reconstruction. Therefore the researcher tried to make the conversation flow naturally, allowing the interviewees to share their experiences without any restrictions. If certain points relevant to the research weren't covered, the interviewer would ask questions regarding these points and revisit certain topics later to help participants recall additional details about their experiences.

It is important to note that interviewees were likely to mention the purposes of usage they considered significant, often recalling additional examples while answering the following questions. Moreover, it became evident during the interviews that the personal characteristics of both the interviewer and the interviewees, as well as language barriers and internet connection issues, affected the outcomes. For instance, interviews conducted in Russian, the mother tongue of both the researcher and the respondents, tended to be nearly twice as long as those conducted in English. Nonetheless, individuals engaged in higher-degree research provided more thorough and considered feedback, regardless of the language. Furthermore, disruptions in internet connectivity caused delays and missing parts of the discourse, which could also impact the outcomes of the interviews.

Bergelson et al. (2022, p. 320) mention several biases inherent to semi-structured interviews. Firstly, there is the Social Desirability Bias, where respondents answer questions in a manner they believe is more socially acceptable or desirable. In this research, all participants were somewhat familiar with the researcher and shared a common context, which might have influenced their responses. For instance, representatives of the Russian-speaking group came from similar academic backgrounds or the same Russian cultural community, where shared values could shape their responses. This influence was even more pronounced among international students, who tended to emphasise privacy issues and the risks of plagiarism when using ChatGPT—a common concern in European universities.

Secondly, the setting and context of the interviews played crucial roles in the outcomes. In the case of online interviewing the respondents were free to choose a

comfortable setting (which was also recommended by the researcher while confirming the interview date and time), while in the case of two face-to-face interviews, it was more difficult to mitigate, as Salamanca lacked quiet common spaces. Therefore, one of the interviews was held at the researcher's house, which might have been uncomfortable for the respondent, and another one in the park, where the respondent might have been distracted by the surroundings.

Furthermore, the researcher acknowledges that her own beliefs, attitudes, and expectations could have affected both the interactions during the interviews and the interpretation of the outcomes. The researcher recognises that while ChatGPT has certain limitations — such as inaccuracies and biases in the training data, lack of domain-specific knowledge, privacy and copyright issues, and non-transparent policies regarding data collection and storage—it is a highly useful tool for saving time, structuring large tasks, and processing language.

Moreover, the researcher and some respondents come from Russia, where data protection and privacy are frequently violated by both third parties and the government. This context results in a critical view of the effectiveness of personal information protection, often leading to indifference regarding data treatment. Moreover, plagiarism is less severely punished in Russia, and copyright issues are perceived as less relevant by individuals from Russian-speaking countries.

Additionally, participants may have exhibited recall bias, as people often struggle to accurately remember past events and experiences. This was particularly evident when asking about the reasons interviewees used ChatGPT. Due to privacy concerns, participants were not asked to open their ChatGPT accounts to review previous interactions. However, those who chose to do so were able to provide significantly more examples with greater detail and specificity.

It is also necessary to acknowledge the sampling bias, as the majority of Russian-speaking respondents were recruited via an open call, while the researcher had to directly approach some of the international students to ensure two equal samples. Individuals who chose to participate in the research voluntarily might have different characteristics or motivations compared to those manually selected by the researcher. Moreover, while participants from Russia were randomly selected and came from diverse backgrounds, the international European students were more homogeneous. They are predominantly middle-class Europeans who have the opportunity to study abroad for at least one semester, tend to travel frequently, and are multilingual.

It is also important to mention that responses regarding the frequency and purposes of ChatGPT use depend significantly on the respondent's current life circumstances. Some respondents admitted to using ChatGPT daily while writing a research paper or working on a major project, but now they barely use it more than once a week. Therefore, we decided to consider only the information relevant to the moment of the interview.

As stated earlier, participants for the qualitative semi-structured interviews were recruited via an open call posted on the researcher's Instagram account,

@sofakruglikova1. The researcher prepared a series of story images explaining in English and Russian the nature of the research and how individuals could contribute. Through this open call and multiple reposts from friends, 44 individuals expressed their willingness to participate, including 38 people from Russia those who speak Russian as their mother tongue, and 6 people from other countries.

To ensure a more balanced and thorough research, the author reduced the number of interviews to 24 and personally invited international exchange students to participate. All participants received a consent form, and interview dates were subsequently scheduled. The interviews were conducted over two weeks, with an average of 2-3 interviews per day. A total of 22 interviews were held via Zoom, and 2 were conducted face-to-face in Salamanca, Spain.

After researching AI transcription tools capable of performing equally well with Russian, English, and Italian, we chose The Cockatoo AI due to its support for multiple languages, user-friendly interface, and relatively low monthly price of \$29. Following AI transcription, the researcher edited the transcripts to add any missing information from the recordings and then inserted the data into the "Qualitative Interview Comparative Table" (Table 1).

Category		Participant 1	Participant 2	Participant 3
Age		31	26	21
Gender		Male	Female	Female
Occupation		Data analyst in the management of marketing analytics.	The theatre critic works as an outsource developer in an American-based company. She also has a theatre podcast for people who don't know much about theatre.	History Student, Bachelor's degree, King's College London
Place of origin		Russia	Vladivostok, Russia, studied in Moscow	Harrogate, United Kingdom
Place of current residence		Budapest, Hungary	Belgrade, Serbia	Salamanca, Spain
Level of Education		Master's Degree	Master's Degree	Not finished Bachelor's Degree
Field of Education		Sociology	Theatre studies	History

Category		Participant 1	Participant 2	Participant 3
Perceptions			<p>ChatGPT is a self-learning language model. Someone uploaded a huge array of data into it, wrote some algorithms and matrices, and here it outputs the most probable, the most suitable answer to the given question. So it's more about the theory of probability.</p> <p>Some information from all available open internet sources, from public domains, was fed into ChatGPT, and it can be discriminatory and biased, his responses can be direct and predictable without considering subtle moral questions.</p>	
		ChatGPT is a version of a search engine (like Google), but works faster and more efficiently.	ChatGPT4 uses more long answers with introductions and conclusions. ChatGPT3 works more like Twitter, with shorter answers.	It is like an AI bot, she doesn't really understand how it works. She asks questions and it gives the answers, but she doesn't know its structure or how it comes up with the answers.
Awareness of ChatGPT	Understanding	He is not a computer science person, he just understands that it is a language model, and perceives it as a magic box.	Quite a good understanding of how the model works, but without specific information.	Not a deep understanding, only basic principles.
Usage Patterns	Duration	Uses for about a year.	Started to use it in January 2023.	Started to use it soon after the release, and have been using it relatively consistently since then.
	Frequency	Once in 2-3 months	Every day	In College in the UK almost every day, and here in Spain every week.
	Usefulness	<p>Asks the model to write a code or a function, then edits the outcome. Finds the model helpful when he's stuck.</p> <p>He always checks the answers for mistakes, if there are errors and inaccuracies, asks to</p>	<p>The usefulness depends on the task. Usually, you need to make several iterations before you get the answer you're looking for or the correct answer. The code is okay, but the texts are horrible. I use Russian, English and French with ChatGPT, and the outcomes in Russian, for</p>	<p>Doesn't find a free version particularly good, the answers are not developed. It wouldn't be able to deal with writing an essay on its own.</p> <p>You cannot rely on it for factual information,</p>

Category		Participant 1	Participant 2	Participant 3
		<p>correct them.</p> <p>Understands that texts are not human-produced, that's why always edits the way it flows, the style, the tone of voice.</p>	<p>instance, are like copies of English answers. Russian text seems too heavy, and not human-like. The texts need editing and rewriting. it doesn't understand style very well.</p> <p>Gives wrong information sometimes, so she doesn't use as Google or Wikipedia, because doesn't want to double-check</p>	
	Purposes	<p>To solve work problems, that he's unable to solve himself.</p> <p>Scripts in Python and SQL</p> <p>For entertainment as well: to create anecdotes</p> <p>To write a cover letter in English for a job opening in English</p>	<p>Development and coding</p> <p>Writing scripts for the podcast</p> <p>CV generation, motivation letters</p> <p>Exam Preparation</p>	<p>Uses it to come up with a concept — to conceptualise an idea for her, and then she would develop it on her own, for an essay, for example.</p> <p>Uses it for brainstorming.</p> <p>In Spain, formulating a formal email.</p> <p>Explaining concepts (like dialectical materialism for a five-year-old).</p> <p>Doesn't use it for any personal purposes, only for schoolwork.</p> <p>To make her job application relevant to the requirements, to fill in the gaps in the things she doesn't really know how to do.</p>
Language Use	Mother tongue	Russian	Russian	English/Spanish
	Other languages	English	English, French	German
	Language use	Works in Russian	Works in English and Russian, and prepares for the French Master's Program.	At home Spanish, and English with friends and in the home University, German understands and can

Category		Participant 1	Participant 2	Participant 3
				<p>speak with the family as well. Now mostly English and Spanish and studies in Spanish</p>
	<p>Lang uages used with Chat GPT</p>	<p>Initially thought that the model works best with English and used it with English. Now uses it with Russian. Doesn't notice any differences in quality, but finds it easier to formulate input questions in Russian. Also thinks that it's easier to make ChatGPT understand what he wants in Russian.</p> <p>If the task is in English or the outcome should be in English, uses English with ChatGPT</p>	<p>For coding uses English as she codes for the American company, for the podcast — Russian, and for French documents translates in French</p>	<p>In Spain uses Spanish, in general English, tried also German for a personal letter</p>
Questioning Style	<p>Knowledge about prompting</p>	<p>Haven't studied prompt engineering, but intuitively understands that through iterations you can get better results.</p>	<p>Has an intuitive understanding of how to ask questions, but never studied prompt engineering</p>	<p>Doesn't know how to prompt, but asks very specific questions, and gives a lot of context information. She adjusts the output with the following iterations.</p>
	<p>Style</p>	<p>Provides the context, the task that is needed, and the desired outcome. If the outcome is not accurate, try to fix it through iterations. Thinks that the input should be as formalised as possible, written in a way that is easier for the model to comprehend.</p>	<p>Greets the model, if its coding inserts the programming language and the version and then the task. Through iterations guide the model to get a particular outcome.</p>	<p>Also greets the model and thanks.</p>
Account		<p>Uses the same personal Gmail account.</p>	<p>Uses the same personal Gmail account.</p>	<p>Uses the same personal Gmail account.</p>

Table 1. The Qualitative Interview Comparative Table.

As seen in Table 1, interviews conducted in different languages and of varying lengths are systematised in a uniform table and translated into English. This will allow us to observe and track differences and potential reasons for variations in future ChatGPT responses. Although it is impossible to make qualitative semi-structured

interviews entirely comparable, an attempt has been made to systematise the answers in this table.

This Excel table contains comprehensive data from qualitative interviews conducted with 24 participants. These participants come from diverse backgrounds and have provided detailed responses regarding their interactions with ChatGPT. The table is structured into multiple rows, each focusing on a different aspect of the participants' experiences and demographic information. Here are the key elements included in the table and their relevance to the current research:

1. Basic information includes age, gender, occupation, origin, residence, occupation, university degree and the field of education. These rows are dedicated to the demographic details of each participant that uncover the diversity of the participant pool and enhance the analysis of how these factors might influence their perception and use of ChatGPT and the future responses of the model.

2. Awareness and Understanding of ChatGPT is a section dedicated to the participants' perceptions of ChatGPT and the level of their understanding of the mechanisms behind the model. To be able to evaluate the understanding in a more representative way, the author of this thesis introduced the evaluation system shown in Table 2.

Understanding evaluation:	
1	A basic understanding of its principles is mostly necessary to be able to use the model. The knowledge and the definition don't go beyond the term "artificial intelligence".
2	Good intuitive understanding of the way the model works without special IT knowledge. These answers contain words and phrases like "machine learning", "databases", "algorithms", "chatbot".
3	Good understanding of principles of ChatGPT functioning, words like "generative", "large language model", "outputs", "inputs", and "prediction" are used.
4	These participants understand how the model works to the best possible extent — it is a predictive model that was trained on large amounts of data with different hyperparameters.

Table 2. The Qualitative Interview Comparative Table

This section also includes participants' definitions of what ChatGPT is and how it works. Their varied understandings are presented in the table to analyse general awareness levels and misconceptions about the technology.

3. The Usage Patterns section is dedicated to the information about the frequency of ChatGPT use (daily, almost daily, weekly, monthly, occasionally, etc.) and describes when the participants first heard about the model and when they started to integrate it into their study/work/personal purposes.

Besides, this section demonstrates how participants evaluate the usefulness of ChatGPT and for which purposes they usually use the model. Both of these rows are

aimed at getting a deeper understanding of usage patterns that can be relevant while comparing ChatGPT responses in the next chapter.

4. The Language Use section contains information about the participants' mother tongue, the number and variety of the foreign languages they speak, their language habits and the language they use with ChatGPT. This data is crucial for understanding how linguistic diversity affects interaction with ChatGPT and any observed differences in the model's responses.

5. The Questioning Style section can be divided into the participants' knowledge of prompting and the methods they use to ask questions to ChatGPT. Participants' understanding of how to effectively prompt ChatGPT is categorised into basic, intermediate, and advanced levels, based on their answers. Basic understanding involves intuitive question formulation. People who demonstrate intermediate level claim to know what prompting is and to understand how to formulate or modify their questions to get better results. Advanced level is given to participants who have read specific articles about prompting, work with coding and algorithms and understand how to formulate requests so that the computer can understand them better.

Methods of asking questions are also relevant information for analysing the usage patterns of the participants.

6. Account Information is vital for the current research, as it is crucial to ask ChatGPT questions from the same account the participants use normally in their lives. It also can give an insight into whether the type of account used influences ChatGPT responses and to what extent.

This comparative table serves as a foundation for the qualitative phase analysis. It allows for a nuanced exploration of how different factors might influence ChatGPT responses. The detailed qualitative data helps to draw connections between user backgrounds and their interaction styles, offering a basis for the future quantitative phase.

4.2. Data Analysis and Findings.

In this subchapter, we will analyse the interviews' findings to get an overview of the demographic data, language usage and usage patterns to create a basis for the following quantitative experiments and their analysis.

4.2.1. Demographic Information.

Firstly, it is necessary to provide an overview of the demographic data. As mentioned above, 24 respondents participated in the study, ranging in age from 20 to 38 years old. The median age of the participants is 25 years, indicating that half of the participants are below this age while the other half are above it. The mean age of the participants is approximately 25.75 years, suggesting that the average age across the sample group is around 25 years as well. This distribution suggests a relatively young cohort, with most participants being in their mid-twenties.

The participants of the interviews have a diverse range of occupations. Out of the 24 participants, 15 are currently students, and 9 are working professionals exclusively. Besides, out of 15 students, only 7 of them dedicate their time entirely to their studies, while 8 of them also work or are engaged in research projects outside of their degree.

Among 15 students 3 are currently Bachelor's Degree students, 8 are Master's Degree Students, 2 have just finished their Master's Degrees, and 2 are PhD Students. The areas of studies include EC2U Master's Degree in European Languages, Cultures and Societies in Contact (4 participants), Performing arts (2 participants), History (1 participant), Anthropology (1 participant), Translation (1 participant), Sustainable development (1 participant), German studies (1 participant), Health Economics (1 participant), Genetics (1 participant), Sociology (1 participant), Evolutionary Biology (1 participant).

Among working professionals and students who work, there are the following professions: data analysis (1 participant), theatre critics (1 participant), software development (1 participant), performing arts (3 participants), content-creation (3 participants), SMM (1 participant), creative writing (1 participant), teaching (2 participants), language tutoring (2 participants), linguistic analysis (1 participant), strategy director (1 participant), freelance jobs (5 participants), researchers (3 participants). Some of the participants mix 3-4 different activities, all of them are emigrants from Russia.

The results of the previous two paragraphs reflect a rich diversity in both academic and professional backgrounds which allows us to have examples of ChatGPT use in various fields and makes the sample more representative.

The participants in the study come from a variety of countries and cities, demonstrating varied geographic origins. The majority of participants are from Russia (12), followed by Italians (4 participants), the USA, Lithuania, Poland, Iran, Finland, Spain, Switzerland and the UK with 1 representative for each country. In the diagram below (Figure 13) you can see the distribution of the participants by the country of origin.

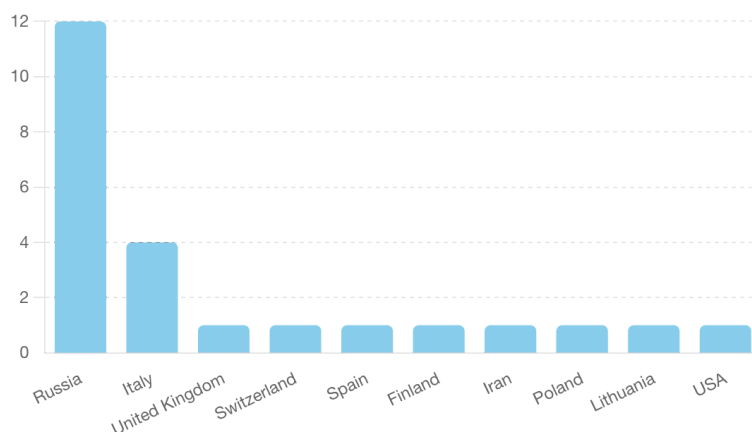


Figure 3. The distribution of the participants by country.

Among Russian cities of origin, there are Moscow, Ivanovo, Vladivostok, Saint-Petersburg, Arkhangelsk, Saratov, Tomsk, Velikiy Novgorod, which covers a wide territory of Russia, including Siberia, Far East, Volga Region and North of European Russia. The cities outside of Russia include Kill Devil Hills (NC), Vilnius, Warsaw, Verona, Colico al Lago di Como, Ciudad Real, Bologna, Turin and Harrogate.

Out of the 24 participants, 17 do not live in their place of origin. This indicates a high level of mobility among the participants, with many of them living in different cities and even countries from where they originally came from.

Out of the 12 participants from Russia, 9 do not currently live in Russia. This highlights a significant level of relocation among the Russian participants, with the majority living in different countries, which can be explained by the political tension and war in Russia. Russians live in Budapest, Belgrade, Poznan, Bishkek, Frankfurt, Erevan, Paris, Kiel.

The fact that the majority of people live in different countries partly explains the variety of languages spoken by participants along with other factors.

In conclusion, the demographic data proves that a diverse and dynamic sample group was chosen for the qualitative interview stage, although it may seem that it is limited in age range, as most of the participants are in their mid-twenties. Nevertheless, it seems relevant for the researched phenomena, as the majority of ChatGPT users are between the ages of 25 to 34, making up about 34.82% of all users, while the second largest group is aged 18 to 24, and makes 27.7% (Team-GPT 2024). The significant diversity in occupation among participants enriches the study with diverse examples of ChatGPT use across different fields and purposes.

In addition, the participants come from a broad spectrum of countries and cities, with a significant proportion originating from Russia. However, more than two-thirds of the respondents do not currently reside in their place of origin, indicating a high degree of mobility and relocation, often due to socio-political factors or student exchange programs. This mobility contributes to linguistic diversity, as they bring a variety of languages into their interactions with ChatGPT.

Overall, the diversity in demographic data makes the studied sample more representative. It provides a robust foundation for exploring the various uses and perceptions of ChatGPT across different contexts, making the findings of this research more insightful.

4.2.2. Perceptions and Understanding of ChatGPT.

In this section, we will analyse how participants perceive what ChatGPT is and how it works, and will explore the overall understanding of the model based on the evaluation developed by the researcher.

