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Man vs. machine: Human responses to an AI newscaster and the role of social presence

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ABSTRACT

Technology advancements made the possibility of artificial intelligence (AI) newscasters a reality. Some news stations across the world have already employed AI to deliver the news, and more news stations may continue this trend. However, little is known about how the audience will respond to news when it is delivered by AI. Thus, the present study investigates people's perceptions about an AI newscaster, compared to a human newscaster, in the context of delivering a weather newscast. Primary findings indicate that people perceive a human newscaster as more credible than an AI newscaster; however, information seeking intentions and behavioral intentions do not differ between the type of newscaster. Further, when listening to a weather newscast delivered by an AI newscaster, the perceived social presence of an AI newscaster is positively associated with greater levels of credibility, information seeking intentions, and behavioral intentions. Collectively, this exploratory research suggests the possibility that AI newscasters can be incorporated to the news broadcasting industry when human resources are limited.

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Artificial intelligence (AI) technologies are becoming more accessible to the general public, and the use and adoption of AI are also growing. Statistics reports that digital voice assistants that feature human-like voices are used by more than 46% of Americans, and a majority of these individuals use the voice assistants on their smartphones (Pew Research Center, 2017a). Also, approximately 25% of U.S. adults report that they own an AI-based smart speaker at their home (Pew Research Center, 2019).

Recent years note an increase in use of AI technologies in the news media industry. For example, the National Weather Service (NWS) started using computerized voices to present news in 2000. As technology improved, the NWS also improved the computerized voices to sound more natural over the years (National Oceanic and Atmospheric Administration, 2018). Television news stations also began to show interests in adopting AI-powered robots as a potential agent to deliver news stories (Richardson, 2018). For example, Xinhau News Agency, a Chinese news station, debuted its first robot newscaster in 2018 and received significant attention from the viewers and general public (Kennedy, 2018); later, the news station also debuted the world's first female robot newscaster in 2019 (Cheng, 2019). The same news station also launched a three-dimension (3D) newscaster (Glover, 2020), which uses 3D technology to create a perception of depth that enhances users' feeling of interactivity and involvement with the technology. South Korea also debuted the country's first robot newscaster on its MBN station (Yoon, 2020). This robot newscaster is a replica of a female anchor in South Korea, which copies the anchor's look, facial expressions, and even mannerisms, and is tasked with reading and delivering the news like other typical human newscasters do (Yoon, 2020).

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As technology advances, the adoption of AI technologies as newscasters (e.g., AI-based robot newscasters, voice AI), referred to as AI newscasters in this study, may increase. However, little is known about how people perceive AI newscasters. Although some research informs the role of AI in news media, most extant studies focus on AI used to produce content (e.g., Carlson, 2018; Clerwall, 2014; Graefe et al., 2018; Thurman et al., 2017) with limited focus on AI newscasters. Hence, it is not clear how people would respond to news delivered by AI. In other words, would people respond to human newscasters and AI newscasters in a similar manner or would people demonstrate different responses? Considering the continuous demand for news consumption and popular use of AI in daily life (Pew Research Center, 2017a), there seems to be a potential for AI newscasters to be adopted and used across news media stations. In this regard, the present study takes an exploratory approach to address the above-mentioned inquiry.

The advent of AI in news media and social presence

AI in news media

Automated journalism uses algorithms, AI software platforms, and natural language generation techniques to automatically produce news content (Carlson, 2015; Montal & Reich, 2017). With this innovative AI-based technology, automated journalism initiated a new way of producing news content, which was primarily a human's job in the traditional news media industry. Some examples include Washington Post's *Heliograf* and Bloomberg's *Cyborg*.

