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Media Choice in Asynchronous Deception Detection

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ABSTRACT

Does richness in asynchronous media affect detection of deceptive messages? Social media and other rich media applications make this issue relevant to managers and decision makers. Prior research indicates deception commonly occurs in everyday communication, and people have difficulty detecting it. Asynchronous online interactions are no exception, particularly if the sender has strategically selected a channel intended to hide their true intentions. The current study investigated whether common media forms found in asynchronous online venues (e.g. text, audio, and video) influenced deception detection. The results suggested that richer media enhanced deception detection. This means that managers must be wary of sender motivations, which can influence message veracity.

Keywords

Media Richness Theory, Deception Detection, Deceptive Communication, Social Media.

INTRODUCTION

Digital deception may cause serious detriment to individuals and organizations. This is important because many businesses depend on technology, particularly in mediated communication areas. Applications such as email, texting, instant messaging, social networking, and video conferencing increasingly enhance the reach of decision makers and reduce business costs. While these technology-mediated communication channels can save time and remove geographic constraints, they also can result in the loss of nonverbal cues valuable to deception detection (Zuckerman et al. 1981). Unfortunately, digital deception practices have grown along with mediated communication practices (Gupta 2015; McHaney et al. 2015). These deceptions can be direct, such as lies specifically intended to further one's personal goals (Toma and Hancock 2010), or indirect, such as exaggerated reviews intended to influence the opinions and actions of others (Ott et al. 2012; Yoo and Gretzel 2009). Past research indicated individuals were not very good at detecting deception in interpersonal settings. In fact, on average, people are little better than chance at successful deception detection (Bond and DePaulo 2006). This suggests the following research questions: Are peoples' abilities to detect deception degraded when using technology-mediated communication channels? If so, do media rich technologies help make decision makers less susceptible to deception, or are vulnerabilities increased?

BACKGROUND

Venues utilizing asynchronous communications have greatly expanded in recent decades. The likelihood of encountering deception in asynchronous venues appears to be very high (Tsikerdekis and Zeadally 2014). Social media operates with a lowered sense of social presence and, in many cases, adds anonymity to communications (Kaplan and Haenlein 2010; McHaney 2011). Another consideration of asynchronous communication is reduction of cues available for deception detection. Compared to synchronous face-to-face communication, available cues are greatly reduced (Daft et al. 1987; Rao and Lim 2000). For instance, synchronous video-based media can transmit more cues than text-based asynchronous media. Likewise, text that has been annotated with non-verbal cues such as sighs, yawns, or more complex emoticons has the capability to transmit more meaning or sentiment (Thelwall et al. 2010). Research has linked a medium's capability to relay the maximum number of cues to more successful deception detection (Rao and Lim 2000), but this does not consider that the same mechanisms can be used to better disguise deception (Tsikerdekis and Zeadally 2014). Deception may arise from a variety of motivations, and some of these are unique to online or other asynchronous environments. For this reason, researchers specifically have studied deceptive behaviors in online venues and provided insights. For example, a study of 257 Israeli respondents indicated reasons for deceptive behavior which included: privacy concerns, identity play, elevating status,

and attractiveness (Caspi and Gorsky 2006). Caspi and Gorsky (2006) further report that "[c]ontrary to face-to-face deception, online deception seems to be an enjoyable activity." (p. 58) This is supported by Ekman's concept of duping delight (2009, pp. 76–79). Caspi and Gorsky (2006) also suggest, "[n]egative emotions, like guilt, shame and fear generally associated with face-to-face deception appear to be lacking in online deception."

MEDIA RICHNESS AND SOCIAL PRESENCE

Media Richness Theory (MRT), developed by Daft and Lengel (1986), proposes that communication media vary in ability to enable users to communicate and change understanding by virtue of the medium's richness. Richer media more closely approximate face-to-face communication, while less rich media do not provide a way to include criteria such as feedback, multiple visual cues, language variety, speech nuances, natural language and personal focus (Daft and Lengel 1986). According to Daft and Lengel (1986), communication media should be matched to message content and communication intent in a way that reduces equivocality or possible misinterpretations.

Like media richness theory, social presence theory suggests certain media types allow the sender to be more ''present" with the receiver (George et al. 2013). This in return increases effectiveness in communication and message exchange. Social presence theory classifies media on a continuum where social presence equates to a receiver's awareness of the sender during interaction. On this continuum, face-to-face is high in social presence while text-based communication is low. Effective communication has the appropriate social presence required for a message to be appropriately transmitted and understood (Rockmann and Northcraft 2008; Short et al. 1976).

In current asynchronous, online environments, a variety of media choices exist. Among these are text, audio, and video. Research suggests every medium, regardless of richness, is capable of being used for deceptive communication. Further, research suggests deception can be detected in all media such that "a written statement may not have nonverbal cues, but inconsistencies in a written narration will reveal deception" (Rao and Lim 2000, p. 6). This statement subtly reveals a dilemma that affects deception detection in various media forms, and thus, research indicates the potential for contradictory expectations in deception detection.