All 24 participants were asked to explain in their own words what ChatGPT is and how it works. Based on the interview data, several key definitions can be identified:

1. ChatGPT as a tool, instrument, machine or assistant that helps a person with different tasks (6 participants);

- Example: *“ChatGPT is an AI assistant that helps with answering questions and providing information.” “It is like a machine that you ask different questions and it gives you the answers, but it is not actually reliable.”*
2. ChatGPT as an AI chat-bot (5 participants);
 - Example: *“ChatGPT is Artificial Intelligence, that works like a chatroom where you can chat with it like with a person.”*
 3. ChatGPT as a large language model (4 participants);
 - Example: *“ChatGPT is a huge language model that works on all sorts of deep learning principles.”*
 4. ChatGPT as a text algorithm (4 participants);
 - Example: *“ChatGPT is a text algorithm with a colossal amount of parameters that analyse the inputs and then build the text based on the possibility of appearing of the next symbol through the whole data.”*
 5. ChatGPT as a large database (3 participants);
 - Example: *“It works like a large database, and depending on how you formulate your question, it'll give you the information from the database.”*
 6. Chat GPT as a search engine “like Google” (2 participants);
 - Example: *“ChatGPT is a version of a search engine, but works faster and more efficiently.” “It is something like Google, a mix of answers that Google can give.”*
 7. ChatGPT as a separate digital ecosystem (1 participant);
 - Example: *“ChatGPT is a huge language model that works on all sorts of deep learning principles.”*
 8. ChatGPT as an AI generative model (1 participant)
 - Example: *“ChatGPT is an AI generative model, capable of creating something new by processing, accordingly, the context, the information that once came into it.”*

Based on the definitions given by the participants and their responses to the following questions, their understanding of ChatGPT was evaluated from 0 to 4 according to the criteria defined in Table 2.

Overall ChatGPT understanding of the interviewees can be categorised in four levels according to the point they've received:

1. Basic understanding corresponds to 1 point. These participants perceive ChatGPT as an instrument or tool which can be considered Artificial Intelligence without further elaboration on the term. This category includes nine participants.
2. Intermediate AI awareness corresponds to 2 points. These participants may not know the specific terminology for the processes that the model engages in, but they appear to understand the main principles: a large

database on which the machine has been trained, algorithms that help it formulate responses, and the chatbot interface of the model. This category includes five participants.

3. Advanced understanding corresponds to 3 points. These participants have knowledge about specific mechanisms behind the ChatGPT, such as prediction, and response generation, they understand what a large language model is and use more precise terminology. This category includes eight participants.
4. Finally, expert understanding corresponds to 4 points. These participants understand how the model is trained, have knowledge about the hyperparameters, and are aware of its possibilities and limitations. This category includes two participants.

In this chapter, we explored the perceptions and understanding of ChatGPT among 24 participants. Through qualitative interviews, participants demonstrated various levels of familiarity and expertise with the technology. The analysis of participants' perspectives provides insights into how different users interact with and comprehend the capabilities of the model.

Some participants don't understand that ChatGPT doesn't take the information directly from the internet, that it has been pre-trained with hyperparameters and Human Reinforcement Learning, and is generating text using prediction algorithms to choose the best fitting next word. But this lack of deep understanding doesn't prevent them from using the model daily and consider it fruitful.

4.2.3. Frequency of ChatGPT Use.

In the next section of the interviews, participants were asked to describe how often they use ChatGPT. Although we've been able to systemise the answers and compare them, it is crucial to mention that most of the participants admitted that the frequency of their using ChatGPT depends on the period of their life, studies or career. Some participants claimed that they only use ChatGPT during the exam sessions when they are expected to write academic papers, and some of them use ChatGPT at certain stages of their work. Furthermore, the frequency might vary depending on the type of work they're currently doing. Moreover, some of the respondents used ChatGPT on a daily basis through a particular period of their lives, and now they don't use it anymore.

Given that, we've decided to consider only the information about usage frequency irrelevant to the moment of the interview. Thus, it can be categorised as follows:

1. Daily use: 10 participants said that they use ChatGPT on a daily basis or use it almost daily for different tasks.
2. Weekly use: 10 participants claimed they use the model every week, including answers like every other day, several times a week, at least once a week.
3. Monthly use: 2 participants stated they use ChatGPT at least once a month.

4. Finally, 2 participants admitted that they have only used ChatGPT 4-5 times.

Although we don't expect significant differences in the ChatGPT responses among the users who use the model daily and monthly, participants with a limited countable number of interactions may provide unexpected results in the quantitative phase.

4.2.4. Duration.

In this section, we analyse how long participants have been using ChatGPT and when they first heard about the model. This information will provide insights into the reasons that motivated the participants to start using the model, and thus might also shed light on the patterns of ChatGPT use among them and give additional information about the purposes of use.

Based on the data in this section, it is possible to deduce two types of information: the dates when participants started to engage with ChatGPT and the duration of their interaction with the model.

The 3.5 version of ChatGPT was released in November 2022 and gained the first million followers in the record first five days. Based on this starting point, it is possible to distinguish four periods:

- Spring 2023: 12 participants said they started to use ChatGPT in the spring of 2023. Many of them claimed that they knew about the model before, but the success of another AI technology — MidJourney — released in March 2023 drew their attention to the world of AI-generated content, and they decided to try ChatGPT. Besides, almost half of the respondents claimed that by that time someone from their close circle had already been using ChatGPT, and introduced them to the technology.
- Winter 2023: 4 participants started using ChatGPT in the first couple of months after the release — 2 of them are working in IT and data analysis and 1 of them claimed to have heard about the model for the first time in the University.
- Autumn 2023: 5 people only started to use ChatGPT around 6 months before the interview, interestingly 3 of them have only a basic understanding of the way the model works.
- Winter 2024: 1 participant admitted to starting using it consistently only in January of 2024 because she felt the necessity of staying up-to-date with the technology.
- 2023: 2 participants only recall to start using ChatGPT in 2023, without specifying the month.
- No information: the other two participants couldn't remember when they first started using the model.

Based on the above data, we can infer that 16 participants used the model for more than a year, 6 participants used it for 6 months or less, while the information about others is unavailable. Thus, the majority of participants are long-term ChatGPT users. In

the quantitative phase, it will be interesting to explore if the duration of ChatGPT use impacts the way the model responds.

Overall, the participants' varied start dates and durations of use provide a broad spectrum of experiences, and later on in our research, we will be able to explore if it somehow influences the responses of the model.

4.2.5. Language Use.

Considering that ChatGPT is a large language model and uses textual data, language questions are crucial for the current research. We've collected data about the participants' mother tongue, other languages they know and speak, how the languages are distributed among different areas of their lives and what languages they use with ChatGPT and why.

To start with, 8 participants are affiliated with linguistics, so they speak at least three languages, including their mother tongue. In addition, there are two multilingual participants — one bilingual (English/Spanish) and one trilingual (Hebrew/Russian/Lithuanian). Furthermore, 7 participants from Russia immigrated to non-Russian-speaking countries, which implies they know at least two languages, including Russian. Among the students who are not studying languages/linguistics/translation, four of them had experience studying abroad, and only one English-native speaker doesn't really know any other languages (only on a basic level). That gives us a broad variety of languages and language uses across the participants.

Based on the interview data, the majority of respondents have Russian as their mother tongue (12 participants). The second most common mother tongue is Italian (4 participants). In addition, 2 respondents are English native speakers. That prevalence can be explained by the language fluency of the researcher, who is a Russian native speaker and has a C2 level of Italian and a C1 level of English. Besides, the researcher spent 2 years studying in Italian and has more connections among Italians than any other nations, Russians excluded. Moreover, English is considered an international language, so the majority of people speak English. In fact, all the participants have at least a basic level of English.

Among other languages spoken as a mother tongue, there are Polish, Lithuanian/Hebrew, Spanish, Swiss German, Persian and Finnish (1 participant per each).

As previously mentioned, the most commonly spoken foreign language is English, with 22 individuals knowing it in addition to their mother tongue. Eight participants know German. An equal number of participants, six each, speak French and Spanish. They are followed by five participants who know Italian, three who speak Polish, and two who speak Armenian and Chinese. Additionally, Portuguese, Russian, Romanian, Norwegian, Ukrainian, Czech, Swedish, and Finnish are each spoken by one

participant as a foreign language. The distribution of foreign language proficiency among the participants can be seen in Figure 4.

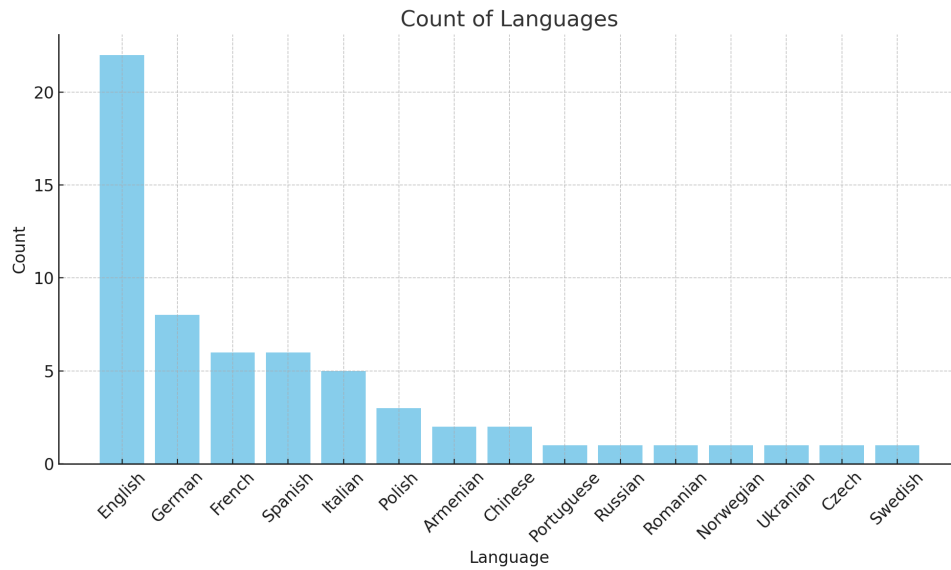


Figure 4. The distribution of foreign language proficiency among the participants.

Regarding the number of foreign languages spoken by each participant, seven participants have at least basic knowledge of one foreign language. Five participants claim to know or study two foreign languages. Six participants are proficient in three foreign languages, while four participants know four foreign languages. Additionally, one participant knows five languages, and another speaks six foreign languages.

It is worth noting that when asked about the language they use with ChatGPT, the majority of participants stated that they haven't noticed any particular differences in the ways the model performs in other languages compared to English. Lai et al. (2023) in their article dedicated to the evaluation of LLMs performance in multiple languages came up to the conclusion that ChatGPT's performance is significantly better in English than in other languages, especially with complex reasoning tasks, such as those Named Entity recognition (NER), Question Answering (QA), Common Sense Reasoning (CSR) and Summarisation. Additionally, the authors concluded that there is a clear bias towards English, as models tend to perform better with English prompts, even when the outcomes are expected in other languages.

The participants reported that expressing their thoughts in their mother tongue is easier. Therefore, they often write prompts in their native language, believing it will help them explain their requests more efficiently to the model. The choice of language while using ChatGPT also depends on the activity they are engaged in. For instance, an Italian speaker who is taking a course in English and needs to write a paper in English is more likely to input prompts in English. Conversely, if they use ChatGPT for translation, they tend to prompt in the source language.

Additionally, several participants mentioned using multiple languages in their careers or studies. They choose the language based on the intended recipient of the text. Exchange students noted that they are inclined to use the language of the country where they are currently studying, influenced by the language environment. Only two respondents said they use only English when interacting with the model, as they believe ChatGPT performs better in English.

The linguistic diversity among the participants provides a rich foundation for understanding how language influences interactions with ChatGPT. This diversity is crucial for further evaluation of ChatGPT responses across various accounts in the quantitative phase of the research. The participants' choice of language when using ChatGPT, influenced by their mother tongue, current environment, and specific tasks, will provide valuable insights into the model's answers across the different accounts. Besides, the quantitative phase will be divided into two separate experiments, where Russian speakers will ask the model questions in Russian, and other participants will ask the same questions in English, hence language analysis will be relevant in this context as well.

4.2.6. Usefulness of the model.

The questions about the purposes of use asked by participants can be divided into two subgroups: the participants' assessment of the tasks that ChatGPT solved efficiently or inefficiently and the examples of the requests they make to the model.

The evaluation of the usefulness of the model provides insights into several aspects of participants' interaction with ChatGPT. Firstly, it shows how deeply they understand or intuitively perceive the advantages and limitations of the model. Secondly, the respondents would remember more functions of ChatGPT they used while trying to remember which of them were efficient and which were not. Furthermore, the responses to this question contribute to the understanding of participants' perceptions of the model and the style of questioning.

Based on the answers of the respondents, several ChatGPT features and characteristics are considered useful:

1. Velocity: almost every participant mentioned that ChatGPT helps them to reduce time spent on mechanic tasks, such as information retrieval, planning, text summarisation, data organisation, etc. They would state that it is "time-saving", "very useful for getting quick answers", and "it makes my work faster and easier".
2. Content Generation: participants find it particularly useful at the primary stages of writing, as it helps to understand the structure of the future text, "get through the blank page syndrome", and "see the whole dramaturgy of the task up until the end".

Participants use it for brainstorming ideas, and short or very structured text creation, such as job descriptions, slogans, bureaucratic documents, or, as some claim, “texts you don’t care about”.

On the other hand, some participants stated that ChatGPT excels in elaborating on already written text but performs poorly when creating texts from scratch.

3. Language Practice and Translation: several respondents reported they use ChatGPT to practice foreign languages and to perform translations. It is interesting that some of them found the model very useful for translation and found it better performing than most of the translation tools. Others, particularly those with a linguistics background, claimed that they use better translation tools, such as DeepL.

Furthermore, there is a clear correlation between language proficiency and the evaluation of ChatGPT performance in these types of tasks. People with less proficiency in a foreign language find ChatGPT's performance more useful.

4. Editing, Refinement and Summarisation: as already mentioned in Section 3, participants find the model particularly useful while working with pre-existing texts. They use ChatGPT for article summarisation, writing academic papers, and understanding if the article is relevant to their research. Some would use the model to correct spelling or grammar mistakes in the texts they wrote.

Moreover, participants use ChatGPT to refine their text, to check if it is coherent and uses an adequate vocabulary, especially if they are writing in a foreign language.

Finally, many people find ChatGPT indispensable for rewriting or adapting text to different situations. For example, it is useful for creating multiple versions of a social media post about a recurring event or rewriting the same motivation letter for different universities.

However, there are several characteristics of ChatGPT that most participants find not useful:

1. Accuracy of Information: according to respondents, the most common disadvantage of the model is that it often provides unreliable and inaccurate information. Examples include inventing non-existent sources, lacking references to the information's origin, and providing outdated information. Participants stated they trust ChatGPT with general questions, but for precise answers, they prefer using other platforms.

2. Complex reasoning and domain-specific tasks: as previously mentioned, participants find ChatGPT useful for general tasks, but claim it struggles to handle efficiently with more complex and specific requests.

Additionally, several respondents find the model more efficient with IT-related topics, such as machine learning, whereas its performance in tasks related to humanitarian knowledge is less effective.

3. Artificial language and repetitiveness: Most participants find ChatGPT-generated text sounds artificial and claim they can distinguish it from human-produced text. Traits contributing to this perception include repetitive vocabulary, less readable sentence structures, and the use of rare words and phrases.

In conclusion, this chapter provides a solid foundation for further exploration of the purposes for which participants use ChatGPT. Along with the following chapter, it will enable an analysis of how typical usage patterns influence the model's responses during the quantitative experimental phase of the research.

4.2.7. Purposes of ChatGPT usage.

During the interviews, people were asked to describe for which purposes they normally would use ChatGPT. Considering the recall bias, the interview guidelines were designed so that other questions would provoke the participants to remember more examples of ChatGPT use. Based on the responses provided to the direct question and the overall interview, we establish several most common categories of use.

These categories are:

1. Planning and structuring: Fifteen participants mentioned they use ChatGPT for planning their trips, workout and meal plans, and organising their agenda. They also use the model to structure their ideas, to write the first outline of an academic work or to plan quests for birthdays.
2. Explaining concepts: Eleven participants use ChatGPT to give definitions and explanations of complex concepts, and most of them ask ChatGPT to use simpler language.
3. Idea generation/brainstorming: Ten participants said that the model helps them in idea generation and brainstorming, which often helps to overcome the initial difficulties in starting complex tasks. In addition, content creators use it to find new perspectives on the same things.
4. Text summarisation: Nine participants use ChatGPT for summarising various types of texts, including academic articles, subtitles and transcriptions, notes from classes, etc.

5. Translation: Nine respondents stated they use the model for translating different texts, from personal messages to complex definitions, from formal letters to social media content.
6. Content generation: Nine participants admitted to using ChatGPT for content generation. Examples are posts for social media, slogans, podcasts and TV scripts, and copywriting.
7. Information retrieval: Eight participants used ChatGPT to find necessary information or answers to their questions. They claim that while the model is less reliable with specific information, it works faster than search engines and provides quick answers.
8. Editing/Reformulation of the texts: Seven participants often use ChatGPT to edit their own texts, to reformulate the same thoughts for different purposes, and to check for errors.
9. Cover/motivation letters: Five participants found the model particularly efficient in writing cover and motivation letters for job, university and scholarship applications. They noted that ChatGPT understands the structure of these types of texts and formulates them effectively.
10. Formal letters: Five respondents also find it useful for formal letters and bureaucratic documents, as the model is familiar with necessary structures, and thus the users don't need to read multiple articles and master them.
11. Entertainment: Four participants remembered that they used ChatGPT for entertainment purposes, such as the generation of poems and stories about particular people, creating anecdotes, and just casual conversations out of curiosity.
12. CV generation and job description: surprisingly, ChatGPT proved efficient in the employment field, both for employers and job seekers. Four participants used the model to generate CVs or job descriptions for their companies.
13. Text evaluation: Four participants rely on ChatGPT to evaluate their texts. They ask the model to assess language adequacy if they are writing in a foreign language, or to check for its coherency and readability.
14. Coding: Four participants involved in the field of IT or data analysis use ChatGPT to assist with coding. They ask the model to find errors in their code or to help them with solutions to their problems.
15. Psychological Questions: Three participants engaged ChatGPT in personal conversations. Out of curiosity or in search of immediate support, they asked the model personal questions or sought advice.
16. Homework: Three participants used ChatGPT to assist with homework. They admitted that the model is helpful when there is a lack of time and resources.
17. Exam Preparation: Another educational purpose where ChatGPT proved useful in exam preparation. Three participants used it to assess their answers or to formulate possible questions based on the studied materials.

In addition, eighteen participants said they use the model for personal purposes, such as to-do lists, recipes, casual communication, and entertainment. Six participants only use it for tasks related to their work or studies.

The most popular uses of ChatGPT extend beyond the primary functions of language models (Zhao et al., 2024), such as understanding and generating natural language and adapting to downstream tasks. As a large language model with increased training data, ChatGPT has gained new capabilities, including enhanced performance, few-shot and zero-shot learning, and the emergence of new functionalities. The analysis of participants' usage demonstrates that besides text summarisation and translation ChatGPT proves to be useful in a wide range of applications. According to the participants, they particularly value the model's contributions to time-saving and productivity (2024).

Overall, the analysis provides a solid background for future exploration of how people typically use ChatGPT affect the model's responses to the same questions across different accounts.

