

HELP! It's up to YOU to DONATE - A Structured Literature Review on Conversational Agents and Promoting Donation Behavior

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Abstract—In a well-functioning society benefactor donations for social causes are vital. The act of donating, e.g., money to charity, can impact others' lives and provide essential services to the indigent. With the rise of conversational agents (CAs) and technology that increasingly impacts our daily lives, it has become important to understand how CAs can possibly promote donation behavior. However, we know little about how to do this, and existing research remains fractured. To improve our knowledge, a literature review was conducted to gain a comprehensive understanding of the current state of research. In total, 41 papers from various donation contexts (e.g., money, time, in-kind) were identified. This review identifies key trends and provides insights to guide future studies. Further, practical implications are derived to equip practitioners with a structured overview.

Keywords—Conversational Agents, Literature Review, Donations, Influencing Behavior

I. INTRODUCTION

Worldwide, benefactor donations are a vital source in building stronger, more resilient, and democratized environments in civil societies [14], [15]. Donations are selfless acts, benefitting the receiving entity, as well as the overall well-being of the giver (e.g., psychological well-being associated with donating blood [16]). Individuals can donate in three different ways, donating money, time, or in-kind. Relevant current literature focuses on the mechanisms available for influencing donation behavior in human-to-human interaction [17]. However, many donations are made digitally on websites or via mobile apps [18], ensuring that questions on shaping human-computer interaction to facilitate donations become part of an essential area of future research [13].

Relatedly, technological advancement and development in cutting-edge technology have led to a rise in the use and application of conversational agents (CAs) across different industries and disciplines, such as customer services and healthcare. CAs are software programs designed to simulate human conversation, enabling individuals to use natural language (i.e., written or spoken words) to communicate with the virtual agent [1]. According to Zhou et al. [2], CAs will play an increasingly important role in our social lives as these systems are becoming more and more prevalent. Recently, CAs have become increasingly popular because due to being accessible at any time, independent of geographical barriers [3], offering cost-efficient solutions (e.g., in customer services) [4], [5], can automate interactions with customer (e.g., as virtual advisors) [6], and are scalable [7]. Prominent examples are Google's Assistant and Amazon's Alexa.

In this context, the use of CAs can be beneficial as users can perceive them to be human-like, leading to higher levels

of trust [8], enjoyment [9], and persuasiveness [10]. This has led to an increased research interest in various domains, including donation contexts that use CAs [11]–[13]. To unleash CAs' full potential to promote donation behavior, past research has engaged various disciplines (e.g., psychology, healthcare, and information science [20]) that study CA effects on their users, also investigating how to design the CA to effectively influence users' behavior. Recent research has shown how donation behavior has been influenced by donation drivers such as self-affirmation [21], motivational intervention [22], and human-like design [13]. For example, the American Red Cross [19] introduced a chatbot that educates users about the process of donating blood and offers a convenient way of scheduling appointments of donating blood. However, there is no comprehensive review across different studies providing an overview of how CAs can promote donation behavior for the different donation types, and which could lead to possible cross-over benefits. This study aims to investigate the issue through the following research question:

What is the status quo of research on conversational agents designed to promote the users' willingness to donate?

To address the research question, this study conducted a comprehensive, structured literature review analyzing 41 papers covering three different donation contexts, donating money, time, and in-kind. The results reveal a significant interest in using CAs in the context of money donations, and a strong tendency for research to focus on text-based CAs. This study offers new insights on how CAs can be applied and what areas need further research.

II. RESEARCH BACKGROUND

A. Conversational Agents

One of the first CAs to be developed was in the 1960s, to simulate a conversation with a psychotherapist, which the developer, Weizenbaum [23], called ELIZA. Since then, CAs have found mainstream attention across a number of disciplines, such as e-commerce, healthcare, and education. Continuous improvements in technical aspects (e.g., natural language, artificial intelligence) and increased awareness of graphical user interfaces lead to infinite opportunities for applications. CAs can be categorized according to their context, type of communication, and embodiment [24], [25].

Regarding the context, CAs are applied either to general themes or to context-specific topics, as in answering broadly applicable FAQs or getting particular information about certain pandemic rules. Concerning the type of communication, the most dominant types are voice-based

CAs [26], text-based CAs [27], or a combination of the two types as voice and text-based CAs [28], such as a text-based chatbot Brendel et al. [29] developed for pre-scanning COVID-19 symptoms.

