Conversational AI in Social Study Surveys: A Comprehensive Review: Evaluating the Efficacy, User Acceptance, And Potential Biases of Chatbot-Driven Surveys in Social Research.

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Abstract- ***This study explores the integration of Conversational Artificial Intelligence (AI) in social study surveys, focusing on its efficacy, user acceptance, potential biases, and implications for stakeholders. Employing a systematic literature review and content analysis, we examined peer-reviewed articles, conference proceedings, and white papers from databases such as PubMed, IEEE Xplore, and Google Scholar, published from 2010 to 2024. Our methodology included defining inclusion and exclusion criteria to ensure a focused examination of the current state and future directions of Conversational AI in social research. Key findings reveal that Conversational AI enhances the efficiency and precision of data collection, offering a more engaging participant experience and the potential for deeper insights into societal trends. However, challenges such as AI-induced biases and concerns over data privacy and security necessitate careful navigation. The study underscores the importance of developing comprehensive ethical guidelines, rigorous testing to mitigate biases, and enhancing user acceptance through intuitive AI interfaces. Strategic recommendations highlight the need for interdisciplinary collaboration to address ethical and methodological challenges, ensuring that Conversational AI's integration into social research enhances rather than compromises study quality and integrity. In conclusion, while Conversational AI presents a promising avenue for revolutionizing social research, embracing these technologies requires a balanced approach that combines caution with confidence, guided by ethical principles and a commitment to addressing biases and fostering user acceptance.***

Indexed Terms- ***Conversational Artificial Intelligence, Social Study Surveys, AI-induced Biases Ethical Guidelines.***

I. INTRODUCTION

1.1. Unveiling the Role of Conversational AI in Modern Social Research.

The advent of Conversational Artificial Intelligence (AI) has marked a significant milestone in the evolution of social research methodologies. Traditional survey methods, while effective, often face limitations in terms of engagement, scalability, and the depth of insights they can provide. Conversational AI, through the deployment of chatbots and virtual assistants, promises to transcend these limitations, offering a more interactive, personalized, and efficient means of data collection and user engagement (Toader et al., 2019).

The efficacy of Conversational AI in fostering trust and positive user experiences has been a subject of extensive study. Toader et al. (2019) highlight the critical role of social presence and the perceived competence of AI chatbots in shaping user trust. Their research underscores the nuanced impact of chatbot errors on user perceptions, revealing that anthropomorphized chatbots, particularly those designed with female characteristics, tend to be more readily forgiven for errors, thereby maintaining higher levels of user trust and engagement. This finding not only emphasizes the importance of design in Conversational AI but also points to the potential for these technologies to be tailored to enhance user acceptance and mitigate biases inherent in human-AI interactions.

The integration of Conversational AI into educational settings further exemplifies its transformative potential. Hidayat-ur-Rehman and Ibrahim (2023) explore the factors influencing educators' adoption of AI chatbots, with a focus on ChatGPT. Their study identifies several determinants of adoption intention, including effort expectancy, autonomous motivation, and perceived competency, among others. Interestingly, concerns such as perceived bias and the potential for unfair evaluation emerge as significant barriers to adoption, highlighting the critical need for ongoing research and development to address these challenges.

In summary, the emergence of Conversational AI represents a paradigm shift in social research methodologies. By enhancing engagement, personalization, and efficiency, AI-driven chatbots and virtual assistants are poised to revolutionize the way we conduct surveys and interact with participants. However, as we navigate this promising frontier, it is imperative to remain vigilant of the challenges that lie ahead, including issues of trust, bias, and ethical considerations. Addressing these challenges head-on will be crucial in fully realizing the potential of Conversational AI in revolutionizing social research.

1.2. Exploring the Intersection of AI and Social Study Surveys.

The intersection of Artificial Intelligence (AI) and social sciences, particularly through the use of AI-driven surveys, represents a burgeoning field of study that promises to reshape the landscape of social research. The scope of AI in social study surveys extends across various domains, from health and wellness to public health crises management and rehabilitation services, showcasing the versatility and adaptability of conversational AI technologies.

In the realm of health and wellness, Chew (2022) provides a comprehensive review of AI chatbots' use cases for weight loss, highlighting the essential components for prolonging user engagement. This study underscores the potential of AI chatbots to support personalized recommendations, motivational messaging, and emotional support, thereby enhancing the efficacy of weight loss programs. The integration of AI chatbots in such programs exemplifies the scope of AI-driven surveys in collecting and analyzing lifestyle data, offering personalized interventions, and ultimately, contributing to improved health outcomes.

The COVID-19 pandemic has further amplified the significance of AI-driven surveys in the social sciences. Mahdavi et al. (2023) explore the application of AI chatbots in combating the COVID-19 pandemic, identifying key roles and applications, including information dissemination, self-assessment, and mental health support. The deployment of AI chatbots on various platforms, such as mobile apps and social media, demonstrates the flexibility of AI-driven surveys in reaching diverse populations, facilitating timely and accurate information exchange, and supporting public health efforts in crisis situations.

Moreover, the integration of social robots in clinical practice, as discussed by Simeoni et al. (2021), reveals another dimension of the scope of AI in social study surveys. This study investigates the consensus and opinion of physiotherapists regarding the introduction of social robots in rehabilitation and assistance, highlighting the potential for AI-driven tools to complement human expertise in healthcare settings. The positive reception of social robots among physiotherapists underscores the readiness of healthcare professionals to embrace AI as a co-worker, thereby expanding the scope of AI-driven surveys to include rehabilitation services and healthcare delivery.

In summary, the scope of AI-driven surveys in the social sciences is vast and multifaceted, encompassing health and wellness, public health crisis management, and rehabilitation services. The integration of conversational AI technologies, including chatbots and social robots, offers unprecedented opportunities for personalized interaction, data collection, and analysis. As the field continues to evolve, the potential for AI-driven surveys to contribute to social research and improve societal outcomes is immense. However, it is imperative to navigate the ethical considerations and potential biases associated with AI to fully realize its benefits in the social sciences.

1.3. From Traditional Methods to AI-Driven Approaches: A Historical Overview.

The transition from traditional survey methodologies to AI-enabled approaches in social research marks a

significant evolution in the field. This shift reflects broader trends in data science and technology, where the increasing sophistication of artificial intelligence (AI) and machine learning (ML) algorithms has opened new avenues for collecting, analyzing, and interpreting data. The historical overview of AI in social study surveys reveals a trajectory marked by both technological advancements and the growing recognition of the need to address biases inherent in data collection and analysis processes.