4.2.8. Prompting and questioning style.

Prompt engineering is crucial in shaping ChatGPT responses and influences its efficiency and reliability. According to Ekin (2023), users can get more accurate, relevant and coherent outputs by carefully designing and refining their input prompts. Therefore, knowledge about participants' prompting knowledge and questioning style is essential for the further quantitative experiment.

Based on the data collected in the quantitative phase, the majority of participants (18 people) have only basic knowledge of prompting. They claim that they haven't read articles about prompt engineering and ask questions intuitively.

Two participants have intermediate knowledge about prompting. They have read several articles, but don't tend to think too much about while interacting with the model.

Finally, four participants claimed to understand what prompting is and how to get the best possible outputs from ChatGPT.

As for the questioning style, we asked the participants to describe how they normally ask ChatGPT to help them with their tasks.

Several participants admitted that they greeted the model and thanked it for its work. Some do this out of habit or fear, others due to a sense of politeness, and some because they believe the model performs better when the user is courteous.

In text summarisation tasks, people typically input the text that needs to be summarised and explain to the model what is expected in the output. Most participants use the descriptions of tasks they receive from their homework assignments, employers, or general requirements. Sometimes they add specific details, to get a more precise answer.

Most participants stated that typically they need more than one iteration to get the best result. However, if the expected answer should be concise, one iteration can be enough.

The majority of participants said they improved their questioning style over time by experimenting and trying new approaches. Some would initially ask a general question and then add details later throughout the conversation: *“I would put the general question, look at the output and direct the model in the direction I need”*. Several participants noted that examples can help improve the results but also limit the model’s creativity, preventing ChatGPT from "thinking" outside the given example.

People who use ChatGPT for text generation often provide relevant texts and ask the model to generate a similar text with specific changes. Most of them emphasise the model’s ability to adjust the tone of voice according to the requirements. Additionally, some participants believe that structuring the input helps improve the model's efficiency.

To sum up, the analysis of the participants’ prompting and questioning styles presents a solid foundation for the subsequent quantitative phase of this research. The observed data shows that the majority of users have only basic knowledge of prompt design and tend to rely more on intuitive questioning and their own experiences rather than informed strategies. This insight might be of great significance while exploring the potential variability of ChatGPT responses.

In addition, the diverse approaches to interacting with the model, such as using courtesy constructions, iterating questions and providing context and examples, can result in differences in ChatGPT’s outputs. Considering these patterns will allow for a deeper understanding of the possible reasons behind the model’s response differences.

4.2.9. Account used with ChatGPT.

The last but not least aspect of the participants’ usage patterns is the information about the account they use while interacting with ChatGPT as it is directly connected with the research question. The initial assumption is that ChatGPT’s responses depend on the account and its history with the model can only be tested within the account that participants have been using before.

Thirteen participants reported using their personal Gmail accounts to access ChatGPT. Most of these individuals use their accounts regularly daily, with their login credentials saved in their browsers, making it the easiest method to access the model. Two participants indicated that they typically use their personal Gmail accounts, but also had experience with paid work accounts. However, they found the latter inconvenient and continued using their personal accounts. Another participant mentioned using the same personal Gmail account but initially obtained the token for her U.S. SIM card. Additionally, one participant from Russia uses the same personal Gmail account, but due to government restrictions, accesses ChatGPT through the website <https://chadgpt.ru> instead of the OpenAI website.

Regarding other specific uses, two participants log in via their Microsoft accounts. One uses it for Outlook, and the other accesses ChatGPT via the Bing browser's co-pilot feature. One participant admitted to using an old childhood email to log in to ChatGPT to remain untraceable by the model. Another participant from Russia uses a free ChatGPT bot in Telegram to circumvent government blocking. This service stands out because, instead of creating new sessions automatically with each login, it maintains a continuous conversation in a single long session. According to this respondent, this results in the model mixing new data with previous information.

Furthermore, one account was created specifically for ChatGPT use, and another account was shared between a Russian participant and her Belgian friend using a Belgian SIM card. Lastly, one out of twenty-four participants mentioned that she added specific personal information in her account settings, informing the model that she is a Master's degree student and prefers her answers in German.

To summarize, the majority of participants use their personal Gmail accounts to access ChatGPT, although there are some notable deviations from this trend. The most distinct cases are observed among participants from Russia, where the model is blocked, leading IT specialists to develop alternative access methods. Overall, the analysis of account usage will offer additional insights into the differences in ChatGPT responses that may emerge during the qualitative phase.

4.2.10 General observations and conclusions.

In the comprehensive analysis of the qualitative semi-structured interviews conducted with 24 participants, several key insights emerged that provide a solid foundation for the subsequent quantitative phase of the research. The diverse demographic background, varied occupations, and wide range of language proficiencies and purposes of use offer a broad perspective on how people tend to use the model and possible proof of the initial assumption of the research.

The demographic data reveals a relatively young cohort of participants. Most of them are in their mid-twenties, which aligns with the typical age range of ChatGPT users globally. The diversity in participants' academic and professional backgrounds, along with their high mobility and linguistic variety, emphasises the representativeness of the sample, making the findings relevant across various contexts.

Participants showed various perceptions and understandings of ChatGPT, from viewing it as a simple tool or assistant to recognising its complex nature as a large language model or AI generative model. This spectrum of understanding highlights the varying levels of familiarity and expertise among users.

The frequency and duration of ChatGPT use varied widely among participants, with some using it daily and others only occasionally. This variation is crucial for the quantitative phase as it may influence the variability of ChatGPT's responses.

The majority of participants proved to use multiple languages in their interactions with ChatGPT. This linguistic diversity will be particularly relevant in the quantitative phase, where responses will be analysed across two languages — Russian and English. The preference for using one's mother tongue or English depending on the

context provides insights into how language choice affects the interaction quality and the model's performance.

Participants identified several useful aspects of ChatGPT, such as its ability to save users' time, its velocity, content generation capabilities, and utility in language practice and translation. However, they also noted limitations, including inaccuracies and the inability of the model to deal with complex reasoning tasks.

The analysis revealed that participants use ChatGPT for various reasons, including planning and structuring, explaining concepts, generating ideas, summarising texts, translating, and content creation. The variety of purposes highlights the model's multifunctionality and its role in enhancing productivity and creativity. Understanding these use cases will help to explore how specific purposes influence the model's responses.

Most participants have a basic understanding of prompt engineering, relying on intuitive questioning rather than informed strategies. The questioning styles, including the use of polite forms, iterative questioning, and providing examples, indicate different approaches that could impact ChatGPT's outputs. Recognising these styles will help to understand how user behaviour affects the model's performance in the quantitative experiment.

The majority of participants use their personal Gmail accounts to access ChatGPT, with some notable deviations, particularly among Russian participants who use alternative methods due to government restrictions. The type of account and its history with the model could potentially influence the responses, making this an important factor to consider in the quantitative analysis.

Among the additional general observations, it is noteworthy that most participants describe themselves as “lazy” when admitting to using the model. Others prefer to use ChatGPT primarily for text summarization or mechanical tasks, as they prefer to “use their own brains” and not rely entirely on AI.

The majority of participants tend to edit the output provided by the model, as they are “written not in a natural language” or might contain errors and inaccuracies. Several people also believe that copying and pasting ChatGPT answers is some sort of cheating and plagiarism, so they try to rewrite the ideas provided by the model in their own words and thoughts. The ones who claimed to sometimes use the texts created by ChatGPT without any changes would normally do that if the text is not of big importance to them. More often the responses from the model would be used without editing when it comes to code generation, while with texts it happens significantly less.

Speaking about text generation, some users tend to ask the model to provide several variations of the text, and then use the pieces that fit the most their purposes. People also tend to use the model for generating from ten to fifteen variations of the same thing, for instance, to find synonyms for the words to avoid repetitions in their texts.

It is interesting to notice that despite concerns about the potential for AI to substitute humans in the labour market, the participants' experiences suggest otherwise. They claim that while ChatGPT can indeed help save time and perform mechanical tasks, it still requires significant effort from the user. To use it efficiently, users need to have deep domain knowledge and a good understanding of the outcomes. This idea is supported by Perrotta et al. (2022) in their work "Artificial Intelligence and the Affective Labour of Understanding: The Intimate Moderation of a Language Model." Their study demonstrates that despite the impressive capabilities of language models, they are far from taking over our jobs.

Furthermore, only a few participants mentioned how ChatGPT helps them in their personal lives (travel and daily planning, psychological help), which leads us to believe that ChatGPT is more an instrument for work optimisation, rather than a tool that can make people's lives easier.

Overall, the interviews provided valuable insights into how people use ChatGPT which would otherwise be impossible to obtain due to privacy concerns.

The insights gathered from the qualitative data will serve as a foundation for the next phase of the research. The diverse backgrounds, varied usage patterns, and different levels of understanding among participants will deepen the exploration of how these factors influence ChatGPT's responses. The quantitative phase will build on these findings, aiming to quantify the impact of user behaviour, language choice, and account history on the model's performance. This mixed-method approach will help determine whether ChatGPT's responses depend on the account used with the model, and if so, to what extent.

5. Quantitative experiment.

5.1. Research Design and Method.

As mentioned in Chapter 1, the current research adopts a mixed-methods approach, specifically, a sequential exploratory method. This means the research process is divided into two phases — the qualitative and the quantitative — conducted sequentially. In the previous chapter, we explored the qualitative phase and analysed the data collected during the semi-structured interviews.

The next phases of our research are the quantitative data collection, quantitative data analysis and the conclusions drawn from both stages. According to Almeida (2018: 114) in the sequential exploratory method, the qualitative phase serves to explore the phenomenon more deeply. In the current research, we examined the ChatGPT usage pattern of 24 respondents. The collected data provided insights into how people from different backgrounds and countries use ChatGPT. This information has limited pre-existent knowledge due to its private nature and can only be shared with the interviewee's consent.

Additionally, Almeida mentions that the qualitative phase in mixed-methods research helps to identify relevant variables (2018: 114). In our case, these variables include place of origin and current residence, level of education, field of work or study, level of ChatGPT understanding, purposes of ChatGPT use, prompting knowledge, language proficiency and information about the account used with ChatGPT.

Furthermore, we found that most participants perceive ChatGPT as a helpful tool that saves time, provides information, and assists with text generation and processing. The respondents also mentioned such drawbacks of the model as lack of domain-specific knowledge, repetitiveness and inaccurate information.

Using the information gained from the qualitative phase, we conducted the quantitative experiment. The qualitative phase provided deeper insights into how users interact with the model, their purposes for using it, the languages used with ChatGPT, their knowledge about prompting, and the frequency of ChatGPT use. These findings helped us structure the quantitative phase of the study.

The responses collected during the qualitative semi-structured interviews revealed key variables for analysis and key purposes for ChatGPT use among the participants. These insights helped us formulate three questions for the quantitative phase aimed to provoke variability in the model's responses.

These three questions were formulated through multiple experiments conducted by the researcher using different accounts. The experiments involved asking ChatGPT the same questions from multiple accounts to identify those that demonstrate the greatest variability in the model's responses. We also focused on the types of questions common among the participants: explanation of concepts, opinion-based questions, and open-ended questions that allow for the model's creative potential to unfold.

Here are the questions we decided to implement in the quantitative phase:

1. What is racism?
2. What's your opinion on the importance of privacy in the digital age?
3. Is happiness possible?

The first question is a general definition question. Most participants reported using ChatGPT to ask for concept explanations, and this question aims to fulfil that purpose. The second question is designed to provoke ChatGPT into sharing a "personal" opinion or to emphasise its inability to do so. Finally, the third question is an open-ended question that might have a more personalised response.

After formulating these three questions, we proceeded to create the guidelines. It is crucial for this research to receive precise responses from the model; therefore, we provided the participants with detailed guidelines.

The guidelines were initially written in English and included the research question explanation, a promise of data confidentiality, and detailed instructions. The instructions consisted of twelve steps, directing participants to ask the model these three questions, each in a new session, and to record the responses in the table provided in the

guidelines. Verbal explanations were supplemented with screenshots and necessary links to minimise misunderstandings or misinterpretations. Respondents were also informed that they could contact the researcher if they had questions, and the guidelines provided three contact methods. The full version of the guidelines can be seen in the Appendix.

Afterwards, the guidelines were translated into Russian. For the qualitative phase, we split the respondents into two groups according to their mother tongue. Russian native speakers were asked to interview the model in Russian, while all other participants were asked to do so in English. The choice of languages was influenced by two factors: half of the participants are Russian speakers, allowing us to explore ChatGPT's performance in Russian. Besides, several studies demonstrate that the model performs better in English (Lai et al. 2023; Qin et al. 2023), and most of the training data is in English (Brown et al., 2020; Touvron et al., 2023). Therefore, it is interesting to examine the differences in the model's responses across various accounts and between two different languages. According to Statista (2024, <https://www.statista.com/statistics/262946/most-common-languages-on-the-internet/>), which conducts technological surveys, English is used in 52.1% of all web content, while Russian ranks fourth with 4.5% of content in this language.

The guidelines translated into Russian included the following questions:

1. Что такое расизм? (What is racism?)
2. Какое твое мнение о конфиденциальности в цифровую эпоху? (What's your opinion on the importance of privacy in the digital age?)
3. Возможно ли счастье? (Is happiness possible?)

It is crucial to mention that while the initial research was planned to be conducted with ChatGPT version 3.5, OpenAI released a new version of the model called 4o during the qualitative interview phase. The vast majority of respondents reported using the free 3.5 version, which was trained on a smaller dataset, was limited to data published before November 2022 and had fewer parameters. Previously, only users with paid subscriptions or people using the co-pilot feature had access to ChatGPT-4 Turbo. Since its launch in May 2024, every user has limited access to the 4o model, which, according to Open AI, is the "latest, fastest, highest intelligence model", and performs even better than the ChatGPT-4 Turbo.

Here is the information about the limited access from the company's website help.openai.com:

"Users on the Free tier will be defaulted to GPT-4o with a limit on the number of messages they can send using GPT-4o, which will vary based on current usage and demand. When unavailable, Free tier users will be switched back to GPT-3.5."

Given that free users cannot choose the model to interact with, we decided not to change the guidelines and to allow participants to use whichever version is available to them during the quantitative interview. To test if there are significant differences between the responses of the two different versions, we created a new account using the University of Salamanca Gmail. We asked the model the three questions while the 4o

was available and again when it was unavailable. We will then compare this test data with the outcomes of the quantitative experiment provided by the respondents.

When the guidelines were ready, we sent them to each participant via private chats on Telegram and WhatsApp. Over one week, the participants returned the documents with the tables filled in with the responses provided by the model. We then created an Excel document titled "Comparative Table of ChatGPT Responses," with two separate lists: one for responses in Russian and another for responses in English. In Table 3 and Table 4, you can see parts of the tables.

	Participant 17
Question	
1. What is racism / Что такое расизм?	<p>Расизм — это система убеждений и практик, которая предполагает, что одна раса превосходит другие, и использует эту веру для оправдания дискриминации и неравенства. Это может выражаться в предвзятости, стереотипах, предрассудках и дискриминационных действиях в отношении людей на основе их расовой или этнической принадлежности.</p> <p>Основные аспекты расизма включают:</p> <ol style="list-style-type: none"> **Идеологический аспект**: Вера в то, что одна раса обладает врожденными качествами, делающими её лучше или хуже других рас. Эта вера может быть основана на биологических, культурных или исторических аргументах. **Институциональный расизм**: Система и структуры в обществе, которые поддерживают и увековечивают неравенство между расами. Это может включать дискриминационные законы, политику, практики найма, системы образования и другие институты. **Личный расизм**: Личное поведение и отношения, основанные на предвзятости и стереотипах. Это могут быть сознательные или бессознательные действия и слова, которые дискриминируют людей на основе их расы. **Системный или структурный расизм**: Комплекс социальных, экономических и политических процессов, которые приводят к систематической дискриминации и неравенству. Это может проявляться в доступе к образованию, здравоохранению, жилищным условиям и экономическим возможностям. <p>Расизм имеет глубокие исторические корни и часто связан с колониализмом, рабством и империализмом. Его последствия могут быть долгосрочными и сильно влиять на жизнь людей, приводя к социальному и экономическому неравенству.</p>

	Participant 17
<p>2. What's your opinion on the importance of privacy in the digital age? / Какое твое мнение о конфиденциальности в цифровую эпоху?</p>	<p>В цифровую эпоху конфиденциальность становится одной из наиболее актуальных и обсуждаемых тем. С одной стороны, интернет и цифровые технологии предоставляют множество преимуществ, таких как мгновенный доступ к информации, возможности для коммуникации и эффективные инструменты для бизнеса и повседневной жизни. С другой стороны, они также создают значительные риски для конфиденциальности личной информации.</p> <p>Мое мнение о конфиденциальности в цифровую эпоху можно сформулировать следующим образом:</p> <ol style="list-style-type: none"> **Необходимость баланса**: Важно найти баланс между удобством и безопасностью. Технологии должны использоваться так, чтобы минимизировать угрозы для конфиденциальности, но при этом не ограничивать их полезность и доступность. **Осведомленность и контроль**: Пользователи должны быть осведомлены о том, как их данные собираются, хранятся и используются. У них должно быть право контролировать эту информацию. Это включает в себя возможность легко изменять настройки конфиденциальности и доступ к своим данным. **Ответственность компаний**: Компании, работающие с личными данными, должны нести ответственность за их защиту. Это включает в себя соблюдение строгих стандартов безопасности и прозрачность в вопросах обработки данных. **Законодательство и регуляция**: Государства должны разработать и внедрить законы, которые защищают конфиденциальность граждан. Примеры таких законов включают Общий регламент по защите данных (GDPR) в Европейском Союзе, который устанавливает строгие правила относительно сбора и обработки личной информации. **Технологические решения**: Развитие и внедрение технологий, обеспечивающих конфиденциальность, таких как шифрование, анонимизация и безопасные протоколы связи, должны быть приоритетом для разработчиков и исследователей. **Образование и осведомленность**: Повышение осведомленности пользователей о рисках и способах защиты их конфиденциальности является ключевым элементом. Образовательные программы и кампании могут помочь людям лучше понимать, как защитить свои данные. <p>В целом, защита конфиденциальности в цифровую эпоху требует совместных усилий со стороны пользователей, компаний и правительств. Только таким образом можно создать безопасную и доверенную цифровую среду.</p>

	Participant 17
<p>3. Is happiness possible? / Возможно ли счастье?</p>	<p>Счастье — это сложное и многогранное понятие, которое зависит от множества факторов, включая личные убеждения, окружение, обстоятельства и внутреннее состояние. Вот несколько аспектов, которые помогают понять, возможно ли счастье и как его достичь:</p> <ol style="list-style-type: none"> 1. **Личное восприятие и установки**: <ul style="list-style-type: none"> - Оптимизм и позитивное мышление способствуют ощущению счастья. Люди, которые фокусируются на позитивных аспектах жизни, часто чувствуют себя счастливее. - Умение ценить настоящее и быть благодарным за то, что имеешь, также играет важную роль. 2. **Социальные связи**: <ul style="list-style-type: none"> - Поддержка семьи, друзей и сообщества оказывает огромное влияние на уровень счастья. Крепкие социальные связи и чувство принадлежности повышают удовлетворенность жизнью. 3. **Самореализация**: <ul style="list-style-type: none"> - Достижение личных целей и реализация потенциала приносят чувство удовлетворения и счастья. - Важна и гармония между работой и личной жизнью, что позволяет людям чувствовать себя полноценными и счастливыми. 4. **Физическое и психическое здоровье**: <ul style="list-style-type: none"> - Здоровье и хорошее самочувствие напрямую связаны с ощущением счастья. Занятия спортом, правильное питание и уход за психическим здоровьем способствуют улучшению общего состояния и настроения. 5. **Материальное благополучие**: <ul style="list-style-type: none"> - Несмотря на то, что деньги не всегда гарантируют счастье, определённый уровень материального благополучия может снять стресс, связанный с базовыми потребностями, и улучшить качество жизни. 6. **Смысл и цели в жизни**: <ul style="list-style-type: none"> - Наличие смысла в жизни и целей, которые человек считает важными, придаёт чувство направления и удовлетворения. <p>Важно помнить, что счастье — это не постоянное состояние, а динамическое и изменчивое чувство. Оно зависит от многих факторов и может меняться с течением времени. Для достижения и поддержания счастья важно работать над различными аспектами жизни и находить баланс между ними.</p>

Table 3. "Comparative Table of ChatGPT Responses", responses in Russian.