Responding to the growth of automated journalism, research has documented the role of AI in news media (e.g., Carlson, 2018; Clerwall, 2014; Graefe et al., 2018; Thurman et al., 2017). For example, Clerwall (2014) examined how people perceive text written by a human journalist compared to text generated from an AI software. The study found that people view text from a journalist to be more pleasant to read than text generated from AI. However, the study found that other perceptions are not significantly different between human- and AI-generated news content. Similarly, Van der Kaa and Krahmer (2014) found no differences in perceived credibility between stories written by AI and a journalist. Although minor differences are noted in some areas, general perceptions toward news media content generated by a human compared to an AI do not appear to be drastically different. It is important to note that research studies could have their own limitations due to various factors (e.g., research stimuli), but regardless, these findings are meaningful as they provide an initial understanding of AI in news media and how people perceive news content generated by AI.

Then, the remaining question is, what if AI delivers news content? How would people perceive the AI newscaster and respond to the news content delivered by an AI newscaster? Considering the growing interest of adopting AI newscasters in the news stations (e.g., Kennedy, 2018; Richardson, 2018; Yoon, 2020), it is an important subject to investigate.

Theoretical understanding of human responses to AI newscasters

The media equation (Reeves & Nass, 1996) provides a fundamental framework for understanding human's perceptions and responses to technology or machines. The media equation suggests that individuals treat media like real people, and individuals' interactions with media technologies are fundamentally social and natural (Reeves & Nass, 1996). For example, C. Nass et al. (1994) found that people apply politeness rules when interacting with computers. In particular, the study found that people provide a more favorable evaluation to a computer they have previously used than to a computer they have no previous experience with. The study also discovered that the sex of the computerized voice influences people's perceptions toward the computer. Specifically, people tend to perceive a computer with a male voice to be more dominant and credible and a computer with a female voice to be more informative about relationship-related topics. These findings collectively

imply that humans tend to apply stereotypes to machines like they do to other humans. As suggested by the media equation (Reeves & Nass, 1996), people tend to treat media technologies as if they were humans.

To further illustrate humans' interactions with machine agents, Spence et al. (2014) suggested the idea of the 'human-to-human interaction script.' The human-to-human interaction script focuses on differences in humans' expectations when interacting with another human or a machine, noting a preference for interacting with the human. A series of empirical studies document evidence that supports this argument. For example, people experience greater social presence and social attraction when anticipating an interaction with another human compared to a robot (e.g., C. Edwards et al., 2019; Spence et al., 2014). Interestingly, people's perceptions of social presence and social attraction of the robot increase after an actual interaction with a robot (A. Edwards et al., 2019). These findings indicate that, although humans may prefer another human over a machine agent, an actual interaction with a machine agent could positively influence the way people perceive a machine agent. In all, although it has not been directly tested regarding an AI newscaster, the fundamental frameworks of the media equation and the human-to-human interaction script provide foundational understanding of how humans would perceive and respond to an AI newscaster.

When comparing an AI newscaster and human newscaster, one distinctive feature is the nature of the voice (e.g., machine voice vs. human voice). Although a machine voice can closely mirror that of a human, they are not the same. Nass and Steuer (1993) argued that a human voice has special acoustic properties that are familiar to humans and people are more responsive to a human voice than a machine voice. In more research, Xu (2019, 2020) found interesting patterns that vary by people's previous technology experiences. In particular, a machine voice fosters favorable perceptions among people with previous experiences of robot interactions, and a human voice fosters favorable perceptions among people with no previous experiences of robot interactions (Xu, 2019). In all, although the contexts are different, the extant research provides an initial understanding of how people might perceive and respond to an AI newscaster with a machine voice.

The present study

There exist a variety of topics that news programs cover, such as weather, health, politics, and sports. Of various contexts, the present study focuses on the weather news. Weather-related information is a part of our daily life; thus, there is a demand for it throughout the day. In the event of natural disasters (e.g., hurricanes), the demand for more information would particularly increase among those who are affected by the weather.

