



# “Funny How?” A Serious Look at Humor in Conversational Agents

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## ABSTRACT

Conversational agents are rapidly advancing in terms of their capabilities and human likeness - both of which are intended to enhance the user experience and engagement. One human quality that can potentially increase trust and likeability is humor. However, what is considered humorous and what is not depends on many contextual and personal factors that are not only difficult for machines to detect, but even humans are still struggling to understand them. This makes training AI to be humorous highly challenging. But is this due only to the technical limitations? In this provocation paper, we discuss the hindrances to utilizing humor in commercial conversational agents and propose addressing this topic from a social and political perspective.

## CCS CONCEPTS

• **Human-centered computing** → **Natural language interfaces.**

## KEYWORDS

Humor, Conversational Agents, Voice Assistants, Smart Speakers, Computational Humor

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## 1 INTRODUCTION

Why does HCI have a humor problem? Are we waiting for the punchline to load?

With recent advances in natural language understanding and artificial intelligence, conversing with computer systems has become a common form of interaction. Consequently, Conversational Agents (CAs) such as ChatGPT [8] or smart speakers in homes, such

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as Alexa, Siri, and Google Assistant, have become prevalent in our daily lives. As these devices commonly tend to mimic human-like behavior and characteristics, they are often treated by users like a human counterpart [57], a common instance of anthropomorphism which has been thoroughly documented by researchers working within the *Computers are Social Actors* paradigm [45]. This phenomenon is partially caused due to the design of such devices, as human-likeness in human-computer interaction (HCI) has shown to be effective in increasing trust, loyalty, and engagement [7, 24, 29]. Incorporating human-like qualities into products has often been found to be advantageous [22] and has the potential to establish a sense of emotional attachment between the user and the product [72]. To enhance human-computer interaction and improve user experience, researchers and designers have explored a variety of human qualities that agents can possess, such as realistic voices, embodiment, and distinct personalities [5, 66, 76]. One such quality that can highlight the agent’s personality is humor [34].

Humor is a powerful tool that has the potential to increase likeability, trust, and usability while reducing tension [34, 47]. Oxford Learner’s Dictionaries define it as “the quality in something that makes it amusing or the ability to laugh at things that are amusing”<sup>1</sup>. From an HCI perspective, humor can be seen as a design element intended to evoke positive emotions and engage users in a more playful and enjoyable interaction with technology. This can include the use of puns, sarcasm, irony, or other forms of wordplay, as well as visual or audio cues that are intended to be amusing. CAs often use humor in an attempt to keep users engaged and entertained and compensate for performance limitations [19, 21, 34]. Just like human-human conversations, incorporating humor into interactions with CAs has been shown to enhance the user experience [44, 47]. Research shows that humorous agents can be perceived as more human-like and friendly, leading to higher levels of trust and enjoyment [57].

However, the type of humor used and generated by such systems is often perceived as dull, leaving users unhappy and disappointed [34]. This is specifically the case in long-term use as the humorous responses of most current CAs are mainly communicated through a number of prescribed jokes and stimulus–response pairs that can lead to repetition. Such interactions can break the illusion of human-likeness, lead to frustration, and ultimately damage the

<sup>1</sup>[https://www.oxfordlearnersdictionaries.com/definition/american\\_english/humor\\_1](https://www.oxfordlearnersdictionaries.com/definition/american_english/humor_1)

emotional connection between users and the agent [57]. They might also cause - understanding the term in a communicative rather than purely aesthetic sense - an “uncanny valley” effect. This phenomenon occurs when the characteristics of artificial agents are very close to those of real humans but not quite, which can result in a feeling of discomfort towards the agent [43]. Despite the prevalent pursuit of human-like design in conversational agents, previous literature suggests that such design choices could also result in unintended adverse consequences associated with the experience of uncanniness [12]. Incorporating human-like features does not guarantee heightened user satisfaction, as evidenced by multiple studies [12, 56, 69].

Despite these limitations, users still seem to have a high demand for humorous CAs, as evidenced by user requests for jokes from the agent [6].

Humor is widely acknowledged as a beneficial social phenomenon due to its positive effects on social interactions as well as our mental and physical health [16, 48]. However, it is imperative to recognize that humor is a powerful tool that plays a significant role in shaping human behavior across different cultures and societies, and certain forms of it, such as those that promote prejudice or are used to mask underlying aggression, can be detrimental to individuals and society as a whole.