Regarding embodiment, CAs appear in different forms, i.e., as physically embodied, virtually embodied, and disembodied. Physically embodied CAs are agents characterized as robots, e.g., SoftBank’s customer service robot “Pepper” [30]. Virtually embodied CAs refer to online animated agents for face-to-face interaction, with different kinds of characteristics, such as Laura, a virtual coach prompting physical activity [31]. More recently, embodied conversational agents (ECA) made major developmental strides, bringing increased research interest, especially in healthcare contexts [32]. ECAs refer to visual 3D representations equipped to use various forms of communication such as human gestures [1], [33], and whose behavior appears as realistic and socially appropriate.

To promote behavioral change with CAs, numerous scholars have investigated various design elements’ effects on users [1], [10], [29], [34]. When users interact with CAs, the design elements can create experiences similar to human-to-human interactions [25]. For example, in business contexts, human-like CAs can positively impact purchase intention [35]. Further, in educational contexts, CAs can positively influence the learning process [36]. Recent research and practice have increasingly investigated the possibility of using CAs to increase users’ donation behavior. To provide a focused overview of the mechanisms which have the behavioral effect of donation, the following section explicates existing work’s main contributions.

B. Conversational Agents for Donations

As mentioned, donations can be made in numerous ways and appear in different forms [37], most prominently as monetary, time and in-kind, donations. With the increasing importance and popularity of digital devices and related emerging trends such as contactless transactions, and increased mobile phone usage, donation techniques now go beyond traditional procedures, shifting to online interactions. Consequently, understanding the mechanisms that underpin how donations can be promoted and that affect users’ donation behavior are rising topics in IS research. Specifically, applying CAs is a promising approach to giving social assistance and guiding technology for donating [13].

To promote the willingness to donate, numerous theories and concepts have been used in research. Most prominently, pro-self versus pro-other (i.e., egoistic vs. altruistic) factors have been used to describe what motivates donation behavior [38]. Based on the theory of self-interest and on social exchange theory, scholars have tried to identify the drivers of donating behavior [39], [40]. For example, donation behavior can depend on personal demographics (e.g., geographical area, income), personal characteristics (e.g., trust, interactivity, perceived usefulness, empathy [41], [42]), and on donors’ perceptions [43].

Further, CA research has shown that CAs’ human-like design impacts users’ behavior [44]. Building on the computers are social actors (CASA) paradigm and on social response theory, the related concepts view computers as social beings and indicate that people assign human traits to computers [45], [46]. Particularly, specific design elements can influence the users’ perception and consequently, impact

their behavior [47]. For instance, many scholars have investigated social cue effects, such as trust that can positively shape users’ intentions, e.g., to donate [1], [13], [48]. Nevertheless, current debates about CA factors that influence donation behavior and the willingness to donate remain scarce. The next section describes the research approach.

III. RESEARCH APPROACH

To investigate the factors relevant to CAs influencing donation behavior, this study follows an approach established by Webster and Watson [49]. Similar to other structured literature reviews in CA research (e.g., Greulich & Brendel, [50]), this present study consists out of three phases. The first phase describes the process of gathering the literature. The second outlines how the literature was coded for further analysis. The third analyzes the coded literature via a concept matrix and a time series analysis.

A. Phase 1: Literature Search

Because the topic of donations is a transdisciplinary one, the databases included a wide variety to gather a comprehensive sample from the available literature. PubMed was chosen to cover medical research (e.g., blood and organ donations), APA PsycArticle to include psychology publications, ACM for computer science research, and Scopus, as a comprehensive database to cover IS research. The literature screening and gathering process was conducted in the second quarter of. To do the search, the following search string was applied:

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((Conversational OR Interactive OR Virtual) AND Agent)
OR Chatbot OR Digital Assistant)
AND
((donation) AND (readiness OR willingness OR
preparedness))
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The string consisted of two parts. The first part referred to CAs and was enriched by numerous synonyms based on Diederich et al. [51]. The second part consisted of the term ‘donation’ and terms relevant to the willingness to donate. Overall, applying the string in all selected databases resulted in a sample of 2535 articles. To identify only relevant studies, articles were filtered according to the content suggested in their titles and abstracts. For instance, papers that did not mention CAs and donations in their title or abstract were not considered, as this indicated that the two topics were not the publication’s main topic. Further, duplicates were removed. This filtering step left us with a sample of 193 papers. After the full text analysis, the final sample resulted in 41 publications.

B. Phase 2: Literature Coding

To code the literature, this paper followed an approach established by Diederich et al. [51], building on coding dimensions frequently used in CA research (e.g., Greulich and Brendel [50]). The coding was extended by adding dimensions specific to the donation type. Five dimensions were part of the coding schema, namely *CA Type*, *Embodiment*, *Donation Type*, *Method*, and *Factors for Influencing Donations*. The next sections will present the dimensions in more detail.

The dimension *CA Type* refers to the different types of user interaction with the CA. These interactions can be either text-based, voice-based, or jointly text- and voice-based [25]. Next, the *Embodiment* dimension, first adopted by Diederich

et al. [51], describes the CA’s appearance. CAs are presented in three main types, namely disembodied (e.g., as plain text), virtually embodied (e.g., as an avatar), or physically embodied (e.g., as a robot). The dimension **Donation Type** is based on Christofi et al. [37] who classify donations into three types (i.e., money, time, and in-kind). Money donations include all forms of monetary donation regardless of whether they are one-time donations or recurring payments. In-kind donations describe all kinds of donations that are non-monetary (e.g., clothing, food). Organ donations are included, because they can also be considered as in-kind [52]. Lastly, time donations are considered for included donations that refer to charitable actions (e.g., working with children).

The dimension **Method** is partly adapted from Palvia et al. [53] and refers to the study design. These can be categorized as qualitative analysis (e.g., interviews) [54], quantitative analysis (e.g., statistics) [55], or meta-analysis (e.g., summarizing existing results) [56]. In this study, the qualitative analysis focuses on the numerous relationships individuals have in interacting with information and the corresponding surroundings in which they act [55]. Lastly, the dimension **Factors Influencing Donations** refer to characteristics and constructs to which each paper refers in studying their impact on behavioral outcomes regarding users’ willingness to donate. To derive this dimension, an inductive approach that builds on existing data was applied [57]. For instance, there was mostly an interplay between trust and transparency, so that, together, they formed one category. Further, education and interactivity, stress and relaxation, emotion, usability, and the power of the donor emerged as valuable sources of input.

C. Phase 3: Literature Analysis

To investigate the current research space, the literature was structured and a time series analysis was conducted. For the literature review, a concept matrix was developed to go beyond descriptive paper summaries [49]. This step allowed to categorize and organize the literature thematically, leading to an inclusive overview of the publications that was gathered [58]. Next, a time series analysis was executed to investigate the various trends and shifts in research [50] by considering the number of publications of each year and outlet (see Figure 1).

IV. RESULTS

To answer the research question, this section presents the results of the structured literature review starting by discussing the concept matrix, and followed by the results of the time series analysis. Next, key trends and future research directions will be outlined.

A. Results of Structured Literature Analysis

Table 1 summarizes the structured literature review’s findings. Considering the CA type, text-based CAs are the most dominant type (51%), followed by both types combined (39%) and the voice-based CAs (10%). To illustrate, Roman et al. [12] developed a CA aimed at providing users with answers about donating blood. They show that a combination of the two CA types are vitally important in events of social significance, such as donations. Regarding embodiment, there is a clear tendency for disembodied CAs (51%), followed by virtual CAs (39%) and physical CAs (12%). Considering physical CAs, Nakata et al. [59] show that individuals are more likely to donate and also to raised the amount they

donate, when a physical CA hugs a human. Similarly, facial expressions can influence users’ willingness to donate [60].

An investigation of the donation type, shows a clear tendency to give money donations (71%), followed by in-kind donations (32%), and time donation (10%). For example, Banjar et al. [61] developed a CA that indicates the medication needs in certain areas, aiming to address the need for donating unused, superfluous pharmaceuticals. Simultaneously, they help to prevent medication expiring due to too many medications delivered in one area. Considering the methodological approach, qualitative (63%), quantitative (32%), and meta-analyses (7%) were represented. For example, Steinemann et al. [62] studied how games can promote behavioral change and changes in donation patterns. They found that interactivity increases donations to charity by 12%. Referring to the factors determining CAs’ influence on donation behavior, trust/transparency and emotion are the most reviewed characteristics (59% each). Following these are education/anymacy (37%), power of donors (29%), usability and stress/relaxation (12% each), which are present but not dominant.

