The Use of Artificial Intelligence (AI) in Qualitative Research for Theory Development

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The Use of Artificial Intelligence (AI) in Qualitative Research for Theory Development

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Theory development is an important component of academic research since it can lead to the acquisition of new knowledge, the development of a field of study, and the formation of theoretical foundations to explain various phenomena. The contribution of qualitative researchers to theory development and advancement remains significant and highly valued, especially in an era of various epochal shifts and technological innovation in the form of Artificial Intelligence (AI). Even so, the academic community has not yet fully explored the dynamics of AI in research and there are significant gaps in our understanding of how AI can be used most effectively in the context of theory building. The aim of this paper, which is driven by critical and conceptualization methodological dynamics, is to investigate the role of AI in the theory development process. As such, it critically evaluates the opportunities and limitations of AI in theory building, delivers a conceptual map of the nexus between AI and theory development, and presents key considerations for the use of AI in the creation of new theories or the advancement of existing ones. Though the necessity of AI tools in theory creation is contested given that the researchers' cognitive and evaluative skills are regarded as critical in this process, the value of AI in advancing theory is not to be underestimated.

Keywords: artificial intelligence, AI, theory, theory building, qualitative research

Introduction

Artificial Intelligence (AI) has become an extremely useful tool in many different fields, including qualitative research (Longo, 2020). Researchers now have access to new avenues for investigating complex phenomena and generating valuable insights thanks to the ability of AI to divulge useful information that can be used to build theoretical discussions and analyze and interpret large volumes of information (Borges et al., 2021; Hwang et al., 2020; Xu et al., 2021). More specifically, transcription tools powered by AI, equipped with sophisticated speech recognition algorithms (Chowdhary, 2020), make the process of transcription of qualitative data (e.g., interviews and focus group discussions) tasks significantly easier for researchers since such tools can transcribe data by automatically converting audio or video recordings into written text. This allows researchers and analysts to concentrate on the analysis and interpretation of the qualitative content. It is also common in qualitative research to deal with significant amounts of data, which may include interviews, field notes (such as from an ethnographic study), and documents. AI tools can provide researchers with assistance in effectively organizing and managing such qualitatively derived data since they may offer various useful features such as data storage, retrieval, and organization. Another area in which AI is making significant contributions to research is through data analysis (Verma et al., 2021; Zhao et al., 2020). Researchers may use various

means such as software or even manual means to code and analyze their data, yet in the case of manual coding and analysis, the process can often be time-consuming and labor intensive. This process may be automated with the help of AI methods, in which researchers are able to gain in-depth understandings of their qualitative data thanks to the ability of algorithms that may recognize themes and patterns in textual data. Data can hence be clustered and categorized (Pallathadka et al., 2023), providing researchers with support in identifying relationships and connections (such as between sub-groups). The visualization of the data is yet another way that AI is helping to support qualitative research. For instance, word clouds, thematic maps, and network graphs are all examples of visual representations that can be used to highlight important themes, connections, and patterns within the data. This enables researchers to effectively communicate complex information to a wider audience, while such types of visualizations are helpful in effectively conveying qualitative insights, which enable better understanding of and engagement with research findings.

Despite the above potentials of AI, there is still further research to be conducted before we can fully understand how it can be effectively used as a research tool (Lund et al., 2023) and, more specifically, how it can advance theoretical knowledge and understanding. There are currently significant gaps in our understanding of how AI can be utilized most effectively in the context of theory building because researchers have not yet fully explored the dynamics of AI in this context. As AI systems are used more frequently in qualitative research, there is a growing need for additional research and guidance in this area. More specifically, by investigating the full potential of AI in theory building, the academic community and practitioners can tap into the power of such technologically advanced means to advance research and understanding. The following sections of the paper will now concentrate on this subject, with the overarching aim of examining how AI can promote the growth and progression of theory and theoretical frameworks. For this reason, as the author of this paper, I have chosen to adopt a conceptual methodological approach (Christou, 2020a; Hulland, 2020) with a critical standpoint attached to it, as explained in more detail in the proceeding section. Resting on the dynamics offered by this methodological approach (Christou, 2020b), an in-depth understanding and a critical and meticulous investigation of the phenomenon under investigation (in this case AI and nexus with theoretical building or advancement) may lead to theoretical linkages, conceptualization, and specific directions and guidelines for the qualitative research community. Hence, the following section of the paper provides a justification and explanation of the methodology that I have used. This is followed by a discussion of theory development and advancement as a complex, critical, and non-standardized concept process. The theoretical discussion is continued by situating AI within the research context while critically evaluating AI's potential, implications, and limitations in relation to research. Following this, I present a critical discussion that attempts to combine and conceptualize the concepts of AI and theory building, enabling me to present key considerations that qualitative researchers ought to consider while making use of AI means for theory development and/or building theoretical models.

Methodological Approach: A Critical and Conceptualization Process

As a qualitative researcher, I find it intriguing how AI has permeated our everyday lives, academia, and research. One would anticipate that the future holds for us, as qualitative researchers, significant alterations in how research is conducted, how information and data are analyzed, and how far various AI systems will advance in proposing research gaps and propositions, forming complex conceptualizations, and reaching conclusions. In other theoretical papers, I have expressed concerns about how technology (also in the form of AI) is used by researchers and addressed issues related to acknowledgment, academic integrity, and

ethical quandaries. In this paper, I discuss a crucial aspect of research, namely the development or advancement of theoretical knowledge through AI-assisted means. As stated in the introduction, I have taken a critical stance for the purpose of this specific study, which may be used by researchers to review and evaluate information, sources and differing perspectives in order to reach conclusions about a specific topic or notion, that is usually under-researched or whose associations with other constructs are yet to be fully explored (Banerjee, 2022; Hannam & Knox, 2005; Noordegraaf et al., 2019).

A critical perspective, as a methodological tool rather than a notion, enables researchers to investigate specific constructs and concepts in depth (Banerjee, 2022; Winterton, 2021) by exploring their dynamics, impacts, and associations or linkages with each other. Usually, it is used to address a specific research inquiry that may lead to a reply resulting in a synthesis or conceptualization of the topic under investigation, such as "how can systematic reviews incorporate qualitative research?" (Dixon-Woods et al., 2006), or in this paper, "how can AI be used for theory development and advancement?" In more detail, I have followed certain steps that made use of both technological (i.e., AI) and cognitive skills while adopting a combination of critical perspective and conceptualization methodological principles (Christou, 2020a; Xin et al., 2013), embracing key aspects of investigation, comparison, cognitive evaluation, and reaching conclusions (e.g., providing guidelines).

Firstly, I used a specific AI system to search for the notion of "AI" to comprehend the potentials of AI within the research context. I have used specific commands based on keywords linked to the notion under investigation (i.e., "implications," "benefits" of AI in research), but also antithetical notions (e.g., limitations linked to AI and research) to obtain a holistic and critical perspective of the topic. This was done to fully appreciate the dynamics of the topic under investigation. Parallel to that, I searched for academic articles (i.e., using the web search engine of Google Scholar) that discussed the use and implications of AI in research practice. Since AI as a "research tool" is a relatively new area of inquiry, it served no purpose to obtain information solely from high-ranking journals; hence I avoided consulting specific journal lists (e.g., Academic Journal Guide). Also, I purposefully avoided instructing the AI system to provide examples of studies that discuss AI implications in research. This was done in order to avoid the possibility of being presented (by the system) with false articles (as in, false citations) and unreliable information. Besides, text-generated or assisted AI systems have been criticized for producing false content (Gimpel et al., 2023); hence, researchers are urged to double-check the sources of the information provided. Following this process, I examined the output produced (i.e., studies of similar research content) by comparing them to each other to ensure reliable conclusions while using a critical perspective of questioning, comparing, and challenging information derived from various sources. Following this phase, a purposeful examination of the construct of "theory" and theory development took place to comprehend its idiosyncrasies and pre-requisites for its advancement. In this instance, emphasis was placed on researchers and studies that discuss thoroughly and in depth the implications of theory development and advancement. The final stage required the merging of the two constructs (AI and theory/development) while establishing their dynamics and various considerations, such as, for instance, the ethical dilemmas and considerations while using AI in theory development. Conceptualization of phenomena, notions, or paradigms may result from critical examinations (Bressanelli et al., 2022; Lin et al., 2019), and although they may not necessarily lead to the delivery of conceptual maps, these may assist readers in comprehending complicated notions and perplexed linkages in a simple yet meaningful diagrammatical format (Christou, 2020b). As a result, the final section of this paper elaborates on the conceptualization of AI as a research tool for theory development and advancement.

Theory Development: A Critical, Yet Complex, and Non-Standardized Process

The term theory derives from the Greek "theoria," as in *θέα* (view) and ὁράω (I see), implying "to observe or speculate." It may be explained as a comprehensive system of ideas and propositions that constitutes a particular approach to a philosophical, scientific, political, economic, or other issue (Sutton & Staw, 1995; Van de Ven, 1989), such as the "theory of ideas" of the classic philosopher Plato. Within a contemporary scientific context, theories are an essential component of academic research since they provide a structure for the organization and comprehension of complicated phenomena, the development of propositions in qualitative research, and the direction of research questions that will guide a study. There are numerous theories that are used in various fields of research, such as, for example, "evolutionary theory," "game theory," "social exchange theory," and "attachment theory." Each of these theories explains a specific phenomenon, or explores a specific process, and/or is used as a lens through which to analyze and transform data. A theory may be relatively "easy or non-complicated" to understand and possibly implement as a theoretical foundation for further investigations. For instance, "social exchange theory" is a socio-psychological theory that explains social interactions and relationships in terms of the costs and benefits that individuals or groups exchange, implying that people form relationships and interact with others based on their perception of the benefits and costs they may face. The specific theory is used to explain the relationships, interactions, and perceptions of specific groups of people with other people, experiences, and facts, in various contexts (Akarsu et al., 2020; Munanura & Kline, 2022). In other cases, a theory may be conveyed more as a (e.g., hierarchical) process, such as, for instance, Maslow's hierarchy theory of needs within the realm of human developmental psychology, which, although it was proposed in 1943, it is still used as a foundation to explain human (e.g., employee) motivation (Acquah et al., 2021). A specific theory may be used solely to explain a specific phenomenon or even in conjunction with another theory. For instance, Chang (2021) used both "social exchange theory" and "social network theory" to examine specific attitudes of people. In other cases, the practicality or applicability of a specific theory within a specific context may be challenged by other researchers, who may argue the usefulness of other or dissimilar theories to explain a specific phenomenon (e.g., Ward & Berno, 2011). Also, theories may be used "outside their field of study." For example, Einstein's theory of relativity encompasses two interrelated theories of physics, one being the special theory of relativity and the other the general theory of relativity (Einstein, 2019). Nevertheless, Christou (2020a) attempted to make use of the theory's general principles and key aspects to advance our knowledge in social inquiry and the social sciences. In summary, I agree with Van de Ven (1989), who argues that a "good theory" is both useful and practical because it advances knowledge in a scientific discipline and directs research toward critical questions.

However, what characteristics should a theory have in order to be considered a theory? Must it meet certain criteria? It is hard, if not impossible, to have certain "boxes ticked" when it comes to common features and elements of theories since these vary and differ depending on their nature, discipline of study, direction, and possibly era of development. For instance, the philosophically driven Plato's theory of the soul, which inspired the teachings of other philosophers such as Socrates, considered the *psyche* as the essence of a person and a decisive mechanism of how people behave (Campbell, 2021). Yet, current psychologists may rely on various psychological theories that seek to explain human behavior, such as Freud's psychodynamic theory, cognitive theories, social learning theory, evolutionary psychology, and attribution theory (Cartwright, 2023; Gruber et al., 2021). Thus, although it is hard to establish certain criteria for theory development, there are nonetheless particular common aspects that contribute towards a "theory" within the context of research, as stressed by researchers (Brown et al., 2019; Hannigan et al., 2019; Post et al., 2020; Zeithaml et al., 2020).

For instance, theories should adequately explain observed phenomena or a topic under investigation and need to have solid theoretical foundations. In addition, theories should be novel and/or have the potential to contribute to the expansion of knowledge in a particular field of study. Furthermore, theories should be robust enough to withstand empirical testing and offer plausible explanations of a specific phenomenon, event, process, or area of inquiry.

Theory Development and Qualitative Research

The process of developing a theory through research is convoluted and not typical of most other processes. To be more specific, developing a theory requires an in-depth familiarity with the relevant literature (theoretical foundation), the ability to identify gaps in that literature, and the dexterous formulation of a research question to fill those gaps. The role of empirical evidence (such as through observations and experimentation) and the analysis of this evidence may serve as a foundation for scientific inquiry given that it can be used to generate or support theories (Borsboom et al., 2021; Kock et al., 2020). Of course, this does not necessarily imply that empirical data (e.g., in the form of interviews) is to be collected to address the study's research aim and possibly lead to the development of a new theory or the advancement of an existing one. Though this is a common practice, there are conceivably instances in which new theory may be developed through other methodological approaches, such as one relying on review principles (Brown et al., 2019). Indeed, there is no one standardized method that can be applied to all research situations because the process of developing a theory can vary depending on the approach, the research question guiding a specific qualitative study, the type of data, and the analysis of them. For instance, researchers might use an inductive methodology, in which they first examine data obtained from various collection methods (such as field observations and interviews) in order to identify patterns and then construct a theory based on their observations of those patterns, involving, for example, thematic or content analysis (Gioia et al., 2013; Leisterer & Jekauc, 2019; Woo et al., 2017). In other situations, a deductive approach may be used. While deductive reasoning is more commonly associated with quantitative research, it can also be applied in qualitative research (Bansal et al., 2018). In this case, the researcher may use a predetermined set of concepts or ideas, existing theories, or conceptual frameworks as a starting point for formulating research questions, develop an interview or observation guide, and seek to confirm or test the theory through the collection and analysis of qualitative data.

Whether and to what extent qualitative research contributes to theory development is context-specific and dependent on methodological and analytical choices. For example, rather than explicitly advancing theory or developing theoretical frameworks, the focus of narrative research (a specific qualitative research approach) tends to be on understanding and interpreting the experiences of individuals and constructing meaning (Andrews, 2021). All the same, narrative research may well challenge existing theories or even propose new ones. Additionally, the primary focus of case study research (another qualitative research method) may be to provide insights into specific cases and may not necessarily lead to the generation of new theories. Nonetheless, case studies as a research approach may be useful in determining the viability of pre-existing theories, aiding in the improvement of theories, and even spawning new theories in certain circumstances. For instance, Welch et al. (2020) identified "inductive theory-building," "interpretive sensemaking," "natural experiment," and "contextualized explanation" as four distinct theoretical approaches that can be derived from case studies. Despite these, there are certain types of qualitative inquiry that are particularly favored for their potential to contribute to theory development. More specifically, grounded theory (considered both a qualitative methodology and an analysis tool that falls within the broader realm of inductive research) has the potential to contribute to theory development by allowing theories

to emerge from data rather than imposing preconceived theoretical frameworks. Furthermore, while examining the interplay of power, social structures, and ideologies, "critical theory" (Tyson, 2023) frequently seeks to challenge and transform pre-existing theories. Also, in the case of ethnography, "immersing" the researcher (for example, in a cultural context) can reveal patterns and social processes that can inform the creation of new theoretical frameworks. Another example is phenomenological research (Williams, 2021) that may focus on the perspectives of individuals, uncovering insights and essences of specific phenomena and contributing to new theoretical insights, theoretical frameworks, or theories (Christou & Savva, 2022).

Theory development is a very challenging and perplexing yet important component of research since it can result in the acquisition of new knowledge, foster the development of a field of study, and explain differing phenomena. The contribution of qualitative researchers in this regard, who can develop theories that have the capacity to act as predictors, explanations, and basis for further examination or exploration will continue to be highly valued by the academic, research, and stakeholder (in each field) communities. This is particularly important in an era of various epochal shifts at the societal level (Nkomo et al., 2019) and technological innovation, as the case of AI, which has revolutionized the way research is conducted, providing simultaneously various opportunities, dilemmas, and drawbacks, as discussed below.

AI within the Research Context: Opportunities, Limitations, and Challenges

Artificial intelligence refers to the process of recreating human intelligence in machines, allowing them to carry out activities that would normally require human intelligence, for instance, interpreting data, recognizing patterns, forecasting outcomes, solving problems, and making decisions in order to achieve objectives. It has been referred to by Berente et al. (2021) as a computational advancement that references human intelligence. Even so, the notion may cover a range of processes and methods, such as machine learning, natural language processing, computer vision, and robotics.

Researchers increasingly employ AI for a variety of purposes, including but not limited to (a) gaining insights into a phenomenon, event, or area of inquiry; (b) being exposed to different approaches and perspectives within a research area or theoretical context; (c) having curiosity about a topic piqued; and (d) facilitating the analysis process and the arrival at conclusions. More specifically, researchers may use AI for industrial automation and robotically performed tasks, such as in surgery, practice, and services (Gaur et al., 2021; Moglia et al., 2021). Specific AI systems may help researchers understand complex phenomena, spark their interest or inquiry into a specific topic worthy of further investigation, provide recommendations (Da'u & Salim, 2020), and help researchers discover relevant publications and articles. AI is additionally used to build complex simulations and models, such as climate, traffic, and economic simulations and models (Akhtar & Moridpour, 2021). Additionally, through AI subfields such as Natural Language Processing (NLP), which focuses on the interaction between computers and human language, researchers may, for example, break down text into smaller sections, such as phrases, and determine the sentiment or emotional tone expressed in a text (Adak et al., 2022; Khan et al., 2020). These tasks are particularly valuable in the fields of social sciences and humanities. AI means may additionally be used for analytical purposes. As such, AI algorithms may be used to analyze datasets and identify patterns, linkages, and trends. Also, they may be used to analyze images and videos (e.g., detect objects, atmospherics, and track movement), enabling researchers to interpret these (Lv et al., 2021). All these AI-related benefits towards research, linked to, for example, practical support and further insights into a phenomenon, may provide further opportunities as well as act as a

valuable instrument for researchers to build new knowledge (also in terms of new theory or advancement of theory) in a specific area of study.

Considering the foregoing, Figure 1 is presented, which provides a concise summary of the dynamics and benefits of employing AI systems during theory or theoretical model development by researchers. These can be broken down into four categories: "inspiration," "technical and practical support," "advancement of a researcher's comprehension," and "providing insights." More specifically, researchers can use AI to better comprehend intricate systems and discover the interrelationships between disparate datasets, which can "inspire" them to create novel and original theoretical frameworks. In addition, AI can provide researchers with "technical and practical support" by helping them generate research questions and propositions in qualitative research or by testing theoretical predictions against empirical data.

Figure 1
Dynamics and Benefits of Artificial Intelligence towards Theory Building
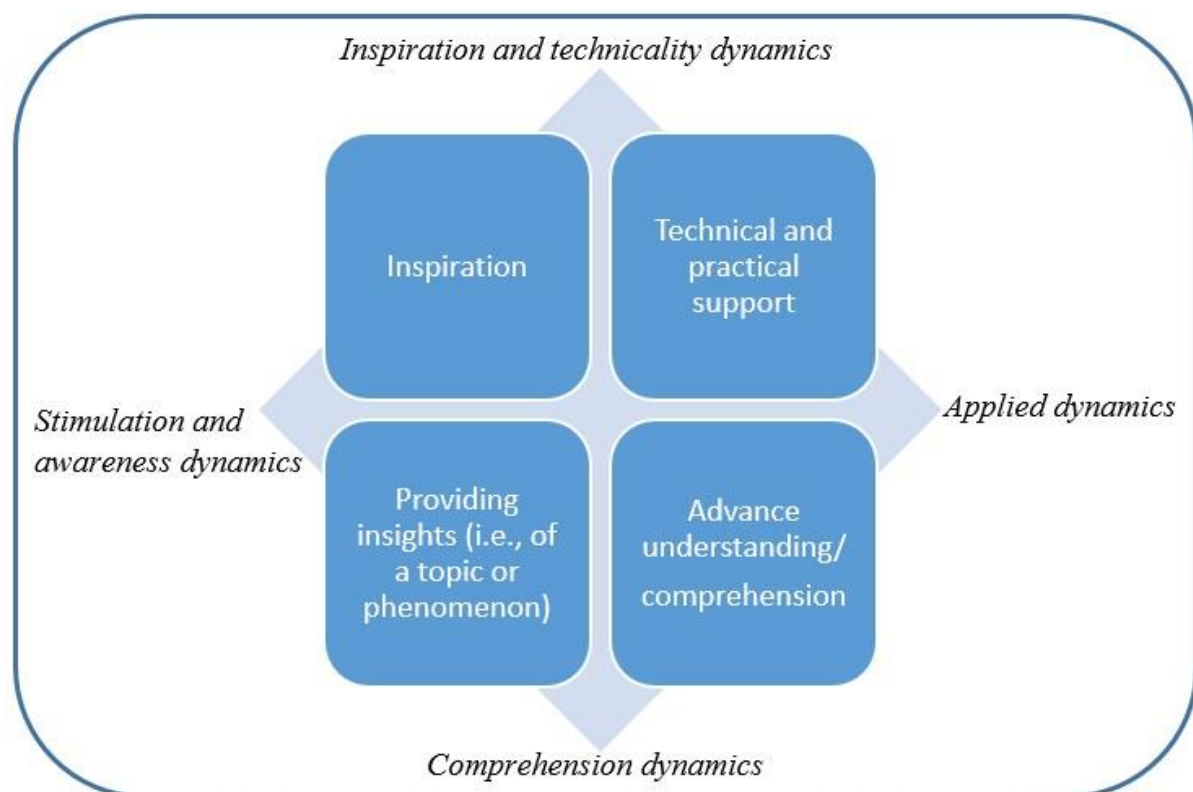
Nonetheless, the application of AI in research presents challenges, such as validity and reliability issues linked to qualitative research (Golafshani, 2003), that ought to be considered by researchers (Ryan, 2020). More specifically, concerns regarding AI's reliability can arise from the fact that it may be prone to producing biased interpretations or inconsistent analyses. This is because AI algorithms frequently operate based on pre-defined statistical patterns and rules that may not capture the nuances and context-specific aspects of qualitative data, leading to interpretations that are inconsistent and having the potential to affect the reliability of the findings of the research. Additionally, since AI models may be limited in their capacity to comprehend certain complexities of qualitative data (such as subjective experiences), their use may raise validity concerns, leading to arguments of oversimplification or misinterpretation of findings. This is because the interpretive nature of qualitative research necessitates profound contextual understanding in addition to nuanced interpretation, both of which AI programs may

have difficulty capturing. Oversimplification is another challenge that is created using AI (Canhoto & Clear, 2020). A potential pivotal aim of qualitative research is to gain insights into phenomena that are complex, nuanced, and dependent on the surrounding environment. AI systems may, however, prioritize efficiency and simplicity over depth and complexity, which could result in oversimplification and the loss of valuable insights. Furthermore, since qualitative research recognizes and embraces the existence of subjectivity (Morgan & Drury, 2003), it may call for researchers to consciously incorporate their own perspectives, rationale, and understandings into their findings. AI systems may deliver specific findings (e.g., clusters) that may minimize the potential of researchers to use their own cognitive skills and rationale in clustering information and reaching conclusions. This also impacts the "interpretation" and presentation of findings. Interpretation is often an iterative process in qualitative research that may require researchers to engage in a continuous process of reflection (Agee, 2009) and the honing of their understandings, particularly in the case of ethnographic or experiential phenomenological studies. Conceivably, the ability of AI models to participate in such reflective and iterative processes is lacking, restricting the breadth and depth of qualitative analysis.

Thus, it is essential to adopt a cautious and critical approach in order to address the challenges presented by qualitative research that combines AI tools with the expertise of researchers to embrace reflexivity and conduct rigorous validation and evaluation. In addition, researchers should be vigilant about the constraints placed on AI models that they use in the methodological approach and study methods sections of their qualitative-based papers.

The Conceptualization of AI as a Research Tool for Theory Development

In the first phase of this paper of a critical and conceptual nature, I have delivered a discussion of theory development as a critical, complex, and non-standardized process, followed by a discussion of how AI systems are implemented within the qualitative research context by exploring their benefits, limitations, and challenges. This final part of my paper merges the afore-discussed topics and notions (i.e., AI and theory development) and attempts to conceptualize AI as a research tool for theory development. Before any discussion is made, one important question that needs to be addressed is, "Can AI generate theory?" For the reasons I outline below, as a qualitative researcher and author of this paper, I must state "no." It could be argued that when AI systems are used to generate output (in the case of generated theoretical information or sources), the resulting "synthesis" performed by an AI system does not yield a theory or even a solid theoretical background of a concept, process, or event, for reasons or limitations explained in the previous section of this paper. Another possible criticism of AI that may be used in the analysis process is that it may not always provide a comprehensive explanation of a phenomenon or a theory through the "automatic" generation of certain clusters or themes, resting on specific pre-arranged algorithms. I contend that in both cases the researcher's cognitive input and evaluative skills are essential to the progress of theory development. This is not to imply that AI systems or programs cannot provide the researcher with useful "tools" as they work to build a theory, such as the generation of data—as in the case of retrieving online reviews, performing a clustering analysis of them, and/or providing information that may contribute to the construction of a solid theoretical foundation. Therefore, AI can be seen as "a valuable means and tool" for progressing our theoretical understanding and possibly contributing to theory building and development, but it is not to be regarded as "theory building machines."

For example, assume a researcher wants to conduct an ethnographic study to investigate how people behave in a specific context (for example, a festival). In the theoretical discussion of the paper, the researcher may wish to employ a specific theory or theoretical lens. As a result,

the researcher may employ a specific AI system (for example, chatGPT) to recommend specific theories that may be able to explain how people behave in general, such as "social learning theory," "cognitive theory," and "socio-cultural theory." A more refined and purposeful search for human behavior in a collective gathering or ritual context may lead the specific AI system to propose the "theory of collective effervescence." Though the AI system may present these alternatives to researchers, they must ultimately decide which specific theory is suitable and capable of explaining the phenomenon under investigation. Of course, the researcher may choose not to use a specific theoretical prism if the study is deemed exploratory in nature. In either case, the researcher can still use another AI system to analyze text and visual data following the fieldwork. Though specialized AI models can help with data clustering based on clustering algorithms, thereby increasing efficiency and providing analysis support, they cannot replace the nuanced insights that can result from the interpretation of ethnographic findings informing new theoretical insights, as performed and presented by the researcher-ethnographer. More specifically, the researcher may choose to perform a clustering analysis of findings through an AI system but could additionally demonstrate cognitive work through: The provision of representative quotes derived from participants to support arguments made; Conduct an additional form of analysis (such as thematic analysis) that can be applied to one, more, or each cluster separately to explore the underlying themes within each cluster (Christou, 2023a); and proceed with the construction of a process or conceptual theoretical diagram.

The following information and representative figures are provided to support my reasoning and to provide a case of how AI can help with theory development. More specifically, Figure 2 illustrates how theory can be developed or advanced via AI means combined with the researcher's input (i.e., critical, evaluative skills, knowledge, and expertise), while the research is guided by a clear purpose and a solid or rigorous implementation of research and analytical processes.

Figure 2
The Triad of Theory Development via Artificial Intelligence (AI) Means and Input by the Researcher
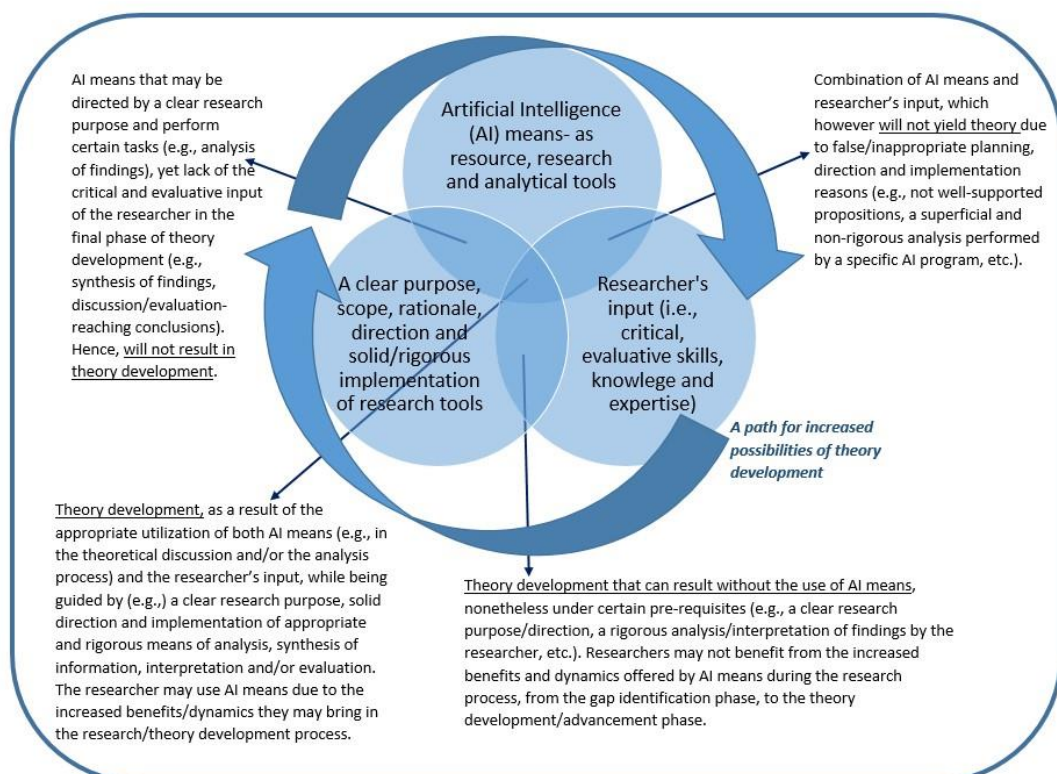
Figure 3 presents in a graphical format this conceptualization while presenting the role of AI systems in research and, more specifically, their role in theory development. As such, it illustrates certain key considerations and pre-requisites (i.e., establishing the cognitive input of the researcher that should not be marginalized while using AI systems) that may guide researchers toward the appropriate use of AI in theory development. These key considerations are provided as a follow-up to the preceding theoretical discussion that was guided by critical perspective principles by examining the limitations but also the dynamics and benefits of AI towards theory building, as clarified in the previous section of this manuscript. It should be noted that Figure 3 should not be treated necessarily as a process but rather as an insightful "conceptual map" that may guide researchers in making use of AI means (i.e., various AI systems) for the purpose of generating new theories or developing or advancing existing ones. In more detail, the conceptual map or figure presents AI implications on its left as a research tool and/or as an analysis tool. On the right, it presents the outcome of the use of AI towards theory building and development. By taking into consideration the differing limitations, considerations, and dilemmas of the use of AI in theory development, as discussed earlier, certain key phases are proposed in the direction of theory advancement. These phases are presented as intermediary points that are illustrated between the use and implementation of AI and theory development, as explained in more detail below.

Figure 3

Conceptual Map of the Nexus of Artificial Intelligence and Theory Development
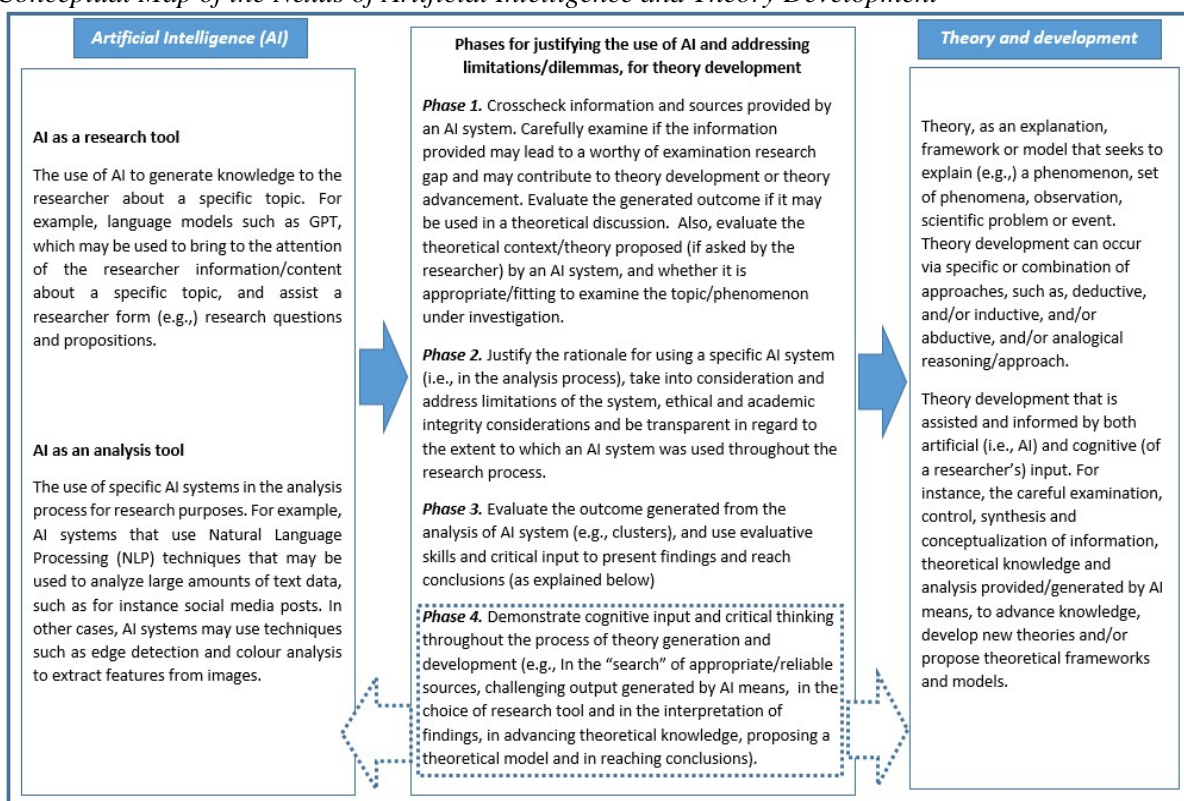
We have established earlier that researchers may use certain AI for the analysis of their findings (Vaishya et al., 2020), reaching conclusions and possibly developing theories, or in the writing part of their theoretical discussions (e.g., forming their theoretical framework). Theorizing is an important part of the research process, and researchers may find that theoretical frameworks help them make sense of and draw conclusions from their data. Qualitative research studies may benefit from having a clear focus and direction, which can be

provided by a thorough understanding of the theoretical context in which the research problem exists. In addition, theoretical frameworks allow researchers to make sense of their findings considering previous research in the field, also in conjunction with AI (Huang & Rust, 2018; Venkatesh, 2022). Because of this, researchers may be able to shape the creation of new theories and the improvement of old ones, while also adding to the body of prior knowledge in their field by basing their studies on well-established theories and concepts. That said, not all studies benefit from or require a theoretical framework; an exploratory study or a descriptive or critical study, for example, would be good examples within the realm of qualitative research. However, researchers are still required to "search" for theories, studies, and academic books that may feed the theoretical discussion of their paper, and AI can facilitate this process. Researchers looking for a theoretical framework may search for theories or theoretical insights via language models or chat modes that leverage language models and other technologies to assist with such queries (for example, ChatGPT and Bing Chat). Even so, a researcher's cognitive input (as in, evaluative skills) is needed not only to determine which specific commands will be implemented in the Al system but also to determine which appropriate and fitting (for the purpose of their study) theory or theoretical context will be used. This should follow the information provided by the system's output and the cross-reference of sources provided by the AI system (reflected in Phase 1 of the diagram).

Phase 2 involves the justification of the use of AI systems in the research process of developing theory. Naming specific AI systems for certain research tasks goes well beyond the aim of my paper. Besides, many of these tools are owned by private companies and are not freely available to the public (this may exclude tools such as ChatGPT), so in most cases they become available once a subscription and payment are established. As in the case of specific software available for the analysis of data, such as "NVivo" or a high-level interpreted programming language, as the case of "Python," the use of AI for research tasks should not only be acknowledged by researchers but also become well-documented and justified (refer to Christou, 2023b; Christou, 2023c). For instance, researchers should be able to explain or justify in detail "why" they have used a specific AI system in their research and "how" its use has facilitated the process of addressing the research aim, performing analysis, reaching conclusions, and advancing theoretical knowledge on a given topic or phenomenon. For example, AI systems may use specific algorithms (including k-means clustering, density-based clustering, or hierarchical clustering) for clustering data, which is a common machine learning technique that involves grouping together similar data points based on their characteristics or attributes. Details and justification of such algorithms should be provided by the researchers in the study methods section of their reports and papers.

Though it is once again emphasized that the process of developing theory is convoluted and atypical, the role of both AI means and cognitive input by the researcher is stressed (Hannigan et al., 2019) and is illustrated in Phases 3 and 4 of the diagram. In more detail, as established earlier, the use of technological means using AI may automate many aspects of the research process, such as systematic reviews, data collection, and analysis. Yet, researchers may become overly reliant on such tools to perform their research tasks, while these (i.e., AI systems) may limit the creativity and innovation of researchers who rely too heavily on these tools. This may provide an obstacle to the generation of new theories or lead to incorrect or biased conclusions, especially in complex or nuanced research areas. Although the primary focus of this theoretical paper is on the question of how to make use of technologically assisted means in the form of AI in theory development, the researcher's cognitive input in qualitative studies is stressed since it is regarded as crucial in this process (Alam, 2021; Fine, 2003; Hulland, 2020; Sale, 2022; Willig, 2019). The researcher's role is extremely important in order to design research and aims, form propositions, interpret findings, and reach conclusions. Researchers may draw on their own evaluative skills, knowledge, expertise, training, and

critical thinking skills to perform these tasks. A researcher who is well-versed in the relevant literature, for instance, might notice that although a study appears to show a linkage between two constructs or notions in qualitative research, there are other factors that could be driving their relationship. Finding and using the most suitable research methods is another crucial part of academic research that leads to the development of new theories. Researchers have the expertise to decide which research methods are most suitable for a given study, as different research questions necessitate different approaches. Hence, researchers contribute both their knowledge and evaluative and critical thinking skills to academic inquiry. In doing so, they can ensure that research is conducted in a rigorous, reliable, trustworthy, and ethical manner. As such, the cognitive input of the researcher is required while using AI for theory development. This may occur during the stage of constructing the theoretical discussion, the choice of theoretical prism or theory to explain a phenomenon, the choice of the appropriate AI means (i.e., program) to analyze the information, and/or the stage of analysis and discussion of findings to reach conclusions and add to the theoretical body of knowledge.

Concluding Remarks

The aim of this paper was to investigate how AI can contribute to theory development. So far, researchers have yet to fully explore the dynamics of AI in the context of theory building, leaving substantial holes in how it may be effectively used in theory advancement. To address the overarching aim of this paper, a critical methodological perspective was employed since it allows researchers to critically examine the depths and linkages of phenomena, procedures, or constructs as the nexus of AI theory development. As such, this paper has provided insights into theory and theory development and discussed the implications, possibilities, limitations, quandaries, and considerations of using AI as a research tool, as well as for theory development, from a critical standpoint. This provided impetus for the creation of specific guidelines and recommendations for making the most of AI when and if attempting to construct new theories or advance existing theories. A conceptual map has been presented that researchers can use to better understand (and justify) the potential for theory development with the help of AI. Even though the paper has some intriguing theoretical implications, many questions remain unanswered. Investigating AI's potential future role in theory construction, for example, is an intriguing field of further and continuous study. The process of developing a theory is convoluted, atypical, and non-typical, deviating significantly from the norm. As a result, it is suggested that more research be conducted in order to comprehend the nuances of theory creation. particularly using AI systems. Furthermore, it has been suggested in a previous section of this paper of a conceptual nature that the researcher's cognitive input is required while using AI tools for theory development. This was stated and justified because this input is needed at various stages of the research process. Nonetheless, further research is needed, such as, for example, delving into information provided by experts and Delphi that may shed light on the extent to which artificial means require human cognition to advance theory.

As a final note, qualitative researchers are increasingly using AI for a variety of research tasks, which has fundamentally altered the research process. However, this has raised concerns about the AI's appropriate and effective application, particularly in complex tasks that frequently rely on the cognitive input of researchers, such as the challenging task of theory development. This topic was covered in this paper, which also emphasized the importance of striking a balance between the human factor (the researcher) and the implications of AI. Though, as a researcher, I find that AI in various forms can be a useful means and tool for advancing our knowledge and contributing to theory development, I do not perceive that it is a necessary requirement for theory creation. Qualitative researchers have contributed to theory

advancement without the use of AI, and even with the employment of AI, their cognitive and evaluative skills are regarded as critical in the process of new knowledge and theory generation.

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