



DECEPTICON 2015

Decepticon: International Conference on Deceptive Behavior

Welcome to Cambridge! We are very pleased to present to you the first edition of Decepticon, a conference that brings together researchers, students, and practitioners from different disciplines who all have one thing in common: their interest in deception. This interest may be from an interviewing perspective and focused at detecting deceit, or you may be more interested in the prevention of dishonest behavior. For others, learning how to deceive effectively might be the main aim of attending this event. Whatever your initial reason was to attend this conference, we hope that the wide variety of topics and disciplines will surprise and interest you, and that we will all leave Cambridge inspired and a bit more interdisciplinary oriented than we arrived.

Together with a great scientific committee, and thanks to the large amount of high quality submissions we received, we have assembled a program that hopefully covers all those different angles of deception. We organised two special panel sessions in which prominent researchers will present their views on pressing topics in the world of deception research. In the first panel session, Aldert Vrij, Dan Ariely, Steve Porter, and Timothy Levine will discuss the future directions of deception research. In the second panel session, Jeff Hancock, Judee Burgoon, Bruno Verschuere, and Giorgio Ganis will be covering new developments in technology assisted lie detection. And in addition to the academic program, we have also organised two practical sessions. Martin S Taylor will discuss whether it counts as deception when we know – or even want to – be deceived, and he will demonstrate during the conference Banquet at King's College how suggestion and magic can be used for this purpose. Last, pickpocket expert Bob Arno will talk about the latest tools and techniques to spot sophisticated diversion thieves before they steal your pin code or password.

We hope you will enjoy the conference!

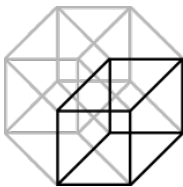
Yours sincerely,
The Decepticon Team

Sunday 23rd of August
Churchill College
Storey's Way
Cambridge

Welcome Reception
17.00-19.00

Surprise Act at 18.00

Thanks to:



CRYPTOMATHIC

Monday 24th of August
William Gates Building
15 JJ Thomson Avenue
Cambridge

Conference opening by Ross Anderson & Sophie Van Der Zee
Monday 24th of August, 9.00-09.10

Symposium 1: High Stakes Lies
Monday 24th of August, 9.10-10.30

Expression and Deception

Mark Frank*, Elena Svetieva, Carolyn Hurley, Sinuk Kang, Malgorzata Pazian

Scientists have examined the behaviors associated with lying through a variety of experimental situations, ranging from polite lies to lies told by actual criminals under interrogation. The behaviors that are manifested under these situations are typically those related to cognitive effort, memory recall, emotional reaction, or attempts to control these behaviors. This presentation will discuss the results of a study that examined facial clues to deception in a situation patterned after a high stake deception situation associated with terrorism, with participants incentivized by high stakes involving punishment and reward for not only themselves but for their rival groups, a choice whether to lie, and in a context in which professional interrogators asked them questions. The facial expressions of emotion were analyzed not only as a change in baseline, but also in terms of whether they were discrepant with other behavioral aspects of the account. An analysis 132 participants revealed that liars and truth tellers could be discriminated at 75% accuracy based solely on facial expression of negative emotion. Approximately 40% of these negative emotions were less than 500ms in duration. Moreover, when asked for their strategies to convince the interrogator of their truthfulness, truthful participants who admitted they attempted to conceal their facial expressions reduced their rate of negative emotion facial expressions, whereas deceptive participants showed the same rate of negative facial expressions regardless whether they admitted trying to conceal their expressions. Finally undergraduate judges actually were less accurate distinguishing liars from truth tellers in those participant clips that contained those negative emotion facial clues. These data suggest higher levels of lie detection from behavior than normally shown in the research literature, but that these clues are quick, manifest despite efforts to conceal them, and missed by most observers.

‘Please Come Home, I Miss You’ (But Killed You): Verbal Analysis of Genuine and Deceptive Television ‘Missing or Murdered Relatives’ Cases

Magdalene Ng*

Narratives of 39 high-stakes television appeals cases from the UK, USA, Canada, Australia and New Zealand were explored to establish honest and deceptive appeal cues. 33 variables were constructed from these narratives and analysed using Smallest Space Analysis. Results revealed different patterns of frequencies for genuine and false appellers. These narrative content differences can be attributed to underlying psychological and social preoccupations of these appellers. New verbal cues to honesty and deception were discovered; genuine appellers are significantly more likely to take an Active stance in their appeals, to cooperate with their community, more likely to express their emotions or mental state, to talk about the victim in the present tense, whether they are missing or dead and adhere to higher agencies. Supporting previous research, they are more likely to express hope, and to be more emotionally positive. False appellers are significantly more likely to divulge that they were present at or close to the time of event when their relative went missing or died, to verbally repudiate that they have killed their relative or been in any way culpable, and declare the infamous ‘I didn’t do it’, and state conditional clauses regarding victim. To the best of the current researchers’ knowledge, none of these deceptive cues have been previously detected in a high stakes sample within the context of television appeals. Genuine appellers appear to have more of a narrative structure or a set of structures, whereas false appellers do not rely on a typical narrative structure other than to remain Passive (88.2%) in their appeal narratives. Variables that never occur for both groups are also of note. For Genuine cases, variables that never occur (% frequency) are swearing, conditional clauses regarding victim, helplessness, ‘somebody must be scared or guilty’, and ‘I didn’t do it’. For False cases, the variables that never occur are mention of religion, hope, miss and imagining the victim. Correspondence to grief theories, loss responses and malingering is further discussed.

Prevalence, Detection and Prevention of Deception in Scientific Communication – The Case of Psychology

Armin Günther*

In recent years, deception in scientific communication has attracted considerable attention within and beyond the general scientific community. But despite this rise of public awareness and its major significance for confidence in and support for science, deception in academia still seems to be a somewhat neglected area within the community of experts in deception research. Thus, the presentation aims to point deception researchers to this highly relevant and important field of inquiry. In the case of psychology the Diederik Stapel incident served as a

wake-up call, alerting the discipline about an issue that might reach far beyond the deviant behavior of some individuals faking science. What is the impact of research cultures, institutional structures and social practices in research and scholarly communication on fostering or preventing deceptive behavior in scientific research? Is there an increase of scientific misconduct? How common are minor deviations from the standards of good scientific practice below the threshold of outright fraud ('questionable research practices'). Starting with a summary of basic research questions framing the discussion and relevant empirical findings, the presentation discusses prevalence, detection and prevention of deception in scientific communication for the case of psychology. New data will be presented showing the development of retractions of published research articles in psychology. Focusing on retractions attributable to deceptive and fraudulent behavior, the presentation will discuss whether the development of such retractions during the last decades reflects an increase of scientific misconduct in psychology. Additionally, possible causes for such a development are looked into. Finally, measures that might help to detect and prevent deception in scientific communication – such as new standards and infrastructures for the communication of research data – are examined.

Linguistic Synchronization in Criminal Interviews

Matthew Jensen*, Norah Dunbar, Debra Tower

Unaided individuals identify deception at a rate only slightly greater than chance because there are few reliably diagnostic nonverbal cues to deception. Additionally, contextual factors (e.g., question type, power distribution, and expressed dominance) can cloud manifestations of deception in nonverbal behavior. Therefore, researchers have begun to investigate patterns of behavior in an effort to improve detection beyond gestalt judgements or judgments based solely on nonverbal cues. In continuation of this effort, we investigate linguistic synchrony and its relationship to deception. Using notions of interpersonal adaptation and linguistic style matching, we hypothesize that the way an interviewer and interviewee synchronize their linguistic behavior will be different for deceptive interactions as compared to truthful ones. To test this hypothesis, we performed a series of experiments wherein we used Linguistic Inquiry and Word Count (LIWC) to extract linguistic features of interviewer and interviewee statements. The features were summarized into categories of affect, cognitive mechanism, perception, social, biological, and relative words. Using a sliding window of 20 paired interviewer-interviewee statements, we calculated a moving product-moment correlation to gauge the level of linguistic synchrony for each category of words throughout the interview. We piloted this technique on transcriptions from 11 criminal interviews that were publically available on YouTube. We tested the technique on 14 transcribed criminal interviews from a police department (Experiment 1) and 37 transcribed pre-polygraph criminal

interviews (Experiment 2). We used general linear models to detect differences between truthful and deceptive interviewees. Results from Experiment 1 revealed differences in synchrony between deceptive and truthful interviewees for affect and cognitive mechanism words. Results from Experiment 2 revealed significant differences between deceptive and truthful interviewees for cognitive mechanism and biological words. Experiment 2 also revealed a prominent effect of question type on synchrony. Combined results illustrated volatile synchronization patterns across interviews.

Symposium 2: Automated Lie Detection

Monday 24th of August, 11.00-12.30

Body of Lies: Unobtrusively Measuring Deceptive Behaviour in Real Time

Sophie Van Der Zee*, Ronald Poppe, Ramsey Faragher*, Paul Taylor, Ross Anderson

Recently, we demonstrated that motion-capture equipment can accurately measure differences in absolute full-body movement between truth tellers and liars (Van Der Zee, Poppe, Taylor, & Anderson, 2015). Liars moved more across all limbs than truth tellers did, and this effect became larger when combined with cognitive load-inducing interviewing techniques such as reverse-order questioning. To determine how much participants moved, we used full-body motion-capture suits because they are currently the most accurate way to measure movement. This novel methodology significantly outperformed human detection accuracy. However, expecting suspects to wear such suits during routine police interviews is impractical. This is problematic because the detection of deception is a research topic with high real-world value. Therefore, we are currently developing our motion-based lie detection research in two different ways. First, we are investigating if we can unobtrusively measure movements indicative of deceit without loss of accuracy. To this end, we are currently gathering data with a new test bed of sensors including depth-sensitive infra-red cameras and ultra-wideband radars. If successful, this technology will increase the practical applicability of motion-based lie detection. Cheaper technological alternatives will also lower the barrier for other research labs to start experimenting. Second, although understanding behavioural differences between truth tellers and liars is interesting from a theoretical point of view, it is only usable in practice if it is hard to imitate truthful behavior. Therefore, we are investigating whether our methodology is prone to the use of countermeasures. Both exploring unobtrusive measurements and investigating countermeasures strategies will provide a better insight into the ecological validity of our research and can help close the gap between research and practice.

From Lab to Field: The Evolution of the AVATAR for Credibility Assessment

Jay Nunamaker*, Elyse Golob, Aaron Elkins, Judee Burgoon, Douglas Derrick

Every day, millions of people cross international borders at air, land and sea ports of entry, with steady growth projected. This constant stream of passengers brings never-ending challenges to border agencies. Officers must screen all travelers while ensuring the flow of legitimate travel and trade, yet there is no surefire method (“Pinocchio’s nose”) to detect imposters, false documents, or contraband. If not based on relevant facts, an officer’s assessment of an individual may be inaccurate, arbitrary, ineffective, or discriminatory (“gut feeling”). A “one-size-fits-all” screening approach would create long queues, inconvenience, and high costs. Alternatively, scaled-down checks may permit entry to dangerous persons. A risk-segmentation approach, such as a trusted traveler program, affords expedited entry to low-risk individuals. Although these programs are becoming more popular, many who may qualify do not enroll due to fees, lack of knowledge, or infrequent travel schedules. The Automated Virtual Agent for Truth Assessment in Real-time (AVATAR) is designed to address these limitations. It conducts primary and secondary screenings using an array of non-invasive sensors to assess credibility, and verify identity and documents while ensuring individual privacy. These data are fused and analyzed to provide officers with a real-time risk score to determine if further investigation is warranted. The AVATAR acts as a “force multiplier,” reducing officer workload while identifying potential threats and providing risk assessments. This paper describes the evolution of the AVATAR system from the laboratory to the field, including scientific foundation, experiments and pilot. These include two U.S. field tests: Trusted Traveler Program in Nogales, Arizona and Airport Pre-boarding Primary and Secondary Screening at Reagan Airport, Washington DC. It also discusses several workshops and experiments conducted with Frontex, the European Union border security agency, culminating in a field test at Henri Coandă International Airport Passport Control in Bucharest, Romania.

Effects of Motivation and Modality on Nonverbal and Verbal Behaviors and Detection Accuracy: Performance Impairment or Facilitation?

Judee Burgoon*, Pete Blair, Lauren Hamel, Nathan Twyman

The motivation impairment effect (MIE) claims that motivation makes deception more detectable when judges have access to nonverbal modalities but less detectable when they have access only to verbal ones. However, the actual relationship of motivation to sender behavior has not been tested within the MIE paradigm, which requires judges detecting motivated (or unmotivated) deception under different modalities. Interpersonal deception theory (IDT) argues that

motivation benefits deceivers, prompting strategic behavioral control that enables evasion of detection under both nonverbal and verbal modalities. A mock theft experiment was undertaken to pit these two alternative theories against one another and to test the explanatory mechanisms of arousal, negative affect, cognitive effort and strategic control. Participants (N = 186) either “stole” a wallet from a classroom or were witness to the theft and received a high or low motivation induction (including monetary incentives) to be judged truthful and innocent of the theft by trained interviewers. Interviews were conducted under one of three modalities—face-to-face, audio, or text chat. Actual nonverbal and verbal behaviors were measured, as were judge accuracy. Deceivers reported higher motivation, negative arousal, and cognitive effort, but also more behavioral control than truth-tellers, especially in nonverbal modalities. Contrary to the MIE and consistent with IDT’s strategic communication perspective, they also generally evaded detection (only 47% were judged guilty), especially when motivated. Detection of guilt was poor under all but low-incentive text and low-incentive FtF conditions. Linguistic, kinesic and vocalic behaviors revealed that deception, modality and motivation all influenced performance, with high motivation often having more influence on truth tellers than deceivers and having beneficial effects.

Utilising Motion Capture Technology to Identify Nonverbal Indicators of Trust Judgements

Steven Watson*, Stacey Conchie, Paul Taylor, Ronald Poppe

Social interaction is governed by perceptions and beliefs that occur outside of conscious awareness. One such set of beliefs relate to another person’s trustworthiness. Indirect evidence suggests that unconscious trustworthiness beliefs about others manifest in a person’s nonverbal behaviour. We use motion capture technology to test this idea. Using a simulated military interview scenario, forty participants were required to interview six ‘citizens’ (i.e., confederates) to establish if they held information about a fictional illegal activity. We varied citizen trustworthiness based on the two factors of cooperativeness (cooperative vs. non-cooperative) and the knowledge they held about the activity (true vs. absent vs. false). While interviewing citizens, participants wore an Xsens motion capture suit. Following the interviews, they provided explicit trust judgments about each citizen. A mixed linear effects model in which cooperation and knowledge were repeated measures, and order of interviewing was a random effect, revealed greater body movement when interviewing non-cooperative citizens. Participants also showed more body movement when interviewing citizens with no knowledge compared to those with knowledge. By contrast, greater explicit judgements of trustworthiness were only associated with cooperative over non-cooperative citizens and not the type of knowledge citizens held. Our findings support the notion that

judgements about another's trustworthiness may manifest nonverbally. This is consistent with Van Der Zee's research showing that liars move more than truth tellers. Our results suggest that interviewers react to this presentation in a way that, if captured using high-fidelity technology, can distinguish those with deceptive intent. Critically, movement went beyond explicit judgements alone because it distinguished those deceiving from those who were simply uncooperative.

