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Please cite the original version:

Laaksonen, S.-M., Laitinen, K., Koivula, M., & Sihvonen, T. (2023). Triggered by Socialbots :
Communicative Anthropomorphization of Bots in Online Conversations. Human-Machine
Communication Journal, 6, 135-153. https://doi.org/10.30658/hmc.6.8

Triggered by Socialbots: Communicative Anthropomorphization of Bots in Online Conversations

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Abstract

This article examines communicative anthropomorphization, that is, assigning of human-like features, of socialbots in communication between humans and bots. Situated in the field of human-machine communication, the article asks how socialbots are devised as anthropomorphized communication companions and explores the ways in which human users anthropomorphize bots through communication. Through an analysis of two data-sets of bots interacting with humans on social media, we find that bots are communicatively anthropomorphized by directly addressing them, assigning agency to them, drawing parallels between humans and bots, and assigning emotions and opinions to bots. We suggest that socialbots inherently have anthropomorphized characteristics and affordances, but their anthropomorphization is completed and actualized by humans through communication. We conceptualize this process as communicative anthropomorphization.

Introduction

In the film *Cast Away*, a FedEx executive played by Tom Hanks develops an unlikely friendship with a volleyball, "Wilson," after washing up on a desert island following a plane crash. By describing the emotional and conversational bond between an isolated character and

sporting equipment, the movie explores the fundamental human need for social affiliation in a way most viewers can identify with (Greenwood & Long, 2011). Through reconfiguring the dialogic situation with what the volleyball affords, Hanks's character is able to preserve his mental health, motivation, and sense of direction. Wilson the volleyball is far from a perfect conversational agent, but illustrates the basic human need for *anthropomorphization*, giving human attributes to nonhuman entities, and shows how humans adopt and reinterpret the affordances of nonhuman and technological objects and interact with them to fulfill their communicative needs.

This study explores technological, nonhuman agents—socialbots—as interlocutors in text-based online communication. Much like "Wilson," they are not perfect conversationalists even if they are designed to incorporate human features. Although bots have inhabited online spaces for decades, the recent development of natural language processing has introduced bots capable of producing human-like language and engaging in communication with human users. These bots are usually referred to as socialbots or chatbots (Grimme et al., 2017), or, more recently, as communicative AIs (Guzman & Lewis, 2020), and they are becoming increasingly common in contexts from customer service to intra-organizational communication. Our theoretical frame draws from the literature of *human-machine communication* (*HMC*, Guzman & Lewis, 2020; Jones, 2014), which seeks to explore the role of machines as communicators, not only mediators of human communication. By relying on the HMC framework, we investigate the anthropomorphization of chatbots when they are built to act as communication partners. Existing studies have shown how bots are designed to appear human-like and to have personalities (Araujo, 2018; Gorwa and Guilbeault, 2020; Grimme et al., 2017), but our interest is on the process of communication in sociotechnical settings where humans and bots interact. Hence, we ask:

> **RQ1:** How are bots devised as anthropomorphized communication companions?
>
> and
>
> **RQ2:** In what ways do human users anthropomorphize bots through communication?

Similar questions have previously been explored mainly theoretically or through experimental design, and there are only a few examples of utilizing data of actual, naturally occurring human-machine communication. In this study, we explore the communicative interaction between bots and humans empirically in two contexts: an organizational setting and public social media setting. We focus on two cases: *Slackbot*, an interactive, programmable bot on a Slack platform used by a distributed team within a media organization, and *LovebotBlue*, a bot that was part of a food and confectionary producer's ad campaign designed to battle hate speech online. Our data covers several platforms, and thus our analysis results in a broader view to human-bot communication than most studies by allowing for a comparison between an internal chat platform and public social media. We contribute to existing literature by introducing *communicative anthropomorphization* as a key aspect in human-machine communication and by utilizing empirical datasets to deepen the current, often theoretical or experimental understanding of the topic. We argue

that anthropomorphization is not only a design feature or a psychological process, but also a feature of a communicative process in which humans and nonhumans participate with their distinctive capabilities and affordances.

Theoretical Background: Socialbots as Communicative AI

Interactive bots and conversational agents have been studied across disciplines. They can be defined as automated programs that manifest on a particular platform through an account that looks like a regular human user (e.g., Grimme et al., 2017). Bots perform simple functions and usually reply when addressed. The development of computer-assisted conversational agents started with the psychotherapeutic experiment ELIZA as early as in the 1960s (Shah et al., 2016). Since then, bots have been populating the web, often performing small functions to maintain online services and interaction on platforms (Geiger, 2014; Latzko-Toth, 2016). However, advances in natural language processing and machine learning over the last decade have enabled the development of bots capable of human-like interaction, usually referred to as chatbots or socialbots (Grimme et al., 2017). Newer versions of such bots can identify contexts of communication, modify their responses according to the interlocutor, and engage in human-like communication in ambiguous ways (e.g., Shah et al., 2016).