Because a weather newscast includes time-sensitive information, delivering the news in a timely manner is critical. However, human newscasters may be unavailable at times to communicate the information with the audience due to unforeseen circumstances. Thus, instead of having an alternative human newscaster to stand by at a news station for situations that may or may not occur, using an AI newscaster, which can be available immediately, may be an ideal alternative in increasing the efficiency and effectiveness of the news delivery (Nisa, 2020). In this regard, how people perceive and respond to a weather newscast delivered by an AI newscaster, as compared to a human newscaster, is worth investigating.

Further, a weather newscast is an appropriate context because the content is mostly objective without much influence of the newscaster's personal viewpoints or opinions. If news content heavily involves subjective interpretations or assessments, the way the news content is communicated (e.g., the newscaster's communication styles) may influence the audience's perceptions of the news messages (Kim & Yang, 2019). In fact, research indicates that when the news is generated by AI, people develop different perceptions of it depending on the news type (e.g., hard news vs. soft news; Liu & Wei, 2019). To avoid any potential confounding factor that may be affected by the news type, the present study focuses on one type, particularly, hard news, which does not necessarily include subjective opinions or personal interpretations from the newscaster.

Primarily, the present study focuses on the following perceptions and responses to a newscast: the perceived credibility of a newscaster, information seeking intentions, and behavioral intentions. *Credibility* is described as 'judgments made by a perceiver . . . concerning the believability of a communicator' (O'Keefe, 1990, p. 181). Credibility is an important aspect used to understand how receivers respond to messages (Johnson & Kaye, 1998; Metzger et al., 2003). Research highlights the importance of perceived credibility of a source because it influences the way receivers evaluate and react to messages, particularly in news media consumption (e.g., Kim & Yang, 2019; Savage & Spence, 2014; Spence et al., 2019, 2021). When comparing an AI newscaster to a human newscaster, the perceived credibility of a newscaster is particularly important because if the audience does not perceive the AI newscaster to be credible, the message would not be effectively received by the audience. Then, the adoption of an AI newscaster may be negatively affected. Thus, the perceived credibility of a newscaster is a critical aspect to examine as it provides a baseline understanding of people's perceptions toward an AI newscaster.

Information seeking intentions, which refer to people's intentions to engage in an active search and meaning-making process to broaden their knowledge (Kuhlthau, 1991), are another critical aspect to consider. One of the common motives to consuming news media (e.g., radio) is to seek information (Free, 2005). Although some exceptions may exist, the information seeking motive implies that people would seek information to obtain a better understanding of the extant knowledge and/or change behaviors based on the information, whether for themselves or others. Thus, when a newscaster delivers news concerning anticipated severe weather conditions and appropriate preparations, one primary goal would be to inform the audience of the condition and encourage the audience to follow up on the suggestions or advice shared by the newscaster (e.g., how to prepare for the hurricane). Although sharing sufficient and detailed information is crucial, due to the time restriction, only selected information might be delivered. Thus, it is important to understand which type of newscasters, AI or human, motivates people to seek more information regarding the content they listened to from the radio.

The present study also examines *behavioral intentions*, which refer to people's intentions to take on an action or perform a behavior (Warshaw & Davis, 1985). When preparing for a potential natural disaster, it is crucial for the public to follow guidelines and take recommended actions promptly to maximize safety and preparedness (Chon & Park, 2021). As shown in previous natural disaster situations (e.g., hurricane Katrina), not following recommendations or guidelines could expose individuals to greater risks (Paek et al., 2008). In order to understand people's behaviors in these potential situations, it is imperative to assess people's behavioral intentions, which are a strong predictor for one's behavioral changes (Ajzen, 1985).

In all, although some may be concerned with the lack of humanness in AI newscasters, some news stations have already adopted AI newscasters (e.g., Kennedy, 2018; Richardson, 2018; Yoon, 2020). However, there is little information about how people perceive and respond to news delivered by an AI newscaster compared to a human newscaster. To understand this emerging phenomenon, the present study seeks to answer the following:

RQ1a-c: How does the agent of the newscaster (AI vs. human) influence people's perceptions and responses to a weather newscast, such as (a) the perceived credibility of a newscaster, (b) information seeking intentions, and (c) behavioral intentions?

Social presence

Social presence was first introduced by Short et al. (1976) in a human-to-human, mediated context. Since then, scholars have further explored and expanded the scope of social presence to embrace more diverse interaction contexts and environments in newer technology contexts, such as interacting with technologies or machines (e.g., Biocca et al., 2003; Lee, 2004). In particular, Lee (2004) defines *social presence* as 'a psychological state in which virtual (para-authentic or artificial) social actors are experienced as actual actors in either sensory or non-sensory ways' (p. 44). While the definition is

not universally agreed upon, the extant literature generally describes social presence as a feeling of being connected to other beings that are physically away but virtually together (Biocca et al., 2003) without necessarily noticing the existence of media (Lee, 2004).

Research documents diverse roles of social presence in the context of interacting with technologies. Through a systematic review of literature, Lombard and Ditton (1997) report that social presence or presence (broader notion of social presence; see, Lee, 2004) has various effects on technology or media experiences, such as involvement, persuasion, memory, and social perceptions. Supporting this theoretical perspective, a good deal of empirical research reports the importance of social presence in diverse contexts such as exercise video games (e.g., Kim & Timmerman, 2018), social TV viewing (e.g., Kim, Merrill Jr., Collins et al., 2020; Kim et al., 2019), human-robot interaction (e.g., C. Edwards et al., 2016; Spence et al., 2014), online education (e.g., Kim et al., 2016; Song et al., 2019), AI-facilitated education (e.g., Kim, Merrill Jr., Xu et al., 2021), social media (e.g., Kim & Song, 2016), and radio (e.g., Kim & Yang, 2019).

When interacting with technology, users' social responses to technology would not occur without perceiving the technology as a social actor (Lee, 2004; Lee & Nass, 2005). Confirming this argument, research further supports that social presence or presence of a technology is a critical factor that fosters positive experiences when interacting with or using the technology (e.g., Kim, Merrill Jr. Song et al., 2020; Lombard & Ditton, 1997). Taken together, the present study predicts that the perceived social presence of an AI newscaster leads to positive perceptions and responses to a newscast delivered by an AI newscaster as following:

> **H1a-c**: Greater social presence of an AI newscaster leads to positive perceptions and responses to a weather newscast delivered by an AI newscaster, such as greater levels of (a) perceived credibility of the AI newscaster, (b) information seeking intentions, and (c) behavioral intentions.

Method

Participants

A total of 146 undergraduate students at a large public university in the U.S. participated in an online experiment. The average age was 20.21 years (SD = 2.06) with more females (n = 92: 63%) than males (n = 54: 37%). The sample consisted of those that identified as White/Caucasian (n = 75: 51.4%), Latino/a/x or Hispanic (n = 42: 28.8%), Black/African American (n = 16: 11%), and other racial or ethnic groups (n = 13: 8.9%). All participants were randomly assigned to one of the two conditions: AI newscaster (n = 72) or human newscaster (n = 74).

Materials and manipulation

Radio was selected as a media platform for the present study. Because radio is a voice-based media, it can effectively adopt the features of voice-based AI. Also, the nature of a voice-based medium guides people to receive and interpret messages solely through the voice of the newscaster, while limiting effects of visual features such as physical characteristics and visual nonverbal cues (e.g., eye contact, gesture). Collectively, these features of radio provide a suitable context to examine AI newscasters in news media.

A short weather newscast segment on how to prepare for a severe weather disaster was created for this study. In the human condition, the news story was recorded by a female professional newscaster. In the AI condition, the same news story was recorded using a female AI voice through a computer program. A few steps were taken to create the AI newscaster's voice. First, the story was transcribed into a text file and then uploaded to a text-to-speech (TTS) software 'SayIt,' an application available on the Mac OS system. This TTS application provides over 50 different synthetic voices and features voices from different populations including males and females, young and old people, and native English speakers and foreign English speakers. It also provides flexibility to adjust the rate of speech ranging from 40 to 400 words per minute. Therefore, the application provides a range of voices, which allows for locating an optimal voice that can

match the female voice used in the human voice condition in this study. After evaluating different synthetic voices, a female voice 'Samantha' was selected, which has a natural accent, similar to that of the human newscaster. The speech was adjusted to 200 words per minute to pair with the speed and the length of the speech in the human condition. After creating the voice file, the newscast segment was inserted into a webpage where participants listened to it over their computer and completed a set of questions subsequently.

Procedure

Following the university's IRB approval, an email recruitment message was sent to potential participants. Interested individuals were led to an online research website and were asked to read and acknowledge the consent form, which explains that participants would be listening to one of the radio segments as part of this research study. Then, they were randomly assigned to listen to a news segment delivered by either an AI newscaster or a human newscaster. After listening to the segment, participants completed a set of questions regarding their experiences. Then, they were redirected to a separate website where they could provide their name for extra credit. Participation was voluntary and confidentiality was guaranteed.

Measures

Preexisting attitudes toward new technologies (α = .83) assessed participants' overall attitudes toward robots/AI. It was measured with three items adopted from C. I. Nass et al. (1995). Example items included: 'How comfortable would be with robots/AI taking routinized roles (e.g., accountants, auto mechanics, bank tellers)?' and 'How comfortable would be with robots/AI taking interpretive roles (e.g., editorial writers, newspaper reporters, novelists)?' Responses were obtained on a 6-point scale (1 = *very uncomfortable*, 6 = *very comfortable*).

Credibility (α = .77) assessed participants' perceived credibility of a newscaster. It was measured with six items adopted from Gong and Nass (2007) (e.g., '*trustworthy-untrustworthy*,' '*unreliable-reliable*'). Responses were obtained on a 7-point semantic differential scale.

Information seeking intentions (α = .92) assessed participants' interests in obtaining further information concerning the topic they listened to. It was measured with five items modified from Spence et al. (2016). Example items included: 'How many tornadoes occur in my local area each year' and 'Information I can share with family members.' Responses were obtained on a 7-point scale (e.g., 1 = *not interested*, 7 = *very interested*).

Behavioral intentions (α = .92) assessed participants' intentions to take action regarding the news segment they listened to and was measured with five items modified from Lin et al. (2018). Example items included: 'Download a tornado warning app for my phone' and 'Follow the National Weather Service.' Responses were obtained on a 7-point Likert-type scale (e.g., 1 = *strongly disagree*, 7 = *strongly agree*).

Social presence (α = .95) assessed participants' perceived social presence of the AI newscaster. It was measured with four items slightly modified from K. M. Lee et al. (2006b). Example items included: 'I felt like the radio newscaster was with me' and 'I felt like the radio newscaster was interacting with me in the same space.' Responses were obtained on a 7-point Likert-type scale (e.g., 1 = *strongly disagree*, 7 = *strongly agree*).

Results

Before conducting the analyses, a control variable was considered. Given that the idea of an AI newscaster is an advanced technology, this study decided to avoid the possibility that preexisting attitudes toward robots/AI could affect participants' listening experiences of the stimulus clip. In fact,

this approach is consistent to the existing studies (e.g., Kim, Merrill Jr., Collins et al., 2021; Kim, Merrill, Xu et al., 2020, 2021). Thus, the proposed research questions and hypotheses were tested while controlling for participants' preexisting attitudes toward robots/AI.

RQ1a-c explored how people would perceive and respond to an AI newscaster compared to a human newscaster when listening to a weather newscast: (a) the perceived credibility of a newscaster, (b) information seeking intentions, and (c) behavioral intentions. A series of ANCOVAs were conducted to test RQ1a-c. Regarding the perceived credibility of a newscaster (RQ1a), participants perceived greater credibility toward the human newscaster ($M = 5.58$, $SD = 0.88$) than the AI newscaster ($M = 5.18$, $SD = 1.16$), $F(1, 143) = 5.54$, $p < .05$, $\eta_p^2 = .037$. With regard to information seeking intentions (RQ1b), there was no significant difference between the two conditions [human ($M = 4.61$, $SD = 1.40$), AI ($M = 4.79$, $SD = 1.46$), $F(1, 143) = 0.612$, $p > .05$, $\eta_p^2 = .004$]. Regarding behavioral intentions (RQ1c), no significant difference was found between the two conditions [human ($M = 3.25$, $SD = 1.79$), AI ($M = 3.38$, $SD = 1.46$), $F(1, 143) = 0.31$, $p > .05$, $\eta_p^2 = .002$]. See, Table 1.

H1a-c predicted that when people listen to an AI newscaster, the perceived social presence of an AI newscaster leads to positive perceptions and responses: (a) the perceived credibility of a newscaster, (b) information seeking intentions, and (c) behavioral intentions. A set of multiple regression analyses were performed to answer H1a-c in the AI newscaster condition. As with the analysis approach utilized in testing RQ1a-c, preexisting attitudes toward robots/AI were controlled for. Thus, a model in each regression test included social presence as well as preexisting attitudes toward robot/AI.

Regarding the perceived credibility of a newscaster (H1a), the model predicted a significant proportion of variance [$R^2 = .115$, $F(2, 69) = 4.48$, $p < .05$]. Specifically, the data indicated that social presence of the AI newscaster ($\beta = .34$, $p < .01$) positively predicted the perceived credibility of the AI newscaster. With regard to information seeking intentions (RQ1b), the model predicted a significant proportion of variance [$R^2 = .194$, $F(2, 69) = 8.29$, $p < .01$]. In particular, social presence of the AI newscaster ($\beta = .41$, $p < .001$) positively predicted information seeking intentions. For behavioral intentions (H1c), the model predicted a significant proportion of variance [$R^2 = .183$, $F(2, 69) = 7.72$, $p < .01$]. As predicted, social presence of the AI newscaster ($\beta = .44$, $p < .001$) positively led to behavioral intentions. In all, H1a-c were supported (see, Table 2).

Table 1. Effects of the nature of a newscaster on outcome variables (RQ1a-c).

Outcome Variables	Condition	*M*	*SD*	*F*	η_p^2
Credibility of a newscaster (RQ1a)	H	5.58	0.88	5.54*	.037
	AI	5.18	1.16		
Information seeking intentions (RQ1b)	H	4.61	1.40	0.61	.004
	AI	4.79	1.46		
Behavioral intentions (RQ1c)	H	3.25	1.79	0.31	.002
	AI	3.38	1.46		

H: Human newscaster; AI: Artificial intelligence newscaster.
Control variable: Attitudes toward new technologies.
* $p < .05$.

Table 2. Social presence predicting outcome variables (H1a-c).

	Credibility of an AI newscaster	Information seeking intentions	Behavioral intentions
Predictors	β	β	β
Control variable	−.11	−.26*	−.10
Social presence	.34**	.41***	.44***
F	4.48*	8.29**	7.72**
R^2	.12	.19	.18

Control variable: Attitudes toward new technologies.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The present research examines how people would perceive and respond to an AI newscaster compared to a human newscaster and explores the role of social presence of an AI newscaster. The following sections explain primary findings along with the implications and contributions of this investigation. Then, the study suggests future research directions based on the limitations identified in this investigation.

