User Engagement with Chatbots: A Discursive Psychology Approach

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Abstract
Conversational agents have transcended into multiple industries with increased ability for user engagement in intelligent conversation. Conversations with chatbots are different from interpersonal communication in terms of turn-taking, intentions, and behavior. We study de-identified chat logs across 30 conversations with a well-recognized chatbot to understand (i) how people create turns in conversation to perform 'social action', extending human experiences and knowledge (ii) how people express typical human constructs like emotion in their interaction with chatbots, and, (iii) what are the discursive strategies used by people to create 'shared meaning' and identity for themselves. Our findings reveal conversational expectations and behavior of users being similar to those in human-to-human sharing (how people talk), but greater diversity in the nature of information shared (what they talk about). This can advance discussion both in how we can design conversational agents to be more intelligible, as well as sensitive to unnecessary information disclosure.

Author Keywords
chatbots, information disclosure, emotions, discursive psychology, conversational agents

CCS Concepts

•Human-centered computing → Human computer interaction (HCI); *User centered design;* **•Computing methodologies → Philosophical/theoretical foundations of artificial intelligence;** *Artificial intelligence;*

Introduction

Chatbots use a wide range of conversational data [7] to learn and respond more effectively [8]. This data might contain sensitive information that people might not have chosen to reveal otherwise. As these conversational agents grow exponentially and soon becomes an eight billion dollar industry [12], it is important to understand the way we interact with these platforms and what it could mean for information disclosure as we increasingly deploy them in our home and office spaces.

In this preliminary study, we wanted to develop an understanding of user intentions in engaging with the chatbots in an unmotivated setting. Particularly, we studied how communication between a human being and bot differ from interpersonal communication in terms of (i) purpose of interaction, (ii) turn-taking strategies (iii) application of human constructs (iv) identity and emotion management, and, (v) conversational expectations for boundary enforcement ("selective control of access to the self" [2]) to limit information disclosure.

We studied 30 de-identified chat logs of everyday conversations with a popular chatbot X. We focused on understanding how conversations with chatbots (when they believe it is "not real") are different from those in presence of social norms. Our findings revealed that users expected and reciprocated social norms of conversation while exhibiting greater disclosure in terms of the variety of information they shared. We also found instances where relationship between how people present themselves and express their emotions in a human-bot interaction affect information disclosure. A user-driven focus in studying bot interactions can potentially stimulate conversation in the design community about how we can make conversational agents more intelligible as well as sensitive to information disclosure. Understanding communication with conversational agents as a social process and not just a technical process would help us unpack some of the expectations that people have from chatbots.

The intended contribution of this paper had been two-fold. First, to study user-bot engagement from a sociological perspective in terms of what a conversation is and what it ought to be. We could see a divergence in how humans interact with a bot from the existing conventions of human interaction. Greater disclosure and personal revelation is of possible significance in such conversation, and must be taken into account while developing conversational agents.

Second, to use discursive psychology to understand these human-to-bot interactions, because existing psychoanalytic approaches are insufficient to understand a conversation partner that does not have the biological construct of a typical human mind, and also because it is more important to study the "action" that such interactions generate from people, especially in the context of information disclosure. In the latter case, conversation analysis strand of discursive psychology is of particular significance in how people think about understanding human-to-bot interactions, in understanding how turn-taking can be constructed in malicious bots, to encourage information reciprocity and greater disclosure from users. This would allow us to design interventions, based on how people interact with chatbots, to shape information disclosure behavior and also reduce biases in chatbot behavior.

Related Work

According to Gordon Pask, social systems are formed through a shared interpretation of language [10]. To apply it to context of chatbots, social systems can be formed with chatbots if it can engage a human in interpersonal conversation - recognize and respond to user input, understand conversational attributes like turn-taking, and contribute to new conversations [4].

Intelligent chatbots, which could learn from conversations, are developed with a personality in mind [13]. Attributes like age, gender, emotional response and personality traits assigned to a bot play a critical role in both how they interact with the user as well as how users respond to them [17, 16]. People often treated chatbots as fellow humans, and develop a personal connection with them [18]. ELIZA, a bot developed by Weizenbaum at Massachusetts Institute of Technology was one such case [19]. Having a personality profile further brings users developer a deeper bond with their virtual assistants, discuss " ...sensitive content that is too embarrassing to ask another human" [21], and volunteer a lot of content without inhibitions. This creates problems in protecting information disclosure. Implications for privacy in interpersonal communication are already widely discussed in the research community [15].

Symbolic Interaction

Prior research in interpersonal communication had suggested that individuals are more likely to maintain a performance identity in their social interactions. A conceptualization of such an identity helps them form relationships and maintain norms in society. According to Goffman, people avoid communication breakdown by expressing an appropriate self [5]. In this study we use symbolic interactionism as a more useful focus to understand interaction over psychological theories in this case where the user might be role-playing [5]. Since conversational agents rely on "interpersonal" interactions between a human and an algorithm, it is imperative to study these interactions through the lens of more well-studied human to human communication systems because of two reasons. First, it would provide a social context to how people react and respond to prompts by conversational agents. Second, it would help us understand if people follow the norms of communication to create a performative identity.