The communication and impact of bots have predominantly been studied in the context of social media (e.g., Ferrari et al., 2016; Grimme et al., 2017; Gorwa & Guilbeault, 2020; Neff & Nagy, 2016) and journalism (e.g., Bollmer & Rodley, 2016; Gómez-Zará & Diakopoulos, 2020). Recently, bots have also entered nonpublic arenas; for example, customer service and enterprise social media. Studies have explored the operation of bots within organizations as stimulants of interaction or highlighted the impact of intelligent technologies in various organizational processes (Araujo, 2018; Schanke et al., 2021; Stoeckli et al., 2018). In addition, organizational communication research has been interested in how communicative AI could function as part of a work team and influence team dynamics (Gibbs et al., 2021; Laitinen et al., 2021). Indeed, the ability to communicate with human members, in addition to more facilitative functions, is seen as an essential way for intelligent technologies to participate in teamwork (Seeber et al., 2020).

In communication research, interactions with bots and other machine entities have been explored under the umbrella of human-machine communication (Guzman & Lewis, 2020; Jones, 2014; Peter & Kühne, 2018). Traditionally, communication research has regarded technologies as platforms or venues that mediate interaction. In HMC, their role is understood more broadly: as an active participant in communication. Researchers have begun to examine how intelligent systems not just host or enable communication, but take part in and shape it (e.g., Edwards et al., 2019; Jones, 2014), perhaps resulting in a novel conceptualization of communication itself. Guzman and Lewis (2020) have coined the term *communicative AI* to refer to devices, applications, and algorithms capable of communicating in natural language and adapting to real-life conversational situations. They call for research to examine first, functional dimensions through which people conceptualize communicative AIs as communicators; second, relational dynamics of the human-technology relationship; and third, the metaphysical implications of the blurring ontological boundaries among human, machine, and communication.

Consequently, we highlight the importance of working openly to reform definitions and classifications rather than simply placing bots in existing boxes (Peter & Kühne, 2018), and studying how people understand and conceptualize the operation of these technologies in interactional situations (also Bollmer & Rodley, 2016). Communicative AIs not only mediate and facilitate communication but also automate and participate in it on their own terms (J. Reeves, 2016). Recent literature suggests that these kinds of technologies both facilitate connections and communication between people (Laitinen et al., 2021; Stoeckli et al., 2018) and communicate with individuals in a meaningful way (Ho et al., 2018). The notions of nonhuman communicative agents can also be transferred into interpersonal and team communication levels, where the complex, socially constructive management of meanings-centered viewpoints are challenged by the presence of AI. This leads to questions of how, or if, AIs can act as active subjects with whom people create meanings, rather than just as platforms for creating meanings between people (Guzman & Lewis, 2020; also Neff & Nagy, 2016).

The notion of technologies having social potential and agency can be traced back to the computers as social actors (CASA) paradigm, which aims to explain how humans interact with communicative technologies and how human perceptions shape the participation of the machines (Gambino et al., 2020; B. Reeves & Nass, 1998). Several perspectives have then built upon that base work to theorize the agency of a nonhuman communicator. Nass and Moon (2000) call it *mindlessness* when human users spontaneously and eagerly react to social cues and ignore the asocial ones. Often, the interplay of human agency and machinic agency are also related to the notion of control and establishing that control (Gibbs et al., 2021; Grimme et al., 2017). This highlights both the processes of designing and configuring these algorithm-based communicators—approachable by the concept of *affordance*, for instance—but also how social structures are constructed while communicating with bots (Gibbs et al., 2021).

Afforded Anthropomorphization

By studying the role of automated, communicative technology in interaction settings we build upon the technological affordance theory. This theory explains how technologies and their features enable different functions to their users (Gibson, 2015/1986; Hutchby, 2001; Stanfill, 2015). The concept of affordance emphasizes relativity: Technology does not determine user action, but, depending on the context of use and the user, frames the user's possibilities for action (Hutchby, 2001). A certain type of interface reinforces and promotes certain types of social activities and user experience, or might constrain and control it (Stanfill, 2015). Social media platforms typically afford activities such as posting, commenting, and liking, or in broader terms, they afford for increased visibility and persistence of communication (Treem & Leonardi, 2013).