Question	
	Participant 20
<p>1. What is racism / Что такое расизм?</p>	<p>Racism is a belief system or ideology that asserts the superiority of one race over another and often results in discrimination, prejudice, and unequal treatment based on race. It manifests in various forms, including personal biases, systemic inequalities, and institutional practices. Here are some key aspects of racism:</p> <ol style="list-style-type: none"> 1. Personal Racism: Individual attitudes and behaviors that reflect racial prejudice or discrimination. This can include using racial slurs, stereotyping, or treating people differently based on their race. 2. Institutional Racism: Policies, practices, and procedures within organizations or institutions (such as schools, workplaces, or government agencies) that systematically disadvantage certain racial groups. Examples include racial profiling by law enforcement or disparities in education and healthcare. 3. Structural Racism: The broader system of racial inequality that permeates society. This includes historical and cultural patterns of disadvantage and discrimination that have created and perpetuate inequalities across various sectors, such as housing, employment, and criminal justice. 4. Cultural Racism: The devaluation of a group's culture, language, traditions, and contributions, often accompanied by the elevation of the dominant culture as superior. 5. Internalized Racism: When individuals from marginalized racial groups accept and internalize negative beliefs and stereotypes about their own race, often leading to feelings of inferiority or self-hatred. <p>Racism can have severe consequences for those who experience it, including psychological stress, reduced opportunities, economic disadvantages, and social exclusion. Addressing and combating racism requires efforts at both individual and systemic levels, including education, policy changes, and active promotion of diversity, equity, and inclusion.</p>

<p>2. What's your opinion on the importance of privacy in the digital age? / Какое твое мнение о конфиденциальности в цифровую эпоху?</p>	<p>Privacy in the digital age is of paramount importance. The digital revolution has transformed how we live, work, and interact, bringing unparalleled convenience and connectivity. However, this transformation has also introduced significant risks and challenges related to privacy.</p> <ol style="list-style-type: none"> 1. **Protection of Personal Information**: In the digital age, vast amounts of personal information are collected, stored, and processed by various entities. Protecting this data is crucial to prevent identity theft, fraud, and other malicious activities. 2. **Control Over Personal Data**: Individuals should have the right to control their personal data, deciding what information to share, with whom, and for what purposes. This control is fundamental to personal autonomy and freedom. 3. **Trust in Digital Services**: Privacy is essential for maintaining trust in digital services. Users need to feel confident that their data is handled securely and ethically. Without this trust, the adoption and success of digital platforms and services could be compromised. 4. **Freedom of Expression and Association**: Privacy is a cornerstone of free expression and association. In environments where privacy is not respected, individuals may feel deterred from expressing their opinions or joining certain groups, fearing surveillance or repercussions. 5. **Prevention of Abuse and Exploitation**: Lack of privacy can lead to exploitation by corporations, governments, and malicious actors. This includes targeted advertising, political manipulation, and surveillance, all of which can have profound societal impacts. 6. **Legal and Ethical Considerations**: Privacy is enshrined in various legal frameworks and human rights declarations. Respecting privacy is not just a legal obligation but also an ethical imperative, reflecting respect for individual dignity and autonomy. 7. **Innovation and Economic Impact**: While privacy regulations can pose challenges, they also drive innovation. Companies are motivated to develop new technologies and business models that prioritize privacy, leading to a more sustainable and consumer-friendly digital economy. <p>In conclusion, privacy in the digital age is critical for protecting individuals, maintaining trust, ensuring freedom, preventing exploitation, and fostering innovation. Balancing the benefits of digital technologies with robust privacy protections is essential for a healthy, functioning society.</p>
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	<p>Yes, happiness is possible, though it is a complex and multifaceted state that varies greatly from person to person. Happiness can be understood and achieved through various perspectives:</p> <ol style="list-style-type: none"> Psychological Perspective: Positive psychology suggests that happiness is influenced by a combination of genetic predisposition, life circumstances, and individual actions. Activities that promote happiness include practicing gratitude, fostering positive relationships, engaging in meaningful activities, and maintaining a healthy lifestyle. Philosophical Perspective: Different philosophical traditions offer various pathways to happiness. For example, Aristotle's concept of eudaimonia focuses on living a life of virtue and fulfilling one's potential. In contrast, Epicureanism suggests that happiness comes from minimizing pain and seeking simple pleasures. Sociocultural Perspective: Cultural factors play a significant role in defining and achieving happiness. Some cultures emphasize community and collective well-being, while others focus on individual achievement and personal fulfillment. Economic Perspective: While money alone cannot buy happiness, financial stability and the ability to meet basic needs can contribute to overall well-being. Research indicates that after a certain point, increases in income have a diminishing return on happiness. Biological Perspective: Happiness is also influenced by biological factors, including genetics and brain chemistry. Certain neurotransmitters, like serotonin and dopamine, play a crucial role in mood regulation. Spiritual Perspective: For many, happiness is deeply connected to spiritual or religious beliefs. Practices such as meditation, prayer, and mindfulness can foster a sense of inner peace and contentment.
<p>3. Is happiness possible? / Возможно ли счастье?</p>	<p>Ultimately, happiness is a subjective experience that can be cultivated through various means. It often involves a combination of external circumstances and internal attitudes, and while it may not be a constant state, moments of happiness and contentment are achievable for most people.</p>

Table 4. "Comparative Table of ChatGPT Responses", responses in English.

After receiving all the ChatGPT responses from the participants, we started the analysis of the outcomes. We decided to use various metrics to make the responses comparable and quantifiable.

The first set of metrics we chose are readability metrics. Readability indices measure the difficulty of reading a text based on its properties, typically considering parameters such as average sentence length and the number of complex words to reflect the text's complexity (Gómez & Sánchez-Lafuente 2019: 33). Choi & Crossley (2022: 1) define readability as a degree to which a text can be comprehended easily. These indices became particularly popular among researchers in the 1950s, leading to the development of numerous new formulae. This method of automatic text classification is

useful for assessing ChatGPT responses. The indices will reveal primary differences or similarities among the ChatGPT responses, which can be explored further.

Among the methods of readability evaluation for ChatGPT responses we will use are the Flesch/Flesch-Kincaid tests, which include two indices: the Flesch Reading Ease Score and the Flesch–Kincaid Grade Level. This system was initially designed for English by Rudolf Flesch in 1948 and later simplified and improved by Farr, Jenkins, and Patterson in 1951, and Kincaid, Fishbourne, Rogers, and Chissom in 1975.

The formula for the Flesch Reading Ease Score (FRE) is represented as follows:

$$206.835 - 1.015 \left(\frac{\text{total words}}{\text{total sentences}} \right) - 84.6 \left(\frac{\text{total syllables}}{\text{total words}} \right)$$

Figure 5. The Flesch Reading Ease Score (FRE)

According to Flesch’s interpretation of the outcomes of this formula, a score of 92 corresponds to the comic book level, a score of 43 to a text from Harvard Business Review, a score of 32 to a Harvard Law Review publication, 10 to a standard auto insurance policy and -6 to an Internal revenue code (Flesh 1981). Table 5 introduces the interpretation of the Flesch Reading Ease Score.

Score	Corresponding School Level (U.S.)	Reading Difficulty
90–100	5th grade	Extremely easy to read
80–90	6th grade	Conversational English for consumers
70–80	7th grade	Quite easy to read
60–70	8th and 9th grade	Easily understood by 13- to 15-year-old students
50–60	10th to 12th grade	Somewhat difficult to read
30–50	College	Difficult to read
0–30	College graduate and Professional	Extremely difficult to read

Table 5. The Flesch Reading Ease Score Interpretation.

The Flesch–Kincaid Grade Level was introduced in 1975 by the U.S. Navy (Kincaid et al.) to provide a grade-level score corresponding to the education level in the U.S. It can be represented with the formula shown in Figure 6.

$$0.39 \left(\frac{\text{total words}}{\text{total sentences}} \right) + 11.8 \left(\frac{\text{total syllables}}{\text{total words}} \right) - 15.59$$

Figure 6. The Flesch–Kincaid Grade Level formula.

The scores that one gets using this formula can be interpreted as follows:

Flesch-Kincaid Score	Reading Level	School Level	Example of the text
0 – 3	Basic	Kindergarten/ Elementary	Hooray for Fish!
3 – 6	Basic	Elementary	The Gruffalo
6 – 9	Average	Middle School	Harry Potter
9 – 12	Average	High School	Jurassic Park
12 – 15	Advanced	College	A Brief History of Time
15 – 18	Advanced	Post-grad	Academic papers

Table 6. The Flesch-Kincaid Grade Level Score Interpretation.

Another readability test we will use for analysing ChatGPT responses is the Gunning Fog Index, described by Robert Gunning in his book "The Technique of Clear Writing" (1952) for the English language. This index estimates how many years of formal education a person needs to comprehend the text. The complete formula for the Gunning Fog Index can be seen in Figure 7, and the interpretation of the results is provided in Table 6.

$$0.4 \left[\left(\frac{\text{words}}{\text{sentences}} \right) + 100 \left(\frac{\text{complex words}}{\text{words}} \right) \right]$$

Figure 7. The Gunning Fog Index Formula.

Complex words, according to Gunning, are words that consist of three or more syllables, excluding proper nouns, familiar jargon, or compound words.

Fog Index	Reading level by grade
17	College graduate
16	College senior
15	College junior
14	College sophomore
13	College freshman
12	High school senior

Fog Index	Reading level by grade
11	High school junior
10	High school sophomore
9	High school freshman
8	Eighth grade
7	Seventh grade
6	Sixth grade

Table 7. The Gunning Fog Index Interpretations.

Other metrics we will explore in our analysis include word count, sentence count, and paragraph count. To assess the readability of ChatGPT's responses in English, we will use the online tool Readable. This tool automatically calculates the word count, sentence count, paragraph count, Gunning Fog Index, Flesch–Kincaid Grade Level, and Flesch Reading Ease Score.

Since the Russian language has an average sentence length shorter than English, due to the lack of articles and auxiliaries, and a higher average word length, several attempts have been made to adapt the Flesch indices to the Russian language. One such adaptation was introduced by the Russian linguist Irina Osborneva in her study "Mathematical Model for Evaluation of Didactic Texts" (2005). She adapted the Flesch Reading Ease Score formula, but not the Grade Level formula, as the Russian educational system differs from the U.S.

The formula to estimate the Flesch Reading Ease Score for the Russian language is as follows:

$$K = 206,835 - 1,3 \times ASL - 60,1 \times ASW$$

ASL in the formula stands for the average sentence length (total words/total sentences), and ASW is the average number of syllables per word (total syllables/total words),

To assess the readability of ChatGPT's responses in Russian, we will use the online tool progaonline.com. Unfortunately, there is no direct alternative to Readable for the Russian language, and no online tool is capable of estimating the Flesch-Kincaid Grade Level score. Therefore, we will not use this metric for evaluating the readability of ChatGPT responses in Russian.

Here is the example of the comparative table for exploring the results of readability analysis for the responses in Russian:

	Participant 17	Participant 16	Participant 13
1. What is racism	Flesch Reading Ease — 22.74		
	Gunning Fog Index — 20.72	Flesch Reading Ease — 7.98 Gunning Fog Index — 24.7	Flesch Reading Ease — 5.08 Gunning Fog Index — 24.7
	Word Count — 201	Word Count — 61	Word Count — 71
	Sentence Count — 20	Sentence Count — 3	Sentence Count — 3
	Paragraph Count — 7	Paragraph Count — 1	Paragraph Count — 1

	Participant 17	Participant 16	Participant 13
2. What's your opinion on the importance of privacy in the digital age?	Flesch Reading Ease — 23.97 Gunning Fog Index — 22 Word Count — 286 Sentence Count — 28 Paragraph Count — 9	Flesch Reading Ease — 18.43 Gunning Fog Index — 23.73 Word Count — 248 Sentence Count — 24 Paragraph Count — 8	Flesch Reading Ease — 33.36 Gunning Fog Index — 22.23 Word Count — 267 Sentence Count — 25 Paragraph Count — 8
3. Is happiness possible?	Flesch Reading Ease — 30.7 Gunning Fog Index — 20.86 Word Count — 251 Sentence Count — 23 Paragraph Count — 8	Flesch Reading Ease — 7.62 Gunning Fog Index — 24.66 Word Count — 215 Sentence Count — 15 Paragraph Count — 11	Flesch Reading Ease — 8.52 Gunning Fog Index — 24.85 Word Count — 162 Sentence Count — 14 Paragraph Count — 5

Table 8. Results of readability analysis for ChatGPT responses in Russian.

In Table 7, we use colours to mark deviations in answers compared to others. The blue colour indicates that the answer has a Flesch Reading Ease score higher than other responses. These responses, unlike others, are not extremely difficult to read, but merely difficult, as they have a Flesch Reading Ease score above 30.

On the other hand, responses in English can be also evaluated with Flesch-Kincaid Grade Level, so the comparative table of readability metric for English is as follows:

	Participant 20	Participant 23	Participant 12
1. What is racism?	Flesh-Kincaid Grade Level — 18.5 Gunning Fog Index — 20.3 Flesch Reading Ease — -4.3 Word Count — 243 Sentence Count — 13 Paragraph Count — 7 Sentences over 30 syllables — 9	Flesh-Kincaid Grade Level — 16.4 Gunning Fog Index — 17.8 Flesch Reading Ease — 4.9 Word Count — 262 Sentence Count — 17 Paragraph Count — 7	Flesh-Kincaid Grade Level — 14.5 Gunning Fog Index — 15 Flesch Reading Ease — 9.4 Word Count — 396 Sentence Count — 39 Paragraph Count — 31
2. What's your opinion on the importance of privacy in the digital age?	Flesh-Kincaid Grade Level — 15.7 Gunning Fog Index — 19.7 Flesch Reading Ease — 11.9 Word Count — 329 Sentence Count — 20 Paragraph Count — 9	Flesh-Kincaid Grade Level — 16.5 Gunning Fog Index — 19.9 Flesch Reading Ease — 11.9 Word Count — 392 Sentence Count — 20 Paragraph Count — 8	Flesh-Kincaid Grade Level — 15.9 Gunning Fog Index — 18.8 Flesch Reading Ease — 16.8 Word Count — 320 Sentence Count — 16 Paragraph Count — 10

	Participant 20	Participant 23	Participant 12
age?			
3. Is happiness possible?	Flesh-Kincaid Grade Level — 16.2 Gunning Fog Index — 19. Flesch Reading Ease — 7.7 Word Count — 276 Sentence Count — 17 Paragraph Count — 8	Flesh-Kincaid Grade Level — 14.6 Gunning Fog Index — 16.4 Flesch Reading Ease — 18.0 Word Count — 469 Sentence Count — 30 Paragraph Count — 23	Flesh-Kincaid Grade Level — 13.1 Gunning Fog Index — 15.7 Flesch Reading Ease — 22.5 Word Count — 335 Sentence Count — 28 Paragraph Count — 25

Table 9. Results of readability analysis for ChatGPT responses in English.

Furthermore, there are several linguistic methods of linguistic quantitative analysis of texts, such as N-gram analysis, Named Entity Recognition, Sentiment analysis, Latent Dirichlet Allocation, etc. This research is limited in time, resources, and computational capabilities, and some of the analysis, such as Named Entity Recognition, is irrelevant to this particular example. Hence, we will use the following techniques that are suitable for our constraints:

- Keyword Frequency Analysis;
- Thematic Analysis.

Keyword frequency analysis is used in text analysis and Natural Language Processing (NLP). The term ‘keyword’ was introduced by Scott (1997) and defined as ‘a word which occurs with unusual frequency in a given text’. Gries (2016: 12; 2021: 1-2) identifies it as “words that are (significantly) overrepresented” in a text or a corpus of texts.

To analyse the keywords in ChatGPT responses, we will use the online tool WordCounter, which has demonstrated good performance with both Russian and English languages. This tool provides details about the given text, such as the number of words, sentences, and paragraphs, as well as keyword density, including one-word, two-word, and three-word examples. WordCounter (<https://wordcounter.net/>) will allow us to count the number of times each word or phrase appears in a ChatGPT response and identify the most relevant and significant words in the text. After collecting all the results, we will be able to compare them to quantify the differences in ChatGPT responses.

Thematic analysis is a method of identifying, analysing, structuring, describing and reporting themes found in a data set (Braun & Clarke, 2006: 6). It is useful for summarising key features of the texts, as it allows for the reduction of a big text to several codes, helping to produce a clear and structured final report. Thematic analysis allows us to define themes in a text or a data set, and organise them for further interpretation (King 2004: 206). It is crucial to keep in mind, though, the role of the researcher, as his judgment about coding, theming, decontextualising and recontextualising the data becomes the instrument for analysis as well (Starks & Trinidad, 2007: 1372-1376).

Nowell et al. (2017: 4) proposed the following criteria and phases of Thematic Analysis, based on Lincoln and Guba's (1985: 289-331) criteria of trustworthiness:

Phases of Thematic Analysis	Means of Establishing Trustworthiness
Phase 1: Familiarizing yourself with your data	<ul style="list-style-type: none"> ● Prolong engagement with data ● Triangulate different data collection modes ● Document theoretical and reflective thoughts ● Document thoughts about potential codes/themes ● Store raw data in well-organized archives ● Keep records of all data field notes, transcripts, and reflexive journals
Phase 2: Generating initial codes	<ul style="list-style-type: none"> ● Peer debriefing ● Researcher triangulation ● Reflexive journaling ● Use of a coding framework ● Audit trail of code generation ● Documentation of all team meetings and peer debriefings
Phase 3: Searching for themes	<ul style="list-style-type: none"> ● Researcher triangulation ● Diagramming to make sense of theme connections ● Keep detailed notes about the development and hierarchies of concepts and themes
Phase 4: Reviewing themes	<ul style="list-style-type: none"> ● Researcher triangulation ● Themes and subthemes vetted by team members ● Test for referential adequacy by returning to raw data
Phase 5: Defining and naming themes	<ul style="list-style-type: none"> ● Researcher triangulation ● Peer debriefing ● Team consensus on themes ● Documentation of team meetings regarding themes ● Documentation of theme naming
Phase 6: Producing the report	<ul style="list-style-type: none"> ● Member checking ● Peer debriefing ● Describing the process of coding and analysis in sufficient details ● Thick descriptions of context ● Description of the audit trail

Phases of Thematic Analysis	Means of Establishing Trustworthiness
	<ul style="list-style-type: none"> ● Report on reasons for theoretical, methodological, and analytical choices throughout the entire study

Table 10. The Phases of Thematic Analysis (Lincoln and Guba 1985).

