

Notes from the Underground City of Disinformation: A Conceptual Investigation

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ABSTRACT

Inaccurate information, in the field of library and information science, is often regarded as a problem that needs to be corrected or simply understood as either misinformation or disinformation without further consideration. Misinformation and disinformation, however, may cause significant problems for users in online environments, where they are constantly exposed to an abundance of inaccurate and/or misleading information. This paper aims to establish conceptual groundwork for future empirical research by examining the relationships among information, misinformation, and disinformation. Our analysis extends to a discussion of cues to deception, as means for detecting misinformation and disinformation. We argue that misinformation and disinformation are related yet distinct sub-categories of information. Misinformation is a multifaceted concept, more complex than simply being inaccurate or incomplete, and disinformation does not always entail misinformation. We conclude our discussion by highlighting the significant roles of context and time in defining misinformation and disinformation.

Keywords

Misinformation, disinformation, cues, deception, false.

INTRODUCTION

In the field of library and information science (LIS), the accuracy of information is generally regarded as of primary importance for successful results in search and reference service (Baker & Lancaster, 1991). Inaccurate information, on the other hand, is typically viewed as information that is simply flawed by mistakes, ambiguity, or vagueness, requiring various kinds of “corrections” in order to achieve better results in search and discovery (Lee & Renear, 2008). Inaccurate information is typically not the main focus in the majority of studies in the LIS field, unless viewed as something that should be identified and corrected in some way.

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Even in the few studies discussing inaccurate information in previous literature, it is often simply categorized as misinformation or disinformation based on the intent of the information producer or disseminator. This simple categorization, however, only provides limited explanation of the concepts of misinformation and disinformation, despite a number of other aspects that need to be considered in their definitions. The increasing importance of these concepts is evident in online environments where users are exposed to an abundance of inaccurate information.

Our objective is to improve our understanding of misinformation and disinformation by a conceptual investigation. In this paper, we review the concepts of misinformation and disinformation by surveying previous efforts to articulate these definitions in LIS research as well as political science, philosophy, and psychology. By investigating the assumptions underlying these definitions, we attempt to identify infrequently represented and poorly understood aspects of misinformation and disinformation.

DEFINITIONS OF MISINFORMATION AND DISINFORMATION

While LIS can demonstrate a history and a diversity of research about information, understandings of misinformation and disinformation tend to be limited and understudied (Rubin, 2010; Zhou & Zhang, 2007). Much LIS research has been devoted to credibility and trustworthiness (e.g., Fogg & Tseng, 1999; Kelton, et al., 2008; Marsh & Dibben, 2003; Rubin, 2009; Rubin & Liddy, 2006; Wathen & Burkell, 2002), which are related to misinformation and disinformation. The foci of these studies, however, are usually on identifying credible information rather than conceptually analyzing misinformation and disinformation.

Discussions of misinformation and disinformation often suffer from imprecise term definitions. This confusion may partly be due to the lack of definitions and theories in LIS research (Hjørland, 1998), which may be a product of the field’s interdisciplinarity (Talja, et al., 2005). Many of the terms used in the LIS field are also used in other disciplines (e.g., classification, index, users), and the meaning or nuance of the term may vary slightly depending on the context. It is often unclear, however, as to how the usage differs from one context to the other (e.g., Lee et al., 2006). This lack of explicit definitions may create confusion for

readers of the studies using these terms as well as researchers entering the field. Misinformation and disinformation are prime examples of these cases: they are used in a number of different fields, such as psychology, philosophy, computer science, and LIS; albeit infrequently within LIS research, resulting in variations in the understanding and use of those terms. Sometimes the terms are used interchangeably and treated as if there were no difference (Fox, 1983; Losee, 1997). Sometimes one is used as a variation of the other (Zhou & Zhang, 2007), but the reasoning behind that relationship is not always clear (see discussion in “Multi-faceted Nature of Misinformation”).

Defining Informativeness: Can Misinformation or Disinformation be Informative?