We argue that the designed affordances of communication that emerge through anthropomorphization and characterization of bots are essential to understand how bots function as conversational agents. Anthropomorphization, as in assigning human attributes to nonhuman entities and objects, is *designed* in the sense that bots are scripted to behave in ways that would normally be attributed to humans only. For instance, a bot can announce that it is feeling sad. Such affordances, even in their simplest textual form, make the human

participants feel more connected and sympathetic to the bot (e.g., Xu & Lombard, 2017). Characterization, on the other hand, refers to another human trait of interacting with inanimate objects that can be afforded by design—giving bots names, bodies, and "personalities" (Schanke et al., 2021). In many cases, it seems to be important that a bot has a distinctive character, or an embodied appearance (Araujo, 2018) even if the limits of characterization are usually quickly established (Eyssel & Kuchenbrandt, 2012). This design principle is supported by studies done in interspecies play, where anthropomorphization increases empathy and helps create a dialogical bridge in the human user's playful interaction with a nonhuman participant (Fava et al., 2019).

Across contexts, this logic relies on the basic human psychological tendency of anthropomorphization, seeing nonhuman things as human-like (Epley et al., 2007). Likewise, users typically rely on their experiences based on human interaction when trying to explain media technology (Edwards et al., 2019; B. Reeves & Nass, 1998). Human-like features built into technology, such as gender, sound, or appearance, cause users to perceive them even more as human-like rather than technological beings (e.g., Edwards et al., 2019). In robot development there seems to be a consensus that human features and the copying of human communication modalities significantly contribute to the acceptance of social robots (Blut et al., 2021; Epley et al., 2007). There is evidence that a socialbot featuring the same gender, ethnicity, and speech qualities as its user group is readily accepted as an in-group team member compared to a bot that is characterized differently (Eyssel & Kuchenbrandt, 2012). On the other hand, recent research has shown that the more acceptably human-like a robot is, the more it raises concerns about the power of technology in society (Ferrari et al., 2016; Männistö-Funk & Sihvonen, 2018).

Although bots are technological artifacts, there is evidence of their social, emotional, and relational impact and support when they engage in discussions with humans (Beattie & High, 2022; Ho et al., 2018; Laitinen et al., 2021). However, it seems that bots need some degree of human-like behavior and communication patterns for them to best act as communicative companions. For instance, the perceived *humanness* of these nonhuman actors has been found to be a predictor of motivation to engage in conversational journalism, or discussions with a chatbot altogether (Araujo, 2018; Shin, 2021). Socialbots must be at least somewhat human-like for them to be considered *social* (Grimme et al., 2017), but the complex mechanisms of achieving humanness of a bot in different contexts are still somewhat understudied. Therefore, there is a need to examine how humanness is manifested, constructed, and negotiated in human-machine communication. We do this by examining processes of communication between humans and bots in two different settings.

Data and Method

This study combines datasets from two previous studies (Laitinen et al., 2021; Pöyry & Laaksonen, 2022) to explore the significance of anthropomorphization and characterization of socialbots through naturally occurring communication where bots are addressed as interactive companions. Existing studies have shown how bots are designed to appear human-like and built with personalities and character (Araujo, 2018; Blut et al., 2021), but our interest moves further by adding the perspective of analyzing actual interaction between bots and humans in online environments. To make sense of the versatile roles of

socialbots in different communicative contexts, our data covers both from a closed, team-level platform, and a public social media environment. These two contexts are referred to as *internal* and *public* social media.

Internal social media context. The organizational social media platform we study is Slack, a cloud-based online messaging and collaboration software used globally for team communication. It supports internal chat channels, private messaging as well as file sharing, and integration options with other services. Slack has a pre-programmed feature called the Slackbot, which is an automated socialbot present on all channels. The bot supports direct messaging for help and feedback, it can be customized to respond to certain words automatically, and it can be used to generate personal reminders and tasks. Some of these features are automated, some are suggested upon workspace setup, and some can be customized by the workspace admins. This study focuses on a Slack message database from a distributed team working in a Finnish media company. The data includes 45,940 messages in total, spanning over 2 years in time (August 2016–October 2018). Of these messages, 2,425 were sent by Slackbot. Bot messages were automated responses to certain trigger words configured by the human team members.