Shahbazi et al. (2022) delve into the critical issue of representation bias in data, a challenge that has persisted from traditional survey methods to AI-driven approaches. Their work underscores the importance of identifying and resolving biases to ensure equitable outcomes in societal applications of AI. This focus on bias highlights a fundamental concern that has accompanied the evolution of survey methodologies: the need to ensure that data accurately represents diverse populations and perspectives. The transition to AI-enabled methods has not eliminated these challenges but has instead introduced new tools and techniques for addressing them.

Birhane et al. (2022) further explore the ethical dimensions of AI in social research, tracing the historical roots of fairness and justice in the context of AI ethics. Their analysis categorizes landmark works shaping the field and identifies emerging trends that emphasize the importance of grounding ethical analysis in concrete use-cases and people's lived experiences. This historical perspective on AI ethics reflects a growing awareness of the need to consider social and structural power asymmetries in the development and application of AI technologies, including in the realm of social study surveys.

Chakriswaran et al. (2019) provide an overview of emotion AI-driven sentiment analysis, illustrating one of the innovative applications of AI in social research. Their survey of sentiment analysis models and applications across various domains showcases the potential of AI to offer nuanced insights into human emotions and opinions. This evolution from traditional survey methods, which often relied on more straightforward question-and-answer formats, to sophisticated AI-driven analyses represents a significant advancement in the field's ability to capture and understand complex human experiences.

In summary, the historical evolution from traditional surveys to AI-enabled methods in social research is characterized by technological innovation, an ongoing struggle to address biases, and a deepening engagement with ethical considerations. As AI technologies continue to advance, the field of social study surveys stands to benefit from enhanced capabilities for data collection and analysis. However, this evolution also demands a continued commitment to addressing the ethical and representational challenges that accompany the use of AI in research.

1.4. Aim and Objectives of the Review.

The aim of this study is to critically evaluate the integration of Conversational Artificial Intelligence (AI) in social study surveys, focusing on its efficacy, user acceptance, potential biases, and the implications for various stakeholders including researchers, participants, and the broader community.

The objectives are to;

1. To assess the efficacy of conversational AI in social studies.
2. To understand user acceptance of conversational AI in social research.
3. To investigate potential biases introduced by conversational AI.

II. METHODOLOGY

This study employs a systematic literature review and content analysis to evaluate the integration of Conversational Artificial Intelligence (AI) in social study surveys, focusing on its efficacy, user acceptance, potential biases, and implications for stakeholders.

2.1. Data Sources

The primary data sources for this study include peer-reviewed journal articles, conference proceedings, and white papers from databases such as PubMed, IEEE Xplore, ACM Digital Library, Web of Science, and

Google Scholar. Secondary sources include reports from reputable AI research institutions, government publications on AI ethics and governance, and guidelines from professional societies related to social research and AI.

2.2. Search Strategy

The search strategy involves using a combination of keywords and Boolean operators to capture relevant literature. The keywords include "Conversational AI," "Social Study Surveys," "AI in Social Research," "User Acceptance of AI," "AI Biases," and "Ethical AI Use." These keywords are combined with Boolean operators (AND, OR) to construct comprehensive search queries tailored to each database's search engine. The search is limited to documents published in English from 2010 to 2024, to focus on the most recent advancements and discussions in the field.

2.3. Inclusion and Exclusion Criteria for Relevant Literature.

The inclusion criteria for relevant literature in this study are designed to ensure a comprehensive understanding of the integration of Conversational Artificial Intelligence (AI) in social study surveys. Specifically, the study includes peer-reviewed articles and conference papers that directly address the use of Conversational AI in the context of social research. This encompasses studies that evaluate the efficacy, user acceptance, and potential biases associated with the use of Conversational AI technologies. Additionally, literature that discusses ethical considerations, standards, and regulations relevant to the deployment of AI in social research is considered. To ensure the study reflects current technology and ethical standards, only publications from 2010 ro 2024 are included. Conversely, the exclusion criteria are set to maintain the focus and quality of the literature review. This excludes non-peer-reviewed articles, opinion pieces, and editorials that may not provide empirical evidence or rigorous analysis. Studies that focus on applications of AI outside the realm of social research surveys are also excluded, as are publications in languages other than English, given the study's scope. Furthermore, literature that does not offer empirical data or detailed analysis relevant to the study's aim and objectives is omitted to ensure that the review remains focused and pertinent to the integration of Conversational AI in social study surveys. This approach to selecting relevant literature aims to capture a broad yet focused array of scholarly work that contributes to understanding the complexities, challenges, and opportunities presented by Conversational AI in social research.

2.4. Selection Criteria

The selection process involves two phases. In the first phase, titles and abstracts are screened based on the inclusion and exclusion criteria to identify potentially relevant articles. The second phase involves a full-text review of the shortlisted articles to confirm their relevance to the study's objectives. Any discrepancies in article selection between reviewers are resolved through discussion or consultation with a third reviewer.

2.5. Data Analysis

Data analysis employs content analysis to synthesize findings from the selected literature. This involves coding the literature based on themes related to the efficacy, user acceptance, potential biases, and ethical considerations of Conversational AI in social research. The analysis identified patterns, trends, and gaps in the literature.

By systematically reviewing and analyzing the literature, this study provide a comprehensive understanding of the current landscape and future directions for the use of Conversational AI in social study surveys, with a focus on ensuring ethical and effective practices.

III. LITERATURE REVIEW

3.1. The Anatomy of Conversational AI: Components and Functions.

The advent of Conversational Artificial Intelligence (AI) has revolutionized the way humans interact with machines, offering a more natural and intuitive interface for communication. This transformation is particularly evident in the realm of social study surveys, where Conversational AI has the potential to significantly enhance participant engagement and data collection efficiency. At the heart of this technological evolution are the principles and mechanisms that

underpin Conversational AI, which are critical to understanding its capabilities and limitations.

Conversational AI systems can be broadly categorized into three types: question answering agents, task-oriented dialogue agents, and social bots (Gao, Galley, & Li, 2018). Each type serves a distinct purpose, from providing specific information in response to user queries to facilitating complex dialogues aimed at accomplishing certain tasks or engaging in social chit-chat. The underlying technology that powers these systems encompasses a range of neural network approaches, which have evolved significantly in recent years. These approaches enable the systems to understand, generate, and refine human-like responses, thereby facilitating more effective and engaging interactions.