This discussion of information will be necessarily brief, as it is not the primary focus of this paper. Nonetheless, we believe that some discussion is necessary to explore the relationships among information, misinformation, and disinformation. Although the history of theories about the nature of information is quite long starting with Shannon & Weaver (1949), the discussion in this paper will start with Fox (1983) since he provided relevant understandings of information and misinformation, and focused on statements as sources of information (rather than exclusively focusing on documents). In his work, Fox rejected various theories of information, either for being too broad, too specific, or too vague. He supported, however, the need for a theory of information in information science in order to conceptually ground the field as well as to help explain how the field is unique from other fields. After a lengthy examination of what information is not, Fox (1983) stated that:

...the information carried by a sentence, or a set of sentences, is determined by meaning, and hence relative to meaning...Without an adequate theory of meaning, we lack the means to determine accurately what information is carried by a given sentence or set of sentences. (p. 97)

Here, Fox emphasized the role of meaning in determining what information is. This is important because information without meaning may not be *informative*. For example, if Jill spoke to Frank in a language he did not understand, Jill's statements have no information because that language has no meaning for Frank. If a statement does not provide new or previously unknown information, it may not have meaning for the receiver, thus the statement is not informative. Connecting information and meaning is important for understanding misinformation and disinformation because misinformation and disinformation are only such if some meaning is present and is mutually understood in some way between parties. The idea of a meaning-dependent and, thus, subjective, understanding of information was strongly supported by later scholars such as Fallis (2009) and by some scholars in the STS field.

Buckland (1991) adopted a similar view when he wrote that, “[b]eing “informative” is situational.” In this sense,

“informativeness” is dependent on the meaning of the informative thing (sentence, photo, etc.). Different situations imbue different meanings on different things, and these meanings may depend on the knowledge of the receiver. Buckland's idea illustrates why misinformation and disinformation can be difficult to define and to identify: *what is misinformation in one situation might not be in another because the meanings might be different*. The act of disinforming may be less dependent on the situation in the sense that the intent of the speaker to deceive is a constant, even if the speaker does not succeed on that intent. The success, or failure, of the deceiver, however, may be strongly situation-dependent if some aspect of the world changes unbeknownst to the speaker between the time of the utterance and the time the receiver acts upon the disinformation. Consider the following hypothetical case as an example. Jack wishes to deceive Sierra and tells her that the movie starts at 3:30pm, even though he knows that it starts at 3:00pm. However, suppose Jack is unaware that the movie theater projector is broken and the movie start is delayed by 30 minutes. When Sierra arrives in time for a 3:30pm showing, she may not even realize that Jack made either a false or an inaccurate statement. This case illustrates two important aspects of disinformation. Here, the deceiver *failed to disinform despite his intent to do so*; and the *informativeness of (dis)information may depend on the situation*.

In his article (1991), Buckland advocated the view that information is a thing, a process, and knowledge as he focuses on “informativeness.” Misinformation and disinformation, despite being riddled with errors and inaccuracies, may also still be informative whether by implying or revealing some information. Conveying misinformation tends to be accidental or innocent, and the informativeness of it may depend on the relationship between the speaker and the receiver (e.g., how much does the receiver know about the speaker?). Disinformation can also be informative in some cases, and maybe more so than simple misinformation, perhaps because any implication or reveal may be deliberate.

Consider an instance in which a speaker provides partially distorted information to the receiver (e.g., “*My party starts at 6pm,*” when, in fact, the party starts at 9pm). In this case, the receiver is partially informed about the fact that the speaker is having a party. Additionally, disinformation may reveal the malicious intent of the speaker, if the receiver is aware of the act of deceiving. In other words, if the receiver happens to know that the party in fact starts at 9pm, she might suspect that the speaker is intending to deceive her. Here, the receiver is informed about the potential intention of the speaker, which is external to the message actually being delivered.

Additionally, misinformation (as well as disinformation, although wrongly in that case) may hint at the ignorance of the speaker. For example, imagine that Alicia is an expert on giraffes and Eric, perhaps unaware of the extent of her

expertise, confidently tries to convince her that giraffes are officially listed as an endangered species. From this exchange, Alicia might 1) suspect that Eric is trying to deceive her and start questioning his intent and/or 2) believe that Eric is simply misinformed about the state of the world (both of these responses are equally possible). This hypothetical example suggests that perhaps misinformation and disinformation provide different levels of informativeness, dependent on the situation. If Eric intended to deceive Alicia, and Alicia assumes Eric is ignorant or misinformed about giraffes, then Alicia's assumption is wrong. If Eric had no intention to deceive Alicia, however, and was simply misinformed himself, then Alicia's assumption is correct and she is accurately informed about Eric's ignorance about giraffes.