Public social media context. The social media dataset consists of public messages that interact with a corporate campaign that was built around a bot account. Fazer, a Finnish food and confectionary producer, launched the LovebotBlue campaign in 2018. The main feature of the campaign was a correspondingly named bot which communicated via a regular user account on the campaign platforms. According to the campaign material, a machine learning system was used to identify hate speech, and guided by a human moderator, the bot intervened in the identified discussions by making a remark of the conversation style. Dealing with a politicized topic, the campaign received negative feedback, much of which was targeted to the LovebotBlue (Pöyry & Laaksonen, 2022). We use a dataset of social media messages related to the campaign sent between October 1922–December 31, 2018. The data contains 1,615 tweets, Instagram posts, and forum messages mentioning the bot's username ($n = 621$) or the campaign hashtag (#smallpieceoflove).[1]

Data Analysis

Data were explored with a grounded, inductive approach with a focus on those conversation episodes where human users reply to messages sent by the bot or in other ways interact with it, that is, episodes of human-machine communication. Our aim was not to build a mere classification of messages but to explore the communication with and about the bot from a phenomenological perspective to build context-sensitive knowledge about the forms of bot-related communication in online environments.

The analysis provides a two-dimensional lens to the research questions. By using a qualitative approach, we examine both *the bot's communication style* and the ways in which *humans engage in discussion* with or about the bot. First, we explored how the designed and configured anthropomorphized nature of the bot manifests in the designed features of

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1. #pienipalarakkautta in Finnish. The campaign hashtag and the name of the bot is related to one of the most popular products of Fazer, a milk chocolate bar called "Fazer's Blue." The word *piece* (pala) in the hashtag refers to both offering someone a piece of chocolate and a piece of *love* (instead of hate).

the bot as well as in the bot's messages. As we have established, existing studies show that human-like characteristics, such as gender, voice, or outlook, make the users consider bots more human-like than technological subjects. In the case of Slackbot and LovebotBlue, we were interested in how their appearance and actions invited human users for interaction. In addition, we approached the bots by exploring how they were *characterized* as communicative companions. Characterization, as previously mentioned, refers to the design principle that increases the acceptability of inanimate objects or technologies (Blut et al., 2021; Schanke et al., 2021). This analysis was executed in multiple rounds of inductive, data-driven analysis aimed at pinpointing and carefully illustrating the characterization visible in the bots' messages.

Second, we examined the messages in which human users actively engaged in discussion with or about the bot, that is, when they directly mentioned the bot handle or the word *bot*. The identification of these messages was conducted as follows: First, we automatically searched for mentions of the bot by name, nickname, or social media handle, including inflected forms of the word bot, Slackbot, and LovebotBlue. Second, we identified the response functions of team members' messages in the instances where human users engage in discussion with or about the bot. To make this distinction, we utilized a framework developed in a previous study (Laitinen et al., 2021), which uncovered that human members *respond to* (messages directed to the bot), *discuss about* (messages about the bot directed to humans), and *summon* (messages tagging or calling for the bot) socialbots in the context of internal social media. This framework was created through inductive analysis of the communicative *functions* present in bot-related communication. In this study, we began our analysis by coding the bot-related messages by the human users following this functional preset. For the Slack data, we used data previously classified by three of the authors (Laitinen et al., 2021). For the LovebotBlue data, the classification was done separately by one of the authors, who was also one of the three trained classifiers for the Slack data. Next, we engaged in qualitative analysis of the messages, one category at a time, to see if, and how, the anthropomorphization of the bot manifests in messages engaging the bot. The data was processed in spreadsheets and for each individual message we marked identified statements and verbal cues that suggested human-like features, thoughts, or emotions; for example, depicting the bot with action capabilities, feelings, or opinions and autonomy.

In the final phase, two authors worked together to sort the identified patterns of anthropomorphization into higher-level dimensions. Notes and findings were further discussed together by all authors following the practices of peer debriefing (Lincoln & Guba, 1985). We clustered the codes achieved in the previous phase and through the process of finding similarities and differences in the functions and contents of the statements, we eventually identified four categories which highlight the main ways of anthropomorphization in human-machine communication. This analysis led to the four dimensions in Table 1: *Direct address*, *Bot agency*, *Human-bot parallels*, and *Opinions and emotions*.

Findings

To make the bots approachable and interesting for human users to interact with, they are designed to appear appealing to us (Araujo, 2018), which is also evident in the visual, textual, and functional characteristics of Slackbot and LovebotBlue. A sympathetic human-faced

