



COVER SHEET

Broadhurst, R G and Cheng, K H W (2005) The Detection of Deception: The Effects of First and Second Language on Lie Detection Ability. *Journal of Psychiatry, Psychology and Law* Volume 12(Number 1):pp. 107-118.

Copyright 2005 Australian Academic Press

Accessed from: <https://eprints.qut.edu.au/secure/00003766/01/DECEPT09.doc>

Cheng, K. H. and R. G. Broadhurst, 2005, 'Detection of Deception: the effects of language on detection ability among Hong Kong Chinese', *Psychiatry, Psychology and Law*, Vol. 12 (1)107-118.

The Detection of Deception: The Effects of First and Second Language on Lie Detection Ability

Cheng Hiu Wan Keens and Roderic Broadhurst***

**M. Phil., University of Hong Kong; ** Associate Professor, University of Hong Kong*

Address all correspondence to the second author: Ms. Keens Cheng, 19-21 On King St., Pictorial Garden, Bellevue Court, 6/F. Flat G., Shatin, N.T. Hong Kong: email address: keens@graduate.hku.hk; Dr. R. Broadhurst, Room 1213, KK Leung Bldg., The University of Hong Kong, Pokfulam Rd., Hong Kong: email address: broadie@hlucc.hku.hk

Abstract

An experiment was designed to test behavioural differences in the detection of deception arising from investigative interviews conducted in either a first or second language. A two (Cantonese or English) by two (deception or truthfulness) between-subjects factorial design was utilized. Twenty-six postgraduate criminology student observers provided judgments of lying in 20 video-taped interviews of undergraduate subjects randomly assigned to either telling the truth or lying about their opinions on capital punishment. Observers did less well in identifying liars in their first language but were more successful in identifying liars speaking in a second language. However, observers made more mistakes with those telling the truth in a second language. The degree that deceivers deployed countermeasures also varied with second language users reporting less ability to control verbal and non-verbal behavioral cues. Deceivers, irrespective of language found lying required more cognitive resources than telling the truth and lying in a second language tends to alter one's facial expression or emotion. Behaviour associated with deception is discussed in the context of bi-lingual 'code switching' that appears to lessen cognitive load while lying and may be a potential marker of deception. Dis-believing-the-truth mistakes, or 'false positives' are as troublesome as false negatives and require attention in the context of cross-cultural interrogations.

Keywords: deception, bi-lingulism; Chinese, emotions

Introduction

A young American Chinese girl is intercepted at the Hong Kong border on suspicion of holding a false passport. Her initial story is disbelieved and she later confesses to using a false travel document and is incarcerated. It subsequently emerged that the passport was genuine, and her arrest was unlawful¹. The risk of similar errors poses considerable problems for immigration and border police and highlights the difficulties of truth verification in cross cultural settings.²

Deception is ‘an act that is intended to foster in another person a belief or understanding which the deceiver considers false’ (Zuckerman et al. 1981) is so common that it makes truth verification a fascinating and important topic in criminal, clinical and interpersonal contexts. The sensitivity of detection skill to cultural and language variation has become increasingly relevant as law enforcement personnel operate in transnational contexts and who encounter the need to interview and interrogate via the medium of a second language.

DePaulo & Pfeiffer (1986) reported that confidence in one’s ability to detect lying and the amount of experience in law enforcement were unrelated to actual accuracy. The literature suggests that, even in professions where the determination of truthfulness is crucial, our general ability to detect lies is no better than that achieved by random chance (Ekman & O’Sullivan 1991; Vrij & Winkel 1993; Desforges & Lee 1995). Vrij (1996), for example, showed that by comparing prisoners, detectives, customs agents, prison guards and college students, prisoners were the most capable at detecting deception. However, some ‘lie catchers’ are consistently better judges of interpersonal deception than others, and it is assumed that this ‘heuristic’ skill might be acquired or enhanced through training. However, Cheng (2004) in a pre and post-test experiment

showed that the confidence of trained law enforcement personnel³ at detecting deception among Cantonese-speaking subjects was not related to actual detection judgment accuracy. Despite a week of intensive training the trainees' accuracy at detecting deception yielded only minor improvement in detecting liars but lower accuracy for detecting truth-tellers. This study replicates methods applied in previous studies (Frank & Ekman, 1997) to explore lie detection accuracy in the context of communication in a foreign or second language.

Most lie detection research has been undertaken in the United States, and has focused on the reliability and limitations of polygraph machines (National Research Council, 2003). Although there are increasing number of studies showing cross-cultural differences in emotional expressions and perception (e.g. see Toshiki, 1999 & Matsumoto, 1990, 1996), and modification of emotional expressions as a result of different cultural display rules (e.g. see Ekman, 1972; Ekman & Friesen, 1969; Friesen, 1972), little is known about the effects of first and second language variations in emotional expressions and deception detection. It is generally acknowledged that the ability to interpret and decode another's non-verbal behaviour is subject to cultural variations. Early work by Landis & Klineberg (1938, cited in Wallbott 1998: 880) showed that '...emotion-facial expression is neither innate nor universal, but to a very large degree culture-dependent'. If non-verbal cues do not always have the same interpretations across cultures, it is plausible that non-verbal and verbal behaviour also differ when the subject speaks in a second rather than a first language, and hence a different pattern of base-line behaviour. Therefore, understanding the effects of language on deception becomes crucial.