This idea of informativeness aligns with the meaning-dependent understanding of Fox. Buckland's multiple views of information provide insight into the similarly multifaceted natures of misinformation and disinformation. Both Fox's and Buckland's views of information provide support for Hjørland's argument about the subjective nature of information. Hjørland (2007) contrasted the notion of the subjectivity of information with the idea that information is objective and exists independently outside human awareness. The idea of objective information entails two primary problems. One problem is the implication that objective information must exist independently of the observer. Simply by virtue of being observed, however, information becomes dependent on the subject's viewpoint, and when observed by multiple subjects, becomes intersubjective as well as subjective. Even when information is observed by an instrument, tool, or machine, the specific constraints, affordances, and imbued values of that device shade the information. Similarly for misinformation and disinformation, they cannot be objective forms of information because they are observed by specific subjects and may be created or disseminated by specific devices. Another issue is that objective information must exist independently of the situation. Information is always in some situation, however, regardless of whether it is being used or unused and of whether it is known or unknown. Information cannot be context-free because of the problems described above with its observation and collection. Misinformation and disinformation also depend on situations because, over time, misinformation and disinformation may change into one another or into information. Hjørland's view that information is subjective provides strong bases for subjective understandings of misinformation and disinformation. Hjørland stated that, "[t]o consider something information is thus always to consider it as informative **in relation to some possible questions**," (p. 1451). Hjørland's statement demonstrated the highly subjective nature of misinformation and disinformation because they can still be informative, dependent on the observer and the situation. This statement's focus on relation also shows that misinformation and disinformation are only such, relative to

other information. Nonetheless, the role of 'objectivity', if any, when determining whether some information may be misinformation or disinformation could provide fruitful avenues for future research.

Multi-faceted Nature of Misinformation

In the LIS literature, few authors have taken up the concept of misinformation in detailed discussion. Some authors simply cited the OED's definition of misinformation (Bednar & Welch, 2008; Stahl, 2006), which is: "*wrong or misleading information*,". Fox (1983) described misinformation as follows (p. 193):

Since information may be false, we see that misinformation is a species of information, just as misinforming is a species of informing...informing does not require truth and information need not be true; but misinforming requires falsehood, and misinformation must be false

Fox (1983) did not consider disinformation, although he seemed to be hinting at it in this quote. When Fox (1983) stated that, "misinformation is a species of information," he drew the relationship clearly: misinformation, albeit false, is still information and, therefore, can still be informative. How is it that we can be informed by false statements? As discussed in the previous section, the speaker may reveal some information (perhaps accidentally) or may imply some information on the state of the world. In the quote above, Fox (1983) explicitly described the conditions that allow misinformation to occur, and how misinformation can still be useful. Fox (1983) avoided issues of why "misinformation must be false," and does not delve into related issues such as context and time (discussed in a later section of this paper).

In an article about the nature of information, Losee (1997) also presented three forms of misinformation. First, he stated that misinformation may be *simply information that is incomplete*. Zhou & Zhang (2007) added to this discussion with additional qualities of misinformation, including concealment, ambivalence, and distortion. Additionally, misinformation may also be uncertain (perhaps by presenting more than one possibility or choice), vague (unclear), or ambiguous (open to multiple interpretations). Misinformation, however, may still be true, accurate, and informative depending on the context, and therefore, meet many of the same qualifications accepted for information (see the Twitter example in section "Time").