TABLE I. CONCEPT MATRIX

| Paper (example 5 out of 41) | CA Type | | | Embodiment | | | Donation Type | | | Method | | | Factors for Influencing Donations | | | | | |
|--------------------------------------|---------|------|------|-------------|---------|----------|---------------|---------|------|-------------|--------------|------|-----------------------------------|-------------------|---------|-------------------------|----------------|-----------|
| | Voice | Text | Both | Disembodied | Virtual | Physical | Money | In kind | Time | Qualitative | Quantitative | Meta | Trust/transparency | Stress/relaxation | Emotion | Education/Interactivity | Power of donor | Usability |
| [63] | | x | | x | | | | | x | | | | x | | x | | | |
| [64] | | | x | | x | | | | | | | | | x | | | | x |
| [61] | | x | | x | | | | x | | | | | x | | | x | | |
| [65] | | x | | x | | | | | | | | | x | | | | | |
| ... | | | | | | | | | | | | | | | | | | |
| [66] | | x | | x | | | | x | | | | | | | | x | x | |
| n=41 Σ | 4 | 21 | 16 | 21 | 16 | 5 | 29 | 13 | 4 | 26 | 13 | 3 | 24 | 5 | 24 | 15 | 12 | 5 |

B. Results of the Time Series Analysis

The time series analysis results reflect a continuous distribution over time, with a steady increase in research beginning in 2018 and reaching a peak in 2020 (see Figure 1). Between 2004 and 2009, no relevant publications were recorded. The drop in 2022 is explained by the fact that this review took place in May 2022, which means six months of the year were not recorded.

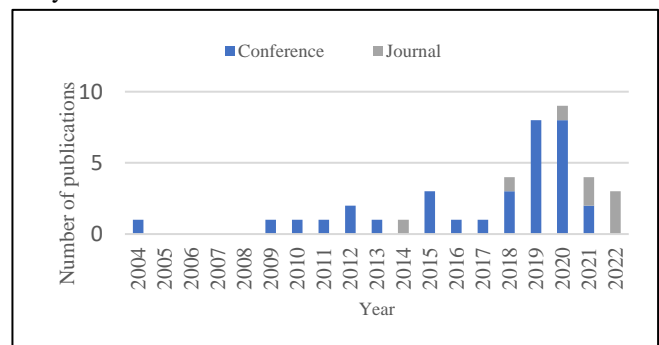


Fig. 1. Time series analysis: Number of publications over outlet types.

Regarding the factors that influence CA behavior and users' willingness to donate, trust/transparency and education/animacy were continuous forces during almost every year. Every other characteristic reflected no clear tendency. Overall, there is a steadily increasing drift in CA research and the investigation of users' willingness to donate.

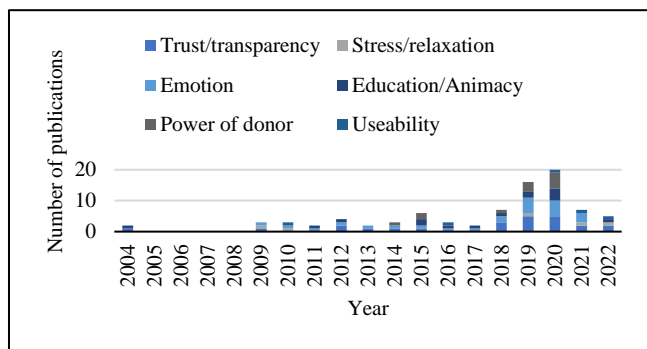


Fig. 2. Factors that can influence donation behavior through CAs over time (multiple selections possible)

V. DISCUSSION

Based on this paper's aim to investigate the status quo in research regarding the CA design to promote the willingness to donate, this study presents novel insights into how CAs in human-computer interactions can foster donation behavior. The results provide evidence of an increased interest in research after 2018 and report numerous mechanisms that have been used to understand how CAs interact with users. Following here, numerous implications for theory and practice in IS research are outlined, and the study's limitations are presented.

A. Implications for Theory

This study presents a thorough and comprehensive analysis of the existing literature in the context of CAs and influencing users' willingness to donate. It provides researchers with an in-depth understanding of the current literature and identifies areas that need further research. In this section, potential ways toward future progress are suggested.

Referring to the context, compared to in-kind and time donations, money donations have been investigated the most intensively. A possible explanation can be that donating money is the most convenient form of contributing in terms of time, and compared, (e.g.), to searching for clothes that could be donated or to going out for community services. For instance, future research could indicate whether CA use would be suitable to boost donation behavior across these different types of donations, and whether the factors that influence behavior would be similar across these different types.