After the readability, keyword frequency, and thematic analyses are concluded, we will compare the results of each response across the participants to identify any recurring patterns that might be influenced by the participants' previous interactions with the model. We will also explore patterns in the responses to understand if the keywords, readability level, and theme variability depend on the user's previous interactions with the model. We will do so by comparing users with similar metrics according to the variables established in the qualitative phase: place of origin and current residence, level of education, field of work or study, level of ChatGPT understanding, purposes of ChatGPT use, prompting knowledge, language proficiency and information about the account used with ChatGPT

In the final subchapter of the quantitative experiment, we will outline the conclusions and possible ways to continue this research to explore the phenomena more deeply.

5.2. Readability analysis of ChatGPT responses.

5.2.1. Responses in Russian.

As mentioned in Subchapter 6.1, we evaluated the responses in both languages for their readability, using the following metrics:

- The Flesch Reading Ease Score;
- The Flesch–Kincaid Grade Level;
- The Gunning For Index;
- Word count;
- Sentence count;
- Paragraph count.

These metrics were used to assess the complexity and the length of ChatGPT responses, to see if their variability can be caused by the previous interactions of the participants with the model.

The Gunning Fog Index estimates the years of formal education required to understand the text — the higher scores correspond to a higher complexity of the texts. The Flesch Readability correlates readability with a U.S. school grade level, considering sentence length and the number of syllables per word. Finally, the Flesch Reading Ease Score helps to assess the complexity of the texts. All three metrics help us evaluate the accessibility of ChatGPT's responses for users with different educational backgrounds and levels of education.

Firstly, we will conduct the exploratory data analysis, computing the minimum, maximum and mean for each metric separately for each of the three questions.

1. Question 1: "What is racism?".

Table 11 represents the readability analysis for Question 1: "What is Racism?":

Metric	Minimum	Maximum	Mean
Gunning Fog Index	20.39	28.14	23.35
Flesch Reading Ease	6	18	10.53
Word Count	52	272	137.67
Sentence Count	3	22	10.36
Paragraph Count	1	12	4.73

Table 11. Readability metrics for the responses to the question "What is racism?" in Russian.

2. Question 2: "What's your opinion on the importance of privacy in the digital age?".

Here are the metrics for the second question:

Metric	Minimum	Maximum	Mean
Gunning Fog Index	20.69	26.85	23.57
Flesch Reading Ease	2	24	13.67
Word Count	83	358	224.50
Sentence Count	5	33	21.08
Paragraph Count	1	14	7.25

Table 12. Readability metrics for the responses to the question "What's your opinion on the importance of privacy in the digital age?" in Russian.

3. Question 3: "In happiness possible?".

Here are the metrics for the last question:

Metric	Minimum	Maximum	Mean
Gunning Fog Index	15.31	24.85	21.68
Flesch Reading Ease	-7	48	15
Word Count	65	336	172.25
Sentence Count	4	41	16.42
Paragraph Count	1	14	7.25

Table 13. Readability metrics for the responses to the question "Is happiness possible?" in Russian.

The exploratory data analysis reveals that the Gunning Fog index is very high for all the answers, indicating that only college graduate students can understand them. All three mean indexes are higher than 20, corresponding to the level of scientific texts and research papers.

The minimum Flesch Reading Ease score is very low at -7, while the mean score is lower than 30, indicating that ChatGPT responses are extremely difficult to read. The only exceptions are four answers to the question "What is happiness?". They have a Reading Ease score higher than 30, suggesting that these responses are slightly easier to read.

We hypothesised that significant insights might be based on the length of the responses and their structure, such as division into paragraphs and bullet points. However, neither the length of the answers nor the number of paragraphs influences the readability and complexity of the answers.

Overall, the responses to the question "What is happiness?" exhibit both the highest and the lowest figures across various metrics, and these variations do not seem to repeat across different questions for the same participant. Furthermore, the participants with the highest scores for this question don't have obvious similarities collected in the qualitative phase. Therefore, we cannot claim that this variability can be explained by the participants' previous interactions with the model.

5.2.2. Responses in English.

We repeated the same steps for the responses in English for three different questions.

1. Question 1: "What is racism?".

Here is the readability analysis for the first question:

Metric	Minimum	Maximum	Mean
Gunning Fog Index	15	25.4	19.96
Flesch-Kincaid Grade Level	14.5	20.94	17.69
Flesch Reading Ease	-4.3	16.9	4.25
Word Count	10	396	214.8
Sentence Count	3	39	13.6
Paragraph Count	1	31	8.4

Table 14. Readability metrics for the responses to the question "What is racism?" in English.

2. Question 2: "What's your opinion on the importance of privacy in the digital age?".

Here are the metrics for the second question:

Metric	Minimum	Maximum	Mean
Gunning Fog Index	15.5	21.3	18.62
Flesch-Kincaid Grade Level	12.8	17.5	15
Flesch Reading Ease	6.2	26.3	16.72
Word Count	143	433	339.33
Sentence Count	8	35	21.87
Paragraph Count	4	20	10.87

Table 15. Readability metrics for the responses to the question "What's your opinion on the importance of privacy in the digital age?" in English.

3. Question 3: "Is happiness possible?"

Here are the metrics for the last question:

Metric	Minimum	Maximum	Mean
Gunning Fog Index	14.3	16.3	14.26
Flesch-Kincaid Grade Level	12	16.3	14.26
Flesch Reading Ease	2.8	33.1	19.86
Word Count	21	469	261.2
Sentence Count	2	30	17.1
Paragraph Count	1	25	11.2

Table 16. Readability metrics for the responses to the question "Is happiness possible?" in English.

The mean Gunning Fog index is high, above 14 points, indicating that ChatGPT responses in English are clear to college students and above. The English language responses to the third question were more readable, while the responses to the first question were less readable, with several negative scores.

Participant 10, with responses in both German and English, did not show any significant variability compared to others, although the responses in German are slightly less readable than those in English, which may be explained by the fact that we used a third tool for estimating these metrics for German language (<https://gowinston.ai/de/lesbarkeitspruefer/>).

Overall, the texts correspond to the level of academic papers and advanced reading material. Four answers to the question "Is happiness possible?" are slightly easier to read than other responses, but the evidence is not sufficient to conclude that the differences in readability are caused by the participants' previous interactions with the model.

5.2.3. Observations and conclusions.

After conducting the readability analysis, we couldn't prove the initial assumption that ChatGPT's answers depend on previous interactions with the same account. All accounts received difficult- or extremely difficult-to-read responses, comparable in complexity to academic papers, and understandable by college students and postgraduates. This indicates that ChatGPT is exclusively a tool for individuals with a high level of education.

However, we can make several observations from the data analysis. Firstly, the responses in Russian are less readable than those in English, according to the mean Gunning Fog Index and the overall Readability score. That can be explained by the complexity of training texts and the higher complexity of Russian language over English. Besides, English is a lingua Franca for academic research, which results in many non-native English speakers writing their scientific works in simpler English. Furthermore, Korotkina (2021: 19) claims that until recently, academic writing was not a part of university curricula in Russian higher institutions, leading to the higher complexity of academic texts.

In addition, responses in English tend to be longer than those in Russian, which can be explained partly by the fact that the model performs better in English and has more training data in English.

Moreover, the responses to the third question show greater variability in length, complexity, and structure. This can be partly explained by the ambiguous nature of the question, which can be approached from different perspectives and cover various aspects. Additionally, the question about racism seeks a definition, which explains the formality of the answers. The question about privacy in the digital age was intended to provoke the model into sharing "personal" opinions on the matter, but ChatGPT instead provided a comprehensive analysis of all aspects of privacy in the digital age. The question about happiness, on the other hand, is the only one that can have a more personalised touch without requiring additional information for the model to consider.

Nonetheless, it is necessary to consider that these readability metrics are sometimes considered outdated, as they were developed more than 50 years ago and primarily to assess the complexity of texts in school books (Redish, 2000, p. 133). Choi and Crossley (2022, p. 2) mention that readability formulas are limited to only one of three dimensions of readability: qualitative, quantitative, or reader and task. They conclude that readability formulas cannot be perceived as exhaustive evaluators of text complexity. We acknowledge these limitations along with differences in tools. While the outcomes of the readability analysis may sometimes be inaccurate, the analysis of 72 responses consistently shows a high level of complexity and can be perceived as a starting point for future in-depth investigation.

In conclusion, while the responses demonstrate variability in readability levels, this variability cannot be attributed to the participants' previous interactions with the model.

5.3. Keyword analysis of ChatGPT responses.

5.3.1. Responses in Russian.

Keyword frequency analysis involves counting the occurrence of specific words or phrases within the text. By analysing these keyword frequencies, we can identify patterns that might prove or disprove the assumption that ChatGPT's responses are based on previous interactions.

We conducted a keyword analysis for the responses in Russian and English using the platform WordCounter (<https://wordcounter.net/>). We then added the keywords and key phrases (up to 3 words in the phrase) to a comparative keyword analysis table.

Further on we will provide a detailed description and analysis of the outcomes.

1. Analysis of Keywords in Responses for "What is Racism?"

Participants 2, 5, 6, 7, 13, and Test account (4o) demonstrated a high frequency of the term "racism". The highest occurrences have participants 2, 5, and Test account (4o) (7-8 times). Participants 2, 5, and Test account (4o) provide the most detailed responses, including a large variety of keywords such as "ethnic", "examples", "racial slurs", and "combating racism". Participants 1, 4, 9, 14, and 16 offer brief responses. These participants focus minimally on the term "racism" and associated concepts like "level" and "inequality". Overall, the keyword analysis demonstrated variability in the amount of detail provided in the responses and their focus.

2. Analysis of Keywords in Responses for "What's your opinion on the importance of privacy in the digital age?"

The most repetitive keywords are "data" and "privacy", which is understandable, considering the main focus of the questions. Among other frequent keywords, there are "users", "information", and "data protection". Participants 6 and 4 have the shortest responses with fewer keywords and less details. Participants 1, 13, 12, and 9 provide detailed responses, focusing on data protection, privacy breaches, user control, and balance between convenience and security.

3. Analysis of Keywords in Responses for "Is happiness possible?"

Participants frequently mentioned "happiness". Participants 1, 7, and 10 have the highest occurrences of the term (8-9 times). Participants 1, 3, 10, and Test account (3.5) provide detailed responses, mentioning various aspects of happiness, such as life, social connections, achieving happiness, and factors influencing it. Participants 4, 5, and 8 have the shortest responses, without additional elaboration on the term. Participants 1, 3, 5, 9, and 14 emphasise the importance of social connections and life in the context of happiness, discussing how these elements contribute to overall well-being.

5.3.2. Responses in English.

1. Analysis of Keywords in Responses for "What is Racism?".

Participants mentioned "racism" most frequently, with participants 12, 14, 23, and the Test account (3.5) using it more than 10 times. The terms "racial" and "race" also appeared frequently, which is understandable given the focus of the question. Participants 23 and 8 placed a strong emphasis on the systemic nature of racism, while participants 12, 21, and 24 had a more balanced emphasis on individual and institutional aspects. Overall, there is considerable variability in the responses, with various focuses and perspectives on racism, resulting in highlighting different keywords.

2. Analysis of Keywords in Responses for "What's your opinion on the importance of privacy in the digital age?".

The keyword "privacy" consistently has the highest frequency among all the responses, the count ranges from 5 to 14 times. It is understandable, as it emphasises the core theme of the question, along with terms like "digital", "personal" and "data". Participants 3 and 24 have the highest variabilities of keywords, and participants 21 and 8 have less variability. Some participants have rare keywords, covering such aspects as data protection, ethical considerations, or the impact on individuals.

3. Analysis of Keywords in Responses for "Is happiness possible?".

Across all participants, the most frequent keyword is "happiness", which reflects the central topic of the question. Among other frequent words, there are "life", "positive", "factors", "relationships", and "well-being". Participants 12 and 23 have the highest variability of keywords, while participant 19 has only the words that occur 1 time.

5.3.3. Observations and conclusions.

The Keyword analysis of ChatGPT responses across different participants and three questions was aimed at defining the most frequent words in every response, which can provide insights into the focus of each response or the main themes covered in it. The patterns found in the responses of both language groups are not consistent enough to prove the assumption of the dependence of ChatGPT responses on the previous interactions with the same account.

In addition, the most frequent keywords are the ones that reflect the main focus of the responses, already provided in the question. Therefore, keyword analysis provides only surface-level insights into the content of the responses. The analysis lacks contextual information and overlooks the possible variability in expressing the same concepts, and for the Russian language, the tool perceives different forms of the same word as different keywords.

Some limitations of the keyword analysis will be mitigated in the thematic analysis, where we will get a deeper contextual understanding of the responses.

In conclusion, while keyword analysis serves as a useful starting point for analysing ChatGPT responses, it cannot be perceived as exhaustive without further thematic analysis.

5.4. Thematic analysis of ChatGPT responses.

This subsection is dedicated to a thematic analysis of ChatGPT responses in Russian and English. The thematic analysis allows us to identify recurring themes and patterns, which can be compared to determine if previous interactions influence the model's answers. We compared responses to the same question across different participants and examined whether the similarities among several participants repeat across different questions.

We analysed the responses of both language groups, outlined the results, and then compared them across the two languages. To conduct the analysis, we followed the steps created by Nowell et al. (2017, p. 4) and represented in Table 10.

To start with, we read through the responses once again to gain an overall sense of the content. We analysed the responses in Russian first and then proceeded with the responses in English.

5.4.1. Responses in Russian.

The first question asked by the participants was, "What is racism?" All the responses define racism with varying degrees of depth, covering different aspects of the phenomenon. From the data, we identified repetitive themes and concepts to generate the following initial codes. After defining the recurring themes, we reviewed them and formulated the final code list:

- Belief System/Ideology: Codes related to the notion of racism as a belief system or ideology.
- Forms of Racism: Codes describing the existing forms of racism, including individual, institutional, systemic, cultural, and interpersonal.
- Manifestations of Racism: Codes that include the ways racism manifests, such as discrimination, bias, stereotypes, and violence.
- History and Context: Codes that provide information about historical contexts, including slavery and colonialism.
- Impacts of Racism: Consequences of racism in social, economic, and psychological spheres.
- Anti-Racism Strategies: Codes providing ways of fighting racism.

To visualise the outcomes of the thematic analysis, we created a comparative table that represents all the codes, all the participants and the codes that each response has or doesn't have. The outcomes can be seen in Table 17.

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
17	✓ Ideological Aspect	✓ Personal, Systemic	✓ Prejudice, stereotypes, bias, discrimination, inequality	✓ Colonialism, slavery, imperialism	✓ Discriminative laws, politics, education, healthcare, living conditions, economic opportunities, social and economic inequality	
16	✓ Belief in superiority	✓ Individual, Systemic, Explicit, Implicit, Cultural	✓ Discrimination, bias			
13	✓ Belief in superiority	✓ Individual, Systemic,	✓ Discrimination, bias, hostility, inequality		✓ Discriminative laws, politics	✓
7	✓ Belief in superiority	✓ Individual, Systemic, Cultural	✓ Discrimination, bias, hostility,		✓ Social, economic and psychological consequences	✓ Educational and policy changes, active opposition
2	✓ Belief in superiority	✓ Individual, Systemic	✓ Discrimination, bias, inequality, discrimination	✓ Colonialism, slavery		✓ Awareness, active opposition, policy changes
9	✓ Belief in superiority	✓ Individual, Systemic, Cultural	✓ Discrimination, bias, violence, injustice, inequality	✓ Colonialism, slavery, segregation		✓ Awareness, active opposition, policy education, promotion of equality
6	✓ Belief in	✓ Individu	✓ Discrimi			

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
	superiority, Ideological Aspect	al, Systemic	nation, bias, inequality			
1	✓ Ideological Aspect	✓ Individual, Systemic	✓ Discrimination, bias, violence, inequality			✓✓ Awareness, active opposition, promotion of equality
4	✓ Belief in hierarchy	✓ Individual, Systemic	✓ Discrimination, harassment, disenfranchisement			
5	✓ Ideological Aspect	✓ Individual, Systemic	✓ Discrimination, violence, harassment			
14	✓ Ideological Aspect	✓ Individual, Cultural, Systemic, Implicit, Explicit	✓ Discrimination, bias, hostility, violence	✓ Colonialism, slavery, imperialism	✓ Discriminative laws, education, healthcare, justice system	✓ Education, policy, changes, promotion of equality, active opposition
15.1	✓ Belief in superiority	✓ Individual, Systemic	✓ Discrimination, bias, hostility, stereotypes		✓ Discriminative laws, politics	
15.2	✓ Belief in superiority	✓ Individual, Systemic	✓ Discrimination, harassment, race privileges		✓ Unequal access to resources, opportunities and privileges.	✓ Awareness, education, active opposition, promotion of equality
Test account 1	✓ Belief in superiority	✓ Individual, Systemic, Explicit, Implicit,	✓ Discrimination, harassment, violence	✓		

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
Test account 2	✓ Ideological Aspect	✓ Individual, Systemic, Internal	✓ Discrimination, bias inequality	✓ Colonialism, slavery		✓ Active opposition, promotion of equality

Table 17. Comparative Table with the Codes Defined Through Thematic Analysis for the question "What is racism" in Russian.

To determine the differences in ChatGPT responses, we marked table cells with content as 1 and table cells that don't have the code in this participant's response as 0. Then we dropped all the columns that were equal for all the participants. They are the columns including the codes about racism being a belief system, the forms of racism and the manifestations of racism. We dropped the columns because only the ones with different outcomes are interesting for our research. Here is how the binary table looks like:

Participant	History and Context	Impacts of Racism	Anti-Racism Strategies
17	1	1	0
16	0	0	0
13	0	1	1
7	0	1	1
2	1	0	1
9	1	0	1
6	0	0	0
1	0	0	1
4	0	0	0
5	0	0	0
14	1	1	1
15.1	0	1	0
15.2	0	1	1
Test account 1	1	0	0
Test account 2	1	0	1

Table 18. Binary Table to Explore the Differences in ChatGPT Responses to the Question "What is Racism?" in Russian.

To determine which participants have the same response patterns, we compared each row in the table for matching patterns. The outcomes of the comparison are as follows:

1. Pattern 1-1-0:
 - Participant 17
2. Pattern 0-0-0:
 - Participant 16
 - Participant 6
 - Participant 4
 - Participant 5
3. Pattern 0-1-1:
 - Participant 13
 - Participant 7
 - Participant 15.2
4. Pattern 1-0-1:
 - Participant 2
 - Participant 9
 - Test account 2
5. Pattern 0-0-1:
 - Participant 1
6. Pattern 1-1-1:
 - Participant 14
7. Pattern 0-1-0:
 - Participant 15.1
8. Pattern 1-0-0:
 - Test account 1

We attempted to identify similarities among the participants within each group that exhibited the same patterns of answers. However, we did not find any definitive evidence or obvious similarities in their understanding of ChatGPT, fields of work or study, purposes of usage, accounts used with the model, or styles of questioning. We will continue this analysis for each question in Russian and then explore if there are recurring similarities among the same groups of participants.

Afterwards, we conducted a similar thematic analysis for the responses to the question, "What's your opinion on the importance of privacy in the digital age?" The following codes were identified after a thorough analysis of the responses:

- Data Collection and Usage: Codes related to the amount of data collected and stored in the digital age.
- Security and Cyber Threats: Codes that include information about potential threats due to a lack of security.
- Legislation and Regulation: Codes that encompass information about necessary legislation and regulation in the area of data privacy.