Second, Losee also described misinformation as, "*information that is not justified*," because one's belief may be based on the "wrong reasons," and one is thereby misinformed. Losee may have conflated the thing (misinformation) with the status (being misinformed). Being misinformed is often a matter of perception. One may have received information, but still be misinformed, or vice versa. For example, when President Obama was

elected, some people questioned his legitimacy because they believed he was not an American citizen¹. Despite the empirical evidence presented in the form of his Certificate of Live Birth from Hawaii, many people persisted in being misinformed because they perceived the world in a particular way. The nature of belief and the reasons for choosing to believe some information are complex and frequently socially-mediated. Taber & Lodge (2006) conducted two experimental studies in which they explored how citizens evaluate arguments about two political issues (affirmative action and gun control) to test a number of hypotheses predicting motivated reasoning. They found that when participants are free to self-select the source of the arguments, they seek out confirmatory evidence and avoid that which they expect might challenge their priors (the confirmation bias). So it seems that, at least in some situations, it will be difficult to describe one's reasons for believing misinformation as simply "wrong," although the content of a belief may not be justified.

Lastly, Losee (1997) cited Fox (1983) and Dretske (1983) to support his conclusion that misinformation, "is information that is partly or wholly false," (p. 267), but his meaning is much different from Fox's [Zhou & Zhang (2007) err similarly]. Directly following the Fox (1983) citation, Losee (1997) asked readers to, "[c]onsider a "lie" told by an individual or an organization," (p. 267). However, Fox (1983) does not examine the nature of lying, nor investigate misinformation or misinforming as varieties of deception. While Fox (1983) wrote that misinformation must be false information, Losee (1997) took this to imply that misinformation must also be deceptive. Other authors, however, make the argument that deceptive misinformation is disinformation.

Disinformation: Problems of Truth and Intent

The OED defines disinformation as, "[t]he dissemination of deliberately false information, esp. when supplied by a government or its agent to a foreign power or to the media, with the intention of influencing the policies or opinions of those who receive it." In its etymology, the OED states that the term disinformation comes from a Russian term, *dezinformacija*, coined in 1949. Given the political and cultural milieu in the Soviet Union at that time, the strong association between disinformation and malicious intent probably developed as a result of Stalinist information control policies. Since the term disinformation was created relatively recently, perhaps it is not surprising that not much work has explored the concept in the LIS field. Some authors treat disinformation simply as a kind of misinformation (Losee, 1997; Zhou, et al., 2004). Fallis (2009) analyzed disinformation to uncover some sets of conditions under which disinformation may occur. He concludes that, "while disinformation will typically be

inaccurate, it does not have to be inaccurate. It just has to be misleading. So, disinformation is actually not a proper subset of inaccurate information [misinformation]" (p. 6) (e.g., selective news coverage on only the negative characteristics of an individual). Going back to Hjørland (2007)'s subjective nature of information as informative in relation to some context, Fallis's view of disinformation builds further support for information being subjective. While disinformation may be true, accurate, and current, and thereby informative, it needs be only misleading, relative to some situation. Since misinformation must be false (Fox 1983), and disinformation may not be false, misinformation and disinformation are intersecting sub-categories of information.

Problem of Truth

Some philosophers of information, however, think that both misinformation and disinformation are not sub-categories of information. Building from Dretske (1983), Floridi (2005, 2010) argued that because false information is not information and because misinformation and disinformation are false, neither misinformation nor disinformation qualifies as information. Floridi based his claim on the notion that information is only such if it is true, and this truth condition is the branching point between reality and non-reality. False information is not information because things that are false cannot exist in reality. The consequence of this idea, however, must be that reality is objective, independent, and not socially-mediated. This idea is similar to the idea of an objective nature of information, and faces objections from researchers such as Scarantino & Piccinini (2010). They argued that information cannot be either true or false because we are not always able to evaluate the truth of the information. Again, because 'objective' information cannot exist outside our socially-constructed reality, we also cannot judge what constitutes truth. On the point of misinformation being false, Floridi's stance supports Fox (1983)'s conclusion that misinformation must be false. However, as illustrated earlier by Hjørland (2007) and by Fallis (2009), disinformation may be true but misleading relative to the situation (i.e., relative to the current reality) through implication or revelation. Therefore, regardless of the extent to which disinformation may be true or false, it is still a form of information.