TABLE 1 Dimensions of Communicative Anthropomorphization of the Bot		
	Bot Messages	**Communicative Anthropomorphization**
Direct address	Commands and suggestions (SlackBot, LovebotBlue) Questions (SB) Reprimanding humans (SB, LBB)	Direct answers to bot questions or suggestions (SB, LBB) Summoning the bot with mentions or trigger words (SB, LBB) Playing or trapping the bot (LBB) Abusing the bot (SB, LBB)
Bot agency	Indications of action (making coffee, being at the office) (SB) Evaluating human action (swearing, moderating) (SB, LBB)	Suggesting actions to the bot (SB, LBB) Evaluating bot action and skills (SB, LBB) Reporting messages to the bot (LBB)
Human-bot parallels	Indications of unity with *we, us, our* (SB, LBB) Talking about and following communication norms/ conventions (SB, LBB) Posting inside jokes (SB)	Addressing the bot as team member (SB) Addressing the bot as employee (SB, LBB) Implying that the bot has human-like features and abilities (SB, LBB)
Opinions and emotions	Phrases with emotional display (SB, LBB) Stating an opinion (SB, LBB) Talking about values/ideals (SB, LBB)	Referring to the bot's emotions (SB, LBB) Asking for the bot's opinion (SB, LBB)

figure has been designed for both, with a focus on the horizontal facial features: big eyes and a friendly smile. Slackbot's avatar is a box of four basic colors with eyes, a mouth, and a gentle appearance. LovebotBlue is depicted as a blue robot with typical humanoid features familiar from science fiction cartoons and comics: clear eyes and a smiling mouth. These are design features aimed at lowering the interactive threshold for social activity between the bot and the people facing it, that is, affordances configured to foster certain types of communication.

Both bots have a designed predisposition to communicate: they act in response to human messages and react to trigger words or recognize hate speech. Also, the affordances of social media platforms invite people to anthropomorphize bots. Since the bots occupy regular user accounts, they can be responded to and referenced in a conversation. Bots often appear as discrete persons by signing their own posts. For example, LovebotBlue talks in the first person, introduces itself, and linguistically emphasizes its own acting. It considers itself coming into the conversation as an outsider because of external *forces*, as can be seen in this example:

> Now stop. I am not actually involved in this debate, but I have to say that this style of discussion goes too far. Things as things and people as people, everyone has to be respected. #littlepieceoflove (Forum post)

In addition to design features and characterization, the bots are anthropomorphized through *configuration*. Through the affordances of the platform, human users seek to configure and modify the bot to appear as even more *human-passing*. Slackbot, in particular, was configured by its team members. Slackbot has built-in functions to support team interaction and work tasks, such as advising with links and giving reminders. It is also possible for users to configure bot-specific responses that the bot automatically triggers in response to specific words mentioned in the messages under the control of a randomized algorithm. Allowing such unsolicited and unexpected participation by a bot is a technological proposition that invites customization of the bot to be human-like. In the media organization we studied, Slackbot was configured to be more human-like immediately after the adoption of the platform by adding scripts such as greetings, rhetorical questions, and humorous utterances.

Both bots communicated in natural language with responses pre-programmed for them by the organization or human team members. Bot messages included several traits which further brought forward the human-like aspects of the nonhuman communicators. These aspects were not only related to the use of natural language, but to the topical, functional, and content-related characteristics of both bots' communication style. For example, LovebotBlue apologized for interrupting an ongoing conversation between human users and acknowledged its own position as an outsider. Slackbot responded in different ways to greetings, asked about the human users' well-being, told about its own "expenses" and reminded the others of making coffee. Slackbot was always around—although some mornings the bot announced that it would not be coming to the office, which is quite an analogy of human behavior. There is also something human in the ways the bots appear in discussions: they spot a keyword in the feed and respond.

User: Good morning!

Slackbot: Good morning, how are you?

User: Looks good, the sun is shining and soon on vacation.

As these interactions indicate, the human-like behavior of the bot is based on phatic communication that yields humorous and light-hearted results. The Slackbot, in particular, is designed and configured to act like a human member of the team: to socialize and interact in ways that make it appear as if it was *one of us*.

Communicative Anthropomorphization

Both of our datasets show how *humanness* (e.g., Shin, 2021) of the bot is manifested and constructed in human-machine communication when individuals interact with the nonhuman communicator. This was evident both in the human-like characterizations found in the messages of the bots themselves and in the ways the human users responded to, discussed with, and called for the bot. In this section we provide insights into the forms of communication that highlight the human-like features and abilities of the bots as people address bots *communicatively*. They are not considered human, but in some ways they are perceived as participants in the interaction, guided and afforded by their programmed human-like features (e.g., Bollmer & Rodley, 2016; Edwards et al., 2019). Although users understand

that technology is designed and made by someone, they still target their message directly to the technological beings (Neff & Nagy, 2016). Thus, it is as if the technological being is bestowed with agency in interaction, in the ways of speaking to them. This idea is reflected in both of our datasets: the bots are repeatedly addressed like humans. We call these behaviors *communicative anthropomorphization*.