HYPOTHESES

Consistent with MRT from a receiver's standpoint, we believe richer asynchronous media reveals more cues to those attempting to detect deception. Therefore, we posit that: *Media type will affect individuals' deception detection accuracy in an asynchronous environment.* We examined the following hypotheses:

H1: Individuals will be more accurate in deception detection in an asynchronous environment when viewing video snippets than when hearing audio snippets.
H2: Individuals will be more accurate in deception detection in an asynchronous environment when viewing video snippets than when viewing annotated text snippets.
H3: Individuals will be more accurate in deception detection in an asynchronous environment when viewing video snippets than when viewing plain text snippets.

In similar fashion, from MRT, we expected audio snippets to contain cues not available in annotated text:

H4: Individuals will be more accurate in deception detection in an asynchronous environment when listening to audio snippets than when viewing annotated text snippets.
H5: Individuals will be more accurate in deception detection in an asynchronous environment when listening to audio snippets than when viewing plain text snippets.

Finally, from MRT, we believed annotated text snippets would contain cues not available in regular text snippets. Therefore:

H6: Individuals will be more accurate in deception detection in an asynchronous environment when viewing annotated text snippets than when viewing plain text snippets.

METHOD

The current study utilized a sample comprising 654 subjects located in the United States. Participants randomly received eight snippets with one of four media representations of the same material (video, audio, annotated text, and plain text) which showed job interviewees truthfully or deceptively describing their background. 5057 responses were received. Of these, 1099 were indeterminate leaving 3958 usable responses split among the media types as shown in Table 1. The primary artifact was video. All other media formats were derivations of the original representation. Camtasia Studio was used to render video into

an audio form. A text transcript, derived manually from the video, was checked for accuracy by several researchers. Finally, annotations regarding physical movements, coughs, yawns, pauses, and other cues were coded into the annotated version of the text file. Multiple researchers checked the result to ensure all noticeable cues faithfully translated into readable form. For example, a yawn was represented as <yawn>, and an abnormal pause in speaking was represented as <pause>. Utterances such as umm, oh, and hmm were also added to the annotated transcript (Lea and Spears 1992).

RESULTS

We used an ANOVA to assess the null hypothesis and determine if deception detection accuracy was impacted by media type. The null hypothesis was rejected due to a significant effect based on media type at the $p<.05$ level for the four treatments [$F(3, 3954) = 4.89$, $p = 0.002$]. Subsequently, t-tests assessed H1 through H6. Table 1 provides the results.

Hypothesis	Media 1	Mean 1	SD 1	N 1	Media 2	Mean 2	SD 2	N 2	T	df	p
H1*	Video	0.554	0.497	966	Audio	0.514	0.500	993	1.79	1957	0.074
H2	Video	0.554	0.497	966	Annotated Text	0.582	0.493	1001	-1.28	1965	0.201
H3**	Video	0.554	0.497	966	Plain Text	0.509	0.500	998	1.99	1962	0.047
H4^	Audio	0.514	0.500	993	Annotated Text	0.582	0.493	1001	-3.09	1992	0.002
H5	Audio	0.514	0.500	993	Plain Text	0.509	0.500	998	0.20	1989	0.838
H6***	Annotated Text	0.582	0.493	1001	Plain Text	0.509	0.500	998	3.30	1997	0.001

* Significant at p<.10, ** Significant at p<0.05, *** Significant at p<.01, ^ Significant at p<.01 but not in expected direction

Table 1. Hypotheses Testing Results

Evaluation of H1 through H6 indicated that specific differences were present in the collected data. In H1, we saw that accuracy of deception detection was marginally better when subjects viewed the content in video rather than audio format, indicating the presence of more cues. In H3 we saw that deception detection was higher in the richer media (e.g. video detection outperformed detection in plain text). In H6, the richer media type, annotated text, provided subjects with higher deception detection accuracy as well. One unexpected result was returned. H4 indicated that deception detection in annotated text was higher than in the audio snippet.

DISCUSSION

Data collected for the current study generally supports earlier findings that richer media provides more cues that enable people to more accurately detect deception. A main effect existed which indicated that media type significantly affects deception detection. These results were considered in more detail and for the most part, richer media led to higher rates of detection. One instance, (e.g H4 where audio snippets were contrasted with annotated text snippets) appeared to contradict this finding. However, other explanations for this outcome may exist and will be investigated in subsequent studies. Several limitations in the study design and measurement need to be mentioned. First, the sample size was large and this might inflate significance levels. Likewise, the snippets used in this study may have been subject to Internet speed constraints and other issues since subjects took the survey using their own equipment. The data collected for this study still is being analyzed. Potential areas for future study include utilizing different forms of social media to determine if various venues lend themselves to easier deception detection in work-related settings. Additional cultural backgrounds, demographic features, social media experience and other factors may impact the results.

CONCLUSION

Richness in asynchronous media appears to affect detection of deceptive messages. The findings of this study provide evidence that media richness and social presence are important factors in deception detection. We believe social media and other rich media applications make this issue relevant to managers, decision makers, and those working in business. Asynchronous online interactions may be subject to senders that have strategically selected a channel intended to hide their true intentions. The results suggest overall that richer media enhanced deception detection. While this is helpful to the receiver, at the same time, it is important to note that asynchronous media can be altered by the sender, which ultimately may make detection more difficult.

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REFERENCES

Bond, C. F., and DePaulo, B. M. 2006. "Accuracy of deception judgments.," *Personality and social psychology review : an official journal of the Society for Personality and Social Psychology, Inc* (10:3), pp. 214–34 (doi: 10.1207/s15327957pspr1003_2).

Caspi, A., and Gorsky, P. 2006. "Online deception: prevalence, motivation, and emotion.," *Cyberpsychology & behavior : the impact of the Internet, multimedia and virtual reality on behavior and society* (9:1), pp. 54–9 (doi: 10.1089/cpb.2006.9.54).

Daft, R. L., and Lengel, R. H. 1984. "Information richness: A new approach to managerial and organizational design," *Research in Organizational Behavior* (6), pp. 191–233.

Daft, R. L., and Lengel, R. H. 1986. "Organizational information requirements, media richness and structural design," *Management Science* (32:5), pp. 554–571.

Daft, R. L., Lengel, R. H., and Trevino, L. K. 1987. "Message equivocality, media selection, and manager performance: Implications for information systems," *MIS Quarterly* (11:3), pp. 355–366.

Ekman, P. 2009. *Telling lies: Clues to deceit in the marketplace, politics, and marriage (revised edition)*, New York: WW Norton & Company.

George, J. F., Carlson, J. R., and Valacich, J. S. 2013. "Media Selection as a Strategic Component of Communication," *MIS Quarterly* (37:4), pp. 1233–1251.

Gupta, M. 2015. "Information systems in the 21st century: culture, agility and big data," Iowa State University.

Kaplan, A. M., and Haenlein, M. 2010. "Users of the world, unite! The challenges and opportunities of social media," *Business Horizons* (53), pp. 59–68.

Lea, M., and Spears, R. 1992. "Paralanguage and social perception in computer-mediated communication," (2:3–4), pp. 321–341.

McHaney, R., George, J. F., and Gupta, M. 2015. "An Exploration of Deception Detection Are Groups More Effective Than Individuals?," *Communication Research*.

McHaney, R. W. 2011. *The new digital shoreline: How web 2.0 and millennials are revolutionizing higher education*, Herndon, USA: Stylus Publishing.

Ott, M., Cardie, C., and Hancock, J. 2012. "Estimating the prevalence of deception in online review communities," *... of the 21st international conference on ...* (available at http://dl.acm.org/citation.cfm?id=2187864).

Rao, V., and Lim, J. 2000. "The impact of involuntary cues on media effects," in *Proceedings of the Thirty-Third Hawaii International Conference on System Sciences.*, IEEE Press (doi: 10.1109/HICSS.2000.926605).

Rockmann, K. W., and Northcraft, G. B. 2008. "To be or not to be trusted: The influence of media richness on defection and deception," *Organizational Behavior and Human Decision Processes* (107:2), Elsevier Inc., pp. 106–122 (doi: 10.1016/j.obhdp.2008.02.002).

Short, J., Williams, E., and Christie, B. 1976. *The social psychology of telecommunications*, New York: John Wiley & Sons, Ltd.

Thelwall, M., Buckley, K., Paltoglou, G., Cai, D., and Kappas, A. 2010. "Sentiment strength detection in short informal text," *Journal of the American Society for Information Science and Technology* (61:12), pp. 2544–2558.

Toma, C. L., and Hancock, J. T. 2010. "Looks and lies: The role of physical attractiveness in online dating self-presentation and deception," *Communication Research* (37:3), pp. 335–351.

Tsikerdekis, M., and Zeadally, S. 2014. "Online Deception in Social Media," *Communications of the ACM* (57:9), pp. 72–80 (doi: 10.1145/2629612).

Yoo, K., and Gretzel, U. 2009. "Comparison of Deceptive and Truthful Travel Reviews," in *Information and Communication Technologies in Tourism 2009*W. Höpken, U. Gretzel, and Rob Law (eds.), Vienna: Springer Vienna, pp. 37–47.

Zuckerman, M., DePaulo, B. M., and Rosenthal, R. 1981. "Verbal and nonverbal communication of deception," *Advances in experimental social psychology* (14), pp. 1–59.