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Victoria L. Rubin

Western University, vrubin@uwo.ca

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Pragmatic and Cultural Considerations for Deception Detection in Asian Languages

VICTORIA L. RUBIN, University of Western Ontario

In hopes of sparking a discussion, I argue for much needed research on automated deception detection in Asian languages. The task of discerning truthful texts from deceptive ones is challenging, but a logical sequel to opinion mining. I suggest that applied computational linguists pursue broader interdisciplinary research on cultural differences and pragmatic use of language in Asian cultures, before turning to detection methods based on a primarily Western (English-centric) worldview. Deception is fundamentally human, but how do various cultures interpret and judge deceptive behavior?

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1. INTRODUCTION

While the field of automated deception detection in English (and a handful of other European languages) is experiencing growth in Natural Language Processing (NLP) or Computational Linguistics (CL), it has received surprisingly little attention from NLP/CL researchers working with Asian¹ languages. In this editorial I articulate what may be the stumbling blocks in further development of deception detection research in Asian contexts and invite other researchers to continue this conversation.

My brief summary of the recent deception detection methodological advances focuses on the idea that it is possible to discriminate deceptive texts from truthful ones by identifying reliable markers in texts, traditionally called verbal cues or deception predictors. Since the exact inventory, effectiveness, and reliability of the cues remain controversial, I turn to insights from interpersonal psychology and Computer-Mediated Communication (CMC).

Perceptions of what constitutes deception in and across Asian cultures are discussed in the literature on cultural differences, sociolinguistics, psychology, philosophy, and anthropology, but the findings are hard to summarize in a short piece. Drawing on select English-language publications from diverse disciplines, I question the assumptions of universality of perceptions of deception and deceptive behaviors across cultures. Current deception research is predominantly driven by studies of Western

¹Asian languages here “include languages in East Asia (e.g., Chinese, Japanese, Korean), South Asia (Hindi, Tamil, etc.), Southeast Asia (Malay, Thai, Vietnamese, etc.), the Middle East (Arabic, etc.), and so on” (per TALIP’s Editorial Charter, Accessed on 7 February 2014 at <http://talip.acm.org/charter.htm>).

Author’s address: V. L. Rubin, Faculty of Information and Media Studies, Language and Information Technology Research Lab, University of Western Ontario, North Campus Building, Room 260, London, Ontario, Canada N6A 5B7; email: vrubin@uwo.ca.

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individuals, culturally rooted in philosophies with a moral imperative of truth-telling. Moral judgements about deception and truth-telling might not be necessarily shared by Asian cultures. Ethical considerations in deciding to tell the truth or not might entail virtues of modesty and self-effacement, the need to save face, or the desire to avoid embarrassment and resolve conflicts without harmful truth-telling. It is unclear at this point whether the psychological findings that produced various sets of verbal deception predictors would still stand under different sets of moral justifications. I will return to this question after I provide a brief background for this discussion. Assuming the reader's distant familiarity with the topic, I start with the introduction of the field of automated deception detection and its position in NLP/CL, stressing its novelty and importance.

2. THE FIELD

A specialized workshop "On Computational Approaches to Deception Detection" was first held in 2012 at the European Chapter of the Association for Computational Linguistics in Avignon, France. Automated deception detection was announced as "a relatively new area of applied computational linguistics that has broad applications in business fraud and online misrepresentation, as well as police and security work" [EACL 2012]. The task has been acknowledged as extremely challenging for over 15 years [DePaulo et al. 1997] and has only recently been proven computationally feasible [Bachenko et al. 2008; Fuller et al. 2009; Hancock et al. 2008; Zhou et al. 2004]. In spite of deception detection's historical roots in interpersonal psychology and communication, the field best connects to opinion mining, spam, and fraud detection within NLP/CL. Opinion mining (or sentiment analysis; see a recent overview in Liu [2012]) has previously absorbed other subjectivity-related work on modality and negation (e.g., Morante and Sporleder, [2012]), factuality (e.g., Sauri and Pustejovsky [2012]), attribution (e.g., Bergler et al. [2004]), and certainty analyses (e.g., Rubin [2007]). Opinion mining shifts emphasis in computational analyses from factual statements to expressed opinions. The nature and specifics of opinions are important for predictive analyses, for instance, which product features do consumers tend to dislike, collectively, and specifically why?

Deception detection offers the next logical step of verifying that opinions are truthful so that dishonest or fraudulent statements are filtered out. Novel deception detection tools are needed in predictive analyses, news filtering, and business intelligence. In personal CMC, information seekers and users can benefit from deception detection tools in situations that require credibility assessment or veracity evaluation. Text-based digital communication, social media, and mobile technologies are expanding globally, but very little is known about pragmatic use of language in the context of lie- or truth-telling across cultures and, specifically, within individual Asian societies.