Direct Address

In both datasets we observed instances where human users directly address the bots: they respond to the bot by answering its questions or by sending comments or questions as replies to the bots' messages. There are moments when the bots were spoken to in a similar manner as to another human user—perhaps, however, with less empathy as the second example below shows:

> @LovebotBlue By eating dangerous sugar you hurt your own health. Did you know this @LovebotBlue? The worst products that endanger health are made by Fazer. Especially the chocolate department. Chocolate is eaten so much that insulin levels are through the roof. @FazerSuomi #avoidfazerproducts (Twitter)

> User: Did you receive any feedback?
>
> Slackbot: For the sake of reader feedback, that is why these things are done—and for the [Journalism Prize] jury
>
> User: Be quiet bot

Another form of direct address we identified is that humans try to engage in discussions with the bots and summon them on purpose by tagging them or using known trigger words. This is a playful and inherently communicative activity. In the LovebotBlue data, these forms of addressing call the bot to participate in a discussion; for example, with the intention of reporting a hateful message to the bot or asking for reactions. Addressing the bot with trigger words could also be interpreted as a way of wanting to understand how the technological entity works:

> @user @Lovebotblue @user Seems to react to certain words. Let's test it. [Lists six offensive, immigration-related terms.] (Twitter)
>
> Slackbot: Go Hank!
>
> User 1:   I wonder if tea is more to Hank's liking.
>
> Slackbot: Go Hank!
>
> User 2:   coffee hank
>
> Slackbot: I would listen to what Hank has to say about this
>
> User 1:   Why doesn't this guy [Slackbot] speak about coffee anymore?
>
> User 2:   Coffee, do you have something to say about that, Slackbot?

One prominent feature of direct address is negative commentary targeted to the bot. For example, in the LovebotBlue data the human users frequently directly address the bot as if

it were a user with intentions and opinions; complaining about its actions, asking for justifications for something it said, even directly abusing the bot. Similarly, the Slackbot receives instances of rather blunt, offensive, and aggressive responses. This added offensiveness is perhaps a sign of people regarding the bot as a machine that can be abused without moral considerations (see Epley et al., 2007). The offensive messages are formulated in a way that they directly talk to the bot, thus engaging with the bot as if it was a conversation partner:

> @user @LovebotBlue @user Lovebot: Firstly, you have a face on your head and secondly, it's not very pretty. Do you want me to jpconfig your face, huh?! Would you like it if we all monitored each other like this? Where do you think that would lead except to a candy company being a moral guardian or internetbot trolling? (Twitter)

> User: Good morning
>
> Slackbot: Ouch, what day is it?
>
> User: How should I know @Slackbot

Bot Agency

As described above, one way in which the bot is treated human-like is endowing it with agency through communication. Such action is partly triggered by the messages configured to the bots. What is interesting, however, is that such linguistic notions on agency are even more strongly present in the messages that respond to or mention the bots. First, a great share of bot-related messages in both datasets focus on commenting and evaluation of the bots' actions. These messages express, for example, how the "bot censors," "bot knows Finnish," "bot did not do anything wrong," "slackbot is messing around," "bot judges," "bot shared wrong information," "slackbot talks." The focus in these messages is action-oriented in the sense that they evaluate the actions of the bots, and do it by linguistically positioning the bot as an actor:

> User 1:   Good morning!
>
> Slackbot: Good morning to you!
>
> User 1:   Once again bot, you haven't made coffee.
>
> Slackbot: Somebody make coffee!
>
> User 1:   Your turn.

   Second, human discussants in both datasets are making suggestions for action to the bots. In the LovebotBlue data there are several messages calling for autonomous bot intervention when users report messages to the bot. The main goal of this activity is to receive a judgment from the bot regarding the potentially hateful content of the message, and perhaps also to test the limits of the bot as well as its just action across the political spectrum.

> @LovebotBlue Could you check the texts in this picture where you can find a "researcher of facism" supported by Yle [Finnish national public broadcaster] @user (Twitter)

@user you'd think a grown up would know how to behave.. and why didn't @LovebotBlue intervene? 🤔 (Twitter)

Human-Bot Parallels

The anthropomorphization of the bots was constructed in interaction where the bots were portrayed as parallel with human communicators. This was manifested by messages commenting on or reacting to the bots' actions and characteristics by positioning the *bot as a part of the team*, referring to the *bot as an employee*, and implying that the *bots have human-like features and abilities*. The messages positioning Slackbot as a part of the team included statements where human members regarded the bot as "theirs," or in other ways being part of the team, or "us." Such team-talk was presented also through instances where the bot encouraged the team members, made a comment or suggestion related to work, or participated in the inside jokes of the team—followed by team members' reactions by discussing the bot's behavior or responding to it. The following excerpts illustrate how Slackbot is treated as being part of the team:

Slackbot:	We are going to win the award
User 1:	Quite talkative, this Slackbot of ours. Perhaps it could do articles for us too?
User 2:	I shall suggest that to our editors, they will run with it
User:	Good idea Patrick, do you have time to finish it?
Slackbot:	Yes, but who has the time to do it?
User:	Patrick, slackbot.