Investigating the mechanisms of cognitive decision-making that attain the desired behavior in users while aiming to influence different types of donations, can enhance our knowledge of the IS community. For instance, considering users' different cognitive attitudes can be a promising approach to influencing the willingness to donate [67]. In this context, CAs can also be designed to overcome certain biases that prevent users from donating, such as the distance bias [68], [69]). This bias refers to individuals' tendency to assign additional weight to things close to them, whether in terms of proximity or time, despite the fact that more distant things might be just as or even more significant [68]. By overcoming this bias, for instance through increased personalization,

users' willingness to donate to more distant causes can be influenced as well.

Concerning the factors that influence users' donation intention, trust/transparency, emotion, and education/interactivity seem to be the guiding factors in how CAs affect the willingness to donate. This corresponds with previous CA research examining the role of trust as a factor influencing behavior, as with the intention to comply [29]. Specifically in health contexts, these factors reflect similar applications when the aim is to influence behavioral change, such as encouraging smokers to stop smoking [70]. Further, Pagliaro et al. [71] illustrate that trust predicts behavioral intention in the context of COVID-19 and, thus, could be an efficient mechanism in controlling pandemic outbreaks.

Lastly, understanding the mechanisms underpinning the factors that influence donation behavior can be a starting point for future research. The IS currently focuses on designing and evaluating CAs in business contexts. Our study indicates they should extend their interest to include CA requirements in the fields of psychology, the social sciences, and economics. For example, merging psychological and neuroscience perspectives could enhance our understanding of how users' behavior is influenced and can be predicted [72]–[75]. The IS community could engage with neuroscientists whose work is often highly controlled and not representative of real-life situations, to examine more realistic experimental research design. They could, e.g., study how CAs impact cognitive emotions and long-term intentions to donate. By working together, neuroscience could gain insight from more realistic experiments, and IS researchers could benefit from valuable intersections with their artifacts.

B. Implications for Practice

This paper has emphasized the increasing significance of influencing donation behavior via CAs, also showing various avenues for future practice. Practitioners can add value and enrich the IS community by building CAs with interactive and emotional aspects. For example, physically embodied CAs, such as the robot, Pepper [30], could bring new understanding of how to attain desired user behavior in real-life settings. Such physically embodied CAs could enhance the engagement with users because they are perceived as more credible, compared to non-physical CAs [76], [77]. This potentially leads to a higher compliance rate.

Drawing on individual studies' results, various implications can be derived. Practitioners could focus on improving their interactivity with potential donors [62]. For example, users exploring a new city with a smartphone, can be educated and simultaneously asked to donate to local organizations. Further, regarding the CA type, voice-based CAs might attain the desired user behavior differently and impact users' donation intention. Equipping CAs with human-like voices can result in higher donation rates [78]. To illustrate, in using voice-based CAs, different target groups, such as people with limited vision, could benefit from fully voice-based CAs. Finally, practitioners might benefit from examining the intersections of different donation types. Our findings show many extant studies in the context of money donations. However, considering time donation, e.g., influencing elderly people to take physical care of young children and mentoring them, could be a rewarding experience, while also enhancing public welfare, especially in focusing on the upcoming IS generation. Overall, considering

these aspects will contribute to our understanding of how CAs can promote donation behavior and lead to increased public welfare.

C. Limitations

Despite all efforts to ensure the validity of our study's results, several limitations need to be mentioned to map out future directions. First, not all databases could be included, therefore, some studies have possibly not been considered. Second, this comprehensive literature review was limited by the timeframe in which the literature search was conducted. Thus, studies published later, have been omitted. Third, the dependency of the search strategy led to a specific set of findings, leading to a limited set of samples.

VI. CONCLUSION

This study aimed to provide a comprehensive overview of how CAs can promote users' willingness to donate. This goal was achieved by conducting a structured literature review and a time series analysis. The results reveal an increased interest in this area of research after 2018 with a focus on text-based, disembodied, and virtually embodied CAs. Key factors in the study regarding influencing donation behavior via CAs and the willingness to donate, were trust/transparency and emotions. However, educating donors and interacting with the CA were similarly important. Further, money donations dominantly characterize the donation type, opening space for future research into other types. By filling the indicated research gaps, we can unlock CAs' full potential and advance the IS community. Additionally, this study provides implications for practitioners by emphasizing the importance of public welfare and users' willingness to donate.

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