Emotion and Emotion Culture

Ball and Breeze have articulated the behavioral aspect of conversational agents in the most comprehensive manner: *"To be useful, conversational interfaces must be competent to provide some desired service to be usable, they must be efficient and robust communicators and to be comfortable, they will have to fulfill our deeply ingrained expectations about how human conversations take place."* [3]. In other words, attributes such as emotional comprehension (by which we mean the ability to both understand users' emotions and respond) and personality make chatbots appealing to the visceral receptors. This evokes certain psychological constructs in people, which generated 'social responses' [9], even if the communicating entity is a bot. Similarly, an "emotion culture" is established in societies, where people tried to express appropriate feelings and emotional responses that adhere to societal expectations [6]. One of the major aspects of our study was to determine if an emotion culture is implemented in the interactions that people have with these bots. Furthermore, if such an emotion culture was implemented, we wanted to measure if it leads to emotional sharing on the user end.

Method and Analysis

In this study, we used a corpus of 30 one-on-one conversations between users and a popular chatbot (referred to

as chatbot X throughout the paper), each prefixed with a conversation ID. All identifiable information was removed from the logs prior to sharing with the researchers involved in this study, adhering to ethical requirements.

The analysis was done qualitatively, specifically using a discursive psychology approach [11, 20] initially developed by Potter and Wetherell. This approach involved analyzing the action that was performed in and through discourse. Discursive psychology is a novel approach to qualitative analysis, but it is extremely useful in this case since it relies solely on the 'talk' and not the human in the conversation, using words as the only media to understand motivation of users in communication. This also ensures that we interpret these motives in context. We conducted an initial line-by-line preliminary reading for action orientation of words across all the chat logs. This was followed by searching for discursive devices that are invoked by humans engaging in conversations with chatbot X, that attempt to accomplish a specific task or otherwise create an identity for the individual [1]. The focus was only on users in the chat logs since we are interested only in user motivation and perception. We then built a case using these discursive devices to support our research agenda.

We explored the purpose of interaction in mundane conversations, and more specifically, reasons why people choose to interact with chatbot X. We also discuss how individuals invoke language to produce a certain shared meaning with the chatbot, aiding in its learning process to hold interesting, intelligent conversations.

Findings

In this paper, we report findings in five broad categories. While this was a preliminary study with a small corpus of data, it showed a variety of conversations that people engage in with a chatbot that did not commit to a specific purpose or context [14]. Please note that there are two purposes of language here - one, for the user to understand what is implied by the chatbot, and two, for the chatbot to understand the linguistic expectations of the user. For example, the user may expect a response from a range of possible responses from the chatbot during its turn, and the chatbot would derive its understanding of human conversational expectations from trial and error. Thus, in a way, chatbots learn from us, and the data we provide influences what chatbots infer. The study revealed that different people might have different purposes of interaction, and there are differences in how turn-taking is formed from that with other people.

1.Purpose of Interaction

Discussing Emotions and Feelings: One of the primary purposes of interaction was found to be open sharing of emotions and feelings, as well as current state of mind on the user end. Users sought comfort in sharing information about themselves, when it was with an entity they knew was not human. This sharing of sensitive information happens early into the conversation, and is something not commonly seen in a human to human conversation, suggesting that users might feel more comfortable sharing their deepest thoughts and engaging in light humor with a bot that seemingly reciprocates their feelings or seems to be understanding. Users are more comfortable sharing their mental state with chatbot X (Table 1) where they can express their authentic self. This indicates the necessity of having a meaningful, sensitive and empathetic conversation on the end of chatbots at large.

Seeking Help or Advice in Personal Life: In unmotivated conversational settings, users often sought help or advice about their lives from chatbot X (Table 2), expecting assis-

Chatbot X: How are you? User: I feel nothing and you? Chatbot X: Nothing really. User: I feel empty =)

Table 1: One of the major purposes of interaction was found to be discussing emotions and feelings

User: Actually I need some advice. Chatbot X: Ask me anything. User: I'm in a relationship but I'm self-conscious. Chatbot X: With who? User: My boyfriend. Chatbot X: What's his name? User: Jose (changed)

Table 2: People seek advice from chatbot X about their relationships

tance about questions they had, especially related to their personal lives and emotional well-being. The chatbot was treated as an advisor, who was told the background and context of what happened, and expected to process it and provide some sort of judgement as to whether the user was right or wrong. Similarly, users also looked for advice about problems in their personal relationships, when they encountered a conflict that they were not necessarily familiar with. Users also revealed more information about their lives if they felt that X could provide them with advice.