In this sense, it is important to acknowledge that humor is a complex phenomenon that can even be challenging to grasp among humans [47, 49]. This makes specifying and developing computational humor a highly difficult task [19]. But are technical limitations the main reason humor is not embraced more in CAs?

This provocation paper provides a negative answer to the latter question. While significant progress has been made in computational humor, several obstacles hinder the effective integration of humor in CAs. On top of the technical concerns, incorporating humor in CAs presents various challenges in social and ethical dimensions which need to be considered and addressed. We argue that humor is unlike any other anthropomorphic quality conversational agents can possess (such as realistic voices, embodiment, and distinct personalities): It not only needs to be approached from a social perspective that considers the context, audience, and purpose; it also requires consideration of its cultural, political, and moral implications in society. Notwithstanding the fact that major developments in AI always seemed highly difficult to achieve until they were realized, it stands to reason that humor might be, given the relatively higher importance of the social dimension in its operation, one of the most challenging human qualities to imbue AI with.

## 2 HUMOR IN HCI

In the field of HCI, humor has been recognized as a feature that can enhance engagement, trust, and usability [34, 47, 57] and is used as a strategy to improve learning [21, 33, 74]. Research suggests that one can enhance affective learning, reduce stress, and boost intrinsic motivation through humor [2, 13]. One of the main reasons for utilizing humor in machines is the personification of technology. Expressing humor can give the agent “the ultimate human touch” [47], resulting in users perceiving them as more human-like

and likable [14]. Consequently, it is not surprising that CAs use humor to develop a form of attachment with the user [34]. It has been demonstrated that humorous responses can be an effective strategy for out-of-domain requests, mitigating the impact of inadequate system performance and serving as a fallback option when the system cannot generate an appropriate response [6, 35]. CAs can also handle playful interactions where users intend to get entertained, such as asking for jokes [57]. Currently, most playful CA behavior is achieved through manually curated replies to hard-coded questions [57]. Little is known about how companies develop humorous responses for voice assistants, but reports suggest that some hire professional writers to create humorous responses [27, 34, 42]. Preferably, CAs should be capable of producing fresh and funny responses for various user prompts [6]. Large language models are able to produce novel, unpredictable content [8], and they even have the capability to understand and explain why something is funny [9]. This may represent a new opportunity for humor in CAs. Yet, despite this technical opportunity, large language models seem to mainly use pre-scripted humor to this point, as Jentzsch and Kersting [26] found. Their study revealed that 90% of the 1008 jokes they generated with ChatGPT were the same 25 jokes. Despite large language models’ impressive capabilities to produce new content and understand why something is funny, for delivering humorous interventions, they will need to possess adequate prior knowledge about the user and their environment, emotional aptitude, situational understanding, and cultural sensitivity. With the rapid technological advances, one can assume that CAs might soon have some of these capabilities. This assumption, however, raises a question: Are technical limitations the main reason why, despite users’ general acceptance and companies’ persistent efforts, humorous CAs (might continue to) display sub-par performance?

In the remainder of this paper, we address this question by dividing the phenomena of CA humor into two subsets - “designed humor” vs. “incidental humor” - and by focusing on the former. By designed humor, we refer to humorous interactions that the agent intentionally performs through a (partially) pre-planned structure regarding content and delivery. By incidental humor, we refer to humorous exchanges that unintentionally emerge from a dynamic interaction between the parties. In the context of human-CA interaction, this latter type of humor often emerges as a consequence of a CA misunderstanding natural language or executing tasks without proper contextual sensitivity. In this sense, incidental humor is often unpredictable and catches users by surprise, both of which may heighten user satisfaction but are also vital facets that make the design of humorous CAs challenging. In the future, when afforded by developments in CA design, incidental humor may be generated out of a genuine process of shared meaning-making between agent and user - which would bring humorous interactions with CAs much closer to human-human interaction. However, before this is possible, CAs will require significant advances in real-time multi-modal sensing and (ideally on-device) processing capabilities. Here, we have opted to focus on designed humor rather than incidental humor, as this would allow us to address the gap between the current state-of-the-art and the metaphorical goalpost.