2.1. Deception Definition and Varieties

From the North American computer-mediated communication perspective, deception is typically defined as a message knowingly and intentionally intended to foster a false belief or conclusion [Buller and Burgoon 1996; Zhou et al. 2004]. It is a deliberate act that excludes honest errors (which are naturally unintentional) and self-deceptions (which are intrapersonal), yet may achieve both malevolent, antisocial, self-serving goals as well as benevolent, prosocial goals such as keeping others from harm, preventing hurt feelings, or genuinely meaning to do good for others (e.g., lies that conceal plans for a surprise party) [Rubin 2010; Walczyk et al. 2008]. The latter are often referred to as "white lies" which seem to be typically excluded from automated deception detection training corpora. Do definitions of deception differ across Western and Asian

cultures? If so, to what extent? How do individual Asian cultures differ, if at all, in terms of perceiving what constitutes deception?

Several taxonomies of deception types exist ranging in number of categories from 2 to 46 (such as commission versus omission or falsification and concealment versus equivocation). Rubin and Chen [2012] provide further metaanalysis of deception and manipulation varieties by their salient features (e.g., intentionality to deceive, accuracy of information, and social acceptability). Current automated techniques for deception detection deal exclusively with falsifications (i.e., lying or deceit). Are there circumstances under which specific Asian cultures would tend to value certain deception favorably, or at least tolerably? Do any socially acceptable pragmatic goals of communication conflict with the moral imperative of truth-telling (e.g., avoiding conflict, saving one's face, or producing an agreeable inaccurate answer)? Next, I will talk about how deception is detected in texts.

3. METHODOLOGICAL ADVANCES

3.1. In the North American / European Context

Since deceiving others is believed to involve changes in emotional, psychological, or cognitive states, certain linguistic cues may indicate lying and can be detected using automated techniques [Hancock et al. 2004]. Systematic differences between truthful and deceptive messages have long been accounted for by the four-factor theory of deception widely accepted in North America [Zuckerman et al. 1981]. "Relative to a truthful baseline, deception is characterized by greater arousal, increased emotionality (e.g., guilt, fear of detection), increased cognitive effort, and increased effort at behavioral control. Because message veracity affects these internal psychological states, and because each of these states is behaviorally 'leaked', observable behavioral differences are expected" [Ali and Levine 2008, page 83].

The automated deception detection task has been formulated as a binary text categorization task: is a message deceptive or truthful? There is a substantial body of research that seeks to compile, test, and cluster predictive cues for deceptive messages (see a discussion of differing sets of predictors in Rubin and Conroy [2012]) but no consensus on one reliable set of verbal cues has been reached. Preexisting psycholinguistic lexicons (e.g., LWIC by Pennebaker and Francis [1999]) and statement validity analysis techniques from law enforcement credibility assessments (as in Porter and Yuille [1996]) are often used to derive predictors. Standard binary classification algorithms applied to predictors achieve 70 – 74% accuracy rates (e.g., Fuller et al. [2009] and Mihalcea and Strapparava [2009]). These results are promising for the field since they supersede notoriously unreliable human abilities of a 54% mean accuracy [DePaulo et al. 1997]. Human judges achieve 50 – 63% success rates, depending on what is considered deceptive [Rubin and Conroy 2011], and extreme degrees of deception are more transparent to judges [Rubin and Vashchilko 2012]. An ongoing yearly symposium (e.g., Jensen et al. [2013]) debates new technologies and procedures for deception detection and credibility assessment in the context of law enforcement, intelligence work, and information security. Cross-cultural aspects are sometimes discussed (e.g., George and Gupta [2013] compare perceptions of deceptive Hindi and American English stimuli), but the research community from Asia is generally underrepresented.

3.2. In an Asian Context

There is surprisingly little to say about NLP/CL efforts on deception detection in the context of the use of Asian languages. A few exceptions concentrate on Chinese

CMC. Zhou and Sung [2008] focus on cue selection based on Chinese online group communication and find that deceivers tend to communicate less and show low complexity and high diversity in their messages as compared to truth-tellers. Hu et al. [2009] construct the first deceptive and nondeceptive Chinese corpora, use SVM, and reach precision and recall comparable to Western studies (78% and 72%, respectively). Acknowledging deception detection is in its initial stages for Chinese texts. Zhang et al. [2012] follow the traditional paradigm and improve on their feature selection method with 86% accuracy results. An analysis of the impressive jump in Zhang et al.'s [2012] success rates is in order, preferably by native speakers. Broader comparable research is needed in other Asian languages.