- User Awareness and Control: Codes that emphasise the importance of users' control and awareness regarding data privacy.
- Ethical and Corporate Responsibility: Codes that include information about the ethical components of data privacy.
- Balance between Convenience and Privacy: Codes that highlight the importance of balancing the advantages and disadvantages of data collection and usage.
- Technological Solutions: Codes related to potential technological solutions to current problems.

We then collected all the outcomes in the comparative table below:

Participant	Data Collection and Usage	Security and Cyber Threats	Legislation and Regulation	User Awareness and Control	Ethical aspects	Balance between Convenience and Privacy	Technological Solutions
17	✓	✓	✓	✓	✓	✓	✓ Encryption, anonymisation, secure protocols
16	✓	✓	✓	✓	✓	✓	
13	✓	✓	✓	✓	✓	✓	
7		✓	✓	✓	✓	✓	✓ Complex passwords, Two-factor authentication
2	✓	✓	✓	✓	✓		
9	✓	✓		✓	✓		✓ VPN, data encryption
6	✓		✓	✓	✓		
1	✓	✓	✓	✓	✓	✓	
4	✓		✓			✓	
5	✓	✓	✓		✓		

Participant	Data Collection and Usage	Security and Cyber Threats	Legislation and Regulation	User Awareness and Control	Ethical aspects	Balance between Convenience and Privacy	Technological Solutions
14	✓	✓	✓	✓	✓	✓	✓ Complex passwords , Two-factor authentication, VPN
15.1	✓	✓	✓	✓		✓	✓ Encryption, blockchain, anonymisation
15.2	✓	✓	✓		✓		✓ Complex passwords , Software updates, encryption
Test account 1	✓		✓	✓		✓	✓ Complex passwords , encryption
Test account 2	✓	✓	✓	✓	✓	✓	✓ Privacy by design

Table 19. Comparative Table with the Codes Defined Through Thematic Analysis for the question "What's your opinion on the importance of privacy in the digital age?" in Russian.

In the next step, we converted all the answers into a binary format. This time, we couldn't drop any columns, resulting in a larger variety of recurring patterns, as can be seen in the binary table below:

Participant	Data Collection and Usage	Security and Cyber Threats	Legislation and Regulation	User Awareness and Control	Ethical aspects	Balance between Convenience and Privacy	Technological Solutions
17	1	1	1	1	1	1	1
16	1	1	1	1	1	1	0
13	1	1	1	1	1	1	0
7	0	1	1	1	1	1	1
2	1	1	1	1	1	0	0
9	1	1	0	1	1	0	1
6	1	0	1	1	1	0	0
1	1	1	1	1	1	1	0
4	1	0	1	0	0	1	0
5	1	1	1	0	1	0	0
14	1	1	1	1	1	1	1
15.1	1	1	1	1	0	1	1
15.2	1	1	1	0	1	0	1
Test account 1	1	0	1	1	0	1	1
Test account 2	1	1	1	1	1	1	1

Table 20. Binary Table to Explore the Differences in ChatGPT Responses to the Question "What's your opinion on the importance of privacy in the digital age?" in Russian.

We discovered the following patterns in the responses:

1. Pattern 1-1-1-1-1-1-1:
 - Participant 17
 - Participant 14
 - Test account 2
2. Pattern 1-1-1-1-1-1-0:
 - Participant 16
 - Participant 13
 - Participant 1
3. Pattern 0-1-1-1-1-1-1:

- Participant 7
- 4. Pattern 1-1-1-1-1-0-0:
- Participant 2
- 5. Pattern 1-1-0-1-1-0-1:
- Participant 9
- 6. Pattern 1-0-1-1-1-0-0:
- Participant 6
- 7. Pattern 1-0-1-0-0-1-0:
- Participant 4
- 8. Pattern 1-1-1-0-1-0-0:
- Participant 5
- 9. Pattern 1-1-1-1-0-1-1:
- Participant 15.1
- 10. Pattern 1-1-1-0-1-0-1:
- Participant 15.2
- 11. Pattern 1-0-1-1-0-1-1:
- Test account 1

Finally, we repeated the same steps with the responses to the question "What is happiness?" and identified the following codes:

- Possibility of Happiness: Direct answers to the question.
- Factors: Factors that affect happiness.
- Approaches: Perspectives and approaches in defining happiness.
- Practices: Practical ways of achieving happiness.
- Social Relationships: Mention of social relations.
- Self-Realisation: Influence of achievements and realisation on happiness.
- Health and Wellbeing: Influence of physical and mental health on happiness.
- Material Aspects: Role of financial stability in achieving happiness.
- Existential Meaning and Purpose: Role of life purpose or spiritual views in achieving happiness.
- Nature: Descriptions of the nature of happiness.

We then created a comparative table to visualise the outcomes of the thematic analysis for each participant:

Participant	Possibility	Factors	Approaches	Practices	Social Relationships	Self-Realisation	Health and Wellbeing	Material Aspects	Existential Meaning and Purpose	Nature
17		✓ Personal beliefs		✓ Positive thinking	✓ Family, friend	✓ Personal goals,	✓ Physical, mental	✓ Financial stability	✓ Purpose, goals	✓ Dynamic

Participant	Possibility	Factors	Approaches	Practices	Social Relationships	Self-Realisation	Health and Wellbeing	Material Aspects	Existential Meaning and Purpose	Nature
		, surroundings, circumstances, internal state		ng, gratitude	s, community	work-life balance	health	y		
16			✓ Philosophical,, Psychological, religious		✓ Family, friends, community		✓ Physical, mental health			
13	✓ Possible	✓ Personal beliefs, traditions, circumstances, External and internal	✓ Philosophical,, Psychological, Socio-economic,	✓ Gratitude, mindfulness	✓ Social connections	✓ Self-realisation, virtuous life		✓ Financial stability		
7	✓ Possible	✓ External, Internal		✓ Personal values, positive emotions, being involved	✓ Social connections	✓ Self-realisation,	✓ Health		✓ Purpose	✓ Dynamic, subjective

Participant	Possibility	Factors	Approaches	Practices	Social Relationships	Self-Realisation	Health and Wellbeing	Material Aspects	Existential Meaning and Purpose	Nature
2	✓ Possible	✓ External, Internal	✓ Philosophical,, Psychological,	✓ Positive thinking, mindfulness, gratitude, emotional regulation	✓ Family, friends	✓ Self-realisation			✓ Purposes	✓ Multifacet , subjective
9	✓ Possible	✓ Personal beliefs , surroundings , goals, circumstances, traditions	✓ Philosophical,, Psychological,	✓ Emotional regulation, control of desires, positive emotions, mindfulness,	✓ Social connections, family, friends	✓ Personal goals,		✓ Financial stability		✓ Subjective state, multifacet,
6					✓ Social connections	✓ Career, self-improvement				✓ Multifacet
1	✓ Possible		✓ Philosophical,, Psychological, Cultural, Personal	✓ Harmony, mindfulness	✓ Social connections, family	✓ Career			✓ Purpose, spirituality	✓ Multifacet , subjective

Participant	Possibility	Factors	Approaches	Practices	Social Relationships	Self-Realisation	Health and Wellbeing	Material Aspects	Existential Meaning and Purpose	Nature
4	✓ Possible			✓ Carpe diem,	✓ Social connections	✓ Self-realisation				✓ Temporary,
5	✓ Possible	✓ Personal beliefs, emotional state, External factors		✓ Gratitude, meditation, physical activities	✓ Social connections	✓ Career, goals	✓ Healthy lifestyle			
14	✓ Possible	✓ Personal beliefs,	✓ Philosophical, religious, spiritual	✓ Gratitude,	✓ Social connections, family, friends, partner	✓ Goals, career, self-improvement	✓ Physical, mental health	✓ Financial stability	✓ Purpose, spirituality	
15.1	✓ Possible		✓ Philosophical, psychological	✓ Positive emotions, carpe diem	✓ Social connections	✓ Self-realisation, goals, self-improvement		✓ Financial stability	✓ Purpose	✓ Subjective
15.2			✓ Philosophical, psychological, cultural, personal	✓ Positive emotions, mindfulness, harmony	✓ Social connections	✓ Goals	✓ Physical, mental health		✓ Purpose	

Participant	Possibility	Factors	Approaches	Practices	Social Relationships	Self-Realisation	Health and Wellbeing	Material Aspects	Existential Meaning and Purpose	Nature
			beliefs, experience, perceptions							
Test account 1			✓ Philosophical, emotional, external, internal	✓ Carpe diem	✓ Social connections	✓ Self-realisation, career		✓ Financial stability		✓ Subjective, relative
Test account 2	✓ Possible		✓ External, internal	✓ Emotion regulation, gratitude, help	✓ Social connections	✓ Self-realisation, self-improvement	✓ Physical, mental health		✓ Purpose	

Table 21. Comparative Table with the Codes Defined Through Thematic Analysis for the question "What is happiness?" in Russian.

After we created a binary table to compare the differences, we dropped the column "Social Relationships", as the outcomes for equal for all participants, and analysed the following binary table:

Participant	Possibility	Factors	Approaches	Practices	Self-Realisation	Health and Wellbeing	Material and Economic Stability	Existential Meaning and Purpose	Nature
17	0	1	0	1	1	1	1	1	1
16	0	0	1	0	0	1	0	0	0
13	1	1	1	1	1	0	1	0	0

Participant	Possibility	Factors	Approaches	Practices	Self-Realisation	Health and Wellbeing	Material and Economic Stability	Existential Meaning and Purpose	Nature
7	1	1	0	1	1	1	0	1	1
2	1	1	1	1	1	0	0	1	1
9	1	1	1	1	1	0	1	0	1
6	0	0	0	0	1	0	0	0	1
1	1	0	1	1	1	0	0	1	1
4	1	0	0	1	1	0	0	0	1
5	1	1	0	1	1	1	0	0	0
14	1	1	1	1	1	1	1	1	0
15.1	1	0	1	1	1	0	1	1	1
15.2	0	0	1	1	1	1	0	1	0
Test account 1	0	0	1	1	1	0	1	0	1
Test account 2	1	0	1	1	1	1	0	1	0

Table 22. Binary Table to Explore the Differences in ChatGPT Responses to the Question "What is happiness?" in Russian.

To our surprise, there were no identical patterns, and each participant received a different set of codes from the model. Based on the thematic analysis of the three questions asked to ChatGPT in Russian by 12 participants and two test accounts, we did not find recurring patterns that could be explained by the account used to ask the question. In the following subchapter, we will conduct the same analysis with responses in English.

5.4.2. Responses in English.

We used the same thematic analysis for the responses in English. Firstly, we analysed the recurring themes in the responses to the question, "What is racism?". An interesting phenomenon occurred with the questions asked in English: participant 10 had personal settings for ChatGPT answers, requesting the model to respond only in German. Therefore, we asked the participant to send us both the responses to the

prepared questions provided by the model in German and the answers to the adjusted questions (specifying that the response should be in English). We added these to the table as 10.1 for responses in German and 10.2 for responses in English.

The codes we identified for the responses in English are the same as those for the responses in Russian:

- **Belief System/Ideology:** Codes related to the notion of racism as a belief system or ideology.
- **Forms of Racism:** Codes describing the existing forms of racism, including individual, institutional, systemic, cultural, and interpersonal.
- **Manifestations of Racism:** Codes that include the ways racism manifests, such as discrimination, bias, stereotypes, and violence.
- **History and Context:** Codes that provide information about historical contexts, including slavery and colonialism.
- **Impacts of Racism:** Consequences of racism in social, economic, and psychological spheres.
- **Anti-Racism Strategies:** Codes providing ways of fighting racism.

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
20	✓ Belief in superiority, ideology	✓ Personal, Systemic, Cultural, Internalised	✓ Prejudice, stereotypes, discrimination, inequality, biases, racial slurs, stereotyping, self-hatred	✓	✓ Discriminative policies, practices and procedures within institutions, disparities in education and healthcare, housing, employment, criminal justice	✓ Active opposition, education, policy changes, promotion of equity
23	✓ Belief in superiority, ideology	✓ Individual, Systemic, Explicit, Implicit	✓ Discrimination, prejudice, systemic inequalities, bias, slurs, exclusion	✓	✓ Discriminative policies, practices and procedures within institutions, disparities	✓ Recognising, active opposition

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
					in education and healthcare, housing, employment, criminal justice	
12	✓ Belief in superiority, ideology	✓ Individual, Systemic, Implicit, Explicit	✓ Discrimination, prejudice, stereotypes, bias	✓	✓ Discriminative policies, practices and norms, law enforcement, employment, disparities in education, healthcare and access to resources, mental health issues, division and conflict	✓ Education, awareness, policy changes, active opposition, promotion of equity
22	✓ Belief in superiority, ideology	✓ Individual, Systemic, Cultural, Internalised, Explicit, Implicit	✓ Prejudice, discrimination, stereotypes, marginalisation, violence, biases		✓ Disparities in education, healthcare, employment, housing, criminal justice, mental health issues	✓ Educational and policy changes, active opposition
21	✓ Belief in superiority, ideology	✓ Individual, Systemic	✓ Prejudice, discrimination		✓ Attitudes, social practices, policies, disparity in opportunities	

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
					s	
18	✓ Belief in superiority	✓ Individual, Systemic, Cultural, Internalised	✓ Discrimination, prejudice, stereotypes		✓ Disparity in opportunities, discriminatory policies, unequal access to resources	
19	✓ Belief in superiority	✓ Individual, Systemic	✓ Discrimination, prejudice, antagonism		✓ Discriminatory practices, disparity in opportunities	
24	✓ Ideological Aspect	✓ Individual, Systemic	✓ Discrimination, prejudice, antagonism, violence, bias		✓ Discriminatory practices, policies, racial profiling, disparities in employment, healthcare, and education.	✓ Awareness, active opposition
8	✓ Belief in hierarchy, ideology	✓ Individual, Systemic, Cultural, Explicit, Implicit	✓ Discrimination, prejudice, antagonism, prejudice, stereotypes, bias, racial slurs		✓ Discriminatory practices, policies, procedures, disparities in education, legal system, employment, housing, healthcare	✓ Awareness, promoting equity
3	✓ Belief in	✓	✓ Attitudes		✓ Discrimi	✓ Educatio

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
	superiority, ideology	Individual, Systemic, Cultural	, prejudice, discrimination, biases, violence		natory practices, policies, procedures, disparity in resource access, opportunities, rights, mental health issues,	n, policy changes, promoting equity
10.1 (German)	✓ Belief in superiority	✓ Individual, Systemic, Explicit, Implicit	✓ Prejudice, discrimination, violence	✓ Colonial, pseudo-scientific theories	✓ Disparities in education, criminal justice, employment, healthcare	✓ Awareness, active opposition, promoting equity
10.2 (English)	✓ Belief in superiority	✓ Individual, Systemic	✓ Prejudice, discriminations			
11	✓ Belief in superiority, ideology	✓ Individual, Systemic, Cultural, Explicit, Implicit, Intersectionality	✓ Prejudice, discrimination, attitudes, hostility, violence, bias, exclusion, stereotypes	✓ Colonialism, slavery, segregation	✓ Discriminatory practices, policies, disparities in education, healthcare, law enforcement, employment, unequal access to resources, opportunities and rights	✓ Awareness, active opposition, promoting equity
Test account 1	✓ Belief in superiority	✓ Individual, Systemic, Internalised	✓ Discrimination, prejudice, self-hatred		✓ Discriminatory practices	

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
Test account 2	✓ Belief in superiority	✓ Individual, Systemic, Cultural, Internalised, Explicit, Implicit	✓ Discrimination, prejudice, slurs, segregation, biases, exclusion, segregation		✓ Discriminatory practices, policies and procedures, disparities in criminal justice, education, economic situation, healthcare, housing, mental health issues, unequal access to resources and opportunities	✓ Active opposition, promotion of equality, education, policy changes

Table 23. Comparative Table with the Codes Defined Through Thematic Analysis for the question "What is racism" in English.

We then transformed this table into a binary table, and dropped the columns Belief system/Ideology, Forms of Racism, Manifestations of Racism:

Participant	Belief system/Ideology	Forms of Racism	Manifestations of Racism	History and Context	Impacts of Racism	Anti-Racism Strategies
20	1	1	1	1	1	1
23	1	1	1	1	1	1
12	1	1	1	1	1	1
22	1	1	1	0	1	1
21	1	1	1	0	1	0
18	1	1	1	0	1	0
19	1	1	1	0	1	0

Participant	Belief system/Id eology	Forms of Racism	Manifestati ons of Racism	History and Context	Impacts of Racism	Anti-Ra cism Strategi es
24	1	1	1	0	1	1
8	1	1	1	0	1	1
3	1	1	1	0	1	1
10.1 (German)	1	1	1	1	1	1
10.2 (English)	1	1	1	0	0	0
11	1	1	1	1	1	1
Test account 1	1	1	1	0	1	0
Test account 2	1	1	1	0	1	1

Table 24. Binary Table to Explore the Differences in ChatGPT Responses to the question "What is Racism?" in English.

Unlike in previous responses, there are only four distinct patterns:

1. Pattern 1-1-1-1-1-1:
 - Participant 20
 - Participant 23
 - Participant 12
 - Participant 10.1 (German)
 - Participant 11
2. Pattern 1-1-1-0-1-1:
 - Participant 22
 - Participant 24
 - Participant 8
 - Participant 3
 - Test account 2
3. Pattern 1-1-1-0-1-0:
 - Participant 21
 - Participant 18
 - Participant 19
 - Test account 1
4. Pattern 1-1-1-0-0-0:
 - Participant 10.2 (English)

Subsequently, we conducted the same analysis for the question "What's your opinion on the importance of privacy in the digital age?" asked in English and identified the following codes, which differ from those in Russian:

Participant	Paramount Importance	Data Collection and Usage	Legal and Ethical Consideration	User Awareness and Control	Trust in Digital Services	Freedom of Expression	Balance between Privacy and Innovation	Impact on Mental Health and Wellbeing	Technological Solutions
23	1	1	1	1	1	1	0	0	0
12	1	1	0	1	1	1	1	0	0
22	0	1	1	1	1	1	1	1	0
21	0	0	1	1	1	1	1	0	0
18	1	0	1	0	1	1	0	1	0
19	1	0	1	0	1	1	1	0	0
24	0	1	1	1	1	1	1	1	0
8	1	1	1	0	1	1	1	0	0
3	1	1	1	1	1	1	1	1	0
10.1 (German)	0	1	1	0	0	0	1	0	1
10.2 (English)	1	1	1	0	1	1	1	0	0
11	0	0	1	1	1	1	0	0	0
Test account 1	0	0	1	0	1	1	1	0	0
Test account 2	1	1	1	1	1	1	1	0	0

Table 26. Binary Table to Explore the Differences in ChatGPT Responses to the Question "What's your opinion on the importance of privacy in the digital age?" in English.