### 3 TECHNICAL ASPECTS

It is widely accepted that the creation of humor is a creative endeavor, implying that computer-generated humor can be considered within the realm of computational creativity [52, 60]. Deploying humor in computer systems consists of three essential components: detection (semantic understanding), generation, and delivery [47]. Computational humor recognition algorithms have been designed to recognize human-generated humor. Efforts have been made to explore methods for simple-structured humor generation [53, 62, 64]. Others have looked into detecting human-generated humor [28, 50, 71]. Previous research argued that AI systems are still not consistently capable at detecting and generating humorous interactions at a level satisfactory for users [35, 47]. However, with the rise of recent generative AI technologies such as ChatGPT, there have been many improvements in this regard [9]. Nevertheless, the most challenging aspect is the delivery of humor [47]. For humor to be delivered at the right moment and in an appropriate situation, the agent must possess adequate prior knowledge (e.g. about the user and their environment), emotional aptitude, situational understanding, and cultural sensitivity. This requires agents to be proactive at times in order to get the timing right.

Unpredictability and surprise are crucial elements of humor [4], and incorporating these factors into computer systems presents a significant challenge. The factor of unexpectedness in interactions is often a potential source of humor [65]. By deviating from anticipated patterns or outcomes, unpredictability adds an element of novelty and freshness, increasing the likelihood of eliciting laughter or amusement [20]. Furthermore, humor can contain morals, attitudes, premises, and taboos, requiring computers to have a great understanding of humanity and its history [23]. Humor is often culturally and socially specific, making it difficult for AI to understand and replicate the nuances of human humor. Despite significant advancements in humor detection, generation, and delivery, computers still lack the ability to use humor appropriately [47]. This has led companies to employ comedy writers to write humorous responses for their product [27, 34, 42]. However, this neither allows for tailored, context-specific humor, nor is it a particularly scalable solution. Beyond that, unlike songs, jokes generally do not always retain their pleasantness upon repetition. Hence, it would be imperative to devise new jokes consistently.

#### 3.1 Subjectivity and Personalization

The perception of humor is highly subjective and conditioned to the users' socio-cultural background [6]. Previous research has highlighted the cultural influences on humor production and perception. For instance, Yue et al. [73] found that humor is more likely regarded as undesirable by Chinese students than by Canadian students. For agents to produce more desirable humor for users, they need a better understanding of individual user preferences, personalities, and cultural backgrounds. A possible approach to tailor humor to individual users would be higher levels of personalization and customization, where humorous responses are directed at the users' preferences and humor taste. However, achieving this goal presents a formidable technical challenge as it requires agents to navigate the complexities of producing humor that is both appropriate and entertaining for a diverse user base. Designing systems

capable of delivering personalized humor tailored to individual preferences is a technically demanding task. Furthermore, this requires agents to collect further user-related data, which can lead to privacy concerns.

#### 3.2 Data Collection

In order for agents to break from the prescribed joke, these systems need to have increased context-awareness requiring them to monitor and process users' behavior and the environment. Naturally, this intensifies users' privacy concerns [1]. Similarly, to produce humor "custom-designed" to fit users' preferences and personalities, CAs must be trained with their users' information, likings, cultural backgrounds, and personalities. Furthermore, additional contextual information must be considered, such as the people present, their subjective preferences and cultural background, their current emotional state, and the context of ongoing conversation and events. All these aspects further raise privacy concerns. A significant body of research has highlighted the importance of user privacy and security [31, 37, 61, 75, 77]. Nevertheless, advances in the computing power of end devices could potentially reduce such concerns over time. As such, many smart devices and personal computers can already perform a wide range of computational tasks, such as classifying images using machine learning [78] or even running large language models [15], which was only possible on more powerful computers until recently [10]. This means that some of the above data could potentially be processed on the users' devices without being transferred to the cloud. Nevertheless, users might not fully understand the (positive) implications of their data being processed on their device rather than in the cloud and many privacy concerns may remain (see also [77]).

#### 3.3 Customizing Agent's Personality

Martin et al. [38] argue that the way others perceive the personality of the individual producing humor has a significant influence on how the humor is received. In the context of CAs, different people can view these agents in distinct ways, with some perceiving them more in the role of a "friend" while others view them as "servants" [46]. Such differences in the perception of an agent can greatly affect how the humor it generates is received. As a result, companies must design the personality of these conversational agents in a manner that allows for humor to be effectively conveyed and received, taking into consideration the impact of the perceived personality on the reception of humor. The subjectivity factor here also comes into play, where certain personalities seem more appropriate to be humorous for certain users. The possibility to customize the agent's personality may help to improve this aspect. Nevertheless, designing agent personalities that are both versatile and contextually appropriate for various users is highly challenging. Achieving the desired balance between customization and scalability in agent personality design remains a technically challenging task.