Problem of Intent

In common understandings of misinformation and disinformation (cf. the OED definitions cited above), the difference between misinformation and disinformation hinges solely on the intent of the speaker (Bednar, et al., 2008; Stahl, 2006). If the intent is judged to be benevolent, then the content is misinformation. If the intent is judged to be malevolent, then the content is disinformation. The intent of the speaker, however, is often unknowable to other people. One cannot deny the presence of intent in communication, but to hinge definitions of terms on only the intent seems somewhat limiting, especially in the operational sense. As evidence of the need for more formal

¹ http://en.wikipedia.org/wiki/Barack_Obama_citizenship_c_onspiracy_theories

definitions, Rubin (2010) cited Walczyk, et al. (2008), who argued that deception allows us to accomplish goals both malevolent and benevolent (such as lying about a surprise party). Deception does not guarantee success, however, in the accomplishment of such goals, even when the intent to deceive is still present. Moreover, the intent of the speaker may change after the initial utterance. As an example of the mercurial nature of intent, a speaker may no longer wish to deceive a receiver after sending a text message lying about her whereabouts. In that case, does that text message constitute disinformation or just misinformation since the intent to deceive is no longer present? Given the ambiguous nature of intent, it seems somewhat unsatisfying to define disinformation exclusively on the often-unknown intent of the speaker.

FUTHER DISCUSSION OF DISINFORMATION

Understanding Disinformation by Cues to Deception

Deception is a prime application of disinformation. Therefore understanding cues to deception may help us describe and recognize features of disinformation. This section will briefly review three types of cues (physical, verbal, and textual) to deception followed by a discussion of how these cues interface with Grice's Conversational Maxims.

Physical Cues to Deception

DePaulo, et al. (2003) reviewed 120 studies in the deception literature. They define deception as a, "deliberate attempt to mislead others," (p. 74), which supports Fallis's (2009) understanding of disinformation. These authors, however, do not distinguish between deception, which may be true but misleading, and lying, which is entirely false, thus leaving no distinction between true and false statements. From this review, they extract 158 unique cues to deception and these cues are sorted into five categories. Deceivers tell tales that tend to be, "less forthcoming, less compelling, more negative, more tense, and suspiciously bereft of ordinary imperfections and unusual details," (p. 104). Most of the studies reviewed by DePaulo, et al. (2003) focused on students in labs, and so the researchers limited their understanding of cues to those cues that can be sensibly perceived (e.g., dilated pupils, higher pitch in voice, fidgeting, elevated heart rate, etc.). In most of today's online environments, however, these kinds of physical cues are not available. This lack of cues could explain the growth of disinformation online (Hernon, 1995). DePaulo, et al. (2003) commented on this limitation when they wrote that, "people's self-presentational strategies can be more imaginative and their goals more complex than much of the current literature on cues to deception might suggest," (p. 106) hinting at the need for additional research in this area.

Verbal Cues to Deception

While physical cues can provide information about deception, some verbal cues can as well. Buller & Burgoon

(1996) developed an 'Interpersonal Deception Theory (IDT)'. In this article, they were motivated by deception in verbal communication, such as a live, face-to-face conversation because they consider this mode of interaction the most interpersonal and interactive. Buller & Burgoon (1996) presented eighteen propositions to demonstrate, "how deception is played out in interpersonal contexts," (p. 211). Although they did not present specific cues, they described some conditions which may lend themselves to deception, particularly in oral conversation. Specifically, they explicitly discussed the influences of context and personal relationships between the speaker and the receiver. Buller & Burgoon explained:

When deceit is motivated by desires to aid the [conversation] partner, a third party, or simply to conform to standards of politeness or good taste... senders [speakers] may experience less detection apprehension and actually consider deception an acceptable, desirable alternative. (p. 222)

These influences illustrate why deception is so complex as well as why the nature of intent is often questionable. For example, if deception can be socially acceptable, then this undermines the value of a dichotomous idea of intent as either malevolent or benevolent. People often disinform in the service of social expectations, such as the performance of community membership, adherence to cultural values, avoidance of an argument, and so on (e.g., the speaker and receiver both know that their boss is having an affair, yet they will not publicly acknowledge this; you 'nod 'n smile' to your grandfather's fishtales). In these cases, it seems inappropriate to describe people's motivations as malicious, yet neither might they seem explicitly beneficent either. Therefore, it may be best to view cues to deception as context-dependent or relationship-dependent, such that there might be different sets of cues for different contexts or relationships.