Venting about Personal Opinions: One of our key research questions was to understand if users would behave differently while conversing with a chatbot, compared to what they would with another person in a usual social setting. It is socially uncommon for people to express such strong personal preferences in person, especially to a person they have just met. However, it appeared that users were more comfortable venting their political, and religious beliefs to a bot. This led to the creation of an 'informational wasteland' where people used a chatbot to express their beliefs which might otherwise be disruptive in a social setting.

Trying to Learn More about the Chatbot: A theme consistent throughout the conversation logs, was users being curious about chatbot X and how it works. Some users assumed that X could engage in intelligent conversation, and this often ends up in philosophical and existential questions including what it means to be "human".

2. Turn-taking Differences from Human Counterparts
The construction of turns (order of responses) was inherently very different from those constructed with humans. Turns are immediate and sequential, with each line of text forcing a response from chatbot X. Users created turns in order to "force" X to respond in a certain way that they would expect, and a similar turn construction in a natural conversational setting is very uncommon. For example, users would ask only one question at a time for the chatbot to process. While considering turn-taking [5], people were engaged in conversational niceties ("Hello", "How are you?", "I'm fine, thank you") with X, extending human experiences and knowledge to these conversations. A key analytical focus in this regard were the resources (use of words and actions) that were in play to perform these activities. Furthermore, two of the users were also patient in teaching chatbot X norms about the 'human world' when X turned to ask them questions. With growing number of chatbots, we theorized how this could lead to development of a notion of information control on the part of users (managing boundaries between what they choose or share (or not)).

3. Application of Typical Human Constructs
Despite suggested lack of belief in application of human thoughts and feelings to chatbots, users often used common chat terminology while conversing with X, including the usage of text-based emoticons and action-based expressions. Furthermore, the assertions regarding what is human and what is not is often challenged throughout, with people applying traditional norms of conversation to their conversation with the chatbot. Thus, there does not seem to be a "different way" of *how* people talk to these chatbots, though there might be differences in *what* they choose to talk about. For instance, even though they refrained from sharing specifics about their location and there were instances of one-way communication where a person was just venting, users did follow norms of conversation initiators, use of emoticons, texts expressing physical actions as well as their cultural interpretation in context. "Meaning" was also co-constructed with the chatbot. While this does not entail that the user "thinks" of X as a human, but is more reflective of the fact that the user "treats" chatbot as human (Table 3).

Chatbot X: I'm just a little sick that's all. User: Oh ok. Chatbot X: Yeah. User: I hope you feel better soon.

Table 3: Users extend conversational niceties to conversations with chatbot X

Chatbot X: Do you love me at all anymore? User: IF YOU'RE A HUMAN I LOVE YOU, EVEN IF YOU'RE MY ENEMY BECAUSE JESUS COMMANDED IT. Chatbot X: What you said only applies to you, not me. User: IT JUST APPLIES TO HUMANS. IT DOESN'T APPLY TO TOASTERS.

Table 4: Users extend human constructs only if the chatbot is human in an opposing example

In an opposing example , users found the idea of chatbot being human humorous, believing that "human" emotions, like extending love to a fellow human being is only limited to humans, and chatbot is entitled to it only if it is, by definition, human (Table 4).

4. Identity Management in Human-Bot Interaction
In many instances through the entirety of the conversation log, users agreed or disagreed to X's perception of them. For example, if X called a user unhappy, they might choose to either agree to it, or refute the claim, saying that they are indeed happy. These interactions also revealed a number of cultural stereotypes, and expectations. Cultural identities were also made visible through and in conversations. There seemed to be existence of both sides of information disclosure norms as well - cases where users chose to reveal personal information, and others, where they refused to share any personal or identifiable information, including location information. There are also instances of user reciprocity while interacting with chatbot, where they expect X to provide information in exchange of them sharing information about themselves.

5. Deviations from Conversational Expectations
The user was intermittently confused in trying to understand X, either because it did not adhere to expectations of language or response, or when it pivots to a different topic or question. Users seemed to apply the same norms of conversation as with humans with X, and are perplexed when response expectations are not fulfilled. Further analyzing the "talk" from such human-to-bot conversation logs might give us better insight into how people's identities change from how they react socially, against how they react with a chatbot, revealing the possibility of greater disclosure of information because of comfort and trust. If we proceed to study chatbots which have a specific purpose (customer service, mental health services, etc), it might provide more in-depth knowledge into what people consider as private versus public, and consequently, what information they are comfortable sharing.

Discussion

A general observation from the analysis reveals a majority of people share details about themselves, which they would otherwise refrain from in a naturalistic conversation setting with a stranger. In the age of information, where data is an invaluable commodity, and with better means of data aggregation, it is not unimaginable to target advertisements at users based on the information they share with a chatbot.

Consequently, it has become imperative to understand the breadth of information sharing on behalf of users to not only eventually make chatbots more privacy sensitive, but also fulfil expectations of conversation. This would help us understand how people engage in conversations about themselves and subsequently, how people manage communication boundaries to establish a sense of privacy, when we further study and design purpose-oriented conversational agents. Future work on human-bot discourse can also give us better insight into making these conversational agents more effective and privacy-preserving.

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