This study examines the relationship between language and facial expressions during attempts to deceive in Hong Kong. Consequently, an experiment was set up to test the lie catchers' ability to judge deception by people speaking in their mother tongue (Cantonese), or in their second language (English). Specifically, we examine the following two hypotheses:

H1: Non-verbal and verbal clues differ significantly between participants speaking in their mother tongue (Cantonese) compared to participants speaking in a second language (English).

H2: Observers will achieve higher judgment accuracy when judging participants' lying in their mother tongue (Cantonese) than participants speaking in a second language (English).

Facial Expressions and Emotions

Ekman (1972) argued that although not all emotional states are correlated with universally recognisable facial expressions, a limited set of six basic emotional facial expressions – joy, sadness, anger, disgust, fear and surprise – were considered universally recognisable. This conclusion was based on studies conducted in the United States, Japan, Borneo and New Guinea (Ekman & Friesen 1969, 1975). Matsumoto (2001) has more recently stressed that cross-cultural work on emotion in the past two decades has brought to light the myriad ways in which cultures around the world are both similar and different in how they conceptualise, experience, express, and perceive emotions. Apart from these basic universal emotions, 'embarrassment' is also a familiar emotion that exerts influence on social behaviour. For example, Charles Darwin (1872: 309) long ago observed that 'blushing is the most peculiar and the most human of all

expressions'. Among Chinese, Bond's (1986) study of emotions found that a second language (English) served as a distancing function and thereby allowed the speaker to be more emotionally neutral when discussing embarrassing topics. These studies have obvious implications for cross-cultural interactions but lie detection research has rarely examined this emotion. Thus apart from the six basic emotions, the present study also looked at the extent to which 'embarrassment' occurred during deception. Recruiting Cantonese-speaking participants therefore adds to our understanding of the cultural variation of 'display rules' in the context of deception.

Culture and language effects

According to Ekman (1992), we learn from childhood a set of 'display rules', which govern one's emotional expression without choice or conscious awareness. Once these display rules are deeply ingrained, they become habitual and difficult to mask or undo. Studies of inter-cultural communication have found that humans learn to decode facial expressions in others in order to interpret accurately emotion cues and display rules (Hall 1979; Hochschild 1979, 1983; Thoits 1984). Matsumoto & Ekman (1989) further suggest that differences in judgments (of truthfulness/emotions) are based on the existence of these cultural decoding rules, and these create tendencies in any culture to amplify, neutralise or qualify such judgments.

In this study, we speculated that people's ability to decode and interpret others' non-verbal and verbal behaviour is subject to cultural variations embedded in language. Three studies help to illustrate this point. First, Dickey & Knower (1941) found that Mexican observers were more accurate in interpreting the

facial expressions of other Mexicans than of Caucasian subjects. Second, when showing magazine photographs to Caucasians, Japanese and Chinese, Vinacke & Fong (1955) observed there was greater agreement when judging the expression of emotions amongst members of their own cultural group compared to those from other cultures. Finally, by comparing assessments of emotions by student samples from the United States, Germany, South Africa and Japan, Joy & Casmir (1998) found that the experience of foreign travel was positively correlated with increased accuracy in the interpretation of facial expressions. Such insights lead to the possibility that lying in a different language (a first as against a second language) may in turn influence the observer's ability to accurately interpret and decode the emotions expressed by deceivers.

Experimental Design

Using an 'opinion paradigm' (Frank & Ekman, 1997) to establish the motivation for telling the truth or deception amongst our subjects, an experiment was designed to test the ability to judge deception of people speaking in their mother tongue (Cantonese), or in their second language (English). The experiment consisted of a two (Cantonese or English speakers) by two (deception or truthfulness) between-subjects factorial design and subjects were assigned to each of the conditions associated with our two main variables, language and deception. One of the major concerns in deception studies is that an experimental design cannot generate sufficient motivation for subjects to genuinely attempt a lie. However, by using the opinion paradigm, an issue (e.g. capital punishment) was both salient and valued by the participants such that it subsequently generated a higher stakes in the experiment. Frank and Ekman (1997) study on the detection of deception has provided validation on the

possibility of higher stakes generated by the opinion paradigm over the crime scenario methodology.

Stimulus material and experimental steps

To begin, an opinion survey was conducted with 135 undergraduate students undertaking a criminal behavior course and four postgraduate students. They were asked what they thought about several debatable moral issues including the reinstatement of capital punishment in Hong Kong, legalising soccer betting and the rights of homosexuals. The students were asked to rate their strength of opinion about these issues on a five point Likert scale. Only those with strong opinions on certain issues were selected (i.e. those who assigned one or five on the scale indicating strongly agree or strongly disagree). Further analysis indicated that a large number of students held very strong opinions either for or against the question of capital punishment. Consequently, 31 students (25 female, 6 male) aged 20-22 years were selected for a video-taped interview and instructed to lie or tell the truth about their opinion about capital punishment. Participants were randomly assigned to speak in English (their second language) or Cantonese (their mother tongue). From these 31 video-interviews, 20 videos (17 female, 3 male) comprising five examples of each of the conditions with the best content, image and sound quality were selected for use in the experiment. To ensure the participants' level of fluency in English and Chinese (Cantonese) was adequate, we asked them to also self-rate (on a Likert scale: 1 = Very Poor, 7 = Very Good) their competence according to the following statement: 'Please indicate the degree of your English/Chinese Proficiency'. After completing the judgment exercise we excluded the video tapes of those who self-rated at 3 or below on this 'proficiency' scale (one participant for the English condition and

two were for the Chinese condition) but otherwise included their responses to the attitudinal questions.