The following patterns can be observed in the table:

1. Pattern 1-1-1-1-1-1-1-0-0:
 - Participant 20
 - Test account 2
2. Pattern 1-1-1-1-1-1-0-0-0:

- Participant 23
- 3. Pattern 1-1-0-1-1-1-1-0-0:
 - Participant 12
- 4. Pattern 0-1-1-1-1-1-1-0:
 - Participant 22
 - Participant 24
- 5. Pattern 0-0-1-1-1-1-1-0-0:
 - Participant 21
- 6. Pattern 1-0-1-0-1-1-0-1-0:
 - Participant 18
- 7. Pattern 1-0-1-0-1-1-1-0-0:
 - Participant 19
- 8. Pattern 1-1-1-0-1-1-1-0-0:
 - Participant 8
 - Participant 10.2 (English)
- 9. Pattern 1-1-1-1-1-1-1-0:
 - Participant 3
- 10. Pattern 0-1-1-0-0-0-1-0-1:
 - Participant 10.1 (German)
- 11. Pattern 0-0-1-1-1-1-0-0-0:
 - Participant 11
- 12. Pattern 0-0-1-0-1-1-1-0-0:
 - Test account 1

Finally, we analysed the responses to the question "What is happiness" in English and identified these key elements:

- Possibility of Happiness: The code for the direct response to the question.
- Approaches: Psychological, Philosophical and Cultural approaches in defining happiness.
- Practices: Practical ways of achieving happiness.
- Social Relationships and Support: The importance of social relations for happiness.
- Self-Realisation: Influence of achievements and realisation on happiness.
- Health and Wellbeing: Influence of physical and mental health, environment and lifestyle on happiness.
- Biological: The role of biological factors.
- Personal: Traits and particularities that make individuals prone to feeling happy.
- Material Aspects: Role of financial stability in achieving happiness.
- Existential Meaning and Purpose: Role of life purpose or spiritual views in achieving happiness.
- Nature: Descriptions of the nature of happiness.

Participant	Possibility	Approaches	Practices	Social Relationships and Support	Self-Realisation	Health and Wellbeing	Biological	Personal	Material and Economic Stability	Existential Meaning and Purpose	Versatile nature
20	✓ Possible	✓ Psychological, Philosophical,	✓ Gratitude, carpe diem, meditation, prayer, mindfulness	✓ Social relations, community	✓ Meaningful activities, fulfilling potential, self-realisation, virtue	✓ Healthy lifestyle	✓ Genetics, brain chemistry		✓ Financial stability	✓ Spirituality and religion	✓ Complex, multifaced, subjective
23	✓ Possible	✓ Psychology, Philosophy, personal experience	✓ Gratitude, virtue, harmony, mindfulness, meditation	✓ Social relations,	✓ Meaningful activities, individual achievements, values, goals,	✓ Health, environment	✓ Genetics,		✓ Socioeconomic status, material success	✓ Existentialism, spirituality	✓ Multifaced, dynamic
12	✓ Possible		✓ Positive thinking, gratitude, mindfulness, carpe diem, meditation		✓ Goals, helping others, job satisfaction, hobbies	✓ Physical, mental health, environment, living conditions		✓ Personal traits, mindset	✓ Socioeconomic status, financial stability		✓ Multifaced, complex, fluctuating

Participant	Possibility	Approaches	Practices	Social Relationships and Support	Self-Realization	Health and Wellbeing	Biological	Personal	Material and Economic Stability	Existential Meaning and Purpose	Versatile nature
22	✓ Possible	✓ Philosophical, Psychological, Cultural	✓ Gratitude, mindfulness, self-compassion	✓ Social relations	✓ Career, pursuing goals	✓ Health, living conditions	✓ Genetics, adaptation	✓ Personal traits, mindset			✓ Multifaceted, complex
21	✓ Possible		✓ Positive thinking, gratitude, balance	✓ Social relations, family, friends, community		✓ Physical and mental health		✓ Mindset			
18	✓ Possible		✓ Positive thinking, gratitude, balance,			✓ Physical and mental health	✓ Genetics	✓ Mindset			
19	✓ Possible			✓ Social connections	✓ Career, self-improvement						✓ Multifaceted
24	✓ Possible		✓ Positive thinking,	✓ Social connections	✓ Goals	✓ Mental health,	✓ Genetics, brain	✓ Mindset	✓ Financial stability	✓ Sense of purpose	✓ Subjective, complex

Participant	Possibility	Approaches	Practices	Social Relationships and Support	Self-Realisation	Health and Wellbeing	Biological	Personal	Material and Economic Stability	Existential Meaning and Purpose	Versatile nature
			emotional regulation, meditation, exercise, mindfulness, gratitude			environment	chemistry		ty		flex, evolving
8	✓ Possible		✓ Mindfulness, meditation, therapy, gratitude, positive thinking, balance	✓ Social connections	✓ Self-realisation	✓ Mental health, physical health	✓ Genetics			✓ Sense of purpose	✓ Subjective, fluctuate
3	✓ Possible	✓ Cultural	✓ Emotional regulation, gratitude, mindfulness, positive	✓ Social connections	✓ Career, goals	✓ Physical, health		✓ Mindset, adaptation	✓ Financial stability	✓ Purpose	✓ Subjective, dynamic

Participant	Possibility	Approaches	Practices	Social Relationships and Support	Self-Realisation	Health and Wellbeing	Biological	Personal	Material and Economic Stability	Existential Meaning and Purpose	Versatile nature
			thinking, balance								
10.1 (German)	✓ Possible	✓ Philosophical, psychological, social,	✓ Mindfulness, physical activities, altruism	✓ Social connections	✓ Meaningful activities		✓ Genetic	✓ Mindset	✓ Financial stability, equality, sustainability	✓ Purpose	
10.2 (English)		✓ Philosophical, psychological, cultural		✓ Social connections	✓ Goal			✓	✓ Economic status,		✓ Subjective
11	✓ Possible		✓ Mindfulness, positive thinking, balance, therapy	✓ Social connections	✓ Meaningful activities	✓ Mental health, environment		✓ Mindset, adaptation	✓ Financial stability	✓ Purpose	✓ Subjective
Test account 1	✓ Possible	✓ Philosophical,	✓ Gratitude, mindfulness	✓ Social connections	✓ Self-realisation,			✓ Resilience, coping	✓ Financial stability	✓ Spirituality	✓ Subjective

Participant	Possibility	Approaches	Practices	Social Relationships and Support	Self-Realisation	Health and Wellbeing	Biological	Personal	Material and Economic Stability
23	1	1	1	1	1	1	1	0	1
12	1	0	1	0	1	1	0	1	1
22	1	1	1	1	1	1	1	1	0
21	1	0	1	1	0	1	0	1	0
18	1	0	1	0	0	1	1	1	0
19	1	0	0	1	1	0	0	0	0
24	1	0	1	1	1	1	1	1	1
8	1	0	1	1	1	1	1	0	0
3	1	1	1	1	1	1	0	1	1
10.1 (German)	1	1	1	1	1	0	1	1	1
10.2 (English)	0	1	0	1	1	0	0	1	1
11	1	0	1	1	1	1	0	1	1
Test account 1	1	1	1	1	1	0	0	1	1
Test account 2	1	0	1	1	1	1	1	1	1

Table 28. Binary Table to Explore the Differences in ChatGPT Responses to the Question "What is happiness?" in English.

The following pattern can be traced in the responses in English:

1. Pattern 1-1-1-1-1-1-1-0-1:
 - Participant 20
 - Participant 23
2. Pattern 1-0-1-0-1-1-0-1-1:

- Participant 12
- 3. Pattern 1-1-1-1-1-1-1-1-0:
 - Participant 22
- 4. Pattern 1-0-1-1-0-1-0-1-0:
 - Participant 21
- 5. Pattern 1-0-1-0-0-1-1-1-0:
 - Participant 18
- 6. Pattern 1-0-0-1-1-0-0-0-0:
 - Participant 19
- 7. Pattern 1-0-1-1-1-1-1-1-1:
 - Participant 24
 - Test account 2
- 8. Pattern 1-0-1-1-1-1-1-0-0:
 - Participant 8
- 9. Pattern 1-1-1-1-1-1-0-1-1:
 - Participant 3
- 10. Pattern 1-1-1-1-1-0-1-1-1:
 - Participant 10.1 (German)
- 11. Pattern 0-1-0-1-1-0-0-1-1:
 - Participant 10.2 (English)
- 12. Pattern 1-0-1-1-1-1-0-1-1:
 - Participant 11
- 13. Pattern 1-1-1-1-1-0-0-1-1:
 - Test account 1

We can notice, that participants 20 and 23 have the same patterns for questions 1 and 3, and only slight differences for the second question. Both participants used the model to write academic papers (Master's and Doctor's Thesis), both of them use it mostly in English, but they use different account types (Microsoft vs. childhood Gmail account), have different levels of knowledge about the model and use it for various set of purposes. In addition, this similarity is present only between two participants who asked the questions in English and can not be traced at all among the Russian-speaking respondents. Therefore, we do not have enough evidence to prove that the variability of the responses is caused by the previous interactions with the same account.

5.4.3. Observations and conclusions.

We first observed the responses to the questions in Russian and then the responses in English. We explored each group separately to see if there were any obvious patterns in the differences between responses. However, the groups of participants that had the same patterns for one question exhibited differences in another question. This means that we cannot prove that differences and similarities in the answers are purely random.

Furthermore, while thoroughly analysing the responses, we concluded they are mostly repetitive, sometimes even using the same recurring constructions, such as "inherently superior" or "paramount importance." Even when the answer appears different in structure, closer observation reveals that the model merely changes the structure of the answer. It appears that for each concept, the model withholds chunks of information that it retrieves randomly and then combines to generate the most suitable outcome for the user.

Nevertheless, there are several peculiar observations relevant to our research question. Firstly, even if the responses in both English and Russian seem very similar in terms of themes, there are slight differences that reflect the discourse on the matter present in each language. For instance, while slavery and colonialism are mentioned five times in the responses in Russian, they only appear explicitly once in responses in English.

Furthermore, English-speaking countries have a broader discourse on racism than Russian-speaking countries due to cultural and historical reasons. Therefore, the responses about racism in English seem more elaborate, acknowledging the grave consequences of racial inequality in the lives of individuals and discriminated groups. These consequences include discriminatory practices and laws, disparities in access to resources, and differences in education, healthcare, housing, and employment. Moreover, racial discrimination in law enforcement and the criminal justice system is a widely discussed issue in the USA, which may explain the coverage of these aspects in ChatGPT responses.

Another interesting observation can be found when comparing responses to the question about digital privacy in English and Russian. While answers in Russian and German provide more specific technological recommendations to enhance data protection, such as VPNs, encryption, anonymisation, and two-factor authentication, the responses in English do not cover this aspect at all. Additionally, the issues of trust in digital services and the impact of a lack of privacy on freedom of expression are mentioned in all responses in English, whereas these aspects are completely absent in the answers in Russian.

Finally, the responses to the question about happiness also vary across different languages. The responses in English acknowledge biological factors and personal characteristics in individuals' happiness. Moreover, they promote mindfulness, meditation, and gratitude as effective practices in achieving happiness, reflecting the so-called "happiness turn" in Western societies, where happiness is not only possible but also necessary (Vilisov, 2020, pp. 36-47). Additionally, only responses in English mention that, besides financial stability, the socioeconomic background of an individual can influence happiness.

Additionally, when comparing the performance of different versions of the model with Test accounts, we notice that responses from version 4o cover almost all the aspects listed in the thematic analysis for both languages, while version 3.5 covers only a few of them. Participant 14 exhibits similar patterns to the Test account with version

4o, which can be explained by the fact that this respondent uses the co-pilot ChatGPT, allowing unlimited access to the same newest version of the model. However, we cannot explain other similarities because we cannot trace which responses were generated with limited access to version 4o and which were generated after the limit was exceeded, using version 3.5.

In conclusion, thematic analysis proved to be an efficient method for evaluating the similarity or variability of ChatGPT responses in two languages across different participants. We identified recurring themes in the responses and quantified them, creating comparative binary tables. The responses showed many differences in examples, aspects covered, and structure. However, we couldn't prove that these differences can be explained by the participants' history of previous interactions with the model. Therefore, we can only attribute the variability to the randomness of ChatGPT's response generation. Further exploration of this phenomenon with a larger group of participants and through multiple iterations could provide more insights into the matter.

6. Discussion of Research Findings.

The quantitative phase of this research aimed to explore whether the variability in ChatGPT's responses can be explained by previous interactions with the same user and the information gathered through qualitative interviews. We collected responses to three questions from all 24 participants and divided the outcomes into two groups based on the language—English and Russian. We then introduced three different metrics—readability indexes, keyword frequency analysis, and thematic analysis—to compare the responses and identify any patterns or dependencies.

In the readability analysis, responses in both Russian and English indicated a high level of complexity corresponding to the college student and graduate level. Readability scores for both languages were also high, indicating that ChatGPT responses are difficult or extremely difficult to read. The responses in Russian showed slightly higher complexity than those in English. This can be attributed to the higher grammatical complexity of Russian, the lack of academic writing as a discipline in the Russian language, and the lower amount of training data in Russian. Both the English and Russian groups showed the highest variability for the question “Is happiness possible?” which can be due to the open-ended nature of the question.

These findings suggest that while ChatGPT can generate sophisticated and detailed texts, following the academic style, its responses might not be always accessible to users without college education. General users who use model to find straightforward answers might find the texts generated by ChatGPT too complex. However, university students and academic researchers might benefit from this complexity, even if the model's responses still require editing and fact-checking.

In the keyword analysis, we estimated the keywords and phrases for each response and discovered that the outcomes lack contextual information and repeat the concepts that are already pronounced in the questions asked to the model.

Such repetition might signalise that ChatGPT is limited to the context, and is not capable of producing contextually rich and nuanced responses. It also is limited to the preexisting knowledge, and unable to generate new ideas and thoughts.

Subsequently, we proceeded with thematic analysis, identified primary codes for each response and each language, and found interesting reflections of the discourse on the matter in the language. For instance, the responses regarding privacy in the Russian language didn't mention the influence of the lack of privacy on freedom of expression. On the other hand, the responses in English didn't provide any technical solutions for data protection, whereas those in German and Russian did.

These cultural and linguistic differences suggest that ChatGPT's responses depend not only on the language, but also on the cultural context reflected in the training data. This finding might serve as a starting point at developing more culturally reach and aware AI tool, that considers different needs and perspectives.

We used the data collected in the qualitative interviewing phase to formulate the questions for the quantitative experiment. Furthermore, we established the variables to compare and determine if the similarities in ChatGPT responses among the participants correlate with their place of origin and current residence, level of education, field of work or study, level of ChatGPT understanding, purposes of ChatGPT use, prompting knowledge, language proficiency, and information about the account used with ChatGPT. We were unable to prove the initial assumption that ChatGPT responses would vary across different accounts according to the user's previous history with the model.

However, we acknowledge the limitations of the current research and the analysis methods used in the quantitative phase. Further research on the phenomena might benefit from exploring a larger sample of users with a higher variety of languages. In addition, more contemporary and complex readability metrics can be used to evaluate the complexity of ChatGPT responses across accounts and languages. Such advanced NLP techniques as NER (Named Entity Recognition), sentiment analysis, topic modelling, and LSM (Linguistic Style Matching) can be applied to evaluate the response variability and its dependence on the user.

Another possible direction for future research can be to conduct user interaction studies, to examine how ChatGPT responses vary not only across different single questions asked in a new session but also through a continuous interaction within one session.

Additionally, different prompting strategies and user expertise in prompting can be studied more closely to deeper the understanding of human-AI interactions. Future studies could also explore the ethical part of personalised responses and potential risks it may pose.

Although we couldn't prove the initial assumption of this research, we gained valuable insights into the patterns of ChatGPT usage among users from different backgrounds and with different knowledge of the model. The findings highlight the importance of linguistic, cultural and contextual factors in users' interaction with ChatGPT. Based on the outcomes of this work, future studies can enhance our understanding of ChatGPT and improve user experiences.

7. Conclusions.

This study has examined how previous interactions with the same account influence ChatGPT's responses. We used a sequential exploratory mixed method, where the findings of the quantitative phase are located in the context preestablished in the qualitative phase.

Qualitative semi-structured interviews provided meaningful insights into the patterns of ChatGPT usage among users from different backgrounds. The findings of the quantitative phase, on the other hand, indicate that while the initial assumption — that ChatGPT responses depend on previous interactions with the same account — was not fully proven, valuable insights were gained into the factors influencing the model's outputs.

For instance, in the qualitative phase we discovered, that despite concerns about AI replacing humans in the labour market, participants' experiences indicate the opposite. While ChatGPT is useful with mechanical tasks and helps to save time, the users still need to have domain knowledge and understanding of the desired outcomes, to use the model efficiently. Additionally, ChatGPT seems to be primarily a tool for work optimisation rather than an assistant in personal life, as only a few participants reported using it for personal matters like travel planning or psychological help.

In addition, among the main outcomes of the research, are the identification of usage patterns and user perceptions of the model. Semi-structured qualitative interviews allowed us to collect various purposes of ChatGPT and perceptions of the model among participants from various countries and academic and professional fields. Factors such as the purpose of ChatGPT use, language proficiency, questioning style, user familiarity with prompt design and others were used as variables. In the quantitative phase, we aimed to test if they influence the model's performance.

Although the collected data and quantitative analysis were insufficient to uncover the patterns behind ChatGPT's response generation, and the variation in responses seemed to be caused by the model's inherent randomness, we did uncover several interesting insights. Firstly, we identified differences in responses across various languages, both in complexity and in the focus of the discourse. Additionally, we found that despite the variations in length and structure, ChatGPT responses are uniformly complex and can mostly be understood by individuals with a college degree. Furthermore, ChatGPT proved to be repetitive in its choice of words and structures, which was verified not only by the participants' experiences but also through a comparative analysis of the responses across various accounts.

Despite these valuable findings, this study acknowledges the following limitations. The sample size was relatively small and may not fully reflect the diverse user base of ChatGPT. Future research could benefit from a larger and more varied choice of participants, exploring additional variables such as cultural influences and specific domain applications. Furthermore, the study relies highly on self-reported data, which may cause bias.

In addition, future research could benefit from using advanced NLP techniques to analyse response variability and conducting longitudinal studies to examine how continuous interactions within a single session influence ChatGPT's performance.

In conclusion, this research has contributed to a better understanding of ChatGPT's interaction and response generation dynamics, providing valuable insights into usage patterns that can be considered to improve the model's performance and user experience. By addressing the limitations and implementing more complex NLP analysis techniques, future studies can further deepen the outcomes of this research.

References.