4. BROADER RELEVANT INTERDISCIPLINARY RESEARCH ON ASIAN LANGUAGES AND CULTURES

In a recent editorial in *Computational Linguistics*, Krahmer [2010] suggests that we can learn a lot from psychologists (and vice versa). Similarly, I would argue that, for deception detection purposes, we can learn a lot from researchers working in the neighboring fields of social sciences and humanities. Anthropologists, psychologists, and sociolinguists can offer insights on differences and similarities among Western and Asian societies. Disassociated strands of literature deal with language pairs and effects on cross-cultural communication, whereas others focus on individual languages and their sociocultural milieu. Here are but a few examples of the much needed research in Asian context. Suzuki et al. [2006] review the use of psychophysiological detection of deception (polygraphy) in Japan where this technique and its results are generally accepted as valid, reliable, and admissible in Japanese courts. Research on verbal indicators appears to be neglected. Lewis and George [2008] rate American and Korean respondents on four cultural dimensions, namely, individualism/collectivism, power distance, uncertainty avoidance, and masculinity/femininity, and identify differences in deception between the two cultures. Yeh et al. [2013] compare deception beliefs and perceived detection cues in the Chinese and Japanese cultures, and find cross-cultural consistency in stereotypes across cultures and differences in gender stereotypes. American, Jordanian, and Indian participants are able to detect deception across cultures that share a language and those that do not; they often show tendencies to judge foreigners as more truthful than compatriots (contrary to the language-based ethnocentrism idea) [Bond and Atoum 2000]. George and Gupta [2013] offer a few other suitable examples in their review of deception across cultures. I invite computational linguists and the broader interdisciplinary community to provide much needed expansion to this select literature overview. I will next turn to philosophy and cross-cultural psychology for a deeper appreciation of potential cultural norm differences.

4.1. Philosophical Roots of Cultural Differences and Associated Challenges

In philosophical traditions, lying is widely condemned and rarely permissible. Englehardt and Evans [1994] indicate philosophers have argued for centuries that lying is wrong.

“Epictetus, the early Stoic, defended, above all, the principle ‘not to speak falsely’ ... Aristotle condemns falsehood as ‘bad and reprehensible’ and explains that the truth is ‘fine and praiseworthy’... In more modern times, Emmanuel Kant took the prohibition against lying as his paradigm of a ‘categorical imperative’, the unconditional moral law. Nietzsche took honesty to be one of his four ‘cardinal’ virtues, and the existentialist Jean-Paul Sartre insisted that deception is a vice, perhaps indeed the ultimate vice” [Englehardt and Evans 1994; page 255].

Nevertheless, the virtues of truth-telling and honesty at all costs may not be universal. The Confucian belief of sincerity mattered significantly more to Koreans than to Japanese students according to Tamai and Lee's [2002] survey. Cross-cultural developmental psychology studies suggest that cultures may categorize untruthful statements differently depending on specific social contexts. Comparing Chinese and Canadian children's and adults' evaluations of lying and truth-telling, Fu et al. [2001] find that "lie- and truth-telling have inconstant moral values: certain forms of lie- and truth-telling, though valued negatively in one culture, may be evaluated positively in another culture" [Fu et al. 2001, page 726]. Lee et al. [1997] corroborate that "in the realm of lying and truth-telling, a close relation between sociocultural practices and moral judgment exists". For instance, "the emphasis on modesty and self-effacement leads Chinese children to believe that lying for reason of modesty has positive moral value whereas truth-telling about good deeds is morally undesirable" [Fu et al. 2001, page 721]. More research on beliefs, attitudes, and moral underpinning is needed, specifically with the goal of assessing the impact of culturally specific norms on deception detection methodologies and selection of deceptive cues.

What are the philosophical or religious roots and motivating factors² for lie- and truth-telling behaviors? Potential differences in socially acceptable moral norms matter because morals and attitudes are often cited as explanations for verbal "leakage" that creates observable cues to deception. For instance, in their Dutch study, Schelleman-Offermans and Merckelbach [2010] emphasize that liars typically do not want to take responsibility for their behavior, or they feel guilty or ashamed about lying and use relatively more negative emotion words and fewer self-references [Schelleman-Offermans and Merckelbach 2010; page 249]. Most deception detection mechanisms operate at the levels of lexico-semantic analysis in combination with machine learning. At a pragmatic discourse level, automated methods have been attempted in very few studies thus far (see Bachenko et al. [2008], Rubin and Lukoianova [2014], and Rubin and Vashchilko [2012]). What does an alternative pragmatic use of language imply for successful deception detection? Do language-blind lexico-semantic machine learning approaches ignore cultural specificities of Asian languages? These questions remain to be answered. The Asian perspectives (such as Zhang et al.'s [2012] success) can inform and extend studies conducted with mostly Western participants.