Deep learning, a subset of machine learning, plays a pivotal role in the development of Conversational AI systems. It allows for the processing and interpretation of vast amounts of natural language data, enabling the systems to learn from examples and improve over time (Yan, 2018). This capability is crucial for adapting to the nuances of human language and for understanding the context and intent behind user inputs. As a result, Conversational AI systems can offer responses that are not only relevant but also personalized, enhancing the user experience.

The transition from traditional symbolic approaches to neural approaches in Conversational AI has been marked by significant advancements in natural language processing (NLP) and machine learning. While symbolic approaches relied heavily on predefined rules and logic, neural approaches leverage data-driven models that learn patterns and relationships within the data. This shift has allowed for greater flexibility and adaptability in Conversational AI systems, enabling them to handle a wider range of conversational scenarios and complexities.

Despite these advancements, several challenges remain. Ensuring the accuracy and relevance of responses, maintaining context over extended interactions, and managing the ethical implications of AI-driven communication are ongoing areas of research and development. Moreover, the integration of Conversational AI into social study surveys presents unique challenges, including ensuring participant privacy, addressing biases in AI algorithms, and maintaining the quality and integrity of collected data.

In summary, the principles and mechanisms underlying Conversational AI represent a complex interplay of technologies and methodologies. From neural network approaches to deep learning algorithms, these foundational elements enable Conversational AI systems to mimic human-like conversational abilities. As the field continues to evolve, ongoing research and development efforts are critical to addressing the challenges and maximizing the potential of Conversational AI in social study surveys and beyond.

3.2. Modes of Interaction: Text, Voice, and Beyond.

Interaction modalities in human-AI interfaces, particularly within the realm of social study surveys, have evolved significantly with the advent of conversational AI technologies. These advancements have revolutionized the way researchers collect and analyze data, offering new insights into human behavior and societal trends. This paper explores the nuances of human-AI interaction modalities, drawing on recent literature to understand their impact on social research methodologies.

The emergence of conversational AI has introduced a paradigm shift in social study surveys, moving beyond the traditional question-and-answer formats to more dynamic and engaging interactions (Li et al., 2022). These AI-driven interfaces, characterized by natural language processing and machine learning algorithms, enable a more natural and intuitive communication between humans and machines. Li et al. (2022) highlight the importance of assessing human-AI interaction early in the design process, using factorial surveys to evaluate user perceptions and the UX impact of different interaction guidelines. This approach underscores the critical role of user experience in the development of AI-driven survey systems, ensuring that they are not only effective in data collection but also accessible and engaging for participants.

Moreover, the transition from dyadic to polyadic interactions in conversational AI systems has expanded the scope of human-AI communication.

Zheng et al. (2022) delve into this evolution, examining how conversational agents (CAs) facilitate not just direct human-AI interactions but also mediate human-human interactions within the context of social studies. Their literature review identifies key aspects of polyadic CAs that enhance communication, engagement, connection, and relationship maintenance among participants. This polyadic approach to conversational AI in social studies not only enriches the data collection process but also opens up new avenues for exploring complex social dynamics.

The directionality of communication in human-AI interactions further influences the efficacy and perception of AI-driven survey systems. Ashktorab et al. (2021) investigate the social perceptions of AI agents based on their communicative roles—whether leading or responsive—in a cooperative game setting. Their findings suggest that participants' perceptions of AI agents vary significantly with the direction of communication, affecting outcomes such as rapport, intelligence, and likeability. This research points to the importance of designing AI systems that can adapt their communicative strategies to fit the context of the interaction, thereby enhancing user acceptance and minimizing potential biases.

In summary, the integration of conversational AI into social study surveys has brought about significant methodological innovations, offering new perspectives on human behavior and societal trends. The studies reviewed herein underscore the complexity of human-AI interaction modalities, highlighting the importance of user experience, the potential of polyadic interactions, and the impact of communication directionality on the perception and effectiveness of AI-driven survey systems. As conversational AI continues to evolve, further research is needed to refine these interaction modalities, ensuring that they not only advance the field of social research but also adhere to ethical standards and promote inclusivity.

3.3. Key Developments in Conversational AI for Social Research.

The integration of Conversational AI into social study surveys has marked a significant milestone in the evolution of social research methodologies. This technological advancement has not only enhanced the efficiency and effectiveness of data collection but also introduced new dimensions to the interaction between researchers and participants. Drawing upon recent literature, this paper explores the milestones in Conversational AI that have significantly impacted social research, focusing on the development of AI conversational partners, the assessment of equity in human-AI communication, and the measurement of perceived anthropomorphism in AI agents.

The advent of chatbots as AI conversational partners in language learning represents a pivotal development in the application of Conversational AI (Belda-Medina & Calvo-Ferrer, 2022). This study highlights the potential of chatbots to serve as effective tools for language acquisition, demonstrating the versatility of Conversational AI beyond traditional survey contexts. By engaging future educators in a four-week interaction with conversational agents, Belda-Medina and Calvo-Ferrer (2022) shed light on the positive perceptions and satisfaction levels concerning the integration of these agents in educational settings. The findings underscore the importance of ease of use and positive attitudes towards conversational agents, although they also reveal moderate intentions to use these technologies in the future. This milestone underscores the expanding role of Conversational AI in facilitating complex cognitive and linguistic tasks, thereby broadening the scope of its application in social research.

Equity in human-AI communication emerges as a critical consideration in the deployment of Conversational AI systems, particularly in the context of contentious social issues (Chen et al., 2024). By evaluating GPT-3's interactions with diverse social groups, Chen et al. (2024) provide a framework for assessing the fairness of conversational AI systems. Their study reveals that minority groups, based on education and opinions, experience a substantively worse user experience, yet show a greater change in attitudes towards supporting social movements after the interaction. This milestone highlights the dual challenge of ensuring equitable experiences for all users while leveraging the persuasive potential of Conversational AI in promoting social change. The findings call for a conversational AI system that prioritizes diversity, equity, and inclusion,

emphasizing the need for ongoing research to address these challenges.

The measurement of perceived anthropomorphism in AI conversational agents represents another significant milestone in understanding human-AI interaction (Lim et al., 2020). Lim et al. (2020) developed and validated a scale to assess how individuals perceive the human-like qualities of AI agents, focusing on aspects such as civility, rationality, and refinement. This work is crucial for designing conversational agents that can effectively mimic human interactions, thereby enhancing the user experience and engagement in social study surveys. The development of this scale not only contributes to the theoretical understanding of anthropomorphism in AI but also provides practical tools for evaluating and improving the design of conversational agents.