A fluent female Cantonese–English bilingual experimenter (a PhD candidate in criminology) carried out the procedure and she delivered the standardized interview questions in English or Cantonese, depending on the assigned condition. The experimenter described the study to subjects as being concerned about how people can effectively communicate an opinion. The interviewer in this study was blind to the experimental conditions to avoid possible bias during the questioning phase. In the initial preparatory phase of the experiment, instructions were given to each participant in a quiet discussion room. Each participant was asked to read and then verbally instructed as to what to do using a standardised script in Cantonese.

Each of the participants was interviewed by the same bi-lingual female interviewer/interrogator about their opinion of capital punishment and if they were lying about it. The question sequence was as follows:

What is your opinion on the issue of ‘capital punishment?
Can you tell me why you hold such opinion?
Did you just make this up a while ago?
Is this really your true opinion?
Are you lying to me now?

The whole interrogation process was videotaped. Each participant sat on a chair and was completely visible so that their body movements and facial expression could be carefully monitored. All the questions were standardised and rapport was established at the beginning of the interview⁴ across all experimental conditions. As soon as the participant entered the interview room, the

experimenter would introduce herself by name and greet them with a handshake. Finally the participants were asked to fill in a questionnaire concerning their confidence about deceiving or convincing the interviewer as well as their attitude about the experiment. General questions related to emotions and behavioural cues in the detection of deception were also included (Appendix).

Following the creation of the stimulus, 27 postgraduate students studying criminology (13 female and 14 male aged ranged between 25-55 with most between 25-35 years 62.9%) voluntary consented to be recruited to participate in a lie detection exercise. They included four correctional officers, seven police officers, three social workers, three ICAC officers, one lawyer, one psychologist and eight others (four Customs and Excise officers, three researchers and one journalist). This group of observers was asked to watch the 20 videos and record their detection deception judgments and attitudes associated with lie detection by filling in a questionnaire (Appendix).

Results

Judgment accuracy

The overall judgment accuracy for the observer group was above chance level i.e. 68.35%; ($t = 10.02, p < .05, n = 27$)⁵. Although results indicated no significant differences in the mean score across each of the conditions (see Table 1), observers scored better when participants were lying in English (i.e. out of five correct responses, the mean score for identifying Cantonese speaking liars was 3.26, compared to 3.7 for English-speaking liars; ($t = -1.363, p > .05, n = 27$). Likewise, observers' were able to better identify truth-tellers among Cantonese-speaking participants than among English-speaking participants (i.e.

out of five correct responses, the mean score for identifying Cantonese truth-tellers was 3.52, and 2.93 for English truth-tellers; ($t = 1.844$, $p = .077$, $n = 27$). In summary observers were more successful in identifying liars speaking in English than liars in their native Cantonese yet they made more mistakes identifying those telling the truth in English.

Table 1 Judgment accuracy among postgraduate observers (insert here)

Controlled behavioural cues

A major concern was that speaking in a second language might influence the observers' judgments due to an increase in 'illustrators' (expressions or body movements used to emphasise speech) displayed by those lying or telling the truth in a second language (English). A detailed behavioural analysis of these videos showed that while deceiving or telling the truth in English, participants displayed more non-verbal movements indicating nervousness and anxiety. In turn, these extra non-verbal behaviours and changes in their baseline behaviour might have caused confusion for the observers. (See Figures 1 and 2 below)

Apart from the confusion among the observers, participants in the video-taped interviews might also have been aware that their non-verbal and verbal behaviour differed while lying or telling the truth in their second language. To assess this, we asked participants whether they had attempted to control the amount of behavioural clues displayed during the interview.

The results indicated that when telling the truth in English, participants' in the video-interviews had explicitly tried to control their direct eye contact and speech hesitations as well as changes in voice pitch, whereas those speaking in Cantonese had not (see Table 2). Regardless of language conditions, Table 2 also

indicates that generally deceivers reported less control over non-verbal indicators of deception like ‘smiling and laughing’, ‘leg and foot movements’, ‘head and body movements’ and ‘micro-expressions’ (i.e. facial expressions) than did truth-tellers. Likewise, deceivers also reported less control over verbal indicators of deception such as speech hesitations and changes in voice pitch. Noticeably, lower control ratings were observed among those lying in English than among those lying in Cantonese, for a majority of the behavioural cues.

Figure 1 Behavioural indicators of deception by English and Cantonese truth-tellers (insert here)

Figure 2 Behavioural indicators of deception by English and Cantonese deceivers (insert here)

Indeed, participants were aware that their non-verbal and verbal behaviour differed when using their first and second language. The fact that verbal and non-verbal indicators of deception were less controllable when lying or telling the truth in English helps to explain the observers’ relatively better lie detection judgment accuracy with English-speaking deceivers and the lower truth detection judgment accuracy (or false-positive errors) with English-speaking truth-tellers.

Table 2 Cues relied upon in detecting deception (insert here)

Perceived reliable cues for lie detection

Although we expected that observers would apply different kinds of cues to detect deception, we found no significant differences between observers’ and deceivers’ reliability ratings of the cues they considered reliable at detecting deception (Table 3). We noticed that observers paid more attention to cues that are easily controlled, such as direct eye contact (used by 96% of observers in

making judgments), smiling and laughing (78%) and hand/arm movements (74%). Observers also relied heavily on facial ‘micro-expressions’ (used by 96% of observers), which are not as easily manipulated (Ekman, 1992). Although micro-expression was considered a useful indicator of deception, our observers were not trained specifically in facial recognition. Therefore we expect improvements in lie detection judgment accuracy when specific training in micro-expressions is offered.

Table 3 Observers’ perceived reliability and frequency ratings (insert here)

Emotions associated with deception

In this study, liars felt that they had expressed relatively more emotions resembling ‘disgust’ and ‘surprise’ than truth-tellers and this also suggests that the ‘opinion paradigm’ generated genuine emotional conflict in deceivers. (For liars the mean score for ‘disgust’ was 2.80 compared to 1.81 for truth-tellers and, the mean for ‘surprise’ was 4.13 for liars and 2.94 for truth-tellers). In a similar experiment, undergraduate observers’ were asked to rate the association between emotion and deception (see Cheng 2004), results indicated that lying was associated more with surprise and embarrassment (for surprise the mean was 4.63; $t = 7.205$, $p < .05$, $n = 79$; and for embarrassment the mean was 4.01; $t = 2.975$, $p < .05$, $n = 79$). Because deception required participants to actively generate and fabricate reasons contrary to their true opinion (i.e. rather than using passive strategies like ‘concealment’ or ‘omission’), deceivers found lying required more cognitive resources than telling the truth.

Language and cognitive resources

Observers in this study believed that ‘it is easier to tell lies and avoid being detected when speaking in Cantonese’ (mean = 5.81, $t = 8.19$, $p < .05$, $n = 27$). Regarding the interaction between cognitive load and language effects, results showed no significant mean difference across all four experimental conditions ($t = 1.509$, $df = 3$, $p > .05$, $n = 27$). However, when we combined the two language conditions (English/Cantonese), deceivers felt that ‘lying requires significantly more cognitive resources’ than did truth-tellers (6.07 was the mean for deceivers compared to 5.5 for truth-tellers; $t = 1.527$, $p < .05$, $n = 31$). When each language condition was examined separately, English and Cantonese-speaking deceivers assigned higher ratings to the cognitive load than English and Cantonese-speaking truth-tellers (for English-speaking deceivers the mean score was 6.0 compared to 6.11 for Cantonese-speaking deceivers; and 5.13 for English-speaking truth-tellers compared to 5.86 for Cantonese-speaking truth-tellers). We found further evidence of language effects by asking participants if they agreed or disagreed: ‘It is difficult to come up with reasons to support the opinion while appearing truthful/deceitful’. Results showed that deceivers experienced more reasoning difficulties while appearing truthful than truth-tellers, although results were not significant (for deceivers the mean was 4.53, compared to 3.94 for truth-tellers; $t = 1.047$, $p > .05$, $n = 31$).

The observers’ were inconsistent about the effects of language on their judgment accuracy. Thus, while observers believed that ‘it is easier to detect lies if others are speaking in Cantonese’ (mean = 4.15, $t = 2.092$, $p < .05$, $n = 27$), they also over-estimated their ability to detect lies accurately. For instance, when participants were lying in their first language (Cantonese), observers accurately

identified them 66.9 per cent of the time, but when they were lying in their second language, observers were able to identify English-speaking deceivers 73.1 per cent of the time (Table 1). These findings conform to general research in cognitive psychology that point to an ‘overconfidence’ effect in human judgment and decision-making. That is, people generally feel more confident than is warranted by measures of their actual competence (Fishchhoff et al. 1977; Koriat et al. 1980).

Observers’ confidence and occupational experience

The confidence levels of our postgraduate student observers at detecting deception dropped significantly after viewing the video interviews (from a pre-test mean of 4.7 to a post-test mean of 3.85; $t = 3.595$, $p < .05$, $n = 27$). Our analysis also showed that police and anti-corruption officers tended to have more confidence than other professions, whose ‘confidence’ ratings fell after the test. However, 85 percent of the observers had received no training in detecting deception although 60 per cent had conducted interviews with clients at work. Nevertheless, confidence scores whether before or after the test was not significantly correlated with accuracy.

Discussion

By observing and questioning our participants, it was apparent that they realised the importance of facial expressions in detecting deception. It is generally agreed that humans are capable of formulating impressions or decode other people’s emotions by looking at their faces as well as paying attention to what is said. Lying in a second language appears to alter one’s facial expression or emotions and this means that one cannot examine the question of lie detection without

taking into account the effect of the language medium and cultural factors. A better understanding of the discrepancies that arise when communicating in a second language in different cultures would lead not only to more effective communication but also to improvements in the accuracy of lie detection judgment. Second, given that the ability to decode non-verbal and verbal behaviour is amenable to learning and training rather than an innate skill, intercultural training in combination with training in lie detection or interviewing should maximise accuracy of detection judgment, within or across cultures.

Confirming our first hypothesis, non-verbal and verbal indicators of deception differed when participants were either lying or telling the truth in English rather than in Cantonese. Contrary to our expectations, observers were better at identifying English-speaking liars than Cantonese-speaking liars, so our second hypothesis was rejected. More importantly, while the observers achieved the highest judgment accuracy with English-speaking liars, they did worst at accurately judging English-speaking truth-tellers. In general, when participants were lying or telling the truth in English, they displayed more non-verbal and verbal indicators of deception than Cantonese speakers. Therefore we could not rule out the possibility that these extra body movements and paralinguistic features caused confusion for the observers. The whole process of lie detection involves identifying truthful individuals as well as deceptive ones, thus these disbelieving-the-truth mistakes, or 'false positives' that we observed are certainly as troublesome as false negatives and require further attention.

It is possible that individuals might be more self-conscious about their truthful presentations than they are outside the experimental condition thus the effect sizes of the deceptive cues they present may be underestimated. Despite the difficulties for capturing the true magnitude of the effects, we have managed to observe behavioural differences among bi-lingual Cantonese and English-speaking deceivers, the extent these differences were caused by social learning or display rules could not be fully explored or substantiated by the current methodology. Our results suggest an association between deception and emotions like surprise, disgust and embarrassment, but their universality remain uncertain, especially cross-cultural differences in display rules in the context of interrogative interviews. Apart from conducting research with bi-lingual Hong Kong Chinese, it would be instructive to examine lie detection among Mandarin-speakers who share the same ethnicity but whose display rules could vary because of the differences in social-cultural learning and behaviour. According to Kendon (1977), a listener may tailor his/her movements and linguistic behaviours to fit with those of the speaker, a process known as ‘interactional synchrony’. To address this concern over the present experiment, the interviewer was explicitly told to avoid extra non-verbal movements and to be linguistically neutral during the interview. Therefore, we effectively minimize the effect of synchronicity between the interviewer and the participants’ in this study.

English and Cantonese-speaking deceivers considered lying required significantly more cognitive resources than English and Cantonese-speaking truth-tellers and suggest an interaction between language and cognitive factors. We also observed that English-speaking deceivers to engage in more response latency and voice pitch changes than Cantonese-speaking deceivers, although the

differences are not statistically significant. Given the increase in cognitive load, the likelihood of leakages among deceivers increased, including leakages among those using a second language. . Since speaking in one's first and second language was sufficient to elicit behavioural differences among our deceivers and truth-tellers, we would expect even more differences between native English speakers (whose second language is not Cantonese) and native Cantonese speakers (whose second language is not English) undertaking similar experiments.

Another important bilingual effect we observed was the phenomenon of code-switching, which refers to the use of words from two different languages within a single discourse. This is illustrated in video-interview 5 and 17 while lying in Chinese; video-interview 12 while lying in English; and video-interview 10 when telling the truth in Chinese (Table 4):

Table 4 Video-tapes indicating Code-Switching (insert here)

According to Chan (1993), Chinese and English are commonly used and code-switching occurs daily among Hong Kong Chinese. However, regarding cognitive factors and code-switching, not until recently have psycholinguists studied the cognitive processes involved in code-switching (Grosjean 1980). According to Silva-Corvalan (1994), code-switching is one of the strategies bilinguals adopt to lighten the cognitive load of having to remember and use two different linguistic systems. Since deceivers in this study considered lying to require more cognitive resources than truth-telling, code-switching was observed among three of the deceivers (video-interviews 5, 12, 17) but only once among

truth-tellers. The extent to which code-switching helps to lessen cognitive load while lying or telling the truth requires further research.

Conclusion

This study supports reservations that lying and telling the truth in one's second language can increase non-verbal and verbal indicators, which are often associated with deception. The evidence presented here also draws attention to the likelihood of 'false positive' errors in mis-identifying truth-tellers when communicating in a second language. However, the extent to which observers attribute these extra non-verbal cues either to the communicator's intention to deceive, to nervousness, or to inability to express the second language is uncertain. DePaulo et al. (2003) recent meta-analysis of the deception detection literature pointed towards the divergence of behaviour associated with lying and difficulties to discriminate behaviours that might be indicative of deceit.

However, scientific search for behavioral cues continues to demonstrate the possibility of different non-verbal and verbal cues occurred during deceptive and truthful communication. Since the meaning of non-verbal behaviour also depends on the language that it accompanies (Lee & Beattie 1998) or the fluency of the speaker, interrogators should be more cautious in assessing deception when interviewing second language users, especially when they observe an increase in behavioural indicators.

Language and culture researchers would agree that most individuals in the world are bi- or multi-lingual (Bialystok, 2001; Schreuder & Weltens, 1993). The current study has partly explored the relationships between language and deception detection. We learned that increases in certain behavioural indicators

can help distinguish truthful from deceptive individuals. Based on the observation that lying requires more cognitive resources than telling the truth, lies could become transparent via verbal or non-verbal behavioural leakages. The demand for urgent improvements in the accuracy of deception detection and the application of lie detection research to real-life settings is considerable. Although there are difficulties with cross-cultural examinations (cultural differences are often hard to define and measure), the influence of cultural characteristics associated with lie detection remains an important area to examine in a world in which cross-border, dual language and cross-culture investigation is increasingly common.

Notes

¹ HKU Wise News Database, Ming Po Editorial, Immigration Department should improve its procedure (February 26, 2001), Retrieved 28 May 2004 from <http://80-libwisearch.wisers.net.epoxy.lib.hku.hk/?gid=HKU&user=ipaccess&pwd=ipaccess>

² Around 2600-3000 or 7 per cent of offenders arrested per annum in Hong Kong are foreign nationals whose first language is not Cantonese and consequently where a language difficulty may arise.

³ Hong Kong law enforcement has in recent years attended lie detection courses such as the Advanced Interview Courses of the Kent Constabulary and Royal Canadian Mounted Police. HKP detective school instructors, other police, immigration, correctional and anti-corruption officers have also attended an 'Analytical Interviewing Course' offered by the University of Hong Kong based on the facial expression work of Paul Ekman and colleagues.

⁴ Questions asked by the interviewer to establish rapport: Hello, I'm X, what is your name? Which faculty are you from? Are you a second or third year student? Alright, I'm now going to ask you several questions about your opinion, are you ready?

⁵ Note: $t = t$ test; n = number of subjects, df = degrees of freedom and p = significance over or below the 95 % confidence interval.

References

- Bialystok, E., (2001). *Bilingualism in development: Language, literacy, and cognition*. Cambridge, UK: Cambridge University Press.
- Bond, M. H., & Lai, T. (1986). Embarrassment and code-switching into a second language. *Journal of Social Psychology*, 126, 179-186.
- Chan, H.K. (1993), 'Code-mixing in Hong Kong Cantonese-English bilinguals: Constraints and processes', *CUHK papers in Linguistics*, 4: 1–24.
- Cheng, Keens. (2004). 'Detection of Deception among Hong Kong Chinese' M.Phil thesis, University of Hong Kong.
- Darwin, Charles. (1982, 1872). 'Chapter 13: Self-Attention, Shame, Shyness, Modesty; Blushing', In *The Expression of the Emotions in Man and Animals*, New York: D. Appleton & Co., pp. 309–46.
- DePaulo, B.M., & R.L. Pfeiffer. (1986). 'On the job experience and skill at detecting deception', *Journal of Applied Social Psychology*, 16: 249–67.
- DePaulo, B.M., & Malone, B.E. & Lindsay, J.J. & Muhlenbruck L. & Charlton K. & Cooper H. (2003) 'Cues to Deception' *Psychological Bulletin*, Vol. 129, No. 1, pp. 74-118.
- Desforges, D., & T. Lee. (1995). 'Detecting deception is not as easy as it seems', *Teaching of Psychology*, 22(2): 128–30.
- Dickey, E., & F. Knower. (1941). 'A note on some ethnological differences in recognition of simulated expressions of the emotions', *American Journal of Sociology*, 47: 190–3.
- Ekman, P. (1972). 'Universals and cultural differences in facial expressions of emotions'. In J. Cole (ed.), *Nebraska Symposium on Motivation*, Lincoln: University of Nebraska Press, pp. 207–83.

-
- Ekman, P. (1992). 'An argument for basic emotions', *Cognition and Emotion*, 6: 169–200.
- Ekman, P. (1999). Facial Expressions. In T. Dalgleish & M. Power, *Handbook of Cognition and Emotion*, New York: John Wiley & Sons Ltd.
- Ekman, P., & W.V. Friesen. (1969). 'Non verbal leakage and clues to deception', *Psychiatry*, 32: 88–106.
- Ekman, P., & W. Friesen. (1975). *Unmasking the Face*, Englewood Cliffs NJ: Prentice-Hall.
- Ekman, P., & W.V. Friesen. (1978). *The Facial Action Coding System*, Palo Alto CA: Consulting Psychologist Press.
- Ekman, P., & M. O'Sullivan. (1991). 'Who can catch a liar?' *American Psychologist*, 46(9): 913–20.
- Ekman P., W.V. Friesen & M. O'Sullivan. (1988). 'Smiles when lying', *Journal of Personality Social Psychology*, 54: 414–20.
- Ekman, P., M. O'Sullivan, W.V. Friesen & K. Scherer. (1991). 'Face, voice, and body in detecting deceit', *Journal of Nonverbal Behavior*, 15: 125–35.
- Fishhoff, B., P. Slovic & S. Lichtenstein. (1977). 'Knowing with certainty: The appropriateness of extreme confidence', *Journal of Experimental Psychology: Human Perception and Performance* 3: 552–64.
- Frank, M.G., & P. Ekman. (1997). 'The ability to detect deceit generalizes across different types of high-stake lies', *Journal of Personality and Social Psychology*, 72(6): 1429–39.
- Friedman, H.S., & J.S. Tucker. (1990). 'Language and deception'. In H. Giles & W.P. Robinson (eds), *Handbook of Language and Social Psychology*, New York: Wiley & Sons.

-
- Friesen, W. V. (1972). Cultural differences in facial expressions in a social situation: An experimental test of the concept of display rules. Unpublished doctoral dissertation, University of California, San Francisco.
- Grosjean, F. (1980). *Life with Two Languages: An introduction to bilingualism*, Cambridge MA: Harvard University Press.
- Hall, E. (1979). 'Cultural models in transcultural communication'. In A. Wolfgang (ed.), *Nonverbal Behavior: Applications and cultural implications*, New York: Academic Press, pp. 11–17.
- Hochschild, A. (1979). 'Emotion work, feeling rules, and social structure', *American Journal of Sociology*, 85: 551–75.
- Hochschild, A. (1983). *The Managed Heart*, Berkeley and Los Angeles: University of California Press.
- Joy, S. & Casmir, F.L. (1998). 'The impact of culture-sameness, gender, foreign travel, and academic background on the ability to interpret facial expression of emotion in others', *Communication Quarterly*, University Park, Spring 1998: 214–27.
- Kendon A. (1977). *Studies in the Behaviour of Social Interaction*. Indiana University: Bloomington, IN.
- Klineberg, Otto. (1938). 'Culture and emotional expression', *Journal of Abnormal and Social Psychology*, 33: 517–19.
- Koriat, A., S. Lichtenstein & B. Fischhoff. (1980). 'Reasons for confidence', *Journal of Experimental Psychology: Human Learning and Memory*, 6: 107–18.
- Landis, C. (1924). 'Studies of emotional reactions: II. General behavior and facial expression', *Journal of Comparative Psychology*, 4: 227–509.
- Lee, V., & G. Beattie. (1998). 'The rhetorical organization of verbal and non-verbal behavior in emotion talk', *Semiotics*, 120: 39–92.