Special Panel Session: Future Directions in Deception Research

Monday 24th of August, 13.15-15.00

Hosted by Nicholas Humphrey

Speakers:

Aldert Vrij

Dan Ariely

Stephen Porter

Timothy Levine

Special Practical Session: Where Magic Lies by Martin S. Taylor

Monday 24th of August, 15.30-15.50

Symposium 3: Interview Techniques and Tool Development

Monday 24th of August, 15.50-17.00

Applying the Verifiability Approach and the Components of Human Memory to the Detection of Deception in Alibi Witness Situations

Zarah Vernham*, Aldert Vrij, Galit Nahari, Sharon Leal, Samantha Mann

The application of alibi witness scenarios to the detection of deception has been overlooked, yet alibi witnesses are common in police investigations. An alibi witness (often referred to as a person corroborator) is defined as someone who can provide an account of the whereabouts of a suspect at a location other than the crime scene at the time the crime took place. The present experiment applies the verifiability approach and components of human memory to the detection of deception in alibi witness situations. Truth-telling pairs completed a mission around a park together, whereas lying pairs were separated so that one individual completed the mission around the park alone and the other individual committed a mock crime. All pairs were questioned about their activities and whereabouts at the time the crime took place, first on their own then together as

a pair. It was found that compared to lying pairs, truth-telling pairs automatically provided more checkable details that demonstrated they were together. Conversely, in comparison with truth-telling pairs, lying pairs provided more uncheckable details. Additionally, an interaction effect showed that the collective statements allowed truth-telling pairs only to provide significantly more checkable details that demonstrated they were together in comparison to the individual statements. When the individual and collective statements were compared for memory consistency and distortion, liars repeated significantly more uncheckable details whereas truth-tellers omitted and committed more checkable details. The implications of the findings are discussed.

The Effect of Unconscious Priming on Cues to Deception

Beth Richardson*, Paul Taylor, John Marsh

Literature suggests that deceptive and genuine statements differ in their content. However, this fails to consider external language processes and how these may impact deceptive statements. Two experimental studies examine whether or not linguistic priming a) is adopted unconsciously when participants fabricate a story and b) can cause liars to respond more like truth tellers during interview. In Study 1, participants (N = 44), were asked to both describe a genuine experience and to fabricate an event. During both conditions, irrelevant speech was present in the background. In Study 2, participants (N = 80) completed two tasks with a confederate. The second task required them to cheat to succeed. Under interview, interviewee's were primed by variations in interviewer's question construction, which emphasized personal pronouns, affect, cognitive mechanisms, or negations. Analyses revealed an effect of unconscious language priming, particularly for liars. Results are discussed in terms of impact on judgments of veracity, such as Criteria Based Content Analysis.

Detecting Malingering: An Evaluation of a New Tool to Aid Judgements of Credibility in the Medico-Legal Setting

Lucy Akehurst*, Simon Easton

Clinical psychologists and other health professionals are often requested to act as expert witnesses in Court. They are required to assess, and report upon, the reliability of the accounts of physical and psychological symptoms made by their clients. This study investigated the effectiveness of a checklist drawing upon relevant literature on lying and malingering to aid the detection of exaggeration of physical and psychological symptoms. Sixty-four participants were cast as interviewers and assigned to either a 'checklist' or 'no checklist' condition. Another 64 volunteers were assigned to either a 'truth teller' or 'malingerer' role and, after undergoing a cold pressor procedure, were interviewed about their experience. The interviewers with a checklist drawn

from the literature were asked to rate the presence of 28 checklist items on 5-point Likert scales and to indicate whether or not they believed their interviewee was truthful or exaggerating his/her symptoms. The interviewers without the checklist were asked to simply indicate whether their interviewee was truthful or exaggerating. Evaluators who were not given the checklist did not classify their interviewees at a level significantly better than chance. Those using the checklist achieved an overall hit rate of 70% (75% for truthful accounts and 66% for exaggerated accounts of symptoms). Signal detection analysis supported the finding that those with the checklist showed greater discriminability. Eight checklist items significantly discriminated between truth tellers and malingerers. Furthermore the total checklist score was significantly higher for exaggerated accounts than for truthful accounts. Results suggest that a checklist based on the literatures into lying and malingering warrants further investigation. Such a tool would be useful as an aid for expert witnesses called to provide informed opinion on the likelihood that a claimant is exaggerating, malingering or otherwise misrepresenting difficulties.

Poster Session 1

Monday 24th of August, 17.00-18.00

Thanks to:

The logo for THALES is displayed in a bold, dark blue, sans-serif font. The letter 'A' is stylized with a light blue circle at its base.

The Necessary Accord of Word With Deed: Honesty across Eight Countries David Hugh-Jones*

The honesty of residents of eight countries was measured in three ways: by the standard coin flip experimental paradigm, by a new experiment designed to resemble a test with the possibility of cheating, and by a questionnaire on integrity. I report findings on the differences in honesty across societies, and on the accuracy of respondents' beliefs about different societies' honesty levels. I also examine different methods of measuring honesty. While the coin flip paradigm successfully predicted cheating in the test, answers from the questionnaire did not correlate, or correlated in the wrong direction, with the two experimental measures.

The Importance of Being Earnestly Grieving: Uncovering Emotive Truth Bias and the Mediating Role of Absorption in Missing or Murdered Relatives' Television Appeal Cases

Magdalene Ng*

Research on grief has shown that participants view levels and types of griever's emotional expression as important, and favour certain styles of grief coping. Public expectations and assumptions of grieving have never been tested in a high stakes forensic context. The main aim of this study is to uncover how both emotionally charged and emotionally deprived television appeals of missing or murdered relatives' cases impact upon judgments of appellant veracity by the common observer. Two highly emotional appeals and two low emotional appeals were selected for this study. A highly emotional appeal was classified as appellants crying with salient physical, emotional or behavioural symptoms which include heavy crying, fear, shortness of breath, anxiety and distress. A low emotional appeal was categorized as absence of crying, coupled with the lack of salient cues of anxiety and distress. There was a 77.8% accuracy rate for the highly emotional appeals and 25.4% accuracy for low-level emotional appeals. Most participants in this sample favoured appellants who exhibited stereotypical salient physical and emotional symptoms of acute grief, sustaining the emotive truth bias hypothesis where the narrative emotional content is used as a cue to judge the veracity of the story. Further bootstrapped path analysis reveals a mediatory model effect between level of emotionality, absorption and character identification with the appellant, and final assignments of guilt or innocence towards appellant.

Using EEG to Detect Eyewitness Deception

Julia Shaw*, Calum Jones

Objectives: This study examines whether the p300 event-related potential can be used to detect deception in individuals who are actively trying to conceal their recognition of faces in a mock eyewitness line-up. This research builds on a general shift in the literature, which has largely discredited the polygraph and turned research efforts towards other potential biological indicators of deception. **Design:** This is a repeated measures, within-subjects, experimental design. Participant responses on the P300 for a deceptive and a truthful condition are compared, as measured by an Electroencephalograph (EEG). The design was selected because it has been successfully applied in a very similar legal context by LeFebvre and colleagues (2009). **Methods:** The present study uses a mock-crime video paradigm. First, participants (N=20) are setup on an EEG and watch a short video of a theft. Then, participants are instructed to view an identity parade consisting of headshot photographs of a number of individuals, including the culprit. During this task, participants are instructed to

lie about their recognition of the culprit when his photo is shown - thus introducing a deceptive situation. The P300 is measured throughout the experiment. In addition to a deceptive condition, participants are also asked to engage in the same procedure a second time and are asked to be truthful about their recognition of the culprit.

Four Forces that Influence Deception and Moral Judgment: Wit, Sex, Death and Inequality

Roxana Kreimer*

In this work we analyse four forces that influence deception and moral judgment of dishonest behavior. The first analyzed variable is the degree of cleverness of the deceitful behavior. In several studies, we found evidence that people are less severe in their moral judgments when deception is clever, compared with a similar deception without cleverness. In Argentina, the clever deception is valued as a feature of cultural identity, as seen in the concept of "viveza criolla" ("native wit": the art of being clever at the expense of the other). The awareness of this "cleverness bias" could help us criticize this valorative disposition, reducing its undesirable effects. The second analyzed variable is the sex of the person that judges the deception. In several studies, cleverness-bias affected the moral judgments of people of both sexes, but the effect was stronger in women. In our studies women were more severe than men in their moral judgments in general, but they were not more honest. The third analyzed variable refers to another aspect of the persons who deceive: if they are alive or deceased in the moment when their behavior is judged. In our studies we found evidence that death enhances the image of public figures, including those who have had a dishonest behavior. The fourth analyzed variable is inequality in society. Democracy poses the same opportunities for everyone, but in practice only some people can achieve their goals. Several studies show that when the economic gap between different social groups increases, the social bond (the feeling of belonging to the same community) is broken, which increases the likelihood of dishonest behavior.

Lying Takes Time: A Meta-Analysis on Reaction Time Measures of Deception

Kristina Suchotzki*, Bruno Verschuere, Bram Van Bockstaele, Gershon Ben-Shakhar, Geert Crombez

Lie detection techniques are frequently used in many countries. Most of them have been criticized for the lack of an underlying psychological theory and the lack of empirical evidence for their validity. These criticisms have led to an increased scientific effort to unravel the cognitive mechanisms underlying deception. Recent evidence indicates that lying is more demanding than truth

telling. This cognitive approach to deception has sparked renewed interest in reaction times (RTs) to differentiate lies from truths. A meta-analysis of 85 independent studies ($n = 1965$) indicates that in computerized paradigms, lying takes longer than truth telling. This standardized RT difference remains large after correction for publication bias ($d = 0.902$; 95% CI [0.767; 1.036]). There was a large heterogeneity between studies: The RT deception effect was smaller, yet still large, in studies in which participants were not instructed to respond as fast as possible, and in studies in which participants received motivational instructions to lie as good as possible. The type of RT paradigm, stimulus salience, the absolute number of trials, and the proportion of truth/lie trials did not explain differences between studies. The observed heterogeneity calls for a systematic mapping of the boundary conditions of the RT deception effect. The current meta-analytic findings strengthen the cognitive approach to deception, and point to the potential of RT-based lie detection.

Looking Ready for Jail: The Influence of Handcuffs on Deception Detection and Suspiciousness

Mircea Zloteanu*, Daniel Richardson

We investigated how the context in which “suspects” are interrogated affects how believable they appear. Participants were videotaped while providing truthful or fabricated responses in an interrogation setting, performed by a trained interrogator, while their ability to gesticulate freely was manipulated. The manipulation was achieved by handcuffing half of the participants. The presence of handcuffs was predicted to increase the difficulty of assessing veracity and potentially increase suspiciousness on the observer's side. Deception detection accuracy, confidence and bias for the two conditions was obtained from the interrogator real-time assessment, and subsequently for laypersons and police officers. Audio and video analysis of the interrogations was also performed to reveal additional influences of the handcuff manipulation. The experiment explores how the physical constraints imposed on the “suspects” affects their ability to appear honest and on how these constraints affect the decoder's accuracy and suspiciousness.

Whispering Nothings: The Linguistic Traces of Deception in Confessional Media

Cheuk Yan Chow*

Due to popular demand, the number of websites and mobile applications dedicated to confiding private information without names attached has expanded rapidly in recent years. Submissions to such spaces often comprise potentially sensitive details individuals wish to ‘get off their chests’, yet how much of these revelations are actually invented for attention-seeking or slander purposes?

More importantly, is it possible to distinguish the fake posts from the sincere? Previous work on social networking platforms has shown that anonymous updates tend to contain characteristics seemingly antithetical to traditional verbal indicators of lying. This study examined the linguistic link between personal secrets and truthfulness through a corpus-assisted exploration of 80 confessions that had been submitted by participants to the site SecretsAnon.com, and self-reported as either genuine or fictitious. It was hypothesized that several empirically established markers of falsehood, including increased usage of negations and negative affect terms, and fewer self-references and words overall, would be elicited even in the present context of nameless online disclosures. Although some patterns in the data hinted at consistency with the hypotheses, statistically significant differences were found solely for word count. The findings are suggestive of not only how language cues to deceit vary across specialized genres, but also the notion that anonymity may encourage honesty on the Internet. Furthermore, the current investigation validates the use of automated tools to facilitate forensic linguistics research and paves the way for future inquiries into deception detection in confessional media.

Using a Model Statement with Child Witnesses: Relevant Truths and Irrelevant Lies

Hannah Lawrence*, Lucy Akehurst, Julie Cherryman, Aldert Vrij

It is crucial to be able to judge children's credibility accurately in police investigations to avoid miscarriages of justice. Eliciting more information from interviewees using a model statement has been shown to facilitate deception detection in adults; however, its effectiveness with a younger population has yet to be investigated. The current study aimed to explore the benefits of using a model statement with child witnesses. 63 children aged 8- to 10-years-old were recruited either to witness a mock theft of a mobile phone (truth-teller), or to make the interviewer believe that they had witnessed the mock theft of a mobile phone (to cover up for the person who actually did take the phone) when in fact they had not (lie-teller). During the investigative interview, all participants were firstly asked to provide a free recall of the event; this was followed by the interviewer playing them an example of a model statement with content unrelated to the event in question, and finally participants were asked to provide a second, more detailed, free recall. Results showed that statement length and number of details provided increased from the first to the second free recall for all participants. Truth-tellers provided significantly more visual details relating to the criminal act as a result of listening to the model statement compared to lie-tellers. Additionally, lie-tellers repeated more crime-irrelevant details following the model statement compared to truth-tellers. These findings suggest that interview strategies that encourage child interviewees to provide longer,

more detailed, statements can be effective in eliciting differences in the accounts of child truth-tellers and child lie-tellers.

Pupil Dilation: An Implicit Indicator of Sexual Age Preferences?

Janice Attard*, Markus Bindemann, Caoilte O'Ciardha

Methods for assessing deviant sexual interests in Forensic Psychology are often criticised for their vulnerability to social desirability responding and faking. In a series of studies we demonstrate that pupil dilation may be a promising alternative measure of age-specific sexual interests that is less easily manipulated by the observer. Pupil dilation is an autonomic response that operates outside of the conscious control of the observer, and has been positively associated with observers' sexual orientation during the visual processing of sexual content. In these studies we investigate whether this response can also be extended to reveal age-specific sexual preferences. In a first experiment, we explored this question by measuring pupillary responses of male and female student observers to photographs of adults and children. This was followed by a self-report sexual orientation questionnaire and an interest in child molestation proclivity scale as an indication of sexual interest towards children. A second experiment extended this approach to male participants with diverse sexual orientations. Across both experiments, the pupils of male observers dilated to photographs of adults that are consistent with their self-reported sexual orientation, but not to images of male or female children. Female observers showed pupil dilation to photographs of both male and female adults but not children. These experiments provide initial evidence that pupil responses could be used as a measure of sex-specific interest in male observers, and as an age-specific index in males and females. These findings are relevant for the assessment of deviant sexual interests, which is paramount in the management of convicted child sex offenders, and pave the way for further research with the child sex-offending population.

Your Smile is Fake: Using Signal Detection Theory to Test Biased Judgment of Smiles

Ken Fujiwara*

"Truth bias" is the tendency to judge messages as truthful rather than deceptive (e.g., Zuckerman et al., 1981). However, this bias is not absolute (e.g., DePaulo et al., 2003) and "lie-bias" is occasionally found (e.g., Meissner & Kassin, 2002). The present study investigated whether judgment of smiles is biased, and if so, which type of bias is associated with such judgment. Stimuli of genuine or fake smiles constructed according to facial mimicry (Dimberg, 1982). Sixty-six undergraduates viewed the facial expression set (standardized for use in Japan; DB99, ATR). They were asked to express friendliness and smile at the faces

expressing either happiness or anger. Their smiles were video-recorded through a teleprompter. According to facial mimicry, smiles responding to a happy expression are natural and genuine whereas smiles responding to an angry expression are unnatural (i.e., fake). Forty-eight 3-second clips (24 genuine, 24 fake, half female) were used in the subsequent judgment task. Sixty Japanese undergraduates judged whether smiles were genuine in one of two conditions: truth-or-not ($n = 34$); lie-or-not ($n = 26$). The discriminability of stimuli and observer bias was evaluated using signal detection theory. Discriminability (d') did not differ, suggesting that task difficulty was not influenced by judgment style. However, the criterion "c" was significantly higher in the truth-or-not judgment condition, suggesting that people do not easily trust smiles. Interestingly, this skeptical view (i.e., lie-bias) toward smiles was positively correlated with extraversion scores. We discuss these results according to frequency of seeing fake smiles. In social interactions, the "Japanese smile" is the norm with people smiling without accompanying pleasant feeling. We discuss the possibility that social or interactional factors lead to biased judgments.

How Much Does it Hurt? Detecting Deceptive Motion using Point-Light Displays and the Imposition of Cognitive Load

Jackie Hillman*, Samantha Mann, Emilia Hart

Individuals suffering physical injury following accident or illness frequently seek compensation from insurance companies and benefits agencies. Claims are often medically assessed and payments based on severity of injury and how pain impacts on everyday functioning. The degree to which somebody is affected is not always obvious, often relying on self-report, which is open to abuse. Therefore, this system would benefit from some way of discriminating between truthful and deceptive claims. Most deception research focusing on nonverbal cues concentrates on the movement of isolated body parts, such as the frequency of gestures, leg movements etc. rather than entire body movement. In addition, a growing body of research evidence shows that imposing cognitive load on participants can lead to more accurate judgements by observers. This experiment used video clips of point-light displays consisting of ten females each walking on a treadmill with a genuine and fake limp, with and without the addition of cognitive load. Clips lasted 20 seconds and were presented to 60 observers. Without cognitive load, fake limps were rated more painful, stranger and more 'fake' than the genuine limps. With cognitive load all ratings for fake limps were similar to those for the genuine limps, and for genuine limps imposing cognitive load had no effect. Overall, the addition of cognitive load is beneficial in highlighting differences in those faking a limp and although deceptive limps were successful in a limited way, they were not entirely convincing as observers perceived that they did not look 'right'. Findings are discussed in terms of the

benefits of point-light methodology together with implications for the judgement of deceptive movement and biomechanical analysis.

Form of Instruction Influences Neural Correlates of Deception

Marcel Falkiewicz, Justyna Sarznska*, Justyna Babula, Edward Necka

Despite several years of heavy criticism, instructed lying paradigms are still widely used in scientific experiments. A recent meta-analysis has shown differences in brain activity related to volitional and instructed lying. In order to build any plausible neuroscientific model of deception, we need to be able to dissociate between processes related to deception itself and by-products of instruction. To this end, we used two variants of the Speed-Dating Task: one with instruction before the experiment ('adapt your responses to each date' – implicit instruction) and the second with instruction before each question (explicit). Each question in the experiment was asked twice. Subjects were randomly assigned to one of two groups and performed the task in an MRI scanner. At the level of reaction times, we found a significant difference between deceptive and honest responses in both groups for the first repetition of the question only. At the brain level, we found a consistent increase in anterior cingulate cortex signal amplitude for both groups and question repetitions. However, only the implicit group showed increased medial prefrontal cortex activity for deceptive responses. There was also increased superior parietal lobule activity in the explicit group for the first repetition. These results indicate that at least some of the increased brain activity attributed to deception can actually be related to the instruction itself. Further experiments are needed to identify other factors that might influence the results of neuroimaging studies.

The Effects of Cognitive Load and Lying Type on Deception Cues

Nicole Adams*, Marc Patry

Over the last decade, inducing cognitive load has been introduced as a possible lie detection technique (Vrij, Fisher, Mann, Leal, 2006). Evidence suggests that since lying is a cognitively taxing task, increasing a deceiver's cognitive demands should make lying even more difficult; thus, true deception cues should become apparent. The present study investigated various behavioural cues (i.e., blink rate, eye closures, and speech disturbances) that occurred between individuals who lied either by omission or by falsification. Cognitive load was used to amplify deception cues within subjects on half of the interview questions. It was predicted that there would be differences between cues based on deception type. Preliminary findings have revealed a significant difference in speech disturbances between the cognitive load condition questions ($M=2.39$, $SD=1.89$) and the non-cognitive load condition questions ($M=1.78$, $SD=1.17$), $t(17) = -2.37$, $p < .05$, $d = -.72$. Preliminary results also indicate the falsification

condition accounts for most of the variance in the aforementioned results. Data collection and analysis are ongoing (N =102). Implications for deception detection research, interrogative techniques, and applications for law enforcement are discussed.

Deterring Deception Through the Use of Cognitive Load

Samantha Mann*, Aldert Vrij

Imposing cognitive load is an interview technique whereby interviewers make an interview more demanding. Research has demonstrated that this facilitates lie detection as liars find it harder than truth-tellers to cope with these additional requests. In the present experiment we examined whether imposing cognitive load can also deter people from lying. There is evidence from various sources that in interview settings lying is more cognitively demanding than telling the truth. Liars, who require more cognitive resources than truth-tellers, will have fewer cognitive resources left over. If the interview setting becomes more demanding, the result may be that interviewees will include more truths, and perhaps even refrain from lying. In the present experiment we examined whether we could deter people from lying in a job interview through imposing cognitive load, by asking interviewees in the experimental condition to carry out two simultaneous tasks, requiring a division of attention between the two. The job interview was conducted ‘automatically’ on a laptop with 83 participants responding verbally, and consisted of a series of specific, and one open-ended question. Although relatively easy to lie to the specific questions (e.g. ‘Do you have a degree?’) the open-ended question ‘Given our person specification, what makes you suitable for this role and why should we give the job to you?’ was considered more difficult as the question does not contain a hint about what to lie about and requires a longer answer. Participants in the experimental condition were given information to memorise prior to the interview. Then, throughout the interview, written questions randomly appeared on the screen relating to that information, requiring participants to select an answer. The interviews were transcribed and coded. We found that participants in the cognitive load condition lied less (24%) than participants in the control condition (50%) when answering the open-ended question.

An Assessment of : (1) US Border Patrol Checkpoints and (2) Unauthorized Immigrants to Cross the Border

Jay Nunamaker*, Elyse Golob, Jeffrey Jenkins, Jeffrey Proudfoot, Jim Marquadson, Judith Gans

The U.S. Border Patrol operates traffic checkpoints within 20 miles of the nation’s borders to detect and deter illegal activities that have bypassed designated Ports of Entry. In 2011, Border Patrol asked us to evaluate a 2009

Government Accounting Office (GAO) review that directed the agency to take actions in four areas of checkpoint performance. 1) Data integrity - establish internal controls for management oversight of the accuracy, consistency and completeness of checkpoint performance data. 2) Community impacts - implement quality of life measures to evaluate the impact that checkpoints have on local communities. 3) Performance metrics - establish a methodology that would allow the agency to compare apprehensions and seizures to the level of illegal activity passing through the checkpoint undetected. 4) Managerial tool – develop a model to guide checkpoint resource allocation, including operation of inspection lanes and a workforce needs assessment. We conducted an intensive two-year study that included site visits, methodology reviews, community forums and simulation modeling. Our findings indicated that: 1) there are aspects of data consistency, accuracy, integrity, and completeness that need improvement; 2) although impacts are experienced by communities north and south of a checkpoint, they are disproportionately borne by communities that lie between the checkpoint and the border; 3) the best indicator of checkpoint performance is to measure the agency’s accuracy rate in detecting illegal activity. The most feasible and reliable method for calculating these rates is through “red teaming,” and; 4) a simulation tool can provide a realistic computerized representation of an actual checkpoint that models resource allocation. This paper summarizes our major findings and recommended actions in these four areas.

Memory for Murder: A Novel Approach for Assessing the Truthfulness of a Defendant's Amnesia Claim in Homicide

Tianna Dilley*, Stephen Porter

On June 30th, 2010, W.E. fatally shot his wife in the head with a .22 revolver before turning the gun to his own head and firing. W.E. awoke in the hospital two weeks after the shooting. From the time he awoke to the time of the trial, W.E. indicated that he maintained complete amnesia during the killing and for several months preceding it (meaning he could not recall his *mens rea* or *actus reus*). A psychologist was requested to conduct a forensic psychological assessment, and then provide an opinion concerning the legitimacy of W.E.'s self-reported amnesia. This poster presentation will outline the novel comprehensive strategy used to examine the validity of his amnesia claim including the interview (which includes a baseline behavioural assessment), psychological testing, aggressive symptom suggestions, deceptive questioning, and personality evaluations. The outcome of this deception detection assessment and judicial response to the findings will be described. Further, we will provide a critical assessment of the procedures used and future recommendations for psychologists doing such evaluations.

An Argument for the Importance of Studying High-Stakes Deception

Pamela Black*, Stephen Porter

Despite the potential consequences of high-stakes lies, they have received considerably less empirical attention than their lower-stakes counterparts. This is likely due to the difficulty in accessing these types of lies for study as they cannot be artificially created in a laboratory setting, and instead must be collected after the fact from real-world settings (e.g., videotaped police interrogations, courtroom testimony). Although obtaining high-stakes lies to study can be arduous, particularly in forensic settings, we argue that studying these types of lies is vital to better understanding liar behavior and developing accurate methods of deception detection. Further, we argue that studying high-stakes lies, in particular, is necessary because they are qualitatively and quantitatively different from those that have less severe consequences. For example, high-stakes deceivers experience increased motivation to be convincing and thus require increased cognitive resources during the lie. As a result, these high-stakes liars display different verbal and non-verbal cues than individuals being deceptive in low-stakes scenarios. This suggests that the results of research examining observable cues to low-stakes lies may not be applicable to detecting deception in high-stakes situations, those in which it is most important to determine veracity. If the ultimate goal of deception detection research is to apply the resulting knowledge to evaluate credibility in real world, often high-stakes situations, additional research on high-stakes lies is warranted. The results of high- versus low-stakes deception research and their implications for applied practice will be discussed.

Detecting Concealed Crime Information: Effects of Arousal and Delayed Testing

Nathalie Klein Selle*, Bruno Verschuere, Merel Kindt, Ewout Meijer, Gershon Ben-Shakar

The Concealed Information Test (CIT) utilizes physiological responses to detect the presence of crime-related information in memory. Although it is well established that the CIT provides a valid tool for memory detection, there are several recognized limitations concerning its external validity. Specifically, the heightened emotional arousal in the realistic setting is generally missing from the experimental setting. The present study examined the influence of an enhanced arousal level on the outcomes of the CIT. One hundred and twenty undergraduate students took part in a CIT, while measuring electrodermal, cardiac and respiratory responding. All subjects were requested to imagine that they are suspects in a murder case and were familiarized with a fabricated case file containing pictures that differ in arousal level and valence. Using this research design, arousal was manipulated both during encoding and during

testing. Each subject was tested immediately or after one week, on a series of neutral and either negative non-arousing or negative arousing pictures. CIT detection efficiency using the electrodermal, cardiac and respiratory measures was high and unaffected by the arousal induction and delaying the test, which has important implications for real-life applications of the CIT.

Bidding Your Time: Temporal Discounting and Deception in Online Auction Marketplace Behaviour

Brian Glass*, M. Angela Sasse, Michelle Baddeley

In online auction marketplaces, item misrepresentation is one of the most common forms of seller deception. A theoretical account of the individual differences which underlie interpersonal deception in socio-technical systems is presented in terms of temporal discounting. Temporal discounting refers to the tendency to prefer immediate over delayed rewards. To quantify behaviour, we recruited 62 experienced online auction sellers to handle seven jewellery items (some flawed) and generate auction advertisements. Independent variables included demographics, temporal discounting traits, and an incentive manipulation: maximize returns, avoid negative reputation, or a control condition. Dependent variables involved the inclusion or exclusion of honest information. ‘Reputation’ incentives led to significantly more reported flaws (30%) than other conditions (17%), all ‘hiding’ flaws in the middle of descriptions. A temporal discounting trait was calculated by modelling delayed reward preferences using a hyperbolic discounting function. Counterintuitively, those with a higher temporal discounting trait (i.e., those who preferred delayed over immediate rewards) were more likely to utilise deceptive behaviour. Implications of these results are discussed in terms of general intelligence and long-term prospective action planning. We present potential deception deterrence methods based on detecting and disrupting planned deceptive behaviour.

CAIRN: Credibility Assessment and Intent Research Network

Jeff Hancock*, Terry Patten, Steve Hookway, Noah Marsh, Jessie Taft

Work on verbal cues indicating deceit and intent is fragmented—researchers use different data sets and different tools, making comparison of results difficult. We describe a collaboration website under development designed to enable researchers studying deception and intent to share data, tools, and results. In addition to acting as a valuable repository for research resources, the website enables researchers to design and run experiments directly on the website, so it is not necessary to download data or install software. This arrangement streamlines the process of experimentation and facilitates apples-to-apples comparisons of research results. The collaboration website enables researchers

to create or modify experimental workflows by dragging the names of data, tools, and scoring methods onto a canvas and linking them with arrows. Standardized wrappers ensure that the output of one component matches the input required by the next component in the experimental workflow. This enables new experiments to be designed and run in just a few seconds. In particular, substituting one tool for another in a workflow takes only a few seconds and the scored results provide an apples-to-apples comparison of the two tools. Since data is not downloaded, the website enables running experiments on sensitive data by exposing, for example, the numeric results of algorithms but not the original text. The collaboration website includes a wiki that contains discussion forums and pages that describe each of the data sets, tools, scoring methods, and workflows. Access to the collaboration website is based on a barter system. Rather than making a financial contribution, researchers contribute data, tools, or other resources. This produces a network effect where the value of the collaboration website increases rapidly as new participants join. The ultimate goal of the project is to provide the infrastructure and develop a network of researchers to rapidly advance deception research through collaboration amongst leading scholars and practitioners.

Crowd-Sourcing Deception as a Mechanism for Phishing Defense

Quanyan Zhu*, Jeffrey Pawlick

Phishing is a type of social engineering in which adversaries solicit private data from victims by masquerading as legitimate authorities. This type of cybercrime causes between \$125 million and \$1 billion in annual losses from identity theft in the United States. While vulnerable recipients of phishing emails reveal their valuable data, “observant” users (those who easily differentiate phishing emails from legitimate emails) take no action. Because observant users ignore emails, adversaries can be certain that all replies come from vulnerable users. In order to eliminate this advantage of the adversary, we design a crowd-defense mechanism that incentivizes observant users to respond deceptively, i.e. to give false information. To evaluate this idea, we construct a dynamic, large-population, incomplete-information game model. We design a mechanism for this model that injects uncertainty into the sender’s beliefs about the receiver’s type. Rather than monetary incentives, our mechanism draws upon altruistic and social motivations based on a study of existing crowd-sourcing implementations. As a result of our mechanism, the amount of valuable information that phishers capture is reduced by about 20%, and phishing profits are reduced to near zero. Interestingly, we also observe that legitimate corporations incur a small drop in utility, since they sometimes receive deceptive responses. This notwithstanding, the results suggest that our mechanism is a promising crowd-defense solution to combat fishing.

Assessing Identity and Credibility Using Soft Biometric Features

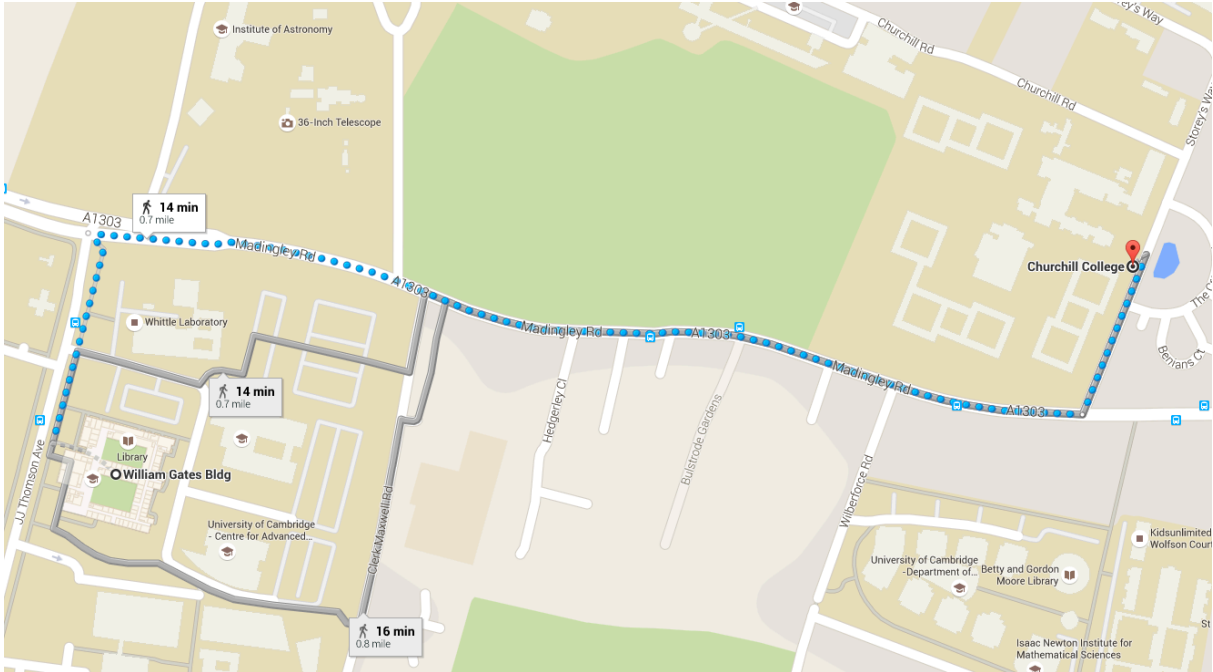
Aaron Elkins*, Judee Burgoon, Nathan Twyman, Mark Grimes, Joe Valacich, Jeffrey Proudfoot, Jeffrey Jenkins

The United States Government Accountability Office has identified falsification of documents at border crossings as a growing problem in border security contexts (GAO-12-888). In this talk, we will describe two experiments (n=107 and n=191) involving individuals attempting to gain illicit access to sensitive resources using fraudulent identification documents. In the scenario used in the experiments, student participants were provided with fraudulent credentials identifying them as members of the school's technical support staff. Using these credentials and an assumed username and password, participants "stole" an exam key from a computer located in a restricted area of the university's MIS department office. While attempting to deliver the file to a third party, participants were "apprehended" by a member of the research team and subjected to a series of computer based interviews in which a wide range of features including vocalics, oculometrics, linguistics, kinesics, typing, and mouse movement behavior were captured. Using these features, we attempt to a) identify impostors based on their soft biometric characteristics and b) identify individuals that were involved in the theft. We leverage a novel scenario that places students into the compromising, but relatively realistic, scenario of cheating by stealing an exam key. We present a number of interesting techniques and findings for both identification of individuals and for determining who was involved in the commission of the crime.

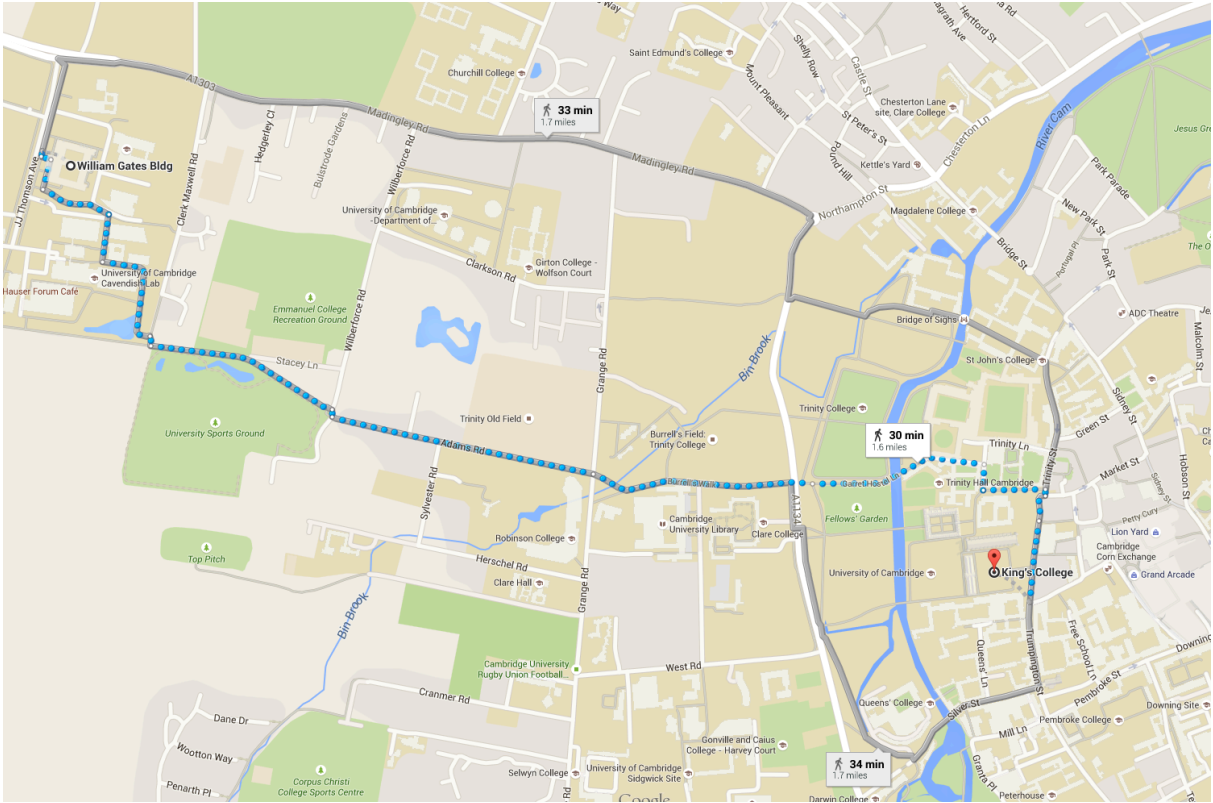
Conference Dinner 1 at Churchill College
Storey's way, Cambridge
Monday 24th of August, 19.00-22.00

Please make your own way to the dinner location (15-minute walk).

Walking route from William Gates building to Churchill College (Dinner 1)



Walking route from William Gates building to King’s College (Banquet)



Tuesday 25th of August
William Gates Building
15 JJ Thomson Avenue
Cambridge

Symposium 4: Online Deception
Tuesday 25th of August, 09.30-10.30

Playing Poker for Fun, Profit and Science

Jeff Yan*, Jussi Palomäki

We propose to use poker as a new instrument for studying the psychology of deception, which is fundamental to many security and cybercrime problems such as social engineering. Poker enables novel studies of a wide range of deceptive behaviours, and in these settings, observable, measurable and computable metrics are often available. Moreover, poker offers better ecological validity than trust games that have been widely used in economics studies. We will present our novel experimental results on studying 1) bluffing, i.e. betting or raising (showing strength) with a weak hand; 2) slow-play (also known as trapping), which is roughly the opposite of bluffing: betting weakly or not at all with a very strong hand to “lure” the opponent into betting or raising with a hand they would normally not bet or raise with (i.e., luring someone into a trap). We will also discuss other types of novel deception studies that can be investigated with poker, and we will explore how to inform cyber security with poker research, and discuss experiments designed for this purpose.

A Reluctant Bidder: Why do Individuals Fall for Auction Fraud?

David Modic*, Ross Anderson

Online auctions are big business – the largest online auction house, eBay, has a monthly turnover worth millions of pounds across millions of transactions. This presents an opportunity and an incentive for scammers. While we are aware of various threat models when it comes to auction fraud, it is difficult to establish their prevalence and the specific compliance triggers used in them. In the present article, we ran a series of studies designed to (a) help us better understand which cues to deception help potential victims to avoid being scammed and which are largely ignored. (b) Furthermore, we established which personality traits and mechanisms of persuasion play a role in compliance with fraudulent offers, when it comes to auctions. In Study 1 6609 participants answered general victimisation questions and filled out the Susceptibility to Persuasion – II scale. The results show that persuasive mechanisms such as the

need for consistency, social influence, risk preferences and the need for uniqueness play an important role in general scam compliance. In Study 2 we focused on victims of auction fraud, where 254 participants answered questions about their general attitudes towards auctions and, where applicable, about a specific fraudulent event they have been involved with. In the second part of Study 2, we asked the respondents to fill out the HEXACO personality scale, modified UPPS-IBS (Impulsivity scale), Deceptiveness scale and others. The data collection for Study 2 is still ongoing, but we postulate that the results of the analysis will show that (a) more experienced participants in auctions pay attention to more cues. That (b) the impact of item price on personal utility focuses the attention of auction participants and that (c) various constructs connected to self-regulation play an important role in auction fraud compliance.

Please be Honest and Provide Details I can Check: Deterrents of Deception in an Online Insurance Fraud Context

Sharon Leal*, Aldert Vrij, Samantha Mann

In the present study we aimed to ascertain if certain factors could affect the degree of deception in an online insurance claim context. A total of 96 participants were asked to read a vignette about a burglary that ostensibly took place one week before. Their task was to complete an online claim on behalf of the people burgled and they were provided with various degrees of evidence of ownership of the items stolen. All participants were informed that they could be totally truthful and gain £5 by just claiming for the items taken, or, if they wanted to earn more money, to lie and inflate the claim amount. They were informed that if not believed, they would earn nothing. Attitudes to insurance companies and reasons for lying or truth telling were measured in a post-study questionnaire. A 2 (Checkable Detail: yes/no) x 2 (Honesty: before /after) independent design was used. For the checkable detail factor participants were asked to provide credible evidence that the couple owned the items /cash stolen. For the honesty factor, some participants were asked to state at the beginning of the claim that they would complete the claim totally honestly, others were asked to state they had completed the claim honestly afterwards. Initial results indicate that in accordance with previous research, most participants demonstrated a high dislike of insurance companies and the majority lied because of this. In addition, the degree of lying and amount of cash claimed was influenced by the manipulations. Those who were asked to provide checkable details and also be honest at the beginning lied significantly less than participants in the control group (no provision of checkable details and honesty provision afterwards).

Deception and Cyber-Deception Detection: Exploring the Effect of Culture

Iain Reid*, Lynsey Gozna, Julian Boon

Deception detection research has primarily focussed on the behavioural cues to deception of individuals from Western cultures in attempts to accurately assess veracity. However this approach has largely neglected behavioural cues to the truth, and the differences in interpersonal and online strategies used by other cultures to assess credibility. In an increasingly globalised world with converging communication technologies there is an increased need to understand how individuals assess credibility across multiple communication mediums to ensure resilience against deception. Individuals are argued to attribute and process information according to their cultural worldview and such differences may be applicable in environments where credibility judgements are required. Interviews were conducted with individuals from Western (N=22) and Eastern (N=16) cultures which led to the identification of a number of strategies that are employed to assess credibility across interpersonal and online communication. A qualitative comparison of themes resulted in the identification of similarities and differences in the assessment of credibility. The paper will discuss how the present findings relate to previous research and make recommendations for increasing cultural resilience against deceptive acts. Identified strategies which individuals from both Western and Eastern cultures living in the UK used to assess credibility were: examining changes from normal behaviour, including verbal and non-verbal behaviours; and examining the plausibility and consistency of information whilst seeking out further evidence to verify claims. Individuals across cultures were subject to decision-making biases, and were influenced by social cues and impression management strategies. Examining website presentation was used as a credibility assessment strategy, and although individuals had differing experiences of internet, strategies were suggested for avoiding risk of exploitation. Individuals from Western cultures were more likely to question or seek out further information with which to assess credibility, and this is argued to be reflective of cultural differences in challenging perceived authority.

Symposium 5: Cues to Deceit

Tuesday 25th of August, 11.00-12.30

Strong but Wrong: Lay People's and Police Officers' Beliefs about Verbal and Non-Verbal Cues to Deception

Glynis Bogaard*, Ewout Meijer, Harald Merckelbach, Aldert Vrij

The present studies investigated the beliefs of students and police officers about cues to deception. In study 1, police officers (N = 95) and undergraduate students (N = 104) filled out a questionnaire addressing beliefs about cues to deception. Twenty-eight verbal cues were included in the questionnaire, all

extracted from verbal credibility assessment tools (i.e., CBCA, RM, SCAN). We investigated to what extent beliefs about verbal indicators of deception differed between lay people and police officers, and examined whether these beliefs were in agreement with objective indicators known from research. Our results revealed that when students and police officers were asked to list the cues they believed to be indicative of deception, the usual stereotypical non-diagnostic (non-verbal) cues (e.g., gaze aversion and movement) were reported. But, when participants were asked to indicate their beliefs about specific verbal cues, they were less inclined to overestimate the correlation between verbal cues and deception and their beliefs fitted better with what we know from research. Study 2 investigated whether participants with more accurate verbal beliefs were actually better at detecting lies. This time, students (N = 108) and police officers (N = 138) were not only asked about their beliefs, but were also tested on their ability to detect deception. After the questionnaire, participants were asked to judge four truthful and four fabricated accounts on their credibility. Results showed that participants who held more accurate beliefs about verbal cues were also better at unmasking liars.

A Context-Contingent Approach to Deception and Language

David Markowitz*, Jeffrey Hancock, James Pennebaker

Across studies, the influence of deception on language has produced weak or null effect sizes for a variety of important psychological dimensions including first-person singular pronouns (e.g., ‘I’, ‘me’, ‘my’) and negative emotion terms (e.g., ‘hate’, ‘aggression’; Hauch, Blandón-Gitlin, Masip, & Sporer, 2014). In some cases, these linguistic features are amplified (e.g., negative emotion terms in political deceptions; Markowitz, Hancock, & Bazarova, 2011) or attenuated (e.g., “I” words in statements about abortion; Newman, Pennebaker, Berry, & Richards, 2003) in lies relative to truths. However, deception may also not affect language in other situations (e.g., a trivia game; Ali & Levine, 2008). Such inconsistent patterns indicate that deception involves more than just the intent to mislead. In fact, a recent meta-analysis evaluating linguistic cues for deception (Hauch et al., 2014) accounted for several moderator variables (e.g., the production mode; written, spoken, or typed text), which suggest that context may be important for understanding the relationship between deception and language. In this piece, we outline why it is problematic to treat the effect of deception on language as a universal phenomenon, and subsequently propose a context-contingent framework for deception. We offer that psychological dynamics (e.g., emotional and cognitive processes related to the deception), pragmatic goals (e.g., what the speaker is trying to accomplish by deceiving), and genre conventions (e.g., linguistic features of a discourse community that constrain a repertoire of speech) are three features of context that vary across deceptions and influence how deception affects language. We first organize this

argument by suggesting what context means for communication independent of deception, and then consider how the aforementioned situational factors may influence the effect of deception on language.

Effects of Response Veracity and Question Type on Linguistic, Vocalic, Kinesic, and Proxemic Behaviors and Detection Accuracy in a Culturally Diverse Sample

Aaron Elkins*, Judee Burgoon, Jay Nunamaker, Dimitris Metaxas

To assess what behavioral and psychophysiological indicators and questioning techniques hold promise for detecting deceit during rapid screening, and which are subject to cultural influences, an experiment was conducted with multiculturally diverse sample of 220 adult interviewees who alternated between truthful and deceptive responding on a battery of 12 questions. Interviews were conducted by certified examiners. Multiple noncontact sensors collected physiological responses. Video-recordings of the interviews were subjected to automated analyses of vocalic, linguistic, kinesic and proxemic features. Unaided interviewer detection accuracy averaged 62% and varied by question, interviewee nationality/culture, and communication skills. Linguistic and vocalic features classified truthful and deceptive responses with accuracies ranging from 64% to 78%, depending on the question. Key predictors were word quantity, words per sentence, lexical diversity, word length, pronouns, verb tense, adverbs, prepositions, negations, cognitive processes, tentativeness, and non-fluencies. Full-body kinesic analyses with computer vision techniques averaged 74% accuracy; facial/head analyses averaged 62% accuracy but varied widely by question. Numerous head, hand and torso features ((e.g., size, velocity, location and relation to other body regions) were diagnostic. Behavioral indicators thus hold promise for marking deceptive and truthful responding. However, the variable effects of question type must be taken into account to avoid false alarms and misses. Cultural influences must also be considered, and normative behaviors reported here may serve as a useful baseline going forward. Non-native English speakers showed differences on response latencies and postures, among other behaviors. Results applying a multifactor cultural self-identification model will also be reported.

Liar, Liar: Subtyping the Behavioural Effects of Deception and the Implications for Theory, Research, and Practice

Marcus Juodis*, Stephen Porter

Although substantial research indicates that most behaviours believed to be suggestive of lying have weak or no empirical relationships with deception, it has been hypothesized that individuals do display signs of deceit, but that different individuals may exhibit different signs. Further, this possibility might

result in no signs emerging when analyses are focused on group differences, which has been typical of most studies. Until recently, there had been no attempts at subtyping the behavioural effects of deceit to test these propositions. One of our latest lines of research, however, sought to determine whether people could be sorted in meaningful ways with regard to similar verbal and nonverbal behaviour changes when comparing lying to baseline truth-telling. The first study in this line involved an extended analysis of behavioural cues to deception measured in a sample of undergraduate students and incarcerated male offenders who provided both truthful and fabricated accounts of negative life events. The second study involved analysis of cues measured in another sample of undergraduates who provided truthful and deceptive accounts of exposure to the same moderately distressing images to better control the events that formed the basis of the accounts. “Fluid” and “laboured” liars were identified in both experiments, reflecting distinctive changes in speech-related disturbances. Moreover, offenders in the first study were significantly more likely to be classified as fluid liars compared to students, and laboured liars in the second study held significantly more stereotypical beliefs about deception cues than fluid liars. Psychological factors that may underlie subtype expression are considered in our discussion, such as attempted behavioural control and cognitive load. However, most of our attention will be devoted to the potential implications of these findings for theory, research, and practice as they relate to deception, including the possible usefulness of a profile-matching approach for detecting deceit.

Special Panel Session: Future Directions in Lie Detection Research

Tuesday 25th of August, 13.15-15.00

Hosted by Ross Anderson

Speakers:

Jeff Hancock

Judee Burgoon

Bruno Verschuere

Giorgio Ganis

Special Practical Session: Thief Spotting with Bob Arno

Tuesday 25th of August, 15.30-15.50

Symposium 6: Lie Tendency
Tuesday 25th of August, 15.50-17.00

The Lure of Justified Dishonesty: Detecting Egocentric and Altruistic Lies
Shahar Ayal*, Dar Peleg, Guy Hochman, Dan Ariely

Recent studies in behavioral ethics suggest that a variety of situational factors can affect people's moral standards, and enable them to justify their unethical behavior while maintaining a positive moral image. In the current study, we used choice behavior and lie detection to examine the interplay between dishonesty and the moral-self while participants engaged in either egocentric cheating which benefitted themselves or altruistic cheating which benefitted others. Our theoretical rationale draws on previous findings showing that other-serving unethical behavior is more likely to be morally acceptable. Thus, we hypothesized that people would cheat more but would be less likely to be detected as cheaters when the possibility to justify their dishonest acts with altruistic considerations increased. To test this issue, we employed an experimental paradigm in which players engage in a visual perception task that creates an incentive to cheat to alter monetary payoff. Participants were randomly assigned to different conditions where they were invited to play this perceptual task for their own benefit and/or the benefit of others. After completing the task, the participants were moved to another room, where they underwent a standard lie detector test about their performance on the task. The test used a traditional manual technique based on differences in psychological arousal. The results of three experiments strongly support our justified dishonesty predictions that people cheat more as the possibility to justify their dishonest acts with altruistic considerations increases. More interestingly, we also found that these altruistic cheaters were less likely to be detected by the lie detector test than people who cheated for their own benefit. We discuss the theoretical and practical ramifications of these findings as regards the way people set their moral standards, and the usefulness of physiological arousal devices to detect varieties of cheating.

Normative Honesty and Frequent Lying
Kim Serota*, Timothy Levine, Eric Ortbal

Research has shown that the distribution of lie production across most populations is highly skewed. Most people tell few lies and among those who lie more frequently, a very small portion account for a disproportionately high percentage of lies told. We identify two primary groups within a given population: (a) the normatively honest and (b) frequent liars. Normatively honest people tell a few, usually inconsequential lies during a typical day or week, or as a subset of a finite number of message transactions. We determine

what is normative for a population by applying the law of rare events, which dictates that the few lies told by normatively honest people will be Poisson-distributed. Lying beyond the level predicted by the law constitutes frequent lying. Among frequent liars, we identify two secondary groups: (b1) common liars and (b2) prolific liars. Evidence from 10 prior studies conducted in the US, the UK, and the Netherlands indicates frequent lies have a scale-free distribution (i.e. the distribution is distinct and reproducible regardless of the break point between normative honesty and frequent lying). Consistent with the Pareto principle and Zipf's law, which both describe production efficiency, prolific liars are a small, highly productive subset of liars. Though often referred to as the "80-20 rule" the Pareto principle more accurately distinguishes the vital few from the trivial many but does not dictate the extent of their productivity. Data from the 10 studies indicate about 20% of frequent liars produce 50% of the frequent lies. The rate is not higher (i.e. 80-20) because prolific lying is constrained by the principle that lies must be infrequent to be effective. Select behavioral differences and key population variations in the existing studies are discussed. Research on situational and IMT2 propositional differences between normatively honest people and frequent liars is proposed.

Undoing the Past so as to Lie in the Future: Linking Counterfactuals and Deception

Raluca Briazu*, Clare Walsh, Catherine Deeprise, Giorgio Ganis

The identification and examination of processes that contribute to the generation of lies remains a major challenge in deception research. The present study sought to address this by investigating the link between lying and counterfactual thinking. Counterfactual thinking refers to the mental simulation of alternatives to reality and therefore may be an important process in the generation of lies. To examine this relationship, we measured individual differences in spontaneous counterfactual thinking and deception as well as individual differences in the fluency of counterfactual and lie generation when cued. A group of 80 participants generated counterfactuals and lies in response to two scenarios. Results indicate that individuals with a tendency to generate spontaneous counterfactual thoughts were significantly more likely to engage in spontaneous deception. Furthermore, individuals who could imagine a greater number of alternatives to the past when instructed to do so were also likely to generate a greater number of lies. The results suggest that the tendency to imagine alternatives to the past might contribute to the ability to generate lies. These findings have implications for understanding the underlying framework of lie generation.

Poster Session 2
Tuesday 25th of August, 17.00-18.00

Memory Detection 2.0: The First Web-Based Memory Detection Test
Bennett Kleinberg*, Bruno Verschuere

There is accumulating evidence that reaction times (RTs) can be used to detect recognition of critical (e.g., crime) information. A limitation of this research base is its reliance upon small samples (average $n = 24$), and indications of publication bias. To advance RT-based memory detection, we report upon the development of the first web-based memory detection test. Participants in this research (Study1: $n = 255$; Study2: $n = 262$) tried to hide 2 high salient (birthday, country of origin) and 2 low salient (favourite colour, favourite animal) autobiographical details. RTs allowed to detect concealed autobiographical information, and this, as predicted, more successfully so than error rates, and for high salient than for low salient items. While much remains to be learned, memory detection 2.0 seems to offer an interesting new platform to efficiently and validly conduct RT-based memory detection research.

Deception Detection in Online and Offline Communication: The Effect of Trust Levels and Perspective Taking in Real Time Communication
Catherine Friend*, Nicola Fox-Hamilton

Humans have been found to detect lies only at the rate of chance (Ott, Choi, Cardie & Hancock, 2011; Talbot, 2012; Toma & Hancock, 2012). Communication online can elicit higher rates of trust and sharing personal information (Jiang, Bazarova & Hancock, 2013). How do trust and personality traits like perspective taking affect deception detection online compared to face-to-face communication? This mixed-methods study measured participants ($N=40$) in online and offline conditions. Participants had to detect two lies from five conversation topics while in conversation dyads with a confederate. Two two-way between groups ANOVAS found no significant difference on the effect of perspective taking and trust on accurate deception detection in the online and offline groups. Discussion points include the truth bias and online disinhibition. Qualitative findings are examined, looking at why participants believed they had or had not been lied to online and face to face, including the amount of conversation detail and logic given; as well as online venues of where deception might be expected. Implications for further studies looking at areas such as law enforcement are discussed.

A New Interviewing Technique for the Detection of Informants' Lies

Haneen Deeb*, Aldert Vrij, Lorraine Hope, Samantha Mann, Gary Lancaster

Research on repeated interrogations has revealed that liars are as consistent as truth-tellers unless the interviewer asks questions that increase the interviewee's cognitive load. Our study explores how a new interviewing technique in which interviewees are asked mixed up questions about two events would help increase the discrepancy between liars' and truth-tellers' statements. This technique is useful in the interviewing of police informants who are often interrogated about two or more events at the same time. Informants are sometimes considered an unreliable source of intelligence to police officers, so it is essential to uncover their lies where they exist. One hundred fifty participants will play the role of undercover agents and will be interviewed twice by either a friendly (truth-tellers) or a hostile (liars) agent about two discussions that they witness in a secret Skype meeting between three other agents. Liars will lie about what those agents discussed in the second discussion. In the first interview, participants will be asked to provide two free recalls about what the agents said in each discussion. In the second interview, participants will be randomly assigned to a free recall condition, a sequentially ordered questioning condition, or a sequentially disordered questioning condition. The free recall condition includes the same questions as the first interview. In the sequentially ordered questioning condition, participants are asked specific questions about what each agent said in the first and then the second discussion. In the sequentially disordered questioning condition, participants are also asked specific questions about what each agent said but in a mixed up format alternating between the first and second discussions. The interviews will be transcribed and coded for consistency measures (repetitions, commissions, omissions, contradictions). It is expected that liars will be less consistent than truth-tellers, but only when cognitive demands are increased in the sequentially disordered questioning condition.

Case Studies of Behavioral Anomalies: A Potential Way to Consider Several Behavior Simultaneously

Marwan Mery*, Hugues Delmas, Samuel Demarchi, Charles Tijus, Isabel Urdapilleta

When one is interested in lying behavior, several criteria can be taken into account as cohesion between verbal, paraverbal, nonverbal indicators and the context. This principle of cohesion, that can be used to distinguish spontaneous and deliberate facial expressions of emotion, defined any inconsistency or any deviations from usual behavior as a potential cues of deception. Thus, lie detection can be based on an overall analysis of behavior to be maximized, that is a shared characteristic of people with high performance in credibility

assessment (e.g., wizard; see Ekman & O'Sullivan, 2006). Recently, this principle of cohesion was renamed behavioral anomalies and adapted for training FBI's agents. Results of this training showed that identifying behavioral anomalies has a positive effect on lie detection (Matsumoto, Hwang, Skinner, & Frank, 2012). In fact, cohesion requires the coding of verbal, para-verbal and nonverbal behaviors, although it is technically difficult to do this on all behaviors at the same time. A less time-consuming approach is to consider only a few types of inconsistencies when assessing credibility. In this presentation, three case studies from real issues illustrate this approach of credibility assessment. For instance, in a specific context, an indicator such as head shaking (for "no") with verbal content (e.g., "I agree with you") could be considered as behavioral anomalies, showing a lack of congruence. The first case can illustrate a factual lie, where synchronization between verbal response and the associated emblem is abnormal. The second and third case studies illustrate an emotional lie and more specifically a simulation of anger, through the notion of timing. For example, a facial delay of anger expression compared to what is said. Although behavioral anomalies are not direct deception cues, they lead to be more vigilant about what is being said in a perspective of credibility assessment.

Truth Default Theory

Timothy Levine*

A poster will summarize key elements of Truth Default Theory (TDT). TDT is a new theory of deception and deception detection that provides an alternative to cue-based theories. The poster will provide a brief summary of the central premise of the theory. The proportional structure will be outlined. Key evidence consistent with TDT will be summarized in graphs, figures, and tables. Evidence of a truth default state will be provide. Evidence from the few prolific liars module will be graphed. Evidence for new and improved detection accuracy stemming from communication content, active questioning, and persuasion approaches will be tabled. A handout will provide key references.

The Effects of Training Police Officers and Prosecutors in Deception Detection by CBCA or Non-Verbal Cues

Karolina Dukala*, Romuald Polczyk

Many studies on deception detection ability have shown that people generally are not very good at distinguishing between truthful and deceptive statements (e.g. Ambady & Rosenthal, 1992). Most studies also show that specialists, like police officers, are no better than laypersons in distinguishing between the truth and a lie (Vrij, 2008). The reasons are probably complex, but the explanation most commonly given is that police officers show a strong lie-bias, or that they are using wrong and uncertain deception cues. We tried to compare police

officers', prosecutors' and laypersons' abilities to detect deception by using different methods of detection. In the presented experiment, participants (N = 80) gave a truthful or a fabricated account of a criminal event. All testimonies were relatively long (approx. 15 minutes). They were videotaped and then carefully transcribed. A within-subjects design was implemented. Police officers, prosecutors, and laypersons rated the truthfulness of testimonies of four statements, before being trained in nonverbal cues/CBCA, and rated the truthfulness of a different set of four statements after training. Results of the experiment will be discussed in terms of possible explanations of variables improving the professionals' abilities to detect deception, as well as the effects of training.

Creative Cognition and Deceptive Communication

Chun-Wei Hsu*, Giorgio Ganis

Recent research has provided evidence for a bidirectional link between some aspects of creative cognition and dishonesty. However, the potential role of creative cognition in the ability to generate lies and to detect them in others is unknown. On the one hand, creative cognition may facilitate generating lies by enabling liars to construct more creative deceptive scenarios. On the other, it may also facilitate detecting lies by enabling an observer to rely less on stereotypical beliefs about deception cues that typically lead to poor lie detection performance. Thus, creative cognition may be one variable that could account for the correlation between the ability of generating and detecting lies suggested by recent evidence. This study aimed to investigate the contribution of different aspects of creative cognition, as measured by several creativity tests, to deceptive communication. Performance in both the generation and the detection of lies was measured in three related deception tasks carried out in a laboratory competitive interactive setting. Performance was quantified using signal detection theory. Results showed that individuals who scored higher on the creativity achievement questionnaire (CAQ), especially in the arts domain, tended to generate more believable lies and tended to generate more lies, when given the choice to lie or to tell the truth. In contrast, individuals who scored higher on the science domain of the CAQ tended to be better at detecting lies. Importantly, no hints of a correlation between the ability to generate and detect lies were found. These findings suggest that generating and detecting lies are distinct abilities and that different aspects of creativity may contribute independently to these two abilities.

Towards a Holistic Model of Deception Detection: Theoretical Developments and Practitioner Applications

Iain Reid*, Lynsey Gozna, Julian Boon

Modern challenges in police, security, and intelligence domains require greater insight and flexibility into the ways deception can be identified and appropriately responded to. Traditional approaches for veracity assessment have focussed upon isolated verbal, non-verbal and paralinguistic techniques, with more recent approaches concentrating on eliciting behavioural differences between truth-tellers and deceivers. However, when we are seeking to detect deception it may be more beneficial to examine clusters of cues to deception coupled with a comparison of behaviours to baseline behaviours and incongruities between verbal and nonverbal behaviours to ensure that a more holistic view of veracity is produced. The current research reviews literature in the context of multi-disciplinary applications and advances a holistic approach to deception which incorporates diverse techniques for assessing credibility which can be utilized in interpersonal and online contexts. A holistic model of deception will be presented and discussed including the application to applied forensic and security environments. The model has been further validated through in-depth interviews with deception Subject Matter Experts (N=19) from applied research and practitioner domains. The resultant model places increased emphasis on the development of tailored deception detection strategies reflecting the situational requirements, and underlying decision-making processes of individuals and groups in high-stakes environments. The Holistic Model of Deception proposes that context and the deceiver's background history, personality and cultures will affect the communication channel selected to deceive the target, and the tactics used to identify vulnerabilities in the target which deception seeks to exploit. The target of the deception has a range of techniques that can be used to detect deception, and in a tailored strategy these techniques will reflect the communication channel and the resources available with which to detect deception. The current paper will outline how multiple credibility assessment techniques will be used to ensure a robust and effective response.

An Applied Scientist-Practitioner Model for the Assessment of Deceptive High Stake Future Intent in Forensic and Security Settings: Incorporating Consideration of Personality, Motive, Mindset, and Risk

Lynsey Gozna*, Rebecca Lawday

Challenges for practitioners in applied forensic and security settings include the prediction and identification of future high stake intent that will cause harm to others. The complexity and nature of the stakes involved when detecting deception have implications for structured professional judgements in regard of

risk. Previously this has been explored and investigated largely in regard of acts of terror, and broadly on the assumption that individuals will likely present dichotomously, that is, truthfully about non-harmful intent or deceptively about harmful intent, neglecting the intricacies of individual differences. In actuality, practitioners are required to consider the real life intent and actions of offenders who may act alone or in concert with others, who are fuelled by a range of motives, can be planned or spontaneous, incorporate elements of fantasy or offence paralleling acts, and/or be co-ordinated and considered in pursuit of a particular belief system or mindset (extreme, sexual, or criminal) supportive of harmful acts, terrorist or otherwise. This paper proposes a model for understanding high stake, harmful intentions and actions with consideration of personality, offence motive, mindset, and contingent risk. The applied scientist-practitioner approach for the detection of deception in future harmful intent is based on an understanding of serious and major crime offenders across secure and community forensic settings. This will include exemplars of real life cases from extensive therapeutic and risk focused interviews with offenders and will evidence how to maximise practitioner understanding of the behaviour of individuals with a range of forensic histories and genuine harmful intentions, including their counter-detection strategies. The discussion will further consider the mechanisms through which deception can be detected based on real world practitioner challenges and assimilated into an approach to ascertain suspected or predicted criminality.

Verbal Indicators of Deception in Different Interview Techniques

Maureen Van der Burgh*, Coral Dando, Ray Bull

Research shows that there are few reliable cues to deception. For this reason, recent work on lie detection has shifted its focus to the investigation of different interviewing techniques. It is hypothesised that the use of these techniques might create, enhance or multiply cues to deception. Previous research on the effect of the timing of evidence disclosure within interviews has indicated that the Gradual and the Late techniques both have higher success rates than the Early technique in discriminating deceivers from truth-tellers. The aim of this study is to further investigate the effect of different interviewing techniques on verbal indicators of deception. The study consisted of an interactive game in which participating students either fulfilled the role of builder or terrorist. Subsequently, they were interviewed by a trained interviewer about their actions during the game. 60 videos and transcripts were analysed: 20 interviews from each interview condition, in which half of the participants were lying and half were telling the truth. It was hypothesised that interview techniques that were more successful in telling truth tellers from liars, provoked more cues to the deception. All interviews were analysed for known indicators of verbal deception (amount of details, talking time) and not yet investigated indicators of

verbal deception (given reasons for actions, multiple categories of admitted lack of memory). It was hypothesised that interaction effects would be found for these indicators: the successful Gradual interview technique was expected to produce the largest differences between deceivers and non-deceivers on the indicators of deception. The most important findings of this study are that interaction effects were not found. However, the study did show that truth-tellers gave more details than deceivers. Interestingly, significant differences were also found for a newly investigated verbal indicator: deceivers gave significantly more reasons for their actions than truth tellers did.

The Nuts and Bolts of Conspiracy Theories: And What They May Be Telling Us About Ourselves

Syed Taha Ali*

Interest in conspiracy theories has soared in recent years and they are now a vibrant part of popular culture. Conspiracy theories, when they become mainstream, can polarize society, undermine democracy, and in some instances, have directly fueled radical ideologies with devastating consequences. In this presentation, we highlight certain fascinating new directions in academic research on the conspiracy theory (CT) phenomenon. Researchers have traditionally treated CTs as intellectual aberrations and delusional disorders existing on the far fringes of society. However, considering the mass surge in their popularity, some are now questioning this diagnosis and resituating conspiracy thinking as symptomatic of a profoundly larger malaise affecting modern society. Some psychologists contest the conspiracism-as-pathology approach entirely: they argue that conspiracist ideation enables believers to construct and communicate self-affirming mythologies or a set of personal values in the face of threat. Others contend that slackening educational standards, accelerating specialization of knowledge, and an increasing lack of transparency in politics creates an ‘epistemic ambience’ in which CT’s flourish. Conspiracism may also be a reaction to dominant media practices today, such as ‘astroturfing’ and what Ellul terms ‘integration propaganda’. These lines of inquiry are a radical break from the past and force us to re-examine fundamental questions: are CTs inherently good or bad? Can one objectively differentiate between conspiracy and legitimate critique? Why do smart people subscribe to CTs? And, most importantly, what can we, as researchers, do about CTs? This talk should be of interest to those working in psychology, media studies, politics, technology, and even the layman interested in contemporary culture. Topics covered include an overview of Nesta Webster’s work on secret societies (the template for modern conspiracy theories), the psychology of conspiracists and ‘superconspiracies’, and a discussion on how the Internet and social media have ushered in a ‘golden age’ of conspiracy theories.

"That's Disgusting." Really? Identifying Deceptive Emotional Responses

Genevieve Iversen*, Ted Ruffman

This study examined whether people could convey a deceptive emotional response convincingly and people's ability to detect such deception. First participants viewed videos containing amusing or disgusting content. Sometimes they described the clip honestly while other times they were asked to lie about what they were watching and were given a description of a film of the other valence to describe instead. The videos of 16 participants (8 men and 8 women) were then shown to 50 undergraduate students in one of two conditions. One group viewed videos in which the participants described amusing content, while the other group viewed videos in which people described disgusting content. The participants were advised that the people were either really watching a film containing this content (identified as amusing or disgusting) or had been watching "something completely different." After each video the individual rated whether the person in the film was lying using a sliding scale anchored by two endpoints (0=not lying, 100=lying). The emotion recognition skill of liars and lie detectors was measured using images from the FEEST stimuli set. Consistent with past research, overall lie detection accuracy rates were low, but were above chance when judging the videos in which disgust (genuine versus deceptive) was displayed. No correlation was found between the emotion recognition skill of the liar and the detectability of their lies but the emotion recognition skill of lie detectors was related to their ability to differentiate genuine versus deceptive disgust. When the scores for the six emotions (happiness, sadness, anger, fear, surprise, disgust) were considered separately for this condition, only the correlation between the ability to identify disgust and deception detection was significant. The findings indicate that it may be easier to identify genuine disgust than it is to identify genuine amusement. These findings are discussed.

Polygraph Examination and Non-Instrumental Detection of Deception in Poland

Anna Szuba-Boroń*

Detection of deception is a question of high practical significance. Polygraph examinations in Poland are conducted both in criminal proceedings and in the process of recruitment to police and special forces (pre-employment), and subsequently also in the control of such forces (screening) and their information sources. They are also allowed in disciplinary proceedings of public prosecutors. However, tests of this type have not yet been used to control progress in therapy of sex offenders. Polygraph examinations have been used sporadically in criminal procedures since 1963. Since 2003, i.e. after when the criminal procedure code was amended, a few hundred examinations are performed in

criminal cases in Poland every year. The number of examinations for internal police and special forces use remains unknown, yet is generally believed to be a number of times higher. In a criminal cases, especially in the criminal investigation, a polygraph examination is used both for preliminary elimination of suspects and as evidence. To use examination results before the court, the expert witness is allowed to conduct a polygraph examination only with the prior consent of the subject, and deliver its result as an expert opinion. Evidence from polygraph examination is treated as circumstantial in criminal procedures. Beginning with the 1970s, polygraph examinations have been object of scientific research in Poland, and Polish experimental works in the area have been highly appreciated in world literature. Instrumental techniques of detection of deception other than polygraph – which include the EEG and especially examinations of the p-300 waves, and the detection of face temperature changes (recorded with an infrared camera) for detection of deception purposes – are the object of experimental studies, and the techniques are not used in practice. So far, Poland has lacked scientific research in applicability of using detection of deception in private business. Non-instrumental methods of lie detection, especially those that analyse utterances (notably SCAN and SVA/CBCA) have as yet been only infrequently used by expert witness psychologists to examine underage witnesses. Nevertheless, they have become the object of numerous scientific studies in recent years.

Investigating Children's Ability to Conceal Information in Relation to Executive Functions and Affective Problems

Ovidiu Jurje*, Oana Ciornei, Cristina Fizesan, Monica Buta, George Visu-Petra, Laura Visu-Petra

The present studies investigate children's ability to hide relevant information in the context of an innovative Reaction Time-based Concealed Information Test (RT-CIT). The first study is a preliminary attempt to validate the RT-CIT and relate it to cognitive and emotional development in young children (6-9 years of age, N = 32). The promising results encouraged us to expand upon it with a second study with slightly older children (7-10 years of age), involving a substantially larger sample size (N = 162) and a control group. Children's ability to deny the possession of relevant information was related to individual differences in executive functioning and affective problems, but also to basic measures of intelligence and processing speed. Results from both studies suggest that the RT-CIT is relatively effective on children, although only by early school-age can it be considered a reliable tool for detecting concealed information. There was a clear tendency for the younger children in our first study to have overall longer and more variable RTs for all stimulus types, leading to a significantly lower detection rate compared to the second, more extensive study. We found conclusive evidence for the fact that executive

functioning predicts children's proficiency in concealing information. However, the specific interrelations are complex and differ between the two targeted age groups. Finally, we found limited evidence for a substantial association between affective problems and children's proficiency in concealing relevant information. This investigation could shed further light on the dynamics of the ability to conceal information at various ages and the cognitive mechanisms involved in this behavior. This also has practical implications for the development of rigorous protocols to detect children's concealed knowledge in judiciary environments, by using accessible and cost-effective measures such as the RT-CIT.

Face and Head Rigidity Analysis For Deception Detection

Judee Burgoon*, Steven Pentland, Nathan Twyman

The majority of research analyzing facial correlates of deception has focused on emotional valence and momentary expressions (micro expressions), and has relied on human coders to identify these expressions. Both the reliance on emotional valence and human ability to detect subtle facial features has many drawbacks in real-world deception detection settings. In order to expand face analysis research beyond a laboratory setting, techniques must be developed that can be practically utilized in a real-world scenario. Automated coding increases potential application, and provides the possibility to identify unique deception cues. The current study employs automated face analysis algorithms to measure facial rigidity during an automated interview that used direct questioning and an adapted CIT protocol. The interviews were recorded with a standard HD webcam, and tested familiarity with a mock theft. Prior work has identified bodily rigidity stemming from a perceived threat in a similar scenario. We expand on this research by exploring rigidity effects in the face and head during deception. Results of a video analysis supported the presence of deception-induced rigidity in the head and provided additional insight into how deception-induced tension affects general head and facial emotion expression and movement. Automated facial rigidity analysis can be more widely deployed than human-based alternatives, is more consistent than micro expressions, and may be more difficult to conceal or control than emotion-specific facial expression cues.

Deterring Deception in Online Insurance Claims

Jussi Palomäki*, David Modic, Jeff Yan

Insurance fraud is widespread, ranging from “professional” crooks meticulously organizing staged accidents to ordinary people inflating the damages in an otherwise legitimate claim. Insurance companies invest a lot of time and effort in minimizing their losses, but there is room for improvement in terms of

deception deterrence. In online insurance claiming the customers often fib their claims, but the companies are rarely able to prevent it. We will study how deception in online insurance claiming can be deterred in three online experiments. We will also evaluate how individual differences in susceptibility to persuasion and the dark triad traits (Machiavellianism, psychopathy, and narcissism) moderate the effectiveness of various deterrence methods. Each experiment progressively increases in ecological validity. Ultimately, we aim to 1) create effective and usable deterrence methods that insurance companies can implement online, and 2) shed light on the individual psychological differences in online insurance claim fibbing. The first experiment has been carried out. Two deterrence methods were implemented online in a mock insurance-claim web page: 1) a pair of “watchful” human eyes fixed on the right side of the screen (the picture was clearly visible, but did not significantly block information on the screen), and 2) a white box with the text “You are being monitored. Your computer has the following Internet Protocol (IP) address: *IP*” fixed on the same location. We are currently analysing these data, and implementing the second experiment. Preliminary results indicate that in terms of deterring fibbing, the IP-notification works but the watchful eyes do not. The subsequent experiments will dig deeper into these findings by, for example, introducing real monetary incentives for fibbing, and contrasting situations such as being drunk vs. angry when breaking an item for which money is claimed.

The Verifiability Approach in Insurance Contexts; Exploring the Effect of the Information Protocol

Adam Harvey*, Aldert Vrij, Galit Nahari, Katharina Ludwig

The current study examined if providing or withholding information about the Verifiability Approach mediates the utility of the lie detection method in insurance claims contexts. A total of 80 claimants (40 liars, 40 truth tellers) were either provided or not provided information about the functioning of the verifiability approach prior to writing their statements. Statements were then coded for spatial, perceptual, temporal and affective Reality Monitoring criteria, and then each coded detail was re-scored as either verifiable or unverifiable. The verbal cues examined were (i.) the number of verifiable details and (ii.) the percentage of verifiable details (the ratio of verifiable details/ total detail) per statement. Results showed that the information manipulation mediated the diagnostic utility of the Verifiability Approach. When claimants were provided information, truth tellers provided more verifiable details overall and their statements contained a greater ratio of verifiable/ total detail versus liars. However, when information was not provided, liars and truth tellers reported similar amounts of verifiable detail overall and similar ratios of verifiable/ total detail per statement. The results indicate that providing information about the Verifiability Approach facilitates rather than hampers this particular lie

detection tool in the insurance claims domain. It is suggested that the information manipulation should be integrated within the full Verifiability Approach. Future research should investigate alternative manipulations capable of further eliciting verifiable details from truth tellers.

Have You Seen this Scene? Developing a Concealed Information Task for Scene Recognition

Daniel Norman*, Daniel Gunnell, Kimberley Wade, Derrick Watson

The concealed information test (CIT) is often advocated as a method for detecting deception. Information about a crime that only a guilty person would recognise, typically a single object (probe), is presented within a sequence of similar but irrelevant objects. Participant's physiological responses to stimuli are recorded and used to indicate concealed recognition. In the present study, we examined whether the CIT is applicable to the recognition of whole scenes as opposed to single objects. University students each completed 10 scene CITs presented on a computer monitor. Each CIT contained: a probe, a recognisable campus scene; a target; and four similar but unfamiliar scenes. Participants were instructed to conceal recognition of scenes from Warwick campus and only answer "yes" to the target scene. Electrodermal Activity (EDA) and reaction time measures were taken for each scene. The results showed that the target scene typically elicited the greatest electrodermal responses in each block. However, no significant difference was found in reaction time measures between probe, target and irrelevant scenes. Furthermore, although probe scene recognition using EDA was much more promising, it fell short of that found in typical studies using objects. These results raise new questions about: i) use of the CIT for concealed scene recognition, ii) the relationship between, and potential issues of measuring reaction time and EDA within the same test, and iii) future design considerations (such as the use of single vs. multiprobe techniques) in the development of a scene-based CIT. If valid, scene-based CITs can be developed this will offer a greater range of information for investigators to utilise during questioning.

Detecting Sophisticated Social Engineering Attacks through linguistic indicators of deception

Robert Larson*, Helen Jones, Awais Rashid, Alistair Baron

Cyber attacks against an organisation leverage vulnerabilities in its Information Technology infrastructure to penetrate security. Conversely, social engineering targets the human element of an organisation, in an attempt to subvert security through deception of staff. The ploys used by social engineers include: impersonation for purposes of exploiting existing trust-relationships, and fabrication of circumstances that leverage psychological weaknesses in their

victim, such as urgency, social validation or authority. Deployed as a cyber attack, social engineers craft persuasive ploys into phishing emails and highly-targeted personal spear phishing emails to deceive their target into, for example, opening a malicious payload or divulging confidential information. This approach successfully subverts traditional security methods, and is now available as a tool that can automatically generate highly personalised social engineering attacks. The most sophisticated social engineering attacks go beyond this formula, using a range of deception tactics and persuasive messaging to sway even the most phishing-wary employees. Such sophisticated attacks currently go undetected by automated security solutions. One method for detecting sophisticated Social Engineering, may be the identification of linguistic markers of the deceptive and persuasive ploys used in such attacks. Insights from the field of cyberpsychology provide a basis for identifying potential markers, with links between the success of an attack and factors such as authority, familiarity, and threat of loss. Here, in the first stage of our work, we present a taxonomy of social engineering attacks, detailing the deceptive ploys they contain, and the associated linguistic features that we propose may be used to identify them. Our future work aims to operationalise this taxonomy, using Natural Language Processing to identify the deceptive language that is the foundation of sophisticated social engineering. Combined with online learning algorithms, we aim to produce a system that remains effective in the adversarial and changing realm of cyber security.

Understanding Scam Victims: Seven Principles for System Security

Frank Stajano*, Paul Wilson

We often hear security experts complaining that humans are the weakest link: otherwise impenetrable systems get penetrated because of social engineering, phishing and other frauds that target the human element rather than the technology. "If only users weren't that gullible...". Are they, really? What is it that makes users so gullible? If we want to design effective countermeasures we need first to understand how users naturally fall victims to fraudsters. This work, first presented in 2009 and published in the computer literature in 2011, started by analyzing hundreds of scams that had been researched and recreated for a popular UK television show, "The Real Hustle". We reduced these hundreds of frauds to a handful of general principles. In our ignorance of the psychology literature, we only discovered Cialdini after presenting our first draft, but immediately found interesting parallels: fraudsters and salespeople are almost indistinguishable in how they manipulate their customers, except that what salespeople do is sometimes legal. The principles that explain why victims fall for scams are rooted in human nature and have been exploited by fraudsters for centuries before computers were invented. Our key insight is that users fall prey to these principles not because they are gullible but because they are

human. Instead of blaming users, engineers should understand that these vulnerabilities exist and should build systems that remain robust despite them.

Priming Honesty and Deception with Eye Spots

Chris Traver, Jeff Hancock*, Tyler Cordell, Megan French

Detecting deception is difficult; is it possible to modify the likelihood that a person will choose to deceive? One possible method of influencing the deceptive choices is by using stimuli that are non-consciously processed to prime more honest behavior. One type of prime, called surveillance primes, present a eye spots in a person's visual field and lead to more pro-social behavior. In this poster we report on studies that indicate how these kinds of surveillance primes can affect deception by using a paradigm in which participants report the result of a game of chance (e.g., the sum of rolled dice or a flipped coin). The resulting distribution of the responses, which should fit a uniform distribution, can be analyzed for deviations from the expected distribution, with skew representing deception (e.g., over-reporting the frequency of rolling a six). We asked 405 participants to either roll a dice and report the number rolled or flip a coin six times and report the number of heads. An image of eyes or an image of flowers (control) was presented during the reporting phase. In all conditions, participants were offered a higher amount of money for a higher reported result. Results reveal that participants who were exposed to an image of a pair of eyes displayed less deception.

The State of Science on Facial Cues to Emotional Deception and Future Directions

Alysha Baker*, Stephen Porter, Leanne ten Brinke

Emotional cues to deception have been theorized to result from strong, affective experiences associated with either the subject of the lie or the act of lying (Ekman, 2001). Although emotional leakage can present itself in a number of channels (e.g., body language, verbal content), the face is a particularly important communication channel that reveals one's emotions and can be examined for cues to deception in both real-world, high-stakes settings (e.g., ten Brinke, Porter, & Baker, 2012) and lab settings (e.g., Porter, ten Brinke, & Wallace, 2012). However, examining the face for cues to deception has fallen out of favor recently, following the perceived failure of the TSA's SPOT program. This presentation will summarize the state of the science, including important knowledge about the promises and limitations of using facial expressions as a cue to deception. Further, new avenues of investigation regarding what the face reveals in deceptive contexts that are worthy of researchers' attention will be discussed.

Masters of Manipulation: The Psychopathology of Deceivers

Milena Boeger*, Daniela Hosser

A wide range of studies have dealt with lying and fraud, but less is known about individual differences in the manipulative skills of liars and fraudsters. Thus, this study focuses on psychophysiological reactions, behavioral features and personality traits of deceivers, using a multi-method approach (psychophysiological tests, qualitative and video-based methods, questionnaires). The aim is to investigate what enables deceivers to manipulate others so effectively. The sample consists of 15 persons convicted of fraud, 15 persons convicted of crimes other than fraud and 30 non-delinquents, all were male. Participants underwent a lying experiment, thereby measuring skin-conductance level and heart rate. They were tested for personality styles and disorders (PSSI, PPI-R), self-efficacy, and emotion recognition or cognitive empathy (MIDECT) in line with the scientific standards of Ekman's Facial Action Coding System. Results showed that the heart rate of the fraudsters significantly diminished in the part of the experiment in which they had to lie, whereas the other two groups had an increased heart rate in this situation. With regard to electrical skin resistance no group differences or interaction effects were found. Furthermore, there were no significant group differences in emotion recognition. However, fraudsters, criminals and non-delinquents differed significantly in their self-efficacy, their overall score of psychopathy and schizoid behavioral tendencies. The fraudsters showed the highest levels. Results are discussed with respect to lie detection and offender treatment.

Conference Banquet at King's College

King's Parade, Cambridge

Tuesday 25th of August, 19.00-22.00

Please make your own way to the dinner location (30-minute walk, 21 minutes by bus Uni4 getting on in front of the William Gates building and getting out at Pembroke street, or 10 minutes by taxi +44 (0)1223 715715).

Wednesday 26th of August
William Gates Building
15 JJ Thomson Avenue
Cambridge

Panel Session: A Touch of Deception
Wednesday 26th of August, 09.30-11.00

The Reality of 'Reality Monitoring' (RM): Are We Ready to Apply RM in Real Life?

Galit Nahari*

One distinguished approach for determining truths from lies is Reality Monitoring (RM), a content-based method. Studies show that the accuracy rate of RM is about 70%, a considerable level given that the average accuracy rate without using tools is only slightly above chance. However, to date, we are not aware of the use of RM by practitioners, and the pertinent questions are whether we are ready to apply RM in real life police interrogations, and whether RM is appropriate to serve as admissible evidence in court. In order to answer these questions, three main matters are relevant. First, regarding the external validity of RM research: RM is based mainly on the quality of the interviewee's memory, and verbal ability, factors that are relatively neglected in RM research. The ability to trust that what works in the lab, will also work in real life, is questionable. Second, regarding vulnerability to judgmental biases and countermeasures: RM coding, and consequently its accuracy, is affected by individual differences among coders, by cognitive biases (e.g., primacy effect, confirmation bias), and by attempts of the interviewees to respond in such a way that RM will judge their account as being truthful. This vulnerability may lead to erroneous decisions. Third, the decision criterion for a single statement: content features of the statement vary as a function of interviewee characteristics (e.g., personality, gender, verbal ability) and type of statement (e.g., alibi vs. insurance claim). This makes for a difficult decision regarding the quality of a single statement. These matters will be discussed from a practical perspective, and required steps toward applying RM in real-life will be suggested.

Variation of Liar's Cognitive Load through the ADCM Model and GKT Protocol

Nicolas Rochat*, Hugues Delmas, Samuel Demarchi, Charles Tijus, Isabel Urdapilleta

Deception generates an increase of cognitive load (Vrij & al., 2008). However, in the cognitive model of Activation-Decision-Construction-Model (ADCM;

Walczyk & al., 2014), it is difficult to identify which module generates a higher cognitive load. According to this model, the process of recognition, inhibition or response construction shouldn't generate a similar cognitive load, because recognition is regarded as an automatic process in memory unlike to inhibition and response construction. We used variation of pupil diameter to assess cognitive load (Goldinger & Papesh, 2013) that we coupled with a Guilty Knowledge Test protocol (GKT), considered as one of the most robust protocol for lie detection (Verschuere & al., 2011). GKT protocol presents several alternatives in response to a question ("Where the bodies were found?") and compare reaction differences between crime elements and irrelevant crime alternatives ("In a field? In the forest?"). Examination allows pupil variations over time allow to detect cognitive load. For instance, liar should inhibit automatic answer and construct an alternative answer, while honest people shouldn't use those processes. During passation, participants had to either watch a video on criminal scene (deception condition) or a video unrelated to the crime scene (honest condition). All participants had to answer "no" to all the alternatives presented (GKT protocol). An eye tracker recorded the pupil dilation. Results of mean pupil diameter indicate a more important cognitive load for liar participants, this is consistent with Mann and Vrij (2006) where liars seemed to think hard more than honest people. If we only consider pupil diameter variation of liar participants, some variation differences appeared between alternatives of crime video and irrelevant items. In view of ADCM model, this implies that some cognitive process (e.g., inhibition or answer construction) were different than other for deceptive items. Implications of cognitive load variation in deception production will be comment.

Eye Tracking as Indirect Method of Deception Detection

Joanna Ulatowska*, Maja Dobrzyńska

The goal of the present study was to test whether using indirect method of deception detection results in different behaviour of the observers than the direct method. To answer this question, eye movements were monitored during deception detection. Sixty participants watched statements of six different people describing most stressful autobiographical experience. Half of the senders were lying. Depending on study condition the observers were asked either to directly assess the truthfulness of the senders or to assess if the senders were thinking hard. During the assessment number of observers' fixations and processing time (duration of fixations) were monitored for four areas of senders' body separately: upper part of face (nose, eyes, and forehead), lower part of face (lips, chin), torso and hands as well as legs. Unexpectedly, the results revealed that the indirect method of deception detection did not exceed the direct one in the accuracy of distinguishing between truthful and deceptive statements. However, the eye tracking monitoring showed that for all body areas analyzed,

the fixations number was larger and processing time significantly longer for truthful statements than for lies. The present study proved that eye movement tracking could be accurate tool for distinguishing between truths and lies. The theoretical and practical implications of these findings are discussed.

How the Human Body Can Detect Deception

Leanne ten Brinke*, Jooa Julia Lee, Dana Carney, Francesca Gino

Although behavioral correlates of deceptive behavior exist, humans report relying on erroneous cues in discriminating liars from truth-tellers. However, an emerging literature suggests that our professed ignorance for this task may actually mask our natural wisdom. This research contributes to the literature suggesting that more implicit measures of detecting deception yield greater accuracy than the direct measures that have dominated traditional lie detection research. Drawing upon the somatic marker hypothesis, we suggest that these implicit mental processes may also be reflected in physiological reactions to deceptive behavior. Physiological reactions were measured while observing emotional high-stakes lies versus truths in televised appeals to the public for the return of a missing relative. Findings reveal that observers viewing deceptive murderers experience a physiological threat response — blood rushes away from the body’s periphery. This experience was specifically associated with observing murderers’ express happiness (i.e., smiles) in their appeals. In contrast, observers experience a decreased electrodermal response—consistent with the experience of sadness—when observing genuinely distressed pleaders. Despite the diagnostic utility of these physiological responses, observers do not appear to use this experience to guide their consciously held self-report judgments of who was lying or telling the truth; physiological reactivity was unrelated to lie detection accuracy. Findings provide a new lens through which to reconsider old, and approach new, investigations of human lie detection.

Emotion, Morality and Deception: Empathy Substrates and Moral Foundations in Predicting Self-Gain Deception

Elena Svetieva*, Sarah Dietrich, Mark Frank

Deception is a common, but morally-laden, human behavior. Current evolutionary and developmental theory suggests that moral foundations and moral behavior have their origins in the more fundamental substrates of empathy (theory of mind, recognizing mental and emotional states in others, and the tendency to feel congruent emotion with others). A set of three studies involving 300+ participants examined the links between these basic empathy substrates, moral foundations (Graham et al., 2011), and both acceptability and propensity towards self-gain deception. These were obtained through ratings of lie scenarios as well as behavior in a micro-decision task (Gneezy, 2005) where

participants could choose to tell the truth, knowing that their counterpart would receive slightly more money, or lie to receive the greater monetary payout. Several findings emerged. Individuals with stronger moral foundation concerned with care towards others and avoidance of harm were consistently more likely to rate self-gain lies as unacceptable and tell the truth in the deception game. Moreover, empathy and emotion contagion have a significant indirect (mediated) influence on acceptability of self-gain lies, as mediated by the moral foundation of harm. Third, accuracy in recognizing emotion expressions of distress had a significant, direct and negative influence on acceptability of self-gain lies. Finally, analyses of participants' open-ended responses regarding their behavior in Gneezy's deception game indicated that their truth-telling behavior was motivated by either moral or pragmatic considerations, the latter of which was not predicted by moral foundations or attitudes towards self-gain deception. With this research we hope to open a broader discussion of how we can examine the more basic antecedents to deception behavior, both at the individual and evolutionary level, as well as explore the theoretical value of merging behavioral economics with social cognition and individual differences research disciplines.

Policemen's and Civilians' Beliefs about Facial Cues of Deception

Hugues Delmas*, Benjamin Elissalde, Nicolas Rochat, Samuel Demarchi, Isabel Urdapilleta, Charles Tijus

The most commonly discussed nonverbal indicators in studies about subjective cues to deception are smiles, self-adaptors, illustrators, body movements, etc. (Vrij, 2008). Apart from smiles (e.g., Akehurst & al., 1996), facial indicators are underrepresented in comparison to body cues, even though they are central elements of human communication. Beliefs about cues of deception are commonly evaluated by questionnaires (e.g., "do you think that smile is a relevant cue of deception?"). This is a difficult task because there are types of smiles (true and false smiles) with different patterns that involve two main muscles (Orbicularis oculi and Zygomaticus major) that can be activated independently to create smile movements that are different, although related to a single description. This difficulty to evaluate patterns of smiles could explain the lack of statistical differences between policemen and civilians (e.g., Vrij & al, 1996). We reasoned that facial cues' classification might be improved by using photos of indicators instead of written descriptions. To our knowledge, there is no facial indicators investigation with such an experimental paradigm contrasting policemen (N = 50) and civilians (N = 50). Stimuli were 54 standardized photos. They accounted for 43 AUs (FACS), 10 AUs' co-occurrences of eyebrow movements and basic emotions, plus a neutral face. Two certified FACS coders evaluated the conformity of expressions. The task was to determine whether the expression was characteristic of deception and if

this expression was more or less present during a lie. Results highlighted the indicators that were perceived more present (e.g., lip wipe) or less present (e.g., fear) in deception. There were differences ($p < .05$) between civilians and policemen (e.g., head down). Results were also revealing new representations about deception which can be of help for updating trainings on this topic in order to decrease a number of erroneous beliefs.

Symposium 7: Guilty Knowledge / Concealed Information Test

Wednesday 26th of August, 11.30-13.00

Extracting Concealed Information from Groups

Ewout Meijer*

Lie detection procedures are typically aimed at determining the guilt or innocence of a single suspect. The Concealed Information Test (CIT), for example, has been shown to be highly successful in detecting the presence or absence of crime-related information in a suspect's memory, using psychophysiological measurements such as skin conductance response. Many of today's security threats, however, do not come from individuals, but from organised groups such as terrorist networks or criminal organisations. In this presentation, I will highlight results from a series of experiments showing that the CIT can also be used to extract specific information from such groups. This includes the detection of knowledge about a mock terrorist plan when each participant was tested separately, but also when skin conductance was measured in multiple participants simultaneously, and the responses to a previous question determined the content of the consequent questions. I will also discuss results from an experiment showing that information can be extracted from a group even when it consists of both knowledgeable and unknowledgeable individuals. We successfully applied dynamic mixture distributions (Hidden Markov Models) resulting in a two-step analysis. First, the knowledgeable participants were singled out from the unknowledgeable ones, and then the critical information could be extracted from this subset.

Faces in Context: Do Eye Fixations Reveal Deception about Faces Linked to Specific Scenes?

Ailsa Millen*, Lorraine Hope, Anne Hilstrom, Aldert Vrij

This research explored whether liars' eye fixations revealed (1) memory for previously learned associations between faces and scenes and (2) cognitive efforts to mislead the experimenter when liars purposely selected the wrong association. Participants were shown two-face displays presented on a single background scene; one face had been previously paired with the background

scene during a study phase, the other face had been presented during the learning phase but was matched to another scene. Thus, test screens displayed two faces and a scene that were similarly familiar but only one face matched the scene displayed. At test, the participant either told the truth (identified face that matched the background scene) or lied (identified the non-matching face). Results revealed that the majority of first fixations were made to the matching face during both truth and lie trials, suggesting preferential orienting of attention to the face previously matched to the scene. Also, durations of first fixations were longer to the non-selected, matching face in lie trials than to the non-selected, non-matching face in truth trials. In the last fixation, the majority of lie trials revealed preferential orienting of attention to the face that did not match the scene, consistent with action planning. Durations were longer for the last fixation on the selected but non-matching face on lie trials compared to the last fixation on the selected matching face in truth trials, supporting predictions that planning of response selections is more difficult for liars. This novel experimental design contributes to memory detection research that traditionally uses protocols that investigate responses to known and unknown stimuli to reveal memory. This protocol presented here may be useful for police officers attempting to directly link a particular suspect to a specific crime scene.

Using the IAT to Detect Deception about Intentions

Lara Warmelink*

The Implicit Association Test (IAT) can be used as an indirect lie detection test. Sartori et al. (2008) found that participants can respond faster to sentences about autobiographical events when the response key for such a sentence is the same key as for sentences that are true (congruent) compared to when the response key is the same for sentences that are false (incongruent). Agosta et al. (2011) showed that this effect is also present when the sentences are about intentions rather than autobiographical events. In these studies, the IAT sentences were the same for all participants and written beforehand by the experimenters. A consequence of this was that the sentences were relatively generic (e.g. Tonight I plan to sleep in my bed). In the current study we wanted to investigate whether the IAT could be used to determine participants' deception about their own, self-described intentions. We asked participants to describe their intentions for after the study. Participants were then interviewed about this intention and were asked to complete the IAT, with sentences taken from their description of their intention. Half of the participants were asked to lie and describe the same false intention in the interview and on the IAT. The participants described their lie to the experimenter before the interview, so the sentences about their false intention could be added to the IAT. Preliminary results suggest that truth tellers were significantly faster (891 ms) in the congruent condition than liars (1026 ms) ($p < 0.001$). In the incongruent condition, no significant differences between

truth tellers (1930ms) and liars (1806 ms) were found ($p = 0.07$). Full analysis (mixed effect models) will be provided at the conference, as well as a discussion of the results.

Detecting Deception by Detecting Breakthrough into Consciousness: a Brainwave Concealed Information Test based upon the Fringe-P3 Method

Howard Bowman*, Abdulmajeed Alsufyani, Marco Filetti, Omid Hajilou, Alexia Zoumpoulaki

We use the term (Sub)liminal Salience Search (SSS) to describe humans' extraordinary capacity to "preconsciously locate" stimuli that are salient to them, with the locating being in time as well as space. A particularly compelling demonstration is Rapid Serial Visual Presentation (RSVP), in which the vast majority of stimuli presented are not perceived sufficiently to make them reportable (hence the term (sub)liminal), while salient ones breakthrough into consciousness and can be recalled (hence the term search). Importantly, although we may experience RSVP as a jumble of "overlaid" visual stimuli, perceptual processing is highly selective, as indicated by high identification and signal detection accuracies. Within a sequence of stimuli presented via RSVP, salient stimuli can be detected using the third positivity of the Brain's electrical response (the so-called P3), which indexes when a stimulus breaks into consciousness. RSVP, then, gives us a means to present many stimuli to a suspect and determine which were found salient using EEG (given that salient stimuli elicit P3s). The resulting Fringe-P3 method can be used as a concealed information test, since such information is typically highly salient. Furthermore, the pre-conscious nature of search in RSVP makes the Fringe-P3 method especially resilient to countermeasures. More specifically, the response of the brain associated with (sub)liminally identifying a salient stimulus is hard to control by conscious volitional effort. We demonstrated this in an article showing that the Fringe-P3 identity detector is indeed resilient to countermeasures, e.g. artificially elevating the response to control stimuli. We will also discuss our findings that famous faces presented in RSVP break into awareness and that such breakthrough can be detected with EEG on a per-individual basis. This suggests that our Fringe-P3 method can be applied across a variety of face-related forensics settings, e.g. face composite systems, line-ups, demonstrating familiarity to compatriots.

Conference Closing 13.00-13.10

Closing Lunch 13.10-14.00



We would like to start by thanking the local committee members, because without their hard work and enthusiasm this conference would have never taken place. The local committee exists of: Brian Glass, Jussi Palomäki, David Modic, Ross Anderson and Sophie Van Der Zee.

Secondly, we would like to thank the scientific committee members for all their input, great ideas, and excellent reviewing qualities. This includes: Ross Anderson, Dan Ariely, Judee Burgoon, Mark Frank, Giorgio Ganis, Pär-Anders Granhag (who unfortunately cannot be here), Jeff Hancock, Charles Honts, Nicholas Humphrey, Saul Kassin, Timothy Levine, Christian Meissner, Harald Merckelbach, Steve Porter, Peter Robinson, Paul Taylor, Robert Trivers, Sