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Revealing sensitive information in personal interviews: Is self-disclosure easier with humans or avatars and under what conditions?

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ABSTRACT

Despite the many advantages of computer-assisted data collection, it is unclear if, when, or under what conditions embodied conversational agents (i.e., ECA, virtual humans) can replace human interviewers to collect personal information in interviews, especially for topics that might be regarded as 'sensitive'. This paper presents results from an exploratory study designed to investigate how topic sensitivity affects individuals' preference to disclose to a human or an ECA interviewer. A convenience sample of 203 undergraduate business students completed a scenario-based survey that asked them to rate the sensitivity of various interview topics and indicate their preference to disclose such sensitive information to human or ECA interviewers. Open-ended questions revealed factors behind preferences for interviewer choice. Findings show a preference for ECAs when topics are highly sensitive and more likely to evoke negative self-admissions. For topics rated low in sensitivity or more likely to evoke positive self-admissions, human interviewers are preferred. Specifically, participants stated that they would feel more comfortable discussing sensitive topics with an ECA interviewer because it could not judge them. This indicates that the evaluative capability of the interviewer plays a factor in the amount of sensitive information elicited from interviewees. Overall, results contribute to an understanding of when and why ECA interviewers can effectively replace human interviewers.

1. Introduction

The proliferation of computer use during the early 1990s led Nass, Steuer, and Tauber (1994) to propose the "computers are social actors" (CASA) paradigm, which suggests that people interact with computers in fundamentally social manners. As computer-mediated communication (CMC) grew and the Internet became more social, researchers discovered that people tend to disclose more sensitive information when communicating to or through a computer as opposed to traditional communication mediums (e.g., face-to-face and pencil surveys, see Richman, Kiesler, Weisband, & Drasgow, 1999, for a review). So, paradoxically, sensitive information disclosure seems to be one way that people do not treat computers the same as they treat humans. The disinhibited communication that computers elicit in social interactions presents numerous opportunities for collecting information about sensitive topics that would otherwise go unrevealed in traditional communication.

While both human and computer interviewing techniques have been widely leveraged to obtain personal and private information from individuals, a promising alternative that combines the advantages of both is the use of embodied conversational agent (ECA) interviewers. ECAs are human-computer interfaces representing human- or cartoon-like characters that communicate using human-like verbal and non-verbal manners (Cassell, Sullivan, Prevost, & Churchill, 2000). Because ECA interviewers are non-intelligent (i.e., non-human), they offer the same protective benefits (e.g., a sense of social distance and lack of social judgment) commonly associated with computer-assisted personal interviews (CAPI) and Internet surveys. ECAs can also be designed to create more realistic social interactions and engender rapport, a benefit of using human interviewers to elicit self-disclosure. However, it is unclear if, when, or under what conditions ECA interviewers can replace human interviewers and what interviewer characteristics hinder or encourage sensitive information disclosure.

The current study was designed to qualitatively explore

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motivations behind people's preferences to disclose sensitive information in interviews with either a human or ECA interviewer. Our results provide evidence that respondents prefer to discuss sensitive topics with ECA interviewers as opposed to human interviewers because they feel less judged by a computer. These findings contribute to the need to understand more deeply why and under what conditions computer-assisted interview techniques can be utilized in research settings or practical applications where there is a need to collect information that might be regarded as "sensitive."

2. Background

Researchers have offered various definitions for topic sensitivity. Oppenheim (1992, p. 140, p. 140) identifies a topic as sensitive if "some individuals find it embarrassing and show reluctance to answer questions about it." Lee and Renzetti (1993, p. 5, p. 5) suggest that a sensitive topic "potentially poses for those involved a substantial threat." Tourangeau and Yan (2007) describe sensitive topics as those that are intrusive, raise fears about the repercussions of discussing them, and trigger social desirability concerns. Each of these varied definitions imply that sensitive topics evoke a sense of reticence and guardedness in individuals that prevent full and honest disclosure. This inhibited disclosure presents problems in a wide variety of fields, including marketing, healthcare (Gratch, Lucas, King, & Morency, 2014; Locke et al., 1992), and psychiatric counseling (Jourard & Lasakow, 1958; Kang & Gratch, 2014). Therefore, the effect that interviewer mode has on the disclosure of information of varying sensitivity is an important issue with wide impact.

Substantial evidence demonstrates that computers are often more effective at eliciting sensitive information from individuals than traditional data collection methods such as paper-based surveys and face-to-face interviews (Lind, Schober, Conrad, & Reichert, 2013; Locke et al., 1992; Richman et al., 1999; Weisband & Kiesler, 1996). Compared to face-to-face communication, computer-mediated communication (CMC) reduces social inhibitions and impression management (Joinson, 2001, 2007). With respect to eliciting sensitive information, evidence suggests that computer-assisted interviews are superior to human interviews for two basic reasons. First, computer-assisted interviews lack evaluative capability. Because computers do not respond visually or verbally to interviewee's responses, interviewees feel less apprehension about being judged or evaluated, which in turn promotes willingness to disclose (Joinson, 2001; Kang & Gratch, 2010). Second, when individuals feel judged or evaluated, they tend to engage in impression management devices that can present a drain on cognitive resources (Kang & Gratch, 2010, 2014). To the extent that computer-assisted interview methods do not trigger impression management, they free individuals' cognitive resources and allow them to focus on answering the question at hand (O'Reilly, Hubbard, Lessler, Biemer, & Turner, 1994). As a result, individuals typically provide higher quality responses, which is especially important when individuals are asked to answer emotionally complex or threatening questions. Therefore, topic sensitivity plays a role in not only the amount but also the quality of information disclosed by individuals depending on the medium.

In general, data collection modes that increase the privacy of responses and provide greater anonymity increase individuals' willingness to answer sensitive questions and reduce response error associated with sensitive topics (Joinson & Paine, 2007; Joinson, 2007; Schaeffer, 2000). For instance, Tourangeau and Smith (1996) compared computer-assisted personal interviewing (CAPI), computer-assisted self-administered interviewing (CASI), and audio-computer-assisted self-administered interviewing (ACASI) in a survey about sexual behaviors and other sensitive topics (e.g., illegal drug use). Overall, individuals were more willing to make potentially embarrassing admissions when there was not a human involved in the interviewing process (i.e., CASI and ACASI). In addition, ACASI – using a recorded human voice – elicited greater admission of illegal drug use. In a later study, Kreuter, Presser, and Tourangeau (2008) found that Internet-based surveys prompt greater and more accurate sensitive information disclosure than computer-assisted telephone interviewing (CATI) and interactive voice response (IVR). Evidence from studies like these support the reasoning that the evaluative capability of a human activates evaluation apprehension in the respondent and substantiate benefits of using audio- and text-CASI for collecting data about sensitive topics.

Yet, others argue that personal interviews are the best way to ask sensitive questions because interviewers have an opportunity to build rapport and establish the level of trust needed for respondents to feel comfortable reporting sensitive information (Aaker, Kumar, Leone, & Day, 2012, p. 223). Humans possess greater abilities to build rapport than computers. Based on self-disclosure theory (Jourard, 1971), individuals are expected to be more honest and disclose more to someone they trust and with whom they feel comfortable. Traditionally, research has shown that a key advantage of person-administered surveys is the presence of a personal interviewer, especially one that is inviting and approachable, to encourage continuance and to probe and draw out personal reflections regarding the topic matter.

Embodied conversational agents (ECAs) communicate in realistic verbal and non-verbal manners, yet lack the full emotional and social intelligence of human beings (Cassell et al., 2000); therefore, they offer the advantages of both computer and human interviewers for eliciting sensitive information disclosure. ECAs have been referred to as embodied agents, virtual humans, and avatars – depending upon their visual characteristics and conversational abilities. Since they are computer generated, the possibilities for their appearance are endless (e.g., their appearance can be human-like or cartoon-like).

Empirical evidence suggests that people respond more positively to an ECA than to a text-only interface (Qiu & Benbasat, 2009; Sproull, Subramani, Kiesler, Walker, & Waters, 1996). On the other hand, some studies indicate that people perceive human-like qualities in ECAs even when they are cognizant that the conversational agent is a computer (Astrid, Krämer, Gratch, & Kang, 2010; Gratch, Wang, Gerten, Fast, & Duffy, 2007a; Gratch et al., 2007b; Holtgraves, Ross, Weywadt, & Han, 2007; Kang, Gratch, Wang, & Watt, 2008). Participants in a study conducted by Kang and Gratch (2014) reported less embarrassment if the ECA interviewer revealed sensitive information first. Gratch et al. (2014) deployed ECAs in medical interviews to see if they could elicit more personal information from patients than human interviewers. They manipulated both the perceived and actual control of the ECA (human or computer). Patients that were led to believe they were talking to a computer disclosed more sensitive information and reported less impression management than those patients who believed they were talking to a human. The actual control of the ECA (human or computer) had no effect on the patients' disclosure; however, the patients that interacted with ECAs controlled by humans (as opposed to computers) rated the systems as more useable. Elsewhere, empirical evidence demonstrates that ECAs (i.e., pedagogical agents) can effectively elicit private information from students (Tombs, Bhakta, & Savin-Baden, 2014). Studies have also shown that ECAs are capable of building social bonds with socially anxious individuals (Kang & Gratch, 2009, 2010), and creating a sense of rapport – an important element for eliciting sensitive disclosures – with individuals (Gratch et al., 2007a, 2006;