4.2. Potential Stumbling Blocks in Research

Several reasons may account for the lack of research interest in deception detection in Asian NLP/CL community³. First of all, it is possible there is more development in the area than what is visible in English-language publications. If true language barriers separate existing bodies of research and the task is extensively discussed in respective Asian languages, I would encourage researchers to consider bringing their research to international computational linguistics venues. I would also humbly request keyword tagging or considering translations of titles and abstracts for the benefit of the researchers without Asian-language backgrounds.

Second, might there be a cultural clash or research ethics difficulty in studying deception? If it is culturally undesirable to speak of or identify deceivers, or the overall

²I readily acknowledge that my societal macrolevel perspective necessarily ignores individual differences, personality traits, and personal motivations to deceive.

³These explanations are purely speculative and subject to verification. The deception detection task itself may also be too new, too complex for humans to figure out, and too hard for machines to compute. The training corpora are practically nonexistent and need to be developed, certainly beyond several corpora examples cited here (English, Dutch, and Chinese).

topic is shaded in negative terms for study participants, it might be avoided altogether. If it were the case, it would be most helpful to have an explicit record or discussion of the issues.

The third potential stumbling block was briefly discussed earlier. Is there a fundamental lack of universal agreement as to what deception needs to be detected? Difficulties arise among dissimilar cultures and misunderstandings are liable to occur in digital environments. Sociocultural models and discussions of philosophical and psychological roots may invigorate the field. Practical implications of such theoretical work are in selecting and identifying appropriate reliable verbal indicators of undesirable deception varieties.

The last stumbling block might be the nature of the languages themselves. If the languages have high degrees of hedging, qualification, or mitigation (say, for politeness sake or out of respect to authority), deceptive verbal cues may be better masked and harder to interpret as compared to English. Pragmatic interpretation of the actual meaning will then be required⁴.

5. CONCLUSION

This editorial provides an overview of automated deception detection in texts and raises several questions essential to performing the task of automated deception detection in an Asian context. The scarcity of automated deception detection research in the Asian applied computational linguistics community is puzzling. I speculate about potential stumbling blocks, namely, research dissemination language barriers, cultural and ethical clashes, methodological challenges, and definitional and conceptual difficulties arising from the context of Asian cultures. I encourage the computational linguistics and broader interdisciplinary research community to respond with appropriate solutions and to engage in several profound aspects of this task, beyond the pure computational challenge. Sociolinguistic, cross-cultural, psychological, and philosophical differences across Asian languages require careful consideration and better international dissemination. More research on cultural norms, beliefs and attitudes can help justify selection of verbal markers of deception, appropriate for Asian socio-cultural norms. The overall significance of deception detection research is in its ability to inform development of automatic analytical methods that complement and enhance notoriously poor human abilities to discern deception from truth. Further assessment of the feasibility and development of automated deception detection is needed for various applications such as personal computer-mediated interaction, social media monitoring, information security, credibility assessment, and intelligence and law enforcement.

⁴Speaking to my dear Japanese colleagues at the National Institute of Informatics in Tokyo and other people during my stay and travels around Japan in 2003, I couldn't help but notice that my "yes/no" questions would be rarely answered with a simple "no". Someone finally explained to me that if I hear "perhaps" (多分) I should probably take it as a polite refusal. And, if someone mentions that a certain arrangement was "a little difficult" (難しいです), it actually means "sorry, won't happen". Though my university professors and travel guide books prepared me to expect politeness, I was still taken aback by this *double-entendre*. Equivocation was pervasive and acceptable in personal face-to-face interactions, perhaps intended to perform a specific pragmatic function such as softening a refusal. Perfectly justifiable in that context, the phenomenon was new to me at the time. I started circling all the hedges and qualifiers I could find in the Daily Mainichi newspapers (in its English version) and noticed that equivocation and overhedging seeps into written communication, even in translation. This observation made me pay attention to how certainty and uncertainty are expressed in English. Coming back to deception detection cues, it seems that (at least in English) it matters how sure one is about what one says, and in what pragmatic contexts. For instance, an overly confident used-car sales pitch or an overly hesitant promise of a phone call are both "a little difficult" to believe.

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