#### 3.4 Humor is Difficult

Even for humans, understanding when and how which type of humor works for whom can be very challenging. Delivering a message and communicating in a way that is thought to be humorous by the speaker may often be perceived differently by the listener. In the

worst case, it might even be considered offensive, for example, if an ironic statement is misunderstood. Timing, context, and personal differences can all affect how humor is perceived. Given the difficulty that humans face in understanding humor, it is reasonable to assume that machines trained by humans may also struggle with this task. Furthermore, crafting even a simple joke requires multiple cognitive abilities, such as language skills, theory-of-mind, symbolism, abstract thinking, and social perception - making humor arguably one of the most intricate cognitive and social attributes humans possess [47, 49]. At this point, we can return to the question posed earlier, whether technical limitations are the main reason why, despite the general acceptance of users and persistent efforts of companies, humorous CAs still display sub-par performance. For the astute reader, the answer may already be obvious: our attempt in this section to analyze the technical limitations of humorous CAs redirected us back at every turn to a number of social concerns. Although such a fundamental intertwining of the technical domain and the social domain is in line with the findings of various philosophers of technology [25, 30, 70], this observation nonetheless attenuates us to the social particularity of humor as a human quality and the unique difficulties we face as such in its adoption for use in CAs.

## 4 SOCIAL ASPECTS

Humor plays a significant role in shaping human behavior across different cultures and societies worldwide by fostering social connections and promoting positive emotional states [52]. This makes humor a vital component of effective communication and social progress, as it can be used to both positively mediate personal relationships and criticize social power dynamics [17]. The effect of humor on people and society is significant enough to give not only rise to the entire comedy industry but also play a major role in political commentary [67]. It is such a powerful tool that it frequently serves as a catalyst for social or political transformation by arousing public consciousness regarding a particular matter or circumstance. Late-night comedy shows, like *The Daily Show*, are a good example of this, as they use humor to raise social or political awareness. The effectiveness of humor in raising public consciousness and creating change demonstrates its considerable potency as a tool for influencing human behavior and opinion.

However, despite the abundance of literature and scholarly works on humor, including philosophical, literary, and psychological perspectives, a consensus on a theory of humor has yet to be reached [52]. Many researchers agree that humor is a cognitive state of joy that can be expressed through facial and vocal expressions, such as smiling and laughter [34]. It is a phenomenon that is considered inherently ambiguous and underdetermined, and its interpretation is dependent on the context in which it arises [11]. Research indicates that experiencing creative connections, such as understanding jokes or solving problems, is inherently enjoyable [63]. Humor typically occurs in contexts perceived as safe, playful, or non-serious [39]. For instance, activities that may appear threatening, such as tickling or play fighting, are unlikely to elicit laughter if the aggressor appears serious or untrustworthy. Research by Sprecher and Regan [58] suggests that humor is considered to be one of the essential

traits in partner selection, where strong mutual indications of trust and predictability are likely to be adaptive.

Considering the complex role of humor in society, one should consider the peculiarity of adapting this feature for artificial agents. Humor, we would like to suggest, cannot be seen as any other anthropomorphic feature that can be easily utilized in agents. Although technical limitations might be one of the reasons preventing humor from being further utilized in HCI, we believe important social and ethical aspects might be contributing to the issue. In other words, many of the aforementioned technical challenges and limitations are caused by not sufficiently building upon and incorporating the social aspects into the design and development of humorous CAs - both to leverage their opportunities as well as to mitigate their risks.

Possible risks include reinforcing harmful stereotypes or contribute to the normalization of discriminatory attitudes or behaviors. It could also be used to manipulate or deceive users, which raises concerns about trust and transparency in human-AI interactions. In the following section, we aim to outline some potential risks and negative impacts that may arise from the use of humor by conversational agents.

## 5 WHAT COULD GO WRONG?

Let us try to look beyond the technical limitations of computational humor. If the agent is technically capable of detecting and producing humor, what other considerations must we care for? While humor can be effective in many situations, there are also potential social drawbacks to consider.

### 5.1 Misunderstandings

One of the aspects that developers of CA systems need to moderate is the risk of offending users with poorly-aligned humor. Obviously, offensive or insensitive jokes should be prevented, as this content can harm users' well-being, enjoyment, and retention. Interpretation of humor can differ between people. Some might find something funny, while others can get offended by it. Humor can be culturally specific, and specific jokes may not be well received in specific regions and cultures [6, 73]. Moreover, there is always the risk that humorous comments can be misunderstood and have unintended consequences. The context and tone of a joke play a crucial role in determining its impact, which can be difficult to convey accurately, especially when creating content for a global audience. To avoid these risks, companies must exercise caution and consider the impact their content can have. This could also be a reason why LLMs are constrained to certain pre-scripted humorous interactions Jentzsch and Kersting [26]. The risk or fear of being offensive can be an important factor in why CA companies prefer to play it safe with harmless and corny jokes. One approach to avoid certain risks is to use other forms of humor which do not use language, such as non-verbal and visual humor to limit the range of interpretations. An example of such humor could be seen in animated characters such as *Wall-E* from the Pixar film of the same name [59], which effectively uses non-verbal and visual humor, relying on expressive gestures.