Primary findings: AI newscaster and social presence

Overall, the study reveals interesting findings with regard to an AI newscaster delivering a weather newscast. First, the study finds that people perceive greater credibility toward a human newscaster than an AI newscaster. While the perceived credibility is statistically greater for a human newscaster than an AI newscaster, the mean score of the AI newscaster is higher than the mid-point on the credibility scale (M = 5.18 on the 7-point scale). Although the contexts are different, this finding is in line with C. Edwards et al.'s (2016) research that examined a robot's perceived credibility in an educational context. C. Edwards et al. found that although people perceive a human teacher to be more credible than a robot teacher, the perceived credibility score of both agents are higher than the mid-point of the scale. Collectively, the findings from this study as well as extant literature suggest that, although people may perceive humans to be more credible than machine agents, they perceive both to be credible.

Second, the present study reveals that, when delivering a weather newscast, human and AI newscasters do not differ in influencing people's information seeking intentions and behavioral intentions. This finding implies that both human and AI newscasters give the same weight to influencing people's intentions regarding the news content. That is, although people may have different credibility perceptions for human and AI newscasters (as reported in the previous paragraph), they respond to the message in the same manner whether the news is delivered by a human or AI. To better understand this finding, this exploratory study calls for more studies to further examine perceptions of AI newscasters.

Next, the study reveals that greater social presence of an AI newscaster leads to greater perceived credibility of the AI newscaster, information seeking intentions, and behavioral intentions. Corroborated by previous literature (e.g., Lombard & Ditton, 1997), this finding highlights the importance of social presence when interacting with a machine agent. Ultimately, the finding suggests the need to identify mechanisms that foster social presence in human-machine communication. In fact, theory-driven research suggests that social factors can foster social presence (Lee & Nass, 2005). Also, a good deal of empirical research documents various social factors that induce social presence of a machine agent in diverse contexts, such as supportive feedback from a video game avatar (Kim & Timmerman, 2018), the personality of a robot (K. M. Lee et al., 2006b), communication styles of AI (Kim, Merrill Jr., Xu et al., 2021), and the embodiment of a robot (K. Lee et al., 2006a). Additionally, a systematic meta-analysis (Oh et al., 2018) report several factors that can induce social presence, such as media modalities, avatar appearance, and users' psychological traits. Regardless of the type of technology, social presence appears to be an important predictor for meaningful experiences.

Implications and contributions

Overall, the present research suggests meaningful implications and contributions. First, the finding that people respond to the different newscasters in a similar way regardless of the nature of the agent (human or AI) implies a promising future to adopt machine agents for occasions where human newscasters are limited. For example, during times when human contact is restricted for safety and health issues, such as the outbreak of COVID-19 (Coronavirus disease 2019), robots can help deliver newscasts. Particularly, telerobots and social robots may potentially help complete tasks. *Telerobots* are semi-automatic robots that are operated from a distance with a screen that features a livestream of

a human (Sheridan, 1989), and *social robots* are autonomous or semi-autonomous robots designed to interact with humans (Bartneck & Forlizzi, 2004). Although these robots do not have the same capabilities that humans have, they are equipped with functionality that allows them to deliver information. Thus, humans can benefit from using AI or AI-based robot newscasters when needs arise.

Second, the present research advances literature on AI in news media. The role of AI as a news content generator has received much attention from both academia and industry (e.g., Carlson, 2018; Clerwall, 2014; Graefe et al., 2018; Thurman et al., 2017). However, relatively little research examines AI as a newscaster, and this naturally caused a lack of information about how people might respond to news delivered by an AI newscaster. Although relatively new, AI newscasters have already made their debut in the news media industry (e.g., Kennedy, 2018; Richardson, 2018; Yoon, 2020). Considering the rapid development of technology and the fast penetration of new technology in the media industry, it is possible that AI newscasters would become more widespread in the future. In this regard, the present investigation provides important baseline information for this matter.

Although the study examines the role of an AI newscaster in the particular context of a weather newscast, the findings provide meaningful implications for radio media to meet the current news demand. According to Nielsen (2018), one of the top three formats that Americans are tuned in to is news talk. In fact, 25% of Americans often consume news by radio (Pew Research Center, 2017b). These reports indicate that there is a high demand for a variety of news programs to meet listeners' needs and preferences at various times throughout the day. Although a newscaster is a primarily a human's job, considering that AI is not bound by work hour restrictions, news stations may benefit from incorporating AI newscasters to supplement human resources. Specifically, by working around the clock, AI newscasters can save news stations money and the news stations can enhance efficiency by delegating repetitive tasks that may not require a critical and complex thinking process (e.g., reporting facts, statistics) to be supported by AI newscasters. As found in the present study, stronger social presence of the AI newscaster helps listeners respond positively to the newscast. Thus, the study highlights the importance of fostering social presence of an AI newscaster to maximize the benefits of adopting AI newscasters.

Ultimately, the findings of the present research contribute to the growing trend of human-machine communication as a field in communication scholarship (Guzman, 2018; Spence, 2019). While scholars in the past primarily focused on people's perceptions of computers as a social actor in human-computer interaction (e.g., Reeves & Nass, 1996), the present study provides support for the research trend of perceiving an AI agent as a social actor. Given that limited research is available regarding voice-based AI as a media personality, like a newscaster, the present study extends the extant body of literature. As commercial services, such as Google Duplex, continue to blur the lines between human interlocutors and AI interlocutors, this study demonstrates a meaningful implication for AI to play a role as a potential newscaster.

Limitations and future research directions

As with any study, imitations should be acknowledged when interpreting the pattern of results. First, the present study only sampled college students. Although this particular group provided useful information in this study, the sample does not generalize to all other radio listeners. Thus, future researchers are encouraged to replicate this study with a more diverse sample.

Second, the present research examined only one news context, a weather newscast. Considering that audiences show different levels of credibility depending on types of news produced by AI (Liu & Wei, 2019), the results of the present study might be limited to a weather newscast. There exist a variety of news programs that cover a range of topics such as entertainment, health, politics, and sports. Thus, future researchers should investigate whether the same results will be found in different topics of the news cast.

Next, participants were only exposed to a one-time news segment. Extant research shows that many individuals often consume news throughout the day (Molyneux, 2018). Thus, the one-time exposure utilized in this study might not be enough for participants to develop lasting perceptions of the newscaster or responses to the news content. Future researchers should consider a longitudinal study to test how individuals' perceptions of an AI newscaster compared to a human newscaster develop over time. Since individuals often develop parasocial relationships with newscasters (Rubin et al., 1985; Savage & Spence, 2014), it would be also interesting to see whether people also develop parasocial relationships with AI newscasters.

Lastly, future research should address different forms of AI, such as embodied and disembodied AI. Embodiment, the degree to which an agent personifies the emotional and physical characteristics of human beings (Somaya & Varshney, 2018), is central to the bodily presence and physical aspects of an agent (K. Lee et al., 2006a). Therefore, disembodied agents will not have a visual or a physical humanlike structure, and embodied agents will appear to be physically humanlike. It is likely that individuals will perceive disembodied AI and embodied AI differently, as previous research reports differences in perceptions between disembodied and embodied machine agents in a variety of contexts (e.g., Fong et al., 2003; Köse et al., 2015; Schneider et al., 2019). Thus, the present study calls for more research to understand how people may respond to disembodied and embodied AI newscasters.

Conclusion

The present study examined people's perceptions and responses to a weather newscast delivered by an AI newscaster compared to a human newscaster and the role of social presence of an AI newscaster. Primary findings indicate that although people perceive a human newscaster as more credible than an AI newscaster, their responses to the news content, particularly information seeking intentions and behavioral intentions, do not differ. Further, the perceived social presence of an AI newscaster leads to greater levels of perceived credibility of the AI newscaster, information seeking intentions, and behavioral intentions. Collectively, this exploratory research suggests the possibility that AI newscasters can be successfully applied to the news broadcasting industry. In particular, AI newscasters could supplement human newscasters when human resources are limited or when human access is restricted. In all, broadcasting companies can make strategic choices to decide when it is best to augment human newscasters with AI newscasters.

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