-
- Matsumoto, D. (1990). 'Cultural similarities and differences in display rules. *Motivation and Emotion*', 14, 195-214.
- Matsumoto, D. (1996). *Emotion and culture: New developments and new challenges*. *Review of Emotion and Culture*, edited by Shinobu Kitayama and Hazel Markus. Washington, DC: American Psychological Association. 385: pp. ISBN 1-56798-224-4. *World Psychology*, 2, 248-249.
- Matsumoto, D. (2001). 'Emotion in Asia: Linking theories and data around the world, Introduction to the special issue on emotion', *Asian Journal of Social Psychology*, 4: 163-4.
- Matsumoto, D. (2001). 'Culture and Emotion'. In D. Matsumoto (ed.), *The Handbook of Culture and Psychology*, New York: Oxford University Press.
- Matsumoto, D., & P. Ekman. (1989). 'American-Japanese cultural differences in intensity ratings of facial expressions of emotion', *Motivation and Emotion*, 13: 143-57.
- National Research Council, (2003). *The Polygraph and Lie Detection*, Washington: The National Academies Press.
- Russell, J.A. (1994). 'Is there universal recognition of emotion from facial expression? A review of the cross-cultural studies', *Psychological Bulletin*, 115: 102-41.
- Silva-Corvalan, C. (1994). *Language Contact and Change: Spanish in Los Angeles*, Oxford: Clarendon Press.
- Swenson, J., & F.L. Casmir. (1998). 'The impact of culture-sameness, gender, foreign travel, and academic background on the ability to interpret facial expression of emotion in others', *Communication Quarterly*, University Park, Spring 1998: 214-27.

-
- Toshiki S., Toshiyuki S., Daiga H., & W.T Siu. (1999). 'Misinterpretation of facial expression: A cross-cultural study', *Psychiatry and Clinical Neurosciences*, 53: Issue 1, pp. 1-45.
- Thoits, P. (1984). 'Stress, coping, social support and psychological outcomes: Emotional process'. In G. Lindzey & E. Aronson (eds), *Review of Personality and Social Psychology*, vol. 5, Beverly Hills: Sage, pp. 219–38.
- Vinacke, W., & R. Fong. (1955). 'The judgment of facial expressions by three national-racial groups in Hawaii: Caucasian faces', *Journal of Personality*, 17: 407–29.
- Vrij, A. (1996). 'Lie expert's beliefs about nonverbal indicators of deception', *Journal of Nonverbal Behavior*, 20(1): 65–80.
- Vrij, A. (2000). *Detecting Lies and Deceit: The psychology of lying and the implications for professional practice*, Chicester: Wiley.
- Vrij A., & F. Winkel. (1993). 'Objective and subjective indicators of deception', *Issues in Criminology and Legal Psychology*, 20: 51–7.
- Wallbott, H.G., (1998). 'Bodily expression of emotion', *European Journal of Social Psychology*, 28: 879–96
- Zuckerman, M., B. DePaulo & R. Rosenthal. (1981). 'Verbal and Non-verbal communication of deception'. In L. Berkowitz (ed.), *Advances in Experimental Social Psychology*, vol. 14, New York: Academic Press, pp. 1–59.

Appendix Attitudinal Questions

Video-interview subjects (participants) and observers were asked in addition to demographic details the following principal attitudinal questions. Responses were recorded using a seven-point Likert scale and an asterisk (*) denotes questions applicable only to participants.

To examine the reliability of behavioral clues at detecting deception, we asked all subjects the following question: To what extent do you think the following are reliable clues to detecting deceit? (1 = Very Unreliable, 7 = Very Reliable)

The amount of eye contacts
The amount of smiling and laughing
The number of head movements
The number of trunk movements
The number of hand and arm movements
The number of leg and foot movements
The number of speech disturbances
Changes in small facial expressions (i.e. micro-expressions)
Changes in pitch of voice

All subjects were asked to rate (1 = Very Poor, 7 = Very Well) their confidence at detecting deception or lying as measured by the following:

How good do you think you are being able to tell if another person is lying?
After viewing all the video segments, how good do you think you are in being able to tell if another person is lying?
*I believe I have successfully deceived the interviewer in this experiment
Lying

In addition possible training and language effects were examined via the following questions (1 = Definitely Disagree, 7 = Definitely Agree):

*If I have received training related to detection of deception, my ability to lie will improve significantly
*I have showed expressions of fear while lying/telling the truth
*I have showed expressions of surprise while lying/telling the truth
Lying requires more cognitive resources than telling the truth
It is difficult to come up with reasons to support the opinion I agree/disagree while appearing truthful (answer according to experimental condition)
It is easier to detect lies if an individual is speaking in your mother tongue (Cantonese) rather than in your second language (English)
It is easier to tell lies if an individual is speaking in your mother tongue rather than in your second language
In my opinion, deceptive statements are less detail than truthful statements

Table 1 Judgment accuracy among postgraduate observers

Condition	video- interview	Mean (%) n= 27	S.D.	S.E.	Minimum (% correct)	Maximum (% correct)
English (truth)	5	63.84	13.478	6.0277	50.0	76.9
Cantonese (truth)	5	70.78	16.238	7.2621	50.0	88.5
English (lying)	5	73.08	14.166	6.3353	61.5	88.5
Cantonese (lying)	5	66.94	21.854	9.7736	30.8	88.5
Total	20	68.35	15.804	3.5339	30.8	88.5

Table 2 Cues relied upon in detecting deception

Cues	Cantonese (lying %) n = 5	English (lying %) n = 5	Cantonese (truth %) n = 5	English (truth %) n = 5
Direct eye contacts	80	80	80	100
Hand and arm movements	60	60	40	60
Smile and laugh	40	0	40	40
Leg and foot movements	20	20	40	40
Speech disturbances	40	20	100	40
Upper body movements	80	20	40	20
Changes in pitch of voice	40	60	60	100
Head movements	20	20	40	60
Micro-expressions	40	40	80	80

Question: 'As an interviewee, do you think you've controlled the followings during the opinion test?' (i.e. control the amount of direct eye contact) Answer: Yes/No response.

Table 3 Observers' perceived reliability and frequency ratings

	Observers' reliability ratings (n = 27)	% of observers using cue to judge	English & Cantonese deceivers' reliability ratings (n = 10)
Direct eye contacts	5.52	96.3	5.33
Hand and arm movements	4.41	74.0	4.53
Smile and laugh	4.44	77.8	3.73
Leg and foot movements	4.41	56.0	4.40
Speech disturbances	5.26	93.0	3.93
Upper body movements	4.30	70.0	4.33
Changes in pitch of voice	5.37	81.0	5.40
Head movements	4.26	63.0	4.13
Micro-expressions	5.48	96.0	5.67

Questions: 'To what extent do you think the followings are reliable cues to detecting deceit?' (1 = Very Unreliable, 7 = Very Reliable). Deceivers' ratings: 'If you are the interviewer looking for the truth, do you think the following are reliable cues to detecting deceit?' (1 = Very Unreliable, 7 = Very Reliable).

Table 4 Video-tapes indicating Code-Switching

video-interview number	Condition	Opinion
video-interview 5	Lying in Chinese	Jik hai jung san kam kum <i>instead of eh...seng yang la</i> (Well life imprisonment instead of eh...eh death penalty)
<i>Translation</i>		
video-interview 17	Lying in Chinese	Gum tung mai ngho kok dak eh..kou d yan yin koi hai <i>deserve fan qui dei zhou gei yah lor...kui dei yin koi sau dou mau yi d jing fag hui...pin wai kui dei gei consequences</i> (And I felt eh...people should deserve what they did...they should receive some form of punishment for...to become their consequence)
<i>Translation</i>		
video-interview 12	Lying in English	Joi hak chok yung....jik hai...em... <i>there will be er...some</i> (Deterrent effects...meaning...em...there will be er...some)
<i>Translation</i>		
video-interview 10	Truth-telling in Chinese	Tung mai dai sam ngho kok dak <i>during</i> kui shou kam kou goh <i>process</i> hai jan hai lin tou kui jan wui hai fan sang kui zhou kwo gei yeh (And thirdly I felt during their imprisonment the process would make him really do some self-reflections to what they've done)
<i>Translation</i>		

Note: ping ying or the romanisation of Chinese script is used here to provide a phonetic translation of Cantonese.

Figure 1 Behavioural indicators of deception by English and Cantonese truth-tellers

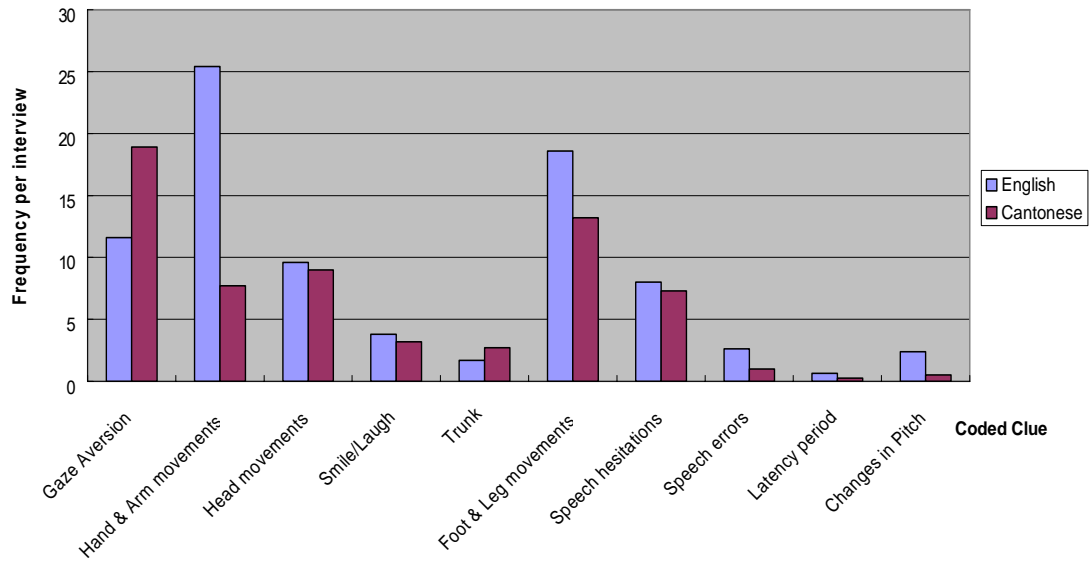


Figure 2 Behavioural indicators of deception by English and Cantonese deceivers