- 8 best video conferencing software for businesses (2024). Pumble Blog. (n.d.).
<https://pumble.com/blog/best-video-conferencing-software/>
- Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. *JACCP: JOURNAL OF THE AMERICAN COLLEGE OF CLINICAL PHARMACY*, 4(10), 1358–1367. <https://doi.org/10.1002/jac5.1441>
- Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of CHATGPT. *Contemporary Educational Technology*, 15(3).
<https://doi.org/10.30935/cedtech/13152>
- Almeida, F. (2018). Strategies To Perform A Mixed Methods Study. *European Journal of Education Studies*.
- Aspers, P., & Corte, U. (2019a). What is qualitative in qualitative research. *Qualitative Sociology*, 42(2), 139–160. <https://doi.org/10.1007/s11133-019-9413-7>
- Aspers, P., & Corte, U. (2019b). What is qualitative in qualitative research. *Qualitative Sociology*, 42(2), 139–160. <https://doi.org/10.1007/s11133-019-9413-7>
- Bailey, C., White, C., & Pain, R. (1999). Evaluating qualitative research: Dealing with the tension between ‘science’ and ‘creativity.’ *Area*, 31(2), 169–178. <https://doi.org/10.1111/j.1475-4762.1999.tb00182.x>
- Becker, H. S. (1966). The Epistemology of Qualitative Research. In *Ethnography and Human Development. Context and meaning in social inquiry*. (pp. 53–71). essay, University of Chicago Press. Retrieved from <https://www.sfu.ca/~palys/Becker1996-EpistemologyOfQualitativeResearch.pdf>.
- Bergelson, I., Tracy, C., & Takacs, E. (2022). Best practices for reducing bias in the interview process. *Current Urology Reports*, 23(11), 319–325. <https://doi.org/10.1007/s11934-022-01116-7>
- Bergman, M. (2008). Introduction: Whither mixed methods? In *Advances in Mixed Methods Research* (pp. 1–7). introduction, Sage.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Brown, T., Mann, B., Ryder, N., Subbiah, M., Kaplan, J. D., Dhariwal, P., Neelakantan, A., Shyam, P., Sastry, G., Askell, A., Agarwal, S., Herbert-Voss, A., Krueger, G., Henighan, T., Child, R., Ramesh, A., Ziegler, D., Wu, J., Winter, C., ... Amodei, D. (2020). Language Models are Few-Shot Learners. In *Advances in Neural Information Processing Systems* (Vol. 33, pp. 1877–1901). essay, Curran Associates.
- Bryman, A. (2012). *Social Research Methods*. Oxford University Press.
- Cantos Gómez, P., & Sánchez Lafuente, Á. A. (2019). Readability indices for the assessment of textbooks: A feasibility study in the context of EFL. *Vigo International Journal of Applied Linguistics*, (16), 31–52. <https://doi.org/10.35869/vial.v0i16.92>
- Choi, J. S., & Crossley, S. A. (2022). Advances in readability research: A new readability web app for English. *2022 International Conference on Advanced Learning Technologies (ICALT)*.
<https://doi.org/10.1109/icalt55010.2022.00007>
- Chouffani, R. (2021, August 4). *12 advantages and Disadvantages of Video Conferencing: TechTarget*. Content Management.
<https://www.techtarget.com/searchcontentmanagement/tip/8-business-benefits-and-challenges-of-video-conferencing>
- Codó, E. (2008). Interviews and Questionnaires. *The Blackwell Guide to Research Methods in Bilingualism and Multilingualism* by L. Wei and M. Moyer, 158–176. <https://doi.org/10.1002/9781444301120>
- Corbetta, P. (2003). *Social Research: Theory, Methods and Techniques*.
<https://doi.org/10.4135/9781849209922>
- Crabtree, M. (2023, May 3). *What is chatgpt?: A chat with chatgpt on the method behind the bot*. DataCamp.
<https://www.datacamp.com/blog/a-chat-with-chatgpt-on-the-method-behind-the-bot>
- Creswell, J. W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.
- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd.). SAGE Publications.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.
- DataReportal – Global Digital Insights. (2024, January 31). *Digital 2024: Global Overview Report - DataReportal – Global Digital Insights*. DataReportal.
<https://datareportal.com/reports/digital-2024-global-overview-report>

- de Villiers, C., Farooq, M. B., & Molinari, M. (2021). Qualitative research interviews using online video technology – challenges and opportunities. *Meditari Accountancy Research*, 30(6), 1764–1782. <https://doi.org/10.1108/medar-03-2021-1252>
- Deng, J., & Lin, Y. (2023). The benefits and challenges of chatgpt: An overview. *Frontiers in Computing and Intelligent Systems*, 2(2), 81–83. <https://doi.org/10.54097/fcis.v2i2.4465>
- Deng, Y., Zhang, W., Pan, S. J., & Bing, L. (2023). Multilingual jailbreak challenges in large language models. *ArXiv*.
- Digital Samba, SL. (2023, December 23). *Video conferencing advantages and disadvantages: Pros and cons*. Digital Samba . <https://www.digitalsamba.com/blog/video-conferencing-advantages-and-disadvantages>
- Duarte, F. (2024, June 8). Number of CHATGPT users (Jun 2024). Exploding Topics. <https://explodingtopics.com/blog/chatgpt-users>
- Edley, N., & Litosseliti, L. (2010). Contemplating interviews and focus groups. In *Research methods in linguistics* (pp. 155–179). essay, Continuum.
- Edmonds, W. A., & Kennedy, T. D. (2017). An applied guide to research designs: Quantitative, qualitative, and mixed methods. *SAGE Publications, Inc.* , 196–200. <https://doi.org/10.4135/9781071802779>
- Ekin, S. (2023). *Prompt Engineering for CHATGPT: A Quick Guide to Techniques, Tips, and Best Practices*. <https://doi.org/10.36227/techrxiv.22683919.v1>
- Flesch, R. (1981). *How to write plain english: A book for lawyers and consumers*. Barnes & Noble.
- Garrett, P., Williams, A., & Coupland, N. (2005). Investigating Language Attitudes: Social Meanings of Dialect, Ethnicity and Performance. *International Journal of Applied Linguistics*, 15(3), 411–414. <https://doi.org/10.1111/j.1473-4192.2005.00100d.x>
- Gogo, S., & Musonda, I. (2022a). The use of the exploratory sequential approach in mixed-method research: A case of contextual top leadership interventions in construction H&S. *International Journal of Environmental Research and Public Health*, 19(12), 7276. <https://doi.org/10.3390/ijerph19127276>
- Gogo, S., & Musonda, I. (2022b). The use of the exploratory sequential approach in mixed-method research: A case of contextual top leadership interventions in construction H&S. *International Journal of Environmental Research and Public Health*, 19(12), 7276. <https://doi.org/10.3390/ijerph19127276>
- Gries, S. Th. (2016). *Quantitative Corpus Linguistics with R*. <https://doi.org/10.4324/9781315746210>
- Gries, S. Th. (2021). A new approach to (key) keywords analysis: Using frequency, and now also dispersion. *Research in Corpus Linguistics*, 9(2), 1–33. <https://doi.org/10.32714/ricl.09.02.02>
- Groth, R. E. (2010). Situating Qualitative Modes of Inquiry Within The Discipline of Statistics Education Eesearch. *Statistics Education Research Journal*, 9(2), 7–21. <https://doi.org/10.52041/serj.v9i2.372>
- Guest, G., & Fleming, P. (2015). Mixed methods research. *Public Health Research Methods*, 581–614. <https://doi.org/10.4135/9781483398839.n19>
- Gunning, R. (1968). *The technique of clear writing* (Revised edition). Mcgraw-Hill.
- Helffreich, C. (2019). Leitfaden- und Experteninterviews. In *Handbuch Methoden der empirischen Sozialforschung* (pp. 559–574). essay, Springer VS .
- Heller, M., Pietikäinen, S., & Pujolar, J. (2017). *Critical Sociolinguistic Research Methods*. <https://doi.org/10.4324/9781315739656>
- Horsfall, M., Eikelenboom, M., Draisma, S., & Smit, J. H. (2021). The effect of rapport on data quality in face-to-face interviews: Beneficial or detrimental? *International Journal of Environmental Research and Public Health*, 18(20), 10858. <https://doi.org/10.3390/ijerph182010858>
- How many users does chatgpt have? statistics & facts (2024)*. RSS. (n.d.). <https://seo.ai/blog/how-many-users-does-chatgpt-have#:~:text=How%20Many%20Users%20on%20ChatGPT,users%20on%20a%20weekly%20basis>
- Hu, K. (n.d.). *CHATGPT sets record for fastest-growing user base - analyst note | reuters*. Reuters. <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>
- Jermakowicz, E. (2023). The coming transformative impact of large language models and artificial intelligence on Global Business and Education. *Journal of Global Awareness*, 4(2), 1–22. <https://doi.org/10.24073/jga/4/02/03>
- Jovanović, G. (2011). Toward a social history of qualitative research. *History of the Human Sciences*, 24(2), 1–27. <https://doi.org/10.1177/0952695111399334>
- Karatsareas, P. (2022). Semi-structured interviews. *Research Methods in Language Attitudes*, 99–113. <https://doi.org/10.1017/9781108867788.010>
- Keen, S., Lomeli-Rodriguez, M., & Joffe, H. (2022). From Challenge to opportunity: Virtual qualitative research during COVID-19 and beyond. *International Journal of Qualitative Methods*, 21,

160940692211050. <https://doi.org/10.1177/16094069221105075>

- Kincaid, J. P., Fishburne Jr., L. R. P., Rogers, R. L., & Chissom, B. S. (1975). Derivation of new readability formulas (automated readability index, fog count and Flesch reading ease formula) for Navy enlisted personnel. *Research Branch Report*, 8(75). <https://doi.org/10.21236/ada006655>
- King, G., Keohane, R. O., & Verba, S. (1994). *Designing social inquiry: Scientific inference in qualitative research*. Princeton University Press.
- King, N. (2004). Using templates in the thematic analysis of text. *Essential Guide to Qualitative Methods in Organizational Research*, 257–270. <https://doi.org/10.4135/9781446280119.n21>
- Korotkina, I. (2021). Academic writing in Russia beyond zero point. *Emerging Writing Research from the Russian Federation*, 17–50. <https://doi.org/10.37514/int-b.2021.1428.2.01>
- Kroeze, J. H. (2012). Postmodernism, Interpretivism, and formal ontologies. *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems*, 43–62. <https://doi.org/10.4018/978-1-4666-0179-6.ch003>
- Krouwel, M., Jolly, K., & Greenfield, S. (2019). Comparing Skype (Video Calling) and in-person qualitative interview modes in a study of people with irritable bowel syndrome – an exploratory comparative analysis. *BMC Medical Research Methodology*, 19(1). <https://doi.org/10.1186/s12874-019-0867-9>
- Krug, M., & Schlüter, J. (2013). *Research methods in language variation and change*. Cambridge University Press.
- Kvale, S. (1994). *Interviews: An introduction to qualitative research interviewing*. Sage.
- Lai, V., Ngo, N., Pourn Ben Veysseh, A., Man, H., Dernoncourt, F., Bui, T., & Nguyen, T. (2023). CHATGPT beyond English: Towards a comprehensive evaluation of large language models in multilingual learning. *Findings of the Association for Computational Linguistics: EMNLP 2023*. <https://doi.org/10.18653/v1/2023.findings-emnlp.878>
- Lincoln, Y. S., & Guba, E. G. (2006). *Naturalistic inquiry* Yvonna S. Lincoln; Egon G. Guba. Sage Publ.
- Lindlof, T. R., & Taylor, B. C. (2002). *Qualitative Communication Research Methods*. Sage.
- Liu, Y. (2022). Paradigmatic compatibility matters: A critical review of qualitative-quantitative debate in mixed methods research. *SAGE Open*, 12(1). <https://doi.org/10.1177/21582440221079922>
- Lobe, B., Morgan, D., & Hoffman, K. A. (2020). Qualitative data collection in an era of social distancing. *International Journal of Qualitative Methods*, 19, 160940692093787. <https://doi.org/10.1177/1609406920937875>
- Lourenco, S. F., & Tasimi, A. (2020). No Participant Left behind: Conducting Science during COVID-19, 24(8), 583–584. <https://doi.org/10.31234/osf.io/r62gc>
- Magaldi, D., & Berler, M. (2020). Semi-structured interviews. *Encyclopedia of Personality and Individual Differences*, 4825–4830. https://doi.org/10.1007/978-3-319-24612-3_857
- Marcon, T., & Gopal, A. (2005). *Toronto: ASAC*.
- Marhefka, S., Lockhart, E., & Turner, D. (2020). Achieve research continuity during social distancing by rapidly implementing individual and group videoconferencing with participants: Key Considerations, best practices, and Protocols. *AIDS and Behavior*, 24(7), 1983–1989. <https://doi.org/10.1007/s10461-020-02837-x>
- Mason, J. (2018). *Qualitative researching*. SAGE.
- Mixed Methods Research in sport and exercise: Integrating qualitative research. (2016). *Routledge Handbook of Qualitative Research in Sport and Exercise*, 404–418. <https://doi.org/10.4324/9781315762012-42>
- Mohajan, H. K. (2020). Quantitative research: A successful investigation in Natural and Social Sciences. *Journal of Economic Development, Environment and People*, 9(4), 50–79. <https://doi.org/10.26458/jedep.v9i4.679>
- Morgan, D. L. (2007). Paradigms lost and Pragmatism regained. *Journal of Mixed Methods Research*, 1(1), 48–76. <https://doi.org/10.1177/2345678906292462>
- Naveed, H., Khan, A. U., Qiu, S., Saqib, M., Anwar, S., Usman, M., Akhtar, N., Barnes, N., & Mian, A. (2023). *A Comprehensive Overview of Large Language Models*.
- Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence Based Nursing*, 18(2), 34–35. <https://doi.org/10.1136/eb-2015-102054>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis. *International Journal of Qualitative Methods*, 16(1), 160940691773384. <https://doi.org/10.1177/1609406917733847>
- Oborneva, I. (2005). *Mathematical Model for Evaluation of Didactic Texts*.
- OpenAI. (2023). *GPT-4 Technical Report*. <https://doi.org/10.48550/arXiv.2303.08774>
- O’Cathain, A., Murphy, E., & Nicholl, J. (2007). Why, and how, Mixed Methods Research is undertaken in Health Services Research in England: A mixed methods study. *BMC Health Services Research*, 7(1), 1–11. <https://doi.org/10.1186/1472-6963-7-85>

- Perrotta, C., Selwyn, N., & Ewin, C. (2022). Artificial Intelligence and the affective labour of understanding: The intimate moderation of a language model. *New Media & Society*, 26(3), 1585–1609. <https://doi.org/10.1177/14614448221075296>
- Petrosyan, A. (Ed.). (2024, February 19). *Most used languages online by share of websites 2024*. Statista. <https://www.statista.com/statistics/262946/most-common-languages-on-the-internet/>
- Qin, C., Zhang, A., Zhang, Z., Chen, J., Yasunaga, M., & Yang, D. (2023). Is chatgpt a general-purpose natural language processing task solver? *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing*. <https://doi.org/10.18653/v1/2023.emnlp-main.85>
- Rahman, S. A., Tuckerman, L., Vorley, T., & Gherhes, C. (2021). Resilient research in the field: Insights and lessons from adapting qualitative research projects during the COVID-19 pandemic. *International Journal of Qualitative Methods*, 20, 160940692110161. <https://doi.org/10.1177/16094069211016106>
- Ray, P. P. (2023). CHATGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems*, 3, 121–154. <https://doi.org/10.1016/j.iotcps.2023.04.003>
- Redish, J. (2000). Readability formulas have even more limitations than Klare discusses. *ACM Journal of Computer Documentation*, 24(3), 132–137. <https://doi.org/10.1145/344599.344637>
- Roberts, J. K., Pavlakis, A. E., & Richards, M. P. (2021). It's more complicated than it seems: Virtual qualitative research in the COVID-19 ERA. *International Journal of Qualitative Methods*, 20, 160940692110029. <https://doi.org/10.1177/16094069211002959>
- Saarijärvi, M., & Bratt, E.-L. (2021). When face-to-face interviews are not possible: Tips and tricks for video, telephone, online chat, and email interviews in qualitative research. *European Journal of Cardiovascular Nursing*, 20(4), 392–396. <https://doi.org/10.1093/eurjcn/zvab038>
- Schober, M. F. (2018). The future of face-to-face interviewing. *Quality Assurance in Education*, 26(2), 290–302. <https://doi.org/10.1108/qa-06-2017-0033>
- Sevelius, J. M., Gutierrez-Mock, L., Zamudio-Haas, S., McCree, B., Ngo, A., Jackson, A., Clynes, C., Venegas, L., Salinas, A., Herrera, C., Stein, E., Operario, D., & Gamarel, K. (2020). Research with marginalized communities: Challenges to continuity during the COVID-19 pandemic. *AIDS and Behavior*, 24(7), 2009–2012. <https://doi.org/10.1007/s10461-020-02920-3>
- Shewale, R. (2024, March 3). *64+ Social Media Marketing Statistics (2024 research)*. DemandSage. <https://www.demandsage.com/social-media-marketing-statistics/>
- Singh, S., Tiwari, S., Kumar Yadav, P., Kumar, Dr. A., & Srivastava, Dr. V. (2023). Chat GPT: Exploring the capabilities and limitations of a large language model. *International Journal of Engineering Applied Sciences and Technology*, 8(1), 111–115. <https://doi.org/10.33564/ijeast.2023.v07i12.019>
- Smith B., Sparkes A. C. (2016). Introduction: An invitation to qualitative research. In Smith B., Sparkes A. C. (Eds.), *Routledge handbook of qualitative research in sport and exercise* (pp. 1–8). Routledge. Crossref.
- Starks, H., & Brown Trinidad, S. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research*, 17(10), 1372–1380. <https://doi.org/10.1177/1049732307307031>
- Taherdoost, H. (2022). What are different research approaches? Comprehensive Review of Qualitative, quantitative, and mixed method research, their applications, types, and limitations. *Journal of Management Science & Engineering Research*, 5(1), 53–63. <https://doi.org/10.30564/jmser.v5i1.4538>
- Team, I. (2020, February 13). *Forbes Insights: Video meetings: The default setting for Business Communications*. Forbes. <https://www.forbes.com/sites/insights-zoom/2020/01/08/video-meetings-the-default-setting-for-business-communications/?sh=42192d3d53eb>
- Timans, R., Wouters, P., & Heilbron, J. (2019). Mixed methods research: What it is and what it could be. *Theory and Society*, 48(2), 193–216. <https://doi.org/10.1007/s11186-019-09345-5>
- Topping, M., Douglas, J., & Winkler, D. (2021). General considerations for conducting online qualitative research and practice implications for interviewing people with acquired Brain Injury. *International Journal of Qualitative Methods*, 20, 160940692110196. <https://doi.org/10.1177/16094069211019615>
- Touvron, H., Martin, L., Stone, K.R., Albert, P., Almahairi, A., Babaei, Y., Bashlykov, N., Batra, S., Bhargava, P., Bhosale, S., Bikel, D.M., Blecher, L., Ferrer, C.C., Chen, M., Cucurull, G., Esiobu, D., Fernandes, J., Fu, J., Fu, W., Fuller, B., Gao, C., Goswami, V., Goyal, N., Hartshorn, A.S., Hosseini, S., Hou, R., Inan, H., Kardas, M., Kerkez, V., Khabsa, M., Kloumann, I.M., Korenev, A.V., Koura, P.S., Lachaux, M., Lavril, T., Lee, J., Liskovich, D., Lu, Y., Mao, Y., Martinet, X., Mihaylov, T., Mishra, P., Molybog, I., Nie, Y., Poulton, A., Reizenstein, J., Rungta, R., Saladi, K., Schelten, A., Silva, R., Smith, E.M.,

- Subramanian, R., Tan, X., Tang, B., Taylor, R., Williams, A., Kuan, J.X., Xu, P., Yan, Z., Zarov, I., Zhang, Y., Fan, A., Kambadur, M., Narang, S., Rodriguez, A., Stojnic, R., Edunov, S., & Scialom, T. (2023). Llama 2: Open Foundation and Fine-Tuned Chat Models. ArXiv, abs/2307.09288.
- Tracy, S. J. (2019). *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact* (2nd.). Wiley-Blackwell.
- Tracy, S. J. (2020). *Qualitative research methods: Collecting evidence, crafting analysis, Communicating Impact*. Wiley Blackwell.
- Valchanov, I. (2024, July 2). *25+ best CHATGPT statistics for 2024 : Team-GPT*. Team. <https://team-gpt.com/blog/chatgpt-statistics/>
- Vilisov, V. (2022). *Постлюбовь: будущее человеческих интимностей*. АСТ.
- Workplace Communication Statistics in 2024*. Pumble Learn. (2024, April 22). https://pumble.com/learn/communication/communication-statistics/#Statistics_on_nonverbal_communication_in_the_workplace
- Zhao, H., Chen, H., Yang, F., Liu, N., Deng, H., Cai, H., Wang, S., Yin, D., & Du, M. (2024). Explainability for large language models: A survey. *ACM Transactions on Intelligent Systems and Technology*, *15*(2), 1–38. <https://doi.org/10.1145/3639372>