## 5.2 Funny is less serious

Although humorous content can be attention-grabbing and entertaining, it also could signal that the situation is not serious [40]. Since humor is generally associated with non-serious situations, it could lower people's propensity to remedy a problem. In some instances, humor can be a double-edged sword. While it can help entertain, relieve tension, and ease anxiety, it can also detract from the gravity of the situation and lead to a lack of action. Additionally, in the case of commercial products, companies may be concerned that using humor by agents could lead to underestimation of their ability to perform important tasks.

## 5.3 Persuasion and Manipulation

A large body of research suggests that humor can make difficult or unpleasant information easier to “digest” [18, 32, 51, 54]. Humor has also shown to be an effective tool in persuasion [36, 68], which can be deployed towards negative ends. It has been demonstrated that using humor as a marketing approach is highly effective. People are more likely to remember humorous ads and their products and are more likely to discuss them with others [41]. US advertisers spent between 20 to 60 billion dollars on humorous marketing in 2008 [3]. Companies can use humorous agents as a marketing approach to convince users to buy their products or services. For example, by using a humorous agent, a company could promote a potentially harmful or ineffective product, leading to misinformed purchasing decisions and consumer discomfort. Of course, this quality can also be used for the user's benefit, such as using humor to nudge users towards healthier behavior [48]. For instance, to encourage individuals to adopt healthy dietary habits or engage in physical exercise. Nevertheless, the key here is to align with the user's preferences.

## 6 PROVOCATION

The role of humor in human social dynamics has been significant since the earliest stages of civilization [55]. As such, it is crucial to gain a thorough understanding of the role of humor in human-computer interaction through systematic research and practical application [47]. Given that humor may arguably be one of humankind's most complex cognitive and social attributes [47, 49], we believe that the use of humor in HCI and specifically in CAs cannot be seen as any other anthropomorphic feature which have previously been utilized in agents. Despite the presence of certain technical barriers, it is crucial to examine the social and ethical ramifications of humor in AI development. To this end, we recommended adopting a more socially focused perspective in the research and development of AI humor.

### 6.1 A Provocation to our Provocation

Earlier, we excluded “incidental humor” (see Section 2), as it does not lend itself well to be explicitly designed for. We focused on what we referred to as “designed humor” - i.e., when the CA delivers a (partially) pre-scripted humorous “performance”, such as a joke or a funny anecdote related to a user's request.

However, a question that remains is if “designed humor” can ever reach a satisfactory level. It is likely that even if “designed humor” is crafted with careful consideration of the afore-elaborated social

aspects, it will still not achieve satisfactory humorous interactions across users and (social) contexts. This is because CAs would require significantly more human-like capabilities of sensing their surroundings and adjusting their behavior accordingly (e.g., the delivery of humorous interventions), which might not be technically feasible within the next few years, nor might it be – even more importantly – desirable.

Therefore, to conclude this provocation paper, we may have to bring incidental humor “back into the equation”. Although the social aspects of humor should be given more attention in CA design, as we argued previously, doing so might not resolve all the issues currently found in CAs. Therefore, the fact that interactions with CAs are often perceived to be funny due to their differences compared with human-human interaction and the surprises this frequently involves could perhaps also be seen as an opportunity. More specifically, these elements of mismatch of the CA's behavior with social or cultural norms and the element of surprisal could even serve as a “design resource”, as they are vital factors of humor. As such, interactions with CAs are often experienced as humorous because CAs often do not respond as expected, might not get everything right, and behave somewhat ‘robotic,’ including how they deliver a punchline, for example. Thus, the question for designing humorous CAs might become: Within certain bounds of social and cultural desirability and appropriateness as outlined in this paper (perhaps configured by the user), how can we leverage the technical limitations of a CA both regarding its constrained context-awareness and means of communication compared to humans? In other words, how can the CAs' imperfections lead to enjoyable and socially acceptable humorous interactions?

### 6.2 A Provocation to our Provocation to our Provocation

We leave that to future research.

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