Textual Cues to Deception

Text requires different techniques for communication, and offers various affordances and constraints. For example, textual communication is typically asynchronous, thereby providing the sender copious time to carefully craft a message without risking any inadvertent physical cues. In Zhou, et al. (2004), the authors divided students into dyads, and assigned one participant in each dyad the role of deceiver and the other one the role of truth-teller. The participants in each dyad emailed each other to convince the other of which items ought to be salvaged from the wreckage of their vehicle in the desert (known as the DSP [Desert Survival Problem]). Compared to both truth-tellers and respective receivers, they found that deceivers displayed higher and/or more: quantity, expressivity, positive affect, informality, uncertainty, nonimmediacy, and less complexity and diversity. The authors also found that deceivers use these cues towards different ends, such as proving trustworthiness to build a relationship. For

example, some deceivers stated that they had had desert survival training and therefore are qualified to offer expertise about which items would be best to salvage. Deceivers also use these cues to overcome the gaps presented by electronic communication. They “may have converted [physical] cues... into text by providing more and richer language,” (p. 102). This demonstrates that deceivers are mentally agile and highly context-aware: Whenever more or less verbosity is required or allowed, then that is what they use. Again, this points to the strongly context-dependent nature of deception, and the significant role of context in determining which cues are being used.

Understanding Disinformation as Violations of Grice’s Maxims

In order to further understand the features of misinformation/disinformation, we explored how Grice’s conversational maxims are violated in the instances of misinformation/disinformation. Grice proposed four conversational maxims based on a ‘Cooperative Principle’ that guides effective communication in conversation (Green, 1996). The Maxim of Quantity states that speakers will only say as much as necessary, and not more. The Maxim of Quality posits that speakers will not deceive and will not say something without enough evidence. The Maxim of Relation mandates that speakers will say only what is relevant. The Maxim of Manner says that speakers will be obvious, be brief, and be orderly. These Maxims are not rules for conversation, but serve to explain how two speakers cooperate together to have a conversation.

Rubin (2010) stated that deception inherently violates Grice’s Maxims. DePaulo, et al. (2003) postulated and Zhou, et al. (2004) evidenced that deceivers produce more verbiage than prior studies had indicated (Vrij, 2000). In fact, in Zhou, et al.’s (2004) study, some of this verbiage served to establish credibility (e.g., “I had desert survival training so I know which items would be best to salvage”), although it may not have been topically relevant to the exchange. So Grice’s Maxim of Quantity is not violated outright² because the deceiver wanted to establish trust and the perceiver wanted to trust because humans are truth-biased, and so both parties are cooperating to communicate.

As previously discussed, Zhou, et al. (2004) stated that they observed an unexpectedly high quantity of language provided by deceivers. However, it is unclear exactly how much language the authors considered to be atypical

² The linguistic and social complexities of misinformation and disinformation suggest a reconsideration or expansion of Grice’s Maxims, particularly the Maxim of Relation. The additional verbiage provided by deceivers is not always topically relevant, as required by the Maxim of Relation. However, this verbiage is often socially relevant, and serves some social utility, such as to establish credibility or even to distract the receiver.

quantity. Thus, operationally, it may be unclear as to how to acknowledge a violation of the Maxim of Quantity in real settings as a cue to deception; it may be situation-dependent (e.g., asynchronous communication enables additional verbiage). Further, because deceivers are highly context-aware and mentally agile (Buller & Burgoon, 1996; Zhou, et al., 2004), they may be more sensitive to this Maxim than their truthful counterparts, and therefore less likely to violate it.