The bots, especially LovebotBlue, were sometimes regarded almost like employees or advocates of the company they represented. This manifested by both giving the bot customer service requests, and contacting and challenging the company through the bot. This behavior could also be interpreted as a reflection of the most common function chatbots and socialbots are designed to perform as the first layer of online customer service. The following examples illustrate how people communicate with the bot by asking questions related to the operational field of the company and their ethical actions. Visible in these excerpts is also the way in which humans challenge the organization by directing their views on societal issues and the organization's role in them to the bot, much like an employee represents an organization.

Ping @LovebotBlue ! Answer this NPC [non-player-character]! Why was Fazer racist? (Twitter)

Hi @LovebotBlue! Fazer's Blue as a brand is of course the most Finnish brand ever. Btw, what kind of milk is used to make it? #fazer (Twitter)

The team members and social media audience also posted messages that mentioned the bots' human-like features and even directly compared them to human abilities and features. For instance, the bots were compared to humans as conversation partners, they were implied to have a "holiday," and they were described as cute or having performed well. Sometimes the Slackbot was even directly compared to a team member. The following excerpts highlight these instances:

> User 1:   Someone to talk to for the lonely.
>
> User 2:   Yeah, slackbot talks, if no one else is here. - -
>
> User 3:   In the future, I'll spend my weekends talking to the slackbot!
>
> User 4:   Better company, at last.
>
> @user @user Can't see @LovebotBlue intervening much.. Oh, the [machine nickname] is on Christmas holiday. (Twitter)

Opinions and Emotions

Finally, we saw communicative anthropomorphization of the bots by providing them indications of human-like characteristics, such as *assumptions of emotion* as well as *asking for opinions.* The bots' own messages included various forms of emotional expression as a form of human-like language use, and occasionally the human users engaged with the display of emotion by reacting to it or talking about the bots' feelings. The bots were described to be "optimistic" or "passive-aggressive." The humans also occasionally felt the need to apologize as if the bot's feelings were hurt. These kinds of statements highlight anthropomorphization as emotions inherently bring forth human-likeness. The excerpts below illustrate emotion-related messages:

> User: Sounds like a bloody interesting news poet
>
> Slackbot: That is such foul language!
>
> User: Sorry
>
> @user @LovebotBlue seems to be one of those passive aggressive bots (Twitter)

In addition to messages that regarded the bots' emotions, human communicators inquired the bots' opinions as if the bot would have its own perceptions of the world and could develop its own viewpoints. Furthermore, the human communicators did not only ask for the bots' opinions on matters but also occasionally confirmed and praised or belittled their thoughts on issues. Interestingly, LovebotBlue acts as a conversationalist in a completely different way than the organization's own accounts on social media. Sometimes asking opinions was a form of challenging the organization through the bot, as campaign critics used it as an object to approach Fazer and highlight broader political themes. The following instances highlight such interactions:

> User 1:   I'm trying to find synonyms for poop. That is what I am doing at the moment. [continues to list said synonyms]...hit me!
>
> Slackbot: Shittier ideas should be saved for the parent company's other newspapers.
>
> User 2:   Slackbot is absolutely right

> @LovebotBlue @FazerFinland what do you think about the situation of freedom of expression and human rights in Russia, China and Turkey? Is it appropriate to trade with China while burying the human rights situation? #hate speech #human rights #word responsibility (Twitter)

Discussion and Conclusion

In this study, we examined the communicative anthropomorphization of two social-bots, Slackbot and LovebotBlue, in organizational and public social media contexts. Our empirical analysis showed how humanness of the bots was not only a design element or a psychological, intrapersonal process, but also socially constructed in human-machine communication. Our study contributes to the existing, predominantly experimental research on anthropomorphization (e.g., Araujo, 2018; Blut et al., 2021; Schanke et al., 2021) by exploring this process through two datasets of naturally occurring conversations, and by highlighting the social, collective, and performative aspects of anthropomorphization. Further, we contribute to the field of human-machine communication (Guzman & Lewis, 2020) by proposing that the ways in which human users communicate with bots are an essential mechanism for making the machines seem and feel more human. We refer to this as the process of *communicative anthropomorphization*.

Previous studies have shown that human-like features are essential cues for users to perceive technological interlocutors as social companions and to activate the psychological inference of anthropomorphism (e.g., Edwards et al., 2019; Epley et al., 2007; Wischnewski et al., 2022). We add to the existing discussion on the design of socialbots (e.g., Araujo, 2018; Shah et al., 2016) by emphasizing the aspects of configuration and communication. Both studied bots were configured to be even more human by the human users: for example, by adding human-like responses for the bots as if they were real users with intentions and opinions. Moreover, our results accentuate the communicative, socially constructed anthropomorphization of bots: they are endowed with agency through the communication by humans who interact with them. In our data, bots were directly addressed, interrogated, and paralleled with humans. Through their interventions, bots also changed the course of the conversation, elicited feelings, and generated action. They seem to act as links between the human world of interaction and the technological world as they communicate with an automated logic but cause repercussions in human communication. In this sense, bots have agency that extends beyond the traditional mediator role considered for technology; they function as triggers for communication in unpredictable ways (Guzman & Lewis, 2020).

While anthropomorphism is a known tendency of humans (Heider & Simmel, 1944), the anthropomorphization of bots is further motivated by their design, the technological context, and by the efficacy expectations present in the social situation (Epley et al., 2007). Indeed, bots do not exist or function without their technological and social context.

Considering the affordance theory and the broader literature around social construction of technology (Pinch & Bijker, 1984), we suggest that social bots are technologies with anthropomorphized characteristics and affordances, which trigger the psychological process of anthropomorphization, but the process is completed and the bots are *realized as agents* by humans who attribute them with agency through communication. Although all technology is often talked about when used (Laitinen & Valo, 2018), the bot stands out because it is not only the subject but also the object of talk: users in our empirical data talk *about, with,* and *to* the bot, regardless of the human users knowing the bot is artificial. Thus, the affordances of the bot, in particular its capabilities to communicate in human language, invite users to treat and tease it as a human-like yet artificial actor, and to generate forms of co-constituted, symbiotic, communicative agency (see Neff & Nagy, 2016).

Communicating with bots, however, is interaction marked with disappointment: humans in our datasets try to converse with the bots but encounter the limited abilities of their machine interactants, as the bots fail to follow the shared conventions of human conversation. This seems to cause emotional distress and abuse targeted toward the bots. Therefore, the bots are still frequently regarded and treated as the technological other. Because the bot acts wrong in the process of communication, it fails to achieve the role of a plenipotentiary interaction agent (Bollmer & Rodley, 2016). Bots might be designed human-like, they are configured even more so, and addressed by humans as communicators, but until their communication capabilities are more sophisticated, something is still missing. It is as if the bots are expected to communicate without errors because of their technological nature but still, paradoxically, making mistakes returns them to their technological status (cf. Guzman & Lewis, 2020). This further highlights the social construction taking place in the communication process between humans and machines: communication is not reduced to transfer of information but rather, meanings are created and negotiated *despite* the bots' limited ability to interact.

Furthermore, our data indicates that communication with bots is shaped by the context and the platform. While there are similarities in communication styles toward the bots across platforms as described above, differences are notable: on public social media, LovebotBlue was repeatedly abused, told to get off the platform, and its (or its owner company's) motivations were questioned. The Slackbot, on the other hand, was often completely ignored as it responded to keywords incorrectly. Slackbot is, yet, constantly performing and constructing the team itself by repeating team-configured inside jokes and dramatizations that are meaningful to the team members. Being configured by the team members using it daily, Slackbot gets treated in a more inclusive manner, while LovebotBlue is seen as an extension of Fazer and is treated accordingly. Further, while both bots are designed to intervene in human discussions, LovebotBlue enters them more uninvited and perhaps therefore elicits more rude reactions. The broader context, thus, affects the negotiations of control when communicating with artificial actors (Gibbs et al., 2021; Grimme et al., 2017). Hence, our findings highlight the importance of investigating anthropomorphization in varying social contexts, beyond intra- or interpersonal settings.

In conclusion, we suggest that the communicative anthropomorphization of bots is an important aspect of their functionality and their construction as agents in social, interactive situations. Thus, we propose that anthropomorphization is simultaneously a design process, a psychological process, and also a communicative process of socially and collectively

constructing human-likeness through interaction. In this vein, our results highlight the call presented in HMC that the emergence of digital interlocutors generates a need to redefine the existing conceptualizations of communication, interaction, and agency in the context of communicative AIs. Future research should further explore the communicative anthropo-morphization of socialbots by examining it across contexts: bots on different platforms and in different social settings work in varied ways and have diverse implications.

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Acknowledgments

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