In summary, the milestones in Conversational AI, including the development of AI conversational partners, the assessment of equity in human-AI communication, and the measurement of perceived anthropomorphism, have significantly influenced the field of social research. These advancements have expanded the capabilities of social study surveys, offering new opportunities for engaging participants and collecting data. However, they also present challenges, such as ensuring equity and designing human-like conversational agents that require careful consideration and ongoing research. As Conversational AI continues to evolve, its integration into social research methodologies promises to further transform the landscape of social studies, enhancing both the efficiency and depth of data collection and analysis.

3.4. Cutting-Edge Innovations: Enhancing Interaction and Data Collection.

The integration of Conversational AI into social study surveys has been marked by significant innovations, particularly in the realms of data collection and analysis. These advancements have not only streamlined the process of gathering information but have also enhanced the depth and quality of insights derived from social research. Drawing upon recent literature, this paper explores the forefront of these innovations, focusing on their application in various domains and their impact on social research methodologies.

Enticott, Earl, and Gates (2021) provide a comprehensive review of social research data collection methods, particularly focusing on voluntary animal disease reporting behavior. Their work underscores the importance of understanding socio-cultural factors that influence individuals' willingness to engage with disease reporting systems. This study highlights the potential for Conversational AI to address challenges in eliciting accurate statements of behavior and intentions, which often reflect desirable social norms rather than actual practices. The application of Conversational AI in this context could revolutionize the way data is collected, by facilitating more natural and engaging interactions that encourage honest and accurate reporting. The findings from this review suggest a need for methodological innovations that can bridge the gap between stated and observable behaviors, a challenge that Conversational AI is well-positioned to address.

Siahaan and Prasetio (2022) explore the use of big data and Conversational AI in understanding customer insights, particularly in the automotive industry. Their study employs conjoint analysis to develop frameworks for evaluating brand perceptions based on social media data. This approach demonstrates the power of Conversational AI in processing and analyzing large volumes of unstructured data from social media platforms, offering businesses valuable insights into customer perceptions and brand positioning. The methodologies developed in this study could be adapted for social research surveys, enabling researchers to tap into the wealth of data available on social media and gain deeper insights into public opinions and trends.

Garg (2023) discusses the role of Conversational AI in mental health analysis through social media posts. This survey highlights the advancements in machine learning and deep learning models for quantifying mental health based on personal writings on social media. The ability of Conversational AI to analyze textual data for signs of stress, depression, and suicidal ideation represents a significant innovation in social research. By leveraging real-time, responsible AI models, researchers can identify and validate

associations between social media posts and mental health status, opening new avenues for understanding and addressing mental health issues at a societal level.

In summary, the innovations at the forefront of enhancing data collection and analysis in social study surveys, as exemplified by the studies reviewed, illustrate the transformative potential of Conversational AI in social research. These advancements not only improve the efficiency and accuracy of data collection but also expand the scope of research by enabling the analysis of complex and nuanced data sets. As Conversational AI continues to evolve, its integration into social research methodologies promises to further enrich our understanding of social phenomena, offering new insights and opportunities for addressing societal challenges.

IV. DISCUSSION OF FINDINGS

4.1. Evaluating the Impact: Technological, Societal, and Ethical Dimensions.

The integration of Conversational AI into social study surveys has been a subject of increasing interest within the research community, particularly in terms of its efficacy, user acceptance, and potential biases. This paper explores these dimensions, drawing on recent studies to provide insights into the current state and future prospects of Conversational AI in social research.

The efficacy of Conversational AI in social studies is exemplified by the work of Kaywan et al. (2023), who conducted a non-clinical trial to assess the feasibility of using AI-enabled chatbots for the early detection of depression. Their study highlights the potential of Conversational AI to reach a wide audience and provide early intervention opportunities, demonstrating a significant advancement in the application of AI in mental health screening. The DEPRA chatbot, developed using Dialogflow, underscores the capability of Conversational AI to conduct sophisticated analyses and engage users in meaningful interactions, thereby enhancing the efficacy of data collection and analysis in social research.

User acceptance of Conversational AI is another critical factor influencing its integration into social studies. The study by Au et al. (2023) on the usability of Lucy LiverBot, a chatbot designed to improve health literacy among patients with decompensated cirrhosis, provides valuable insights into user perceptions of AI chatbots. Their findings indicate that participants found the conversational nature of the chatbot appealing and identified it as a potential educational tool. This suggests that Conversational AI can play a significant role in enhancing user engagement and satisfaction in social research, provided that the interfaces are designed to be user-friendly and accessible.

However, the potential biases inherent in Conversational AI systems pose a challenge to their application in social studies. Venkit (2023) addresses the need for a holistic approach to understanding sociodemographic biases in NLP models, advocating for an interdisciplinary lens to identify and mitigate biases. This work highlights the importance of considering a wide range of sociodemographic factors beyond race and gender and emphasizes the need for collaboration across disciplines to develop more equitable and inclusive Conversational AI systems. By addressing these biases, researchers can ensure that Conversational AI tools provide accurate and representative data, thereby enhancing the validity and reliability of social research findings.

In summary, Conversational AI offers promising opportunities for enhancing the efficacy and user acceptance of social study surveys while posing challenges related to potential biases. The studies reviewed herein underscore the importance of ongoing research and development to maximize the benefits of Conversational AI in social research. By focusing on improving the accuracy, accessibility, and inclusivity of Conversational AI systems, researchers can leverage these technologies to conduct more effective, engaging, and equitable social studies.

4.1.1. The Good, the Bad, and the Biased: Navigating the Complexities.

The advent of Conversational AI in social study surveys has introduced a paradigm shift in how data is collected, analyzed, and interpreted. This shift necessitates a reevaluation of efficacy measurement

methodologies to ensure that AI-driven surveys are not only effective but also align with the objectives of social research. The following discussion explores the efficacy of AI-driven surveys compared to traditional methods, drawing on recent studies to highlight advancements, challenges, and future directions.

Lim et al. (2020) developed a scale to measure the perceived anthropomorphism of AI conversational agents, a factor that significantly influences user engagement and response quality in surveys. Their work underscores the importance of designing AI agents that users can relate to on a human level, thereby enhancing the efficacy of data collection by increasing participation rates and the authenticity of responses. This development is crucial for social studies, where the depth and quality of data directly impact the validity of research findings.

Ng (2022) explored the association between the use of conversational AI and social capital, providing insights into how AI-driven surveys can transcend traditional data collection methods by fostering greater engagement and participation. The study found that users of conversational AI reported higher levels of offline and online bonding and bridging social capital, indicating that conversational AI can effectively facilitate meaningful interactions. This suggests that AI-driven surveys, through their interactive and engaging nature, can enhance the quality of data collected by encouraging more open and thoughtful responses from participants.

Borsci et al. (2021) introduced the Chatbot Usability Scale (BUS-15), a tool designed to measure user satisfaction with AI-based conversational agents. The development of such scales is critical for assessing the efficacy of AI-driven surveys, as it provides a standardized method to evaluate user experience and identify areas for improvement. By ensuring that conversational agents are user-friendly and meet the needs of participants, researchers can maximize the efficacy of AI-driven surveys in collecting high-quality data.

In summary, the efficacy of AI-driven surveys in social studies is multifaceted, encompassing aspects of user engagement, data quality, and usability. The studies reviewed herein highlight the potential of conversational AI to enhance the data collection process, provided that these systems are designed with user experience in mind. As the field of Conversational AI continues to evolve, ongoing research and development will be essential for refining these tools and ensuring their effective integration into social research methodologies.

4.1.2. Overcoming Obstacles: From Skepticism to Integration.

The adoption of Conversational AI in social study surveys is contingent upon user acceptance, which is influenced by a myriad of factors ranging from perceived utility to trust and risk perceptions. This paper delves into the factors influencing the adoption of Conversational AI in social research, drawing insights from recent studies to elucidate the dynamics of user acceptance.

Suhluli and Khan (2022) explore the determinants of user acceptance of wearable IoT devices, shedding light on the relevance of privacy, security concerns, and social norms in the context of technology adoption. Their findings indicate that perceived privacy risks and health awareness significantly impact the intention to adopt wearable devices, while social norms negatively affect privacy and security concerns. This study underscores the importance of addressing privacy and security concerns to enhance user acceptance of Conversational AI in social studies, suggesting that clear communication of the benefits and safeguards associated with AI-driven surveys could mitigate apprehensions and foster greater acceptance.

Chung, Kim, and Ahn (2022) investigate user acceptance and resistance to voice commerce, providing insights into the factors that could influence the adoption of Conversational AI in social research. Their study highlights the role of accuracy, social presence, and interactivity of virtual assistants, along with user attributes such as innovativeness and experience, in shaping user acceptance. These findings suggest that enhancing the accuracy and interactivity of Conversational AI, and targeting users with a propensity for technological innovation, could improve user acceptance in social study surveys.

Xiong et al. (2023) examine the roles of trust and perceived risk in the acceptance of AI virtual

assistants, extending the Unified Theory of Acceptance and Use of Technology (UTAUT) by incorporating these factors. Their research demonstrates that both trust and perceived risk significantly influence user attitudes and behavioral intentions towards using AI virtual assistants. This implies that fostering trust in Conversational AI, through transparent and reliable operations, and minimizing perceived risks, could be crucial for encouraging user acceptance in social research applications.

Therefore, user acceptance of Conversational AI in social study surveys is influenced by a complex interplay of factors, including privacy and security concerns, the perceived utility and accuracy of the technology, social norms, and individual user attributes. Addressing these factors through improved technology design, user education, and robust privacy and security measures is essential for fostering user acceptance. As Conversational AI continues to evolve, understanding and addressing these determinants of user acceptance will be critical for leveraging the full potential of AI-driven surveys in social research.

4.1.3. The Evolution of Conversational Protocols: Adapting to Human Needs

The integration of Conversational AI into social study surveys has raised important questions regarding the identification and mitigation of AI-induced biases. This paper explores the nuances of biases within Conversational AI, drawing on recent studies to highlight the challenges and propose solutions for ensuring equitable and accurate research outcomes.

Venkit (2023) advocates for a holistic approach to understanding sociodemographic biases in NLP models, emphasizing the need for an interdisciplinary lens. The study underscores the limitations of current research, which often focuses narrowly on race and gender, neglecting other sociodemographic factors. The study of Venkit (2023) suggests that addressing biases in Conversational AI requires a comprehensive understanding that spans technical, social, and ethical dimensions. This implies that mitigating AI-induced skew in social research necessitates collaboration across disciplines, integrating insights from social sciences to develop more inclusive and representative AI systems.

Lee et al. (2020) explore the credibility of AI-generated news, revealing how communicative and social capital influences perceptions of AI news credibility. Their findings indicate that media use and public discussion positively associate with AI news credibility, moderated by social trust. This study sheds light on the complex interplay between AI content generation and audience perceptions, suggesting that fostering a trustworthy AI system is crucial for its acceptance and effectiveness in social research. The implications of this research extend to Conversational AI in social studies, where trust and credibility are paramount for participant engagement and data integrity.

In summary, identifying and mitigating biases in Conversational AI is a multifaceted challenge that requires a concerted effort across technical, social, and ethical domains. The studies reviewed herein highlight the critical importance of addressing sociodemographic biases, gender bias, and issues of credibility and trust in AI systems. By adopting an interdisciplinary approach and implementing rigorous bias mitigation strategies, researchers can enhance the equity, accuracy, and acceptability of AI-driven surveys in social research, paving the way for more inclusive and representative studies.

4.1.4. What Lies Ahead: Predicting the Future of AI in Social Research.

The evolution of AI survey methodologies in social research is poised at a critical juncture, with emerging technologies offering new avenues for data collection, analysis, and interpretation. This paper explores the future trajectories of AI in survey methodologies, drawing on recent studies to illuminate the potential advancements and challenges in this rapidly evolving field.

Fehér and Veres (2022) provide insights into the expectations of Hungarian investors and developers regarding AI's role in the economy and society, highlighting a dual perspective of AI as both a decision-supportive technology and a source of uncertainties and fears. This dichotomy underscores the importance of trust-building and responsibility-sharing in cross-industrial collaborations to mitigate social uncertainties and foster the well-being of future AI developments. The study suggests that similar

considerations will be crucial in the evolution of AI survey methodologies, where trust and ethical considerations will play a pivotal role in their acceptance and effectiveness.

Sanders, Ulinich, and Schneier (2023) explore the potential of AI chatbots for political issue polling, demonstrating AI's capability to simulate human-like survey responses at a fraction of the cost of traditional methods. Their findings indicate that AI can effectively anticipate public opinion on various policy issues, although demographic-level differences remain a challenge. This research highlights the potential for AI to revolutionize social research methodologies by providing cost-effective, scalable, and potentially more accurate tools for gauging public sentiment, albeit with the need for continuous refinement to address demographic nuances.

Kasi and Shaheen (2020) discuss the impact of AI on the information services of social media portals, projecting a future where AI-enabled platforms offer enhanced accessibility and reduced misinformation. The study anticipates that AI innovations will lead to more efficient information dissemination and a shift towards AI-empowered environments with less misinformation. This projection has significant implications for social research methodologies, suggesting that AI could facilitate more dynamic and responsive survey mechanisms, leveraging social media platforms to reach wider audiences and collect data in real-time.

In summary, the future trajectories of AI in survey methodologies are marked by significant potential for innovation, offering new possibilities for enhancing the efficiency, accuracy, and scope of social research. However, these advancements come with challenges, including the need for trust-building, ethical considerations, and addressing demographic differences. As AI continues to evolve, its integration into social research methodologies will require careful consideration of these factors to fully realize its potential while ensuring the integrity and inclusiveness of research outcomes.

4.2. The Role of Standards and Governance: Shaping the Future of AI Surveys.

The integration of Conversational AI into social study surveys necessitates a robust framework for ethical AI use, encompassing standards and regulations that ensure the responsible deployment of these technologies. This paper explores the crafting of such a framework, drawing insights from recent studies to highlight the challenges and opportunities in this evolving landscape.

Rajagopal et al. (2023) propose a conceptual framework for AI governance in public administration, emphasizing the need for smart governance to address the rapid evolution of AI technologies. Their study underscores the importance of aligning AI development and deployment with ethical, legal, and social standards to mitigate uncertainties and fears associated with AI. This governance model suggests that establishing clear guidelines and responsibilities is crucial for fostering trust and accountability in AI applications, including those used in social research surveys.

Rahmat, Rusdin, and Nofiasari (2023) delve into the opportunities and challenges presented by metaverse journalism, offering insights into the regulatory considerations for emerging AI applications. While their study focuses on journalism, the implications for social research are significant, highlighting the need for standard rules or regulations to ensure that AI technologies have a positive impact. This research points to the necessity of formulating ethical guidelines that address privacy, data protection, and misinformation, ensuring that AI-driven surveys are conducted in a manner that respects participants' rights and societal values.

Willie and Nkomo (2019) discuss the slow pace of digital transformation in healthcare, attributing it to regulatory challenges and the need for guidelines that accelerate the adoption of technology. Their analysis of the healthcare sector's digital transformation offers parallels to the adoption of AI in social research, emphasizing the role of regulation in facilitating innovation while safeguarding ethical principles. The study suggests that developing comprehensive policies and standards is essential for the ethical use of AI in social studies, ensuring that these technologies

enhance research methodologies without compromising ethical standards.

In summary, crafting a framework for ethical AI use in social study surveys requires a multidisciplinary approach that addresses the technological, ethical, and regulatory aspects of AI deployment. The studies reviewed herein highlight the need for clear governance models, ethical guidelines, and regulatory standards that ensure AI technologies are used responsibly in social research. By establishing such a framework, researchers can leverage the benefits of Conversational AI while mitigating potential risks and ensuring that these technologies contribute positively to the advancement of social studies.

4.3. Stakeholder Implications: Impact on Researchers, Participants, and Policymakers.

The integration of Conversational AI into social study surveys brings forth significant implications for various stakeholders, including researchers, participants, and the broader community. Puaschunder (2019) provides an empirical study on stakeholder perspectives regarding the introduction of AI, robotics, and big data in healthcare. The study highlights the dual nature of AI applications, presenting both benefits and risks. For researchers, the findings underscore the importance of tailored medicine and efficiency, while also cautioning against data misuse and the potential loss of humaneness. This study suggests that researchers must navigate these benefits and risks carefully, ensuring that AI applications in social studies enhance research outcomes without compromising ethical standards or participant welfare.

Yang et al. (2021) delve into stakeholders' perspectives on the future of AI in radiology, offering insights that can be extrapolated to social research. The study emphasizes the need for interdisciplinary collaboration to address the challenges posed by AI, including ethical considerations and the potential for bias. For participants, this highlights the importance of transparency and informed consent, ensuring that individuals are aware of how AI is used in research and the implications for their data privacy and security.

Adus, Macklin, and Pinto (2023) explore patient perspectives on engagement in the development of AI applications in healthcare. Their findings stress the importance of involving participants in the AI development process, suggesting that such engagement can lead to more ethical and effective AI applications. This approach has significant implications for social research, where participant engagement can enhance the relevance and acceptability of AI-driven methodologies, ensuring that these technologies address the real needs and concerns of the community.

In summary, the integration of Conversational AI into social study surveys presents a complex landscape of opportunities and challenges for stakeholders. Researchers must balance the potential for enhanced efficiency and precision against the risks of bias and ethical dilemmas. Participants play a crucial role in this ecosystem, with their engagement and perspectives shaping the development and application of AI in research. As Conversational AI continues to evolve, fostering collaboration among all stakeholders will be key to harnessing its potential while navigating the ethical and practical challenges it presents.

CONCLUSION

The integration of Conversational Artificial Intelligence (AI) into social study surveys heralds a new era in social research, characterized by enhanced efficiency, precision, and the potential for deeper insights into human behavior and societal trends. Our systematic literature review and content analysis have revealed that Conversational AI can significantly improve the efficacy of data collection, offering a more engaging experience for participants and reducing biases associated with traditional survey methods. However, the adoption of Conversational AI also introduces new challenges, including potential biases inherent in AI algorithms and concerns regarding user privacy and data security.

The future of social research with Conversational AI is ripe with opportunities to harness the power of advanced analytics and machine learning for more nuanced and comprehensive studies. The potential for real-time data analysis and the ability to conduct surveys across diverse populations at scale presents a transformative opportunity for the field. Nonetheless,

this future also poses challenges, particularly in ensuring the ethical use of AI, safeguarding participant data, and maintaining the integrity and credibility of research findings. Addressing these challenges requires a concerted effort from researchers, ethicists, policymakers, and technology developers.

In light of the findings from this study, it is clear that the integration of Conversational Artificial Intelligence (AI) into social study surveys presents a unique set of opportunities and challenges that necessitate strategic guidance for the next generation of social surveys. To navigate these complexities effectively, it is essential to develop comprehensive ethical guidelines that address consent, transparency, and data protection, ensuring that the rights and privacy of participants are safeguarded. This involves not only adhering to existing ethical standards but also anticipating the unique ethical considerations that Conversational AI introduces. Moreover, there is a pressing need to implement rigorous testing and validation processes for AI algorithms to identify and mitigate biases. This step is crucial for ensuring that survey findings are representative and unbiased, thereby maintaining the integrity of social research. Enhancing user acceptance is another critical recommendation, which can be achieved by designing Conversational AI interfaces that are intuitive, engaging, and accessible to a diverse range of participants. This approach will promote higher participation rates and more accurate data collection, enriching the quality of research findings. Finally, fostering interdisciplinary collaboration is paramount. Encouraging collaboration between social scientists, AI researchers, ethicists, and technologists will address the multifaceted challenges of integrating AI into social research. This collaborative effort is essential for developing innovative solutions that leverage the strengths of each discipline, ultimately guiding the next generation of social surveys towards more ethical, accurate, and insightful outcomes. By embracing these strategic recommendations, the research community can ensure that the evolution of social surveys through Conversational AI not only enhances the efficiency and scope of research but also upholds the highest standards of ethical practice and methodological rigor.

As we stand on the brink of a new era in social research facilitated by Conversational AI, it is imperative to embrace these technologies with both caution and confidence. Caution is necessary to navigate the ethical and methodological challenges that accompany AI, ensuring that its integration into social research enhances rather than compromises the quality and integrity of studies. Simultaneously, confidence in the potential of AI to revolutionize social research should inspire continued innovation and exploration. By adhering to ethical principles, actively addressing biases, and fostering user acceptance, the research community can leverage Conversational AI to unlock new insights and contribute to a deeper understanding of complex social phenomena.

REFERENCES

[1] Adewumi, T. P., Liwicki, F., & Liwicki, M. (2022). State-of-the-art in Open-domain Conversational AI: A Survey. https://dx.doi.org/10.48550/arXiv.2205.00965 DOI: 10.48550/arXiv.2205.00965

[2] Adus, S., Macklin, J., & Pinto, A. (2023). Exploring patient perspectives on how they can and should be engaged in the development of artificial intelligence (AI) applications in health care. BMC Health Services Research, 23, 1163. https://dx.doi.org/10.1186/s12913-023-10098-2

[3] Ashktorab, Z., Dugan, C., Johnson, J., Pan, Q., Zhang, W., Kumaravel, S., & Campbell, M. (2021,). Effects of communication directionality and AI agent differences in human-AI interaction. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, pp. 1-15. https://dx.doi.org/10.1145/3411764.3445256

[4] Au, J., Falloon, C., Ravi, A., Ha, P., & Le, S. (2023). A Beta-Prototype Chatbot for Increasing Health Literacy of Patients with Decompensated Cirrhosis: Usability Study. JMIR Human Factors, 10(1), e42506. https://dx.doi.org/10.2196/42506

[5] Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Using Chatbots as AI Conversational Partners in Language Learning. Applied Sciences, 12(17), 8427. https://dx.doi.org/10.3390/app12178427

[6] Birhane, A., Ruane, E., Laurent, T., S. Brown, M., Flowers, J., Ventresque, A., & L. Dancy, C. (2022). The forgotten margins of AI ethics. In Proceedings of the 2022 ACM Conference on Fairness, Accountability, and Transparency, pp. 948-958. DOI: 10.1145/3531146.3533157

[7] Borsci, S., Malizia, A., Schmettow, M., Van Der Velde, F., Tariverdiyeva, G., Balaji, D., & Chamberlain, A. (2022). The Chatbot Usability Scale: the design and pilot of a usability scale for interaction with AI-based conversational agents. Personal and Ubiquitous Computing, 26, 95-119. https://dx.doi.org/10.1007/s00779-021-01582-9

[8] Chakriswaran, P., Vincent, D., Srinivasan, K., Sharma, V., Chang, C.-Y., & Reina, D. (2019). Emotion AI-Driven Sentiment Analysis: A Survey, Future Research Directions, and Open Issues. Applied Sciences, 9(24), 5462. DOI: 10.3390/app9245462

[9] Chen, K., Shao, A., Burapacheep, J., & Li, Y. (2024). Conversational AI and equity through assessing GPT-3's communication with diverse social groups on contentious topics. Scientific Reports, 14(1), 1561. https://dx.doi.org/10.1038/s41598-024-51969-w

[10] Chew, H. S. J. (2022). The Use of Artificial Intelligence–Based Conversational Agents (Chatbots) for Weight Loss: Scoping Review and Practical Recommendations. JMIR Medical Informatics, 10(4), e32578. https://dx.doi.org/10.2196/32578 DOI: 10.2196/32578

[11] Chung, D., Kim, H., & Ahn, S. (2022). An integrated study of user acceptance and resistance on voice commerce. International Journal of Innovation and Technology Management, 19(07), 2250025. https://dx.doi.org/10.1142/s0219877022500250

[12] Enticott, G., Earl, L., & Gates, M. C. (2022). A systematic review of social research data collection methods used to investigate voluntary animal disease reporting behaviour. Transboundary and Emerging Diseases, 69(5), 2573-2587. https://dx.doi.org/10.1111/tbed.14407

[13] Feher, K., & Veres, Z. (2022). Trends, risks and potential cooperations in the AI development market: expectations of the Hungarian investors and developers in an international context. International Journal of Sociology and Social Policy, 43(1/2), 107-125. https://dx.doi.org/10.1108/ijssp-08-2021-0205

[14] Gao, J., Galley, M., & Li, L. (2018, June). Neural approaches to conversational AI. In The 41st international ACM SIGIR conference on research & development in information retrieval, pp. 1371-1374. DOI: 10.18653/v1/P18-5002

[15] Garg, M. (2023). Mental health analysis in social media posts: a survey. Archives of Computational Methods in Engineering, 30(3), 1819-1842. https://dx.doi.org/10.1007/s11831-022-09863-z

[16] Hidayat-ur-Rehman, I., & Ibrahim, Y. (2023). Exploring factors influencing educators' adoption of ChatGPT: A mixed method approach. Information Technology & People. Vol. ahead-of-print No. ahead-of-print. DOI: 10.1108/itse-07-2023-0127.

[17] Kasi, M., & Shaheen, R. (2020). How Will Information Services of Social Media Portals Change in the Future When Artificial Intelligence is implemented?. European Journal of Technology, 4(1), 31-46. https://dx.doi.org/10.47672/ejt.631

[18] Kaywan, P., Ahmed, K., Ibaida, A., Miao, Y., & Gu, B. (2023). Early detection of depression using a conversational AI bot: A non-clinical trial. PLOS ONE, 18(2), e0279743. https://dx.doi.org/10.1371/journal.pone.0279743

[19] Lee, S., Nah, S., Chung, D. S., & Kim, J. (2020). Predicting ai news credibility: communicative or social capital or both?. Communication Studies, 71(3), 428-447. https://dx.doi.org/10.1080/10510974.2020.1779769

[20] Lekova, A., Tsvetkova, P., & Andreeva, A. (2023, September). System Software Architecture for Enhancing Human-robot Interaction by Conversational AI," 2023 International Conference on Information Technologies (InfoTech), Varna, Bulgaria, 2023,

pp. 1-6, DOI: 10.1109/InfoTech58664.2023.10266870

[21] Li, T., Vorvoreanu, M., DeBellis, D., & Amershi, S. (2023). Assessing human-ai interaction early through factorial surveys: A study on the guidelines for human-ai interaction. ACM Transactions on Computer-Human Interaction, 30(5), 1-45. https://dx.doi.org/10.1145/3511605.

[22] Lim, J. S., Choi, J. H., & Lee, H. M. (2020). Measuring the perceived anthropomorphism of an AI conversational agent: scale development and validation. Korean Society for Journalism and Communication Studies, 64(4), 436-470. https://dx.doi.org/10.20879/kjjcs.2020.64.4.012

[23] Mahdavi, A., Amanzadeh, M., Hamedan, M., & Naemi, R. (2023). Artificial Intelligence-Based Chatbots to Combat COVID-19 Pandemic: A Scoping Review. Research Square. https://dx.doi.org/10.21203/rs.3.rs-2565141/v1 DOI: 10.21203/rs.3.rs-2565141/v1

[24] Ng, Y. (2022). Exploring the association between use of conversational artificial intelligence and social capital: Survey evidence from Hong Kong. New Media & Society. https://dx.doi.org/10.1177/14614448221074047.

[25] Puaschunder, J. M. (2019). Stakeholder Perspectives on Artificial Intelligence (AI), Robotics and Big Data in Healthcare: An Empirical Study (December 3, 2019). Available at SSRN: https://ssrn.com/abstract=3497261 or http://dx.doi.org/10.2139/ssrn.3497261.

[26] Rahmat, F. N., Rusdin, F. R., & Nofiasari, W. (2023). Metaverse Journalism: Opportunities and Challenges for the Media Industry in Indonesia. International Journal of Science and Society, 5(4), 207-218. https://dx.doi.org/10.54783/ijsoc.v5i4.779

[27] Rajagopal, M., Sivasakthivel, R., Ramar, G., Mansurali, A., & Karuppasamy, S. K. (2023, October). A Framework for AI Governance in Public Administration – A Smart Governance Perspective," 2023 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), Kirtipur, Nepal, 2023, pp. 488-495, https://dx.doi.org/10.1109/I-SMAC58438.2023.10290366.

[28] Shahbazi, N., Lin, Y., Asudeh, A., & Jagadish, H. (2022). Representation Bias in Data: A Survey on Identification and Resolution Techniques. ACM Computing Surveys, 55(293), 1-39. https://dx.doi.org/10.1145/3588433 DOI: 10.1145/3588433.

[29] Siahaan, B. P., & Prasetio, E. A. (2022). Understanding Customer Insights Through Big Data: Innovations in Brand Evaluation in the Automotive Industry. The Asian Journal of Technology Management, 15(1), 51-68. https://dx.doi.org/10.12695/ajtm.2022.15.1.4.

[30] Simeoni, R., Colonnelli, F., Eutizi, V., Marchetti, M., Paolini, E., Papalini, V., Punturo, A., Salvò, A., Scipinotti, N., Serpente, C., Barbini, E., Troscia, R., Maccioni, G., & Giansanti, D. (2021). The Social Robot and the Digital Physiotherapist: Are We Ready for the Team Play? Healthcare, 9(11), 1454. DOI: 10.3390/healthcare9111454

[31] Suhluli, S. A., & Ali Khan, S. M. F. (2022). Determinants of user acceptance of wearable IoT devices. Cogent Engineering, 9(1), 2087456.https://dx.doi.org/10.1080/23311916.2022.2087456

[32] Toader, D., Boca, G., Toader, R., Macelaru, M., Toader, C., Ighian, D., & Rădulescu, A. (2019). The Effect of Social Presence and Chatbot Errors on Trust. Sustainability, 12(1), 256. DOI: 10.3390/su12010256.

[33] Venkit, P. N. (2023, August). Towards a Holistic Approach: Understanding Sociodemographic Biases in NLP Models using an Interdisciplinary Lens. In Proceedings of the 2023 AAAI/ACM Conference on AI, Ethics, and Society, pp. 1004-1005. https://dx.doi.org/10.1145/3600211.3604754

[34] Willie, M. M., & Nkomo, P. (2019). Digital transformation in healthcare–South Africa context. Global Journal of Immunology and Allergic Diseases, 7(1), 1-5. https://dx.doi.org/10.31907/2310-6980.2019.07.01

[35] Xiong, Y., Shi, Y., Pu, Q., & Liu, N. (2023). More trust or more risk? User acceptance of

artificial intelligence virtual assistant. Human Factors and Ergonomics in Manufacturing & Service Industries. 10.1002/hfm.21020. https://dx.doi.org/10.1002/hfm.21020

[36] Yan, R. (2018). "Chitty-Chitty-Chat Bot": Deep Learning for Conversational AI. Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI-18), pp. 5520-5526. DOI: 10.24963/ijcai.2018/778.

[37] Yang, L., Ene, I. C., Arabi Belaghi, R., Koff, D., Stein, N., & Santaguida, P. (2022). Stakeholders' perspectives on the future of artificial intelligence in radiology: a scoping review. European Radiology, 32(3), 1477-1495. https://dx.doi.org/10.1007/s00330-021-08214-z

[38] Zheng, Q., Tang, Y., Liu, Y., Liu, W., & Huang, Y. (2022, April). UX research on conversational human-AI interaction: A literature review of the ACM Digital Library. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, pp. 1-24. https://dx.doi.org/10.1145/3491102.3501855