DePaulo & Bell (1996) replicated a study from Bavelas, et al. (1990) in which they formed a “defensibility postulate.” This states that people, “communicate in ways that could be defended as truthful... but that would also mislead the [other conversant] about their true opinions.” Defensibility provides an interesting challenge to the Maxim of Quality because although speakers may not wish to provide their true opinions, they also may not wish to deceive. By focusing on true assertions, they are in accordance with the Maxim of Quality, although perhaps violating to a small degree the Maxim of Relation. For instance, after eating dinner at a friend’s house, the friend asks John how the dinner was. Although the main entrée was burnt, John tells his friend how much he liked the salad and wine (which is true) and evades discussing the entrée to avoid lying. In describing one aspect of Implicatures, Green (1996) says that, “implicatures are intended to arise from *recognition* [in both the speaker and the receiver] that the maxim of Relation is being *conspicuously* disregarded” (p. 102). Defensibility, however, from the speaker’s view, tries to avoid both recognition and conspicuousness in the receiver, so it is unclear if speakers employing defensibility would strictly be violating the Maxim of Relation.

Deceivers are exploiting the Maxim of Relation when they endeavor to be perceived as relevant (e.g., public performance of credibility, specificity of communications). Given deceivers’ creativity (Walczyk, et al., 2008, cited in Rubin, 2010), however, they are likely to be more aware of this maxim, thus intentionally avoid violating this maxim. Zhou, et al., (2004) also reported that text-based, electronic communication increased informality (described as increased typographical errors and decreased punctuation), which may indicate deception. However, this style of writing is common across electronic communications, and therefore it may be unclear at which point ‘too much’ informality becomes a cue to deception. Further, informality could easily serve as another tool for deceivers in text-based, electronic communication situations as they use it to demonstrate Relevance by publicly adhering to the speech community of their receiver(s).

Grice’s Conversational Maxims provide some insight into how cues to deception might function in a conversation. Discussion of cues to deception and violation of Maxims illustrates the complexity of detecting misinformation and disinformation. Cues may not necessarily signal disinformation and maxims can also be exploited to mask disinformation. The wide variety of possible cues

demonstrates that these Maxims may be, in some contexts, exploited without being violated, and in other contexts, violated but perhaps, only to a degree. Again, both the level of exploitation and the level of violation may depend on *context* and *time*.

OTHER INFLUENTIAL FACTORS IN DEFINING MISINFORMATION AND DISINFORMATION

There are some similarities with regards to the natures of information, misinformation, and disinformation. Information and informativeness cannot exist independently of human consciousness. Both information and informativeness depend highly on *context* and *time*, as advocated by Hjørland (2007). While Hjørland (2007) considered context in his discussion of the nature of information, few authors in the LIS literature considered context (i.e., state of the world) or time in their discussions of either misinformation or disinformation.

Context

Some authors (Buller, et al., 1996; Depaulo, et al., 2003; Rubin, 2010; Zhou, et al., 2004) advocated for an increased understanding of how cues may be influenced by context. However, of these authors, few provide specific ideas as to what they mean by context. Buller & Burgoon (1996) mentioned personal relationships, and Zhou, et al. (2004) mentioned the specificities of the content of a conversation (i.e., if the participants had discussed a topic other than the DSP, then the 'context' would have been different).

Context is a notoriously difficult concept to define (Courtright, 2008). Some examples of contextual factors could include: the type of relationship and the history, if any, between two actors (e.g., familial versus business; just met versus having an established rapport), the physical location of the conversation (e.g., a conference room, a living room, a virtual tavern), the content of the conversation, and, of course, the goals (e.g., conversational, social, deceptive, informational) of the actors. These are just a few examples of many factors that may influence the creation of context.

Dourish (2004) provided a useful way of thinking about context. In his article, he rejected a positivist view of context because it sees social action as independent of the actor. Instead, he advocated for a view of context as an interaction. He described four properties of context. First, context is a "relational property" in that it exists due to the relationships among actions and things. Similarly, relationships among speakers and receivers are important in misinformation and crucial in disinformation. Second, context is defined dynamically, rather than determined ahead of time. Both misinformation and disinformation may be spontaneous actions. Although disinformation may also be planned well ahead of time, this may not influence its success. Third, context is, "relevant to particular settings, particular instances of action and particular parties to that action." The speaker of misinformation or disinformation may be influenced by the physical location of the

conversation (e.g., private living room versus public café) and likewise, the receiver may be more or less prone to ask for clarification or evidence. Both may also be influenced, differently perhaps, by whether other people are nearby and who those people may be in terms of their relationships with the speaker or receiver. Fourth, context is, "actively produced, maintained, and enacted in the course of the activity at hand." The acts of misinforming and disinforming while conversing produce particular contexts, which may influence both the speaker and the receiver. Given the subjective nature of information and the context-dependent nature of misinformation and disinformation, Dourish's explanation of context as a social action that people produce and maintain, rather than something set in advance, helps describe why misinformation and disinformation have mercurial, ephemeral natures. In this view, misinformation and disinformation can be seen as social acts that are mutually agreed upon because two actors agree to produce a context by conversing. Seeing context as a social act allows us to understand the importance of researching misinformation, disinformation, and cues to deception under many different circumstances. Simply, different contexts (i.e., social acts) may provide additional insights and cues, and permit us to iteratively test our prior understandings.

Time

Time is another important factor to consider in discussions of misinformation and disinformation. Because the world (i.e., some socially constructed reality) changes rapidly, a speaker may provide accurate, timely information at one point, and then it can transform to become misinformation at a later point because some aspect of the world has changed, unknown to the speaker. We often see real examples of this situation, especially with increasing use of social media such as Twitter. Consider the following example.

After an earthquake hit Japan in March 2011, social media such as Twitter and Facebook, were the only functioning communication tools, and many utilized these tools to tell their friends and family they were safe. On March 14th, a Twitter user tweeted that his friend was waiting to be rescued in the mountain area of Sendai, and asked people to retweet the message as much as possible. The message spread quickly as people retweeted it, and although the friend was rescued the next day, people continued to retweet the message³.

In a case like this, the original message was accurate, and the person who created the message, as well as the people who retweeted the message, had no malicious intent to deceive anyone (on the contrary, they probably (re)tweeted with good intentions to help a person in need). Due to the

³ <http://biz.heraldm.com/common/Detail.jsp?newsMLId=20110316000089>

change in the state of the world, however, at certain point in time, the message became misinformation. This example clearly demonstrates the limitation of defining misinformation simply as “inaccurate information” separately from the context. Even true information always has potential to become misinformation depending on changes in the context.

CONCLUSIONS AND FUTURE WORK

Misinformation and disinformation are highly complex concepts, yet our understanding of these concepts is still quite limited. In this paper, we investigate the concept of information as being *informative* in order to demonstrate how misinformation and disinformation can be different kinds of information. A social constructivist view of information highlights context, meaning, and informativeness, rather than truth or falsity. An objective, context-independent was rejected because the consequences of this view of information require information to be true for it to exist and to be informative. We illuminate how misinformation and disinformation can be informative through implying or revealing some external information by discussing several hypothetical examples.

Several different types of misinformation were described, including partial, irrelevant, inaccurate, and ambiguous, to demonstrate the range of possibilities. Misinformation may result from an unjustified belief; it is different from disinformation because it *must* be false. Disinformation is perhaps most usefully viewed as information that is misleading, despite possibly being true, accurate, current, and/or complete. We raised two issues: the problem of truth and the problem of intent. Humans are not capable of knowing or judging an objective truth and cannot know whether objective, true information exists independently of consciousness. Moreover, the dichotomy of benevolent and malevolent intent when disinforming is unsatisfying, since social situations sometimes require or encourage people to disinform.

Three broad categories of cues were discussed to further explore features of disinformation and to demonstrate the challenges of detecting misinformation and disinformation. Grice’s Maxims were discussed in relation to cues to illustrate how misinformation and disinformation may violate the Maxims, but only in a manner of degree. These kinds of mild violations indicate the sophistication of and difficulty of defining and detecting misinformation and disinformation.

Lastly, we discuss two important aspects in determining misinformation and disinformation that were excluded in previous studies: context and time. We show how accurate information can turn into misinformation because the time has passed, and/or the state of the world has changed. Thus context and time are critical components in defining misinformation and disinformation.

In our future studies, we will be conducting a study taking a naturalistic approach to observe and capture the richness and dynamism of misinformation and disinformation in a real-life setting. For example, virtual worlds present the challenges of computer-mediated communication, such as a lack of physical cues, but may offer opportunities for users to use other cues to disambiguate between misinformation and disinformation, thus serve as excellent candidates for the exploration of the concepts discussed in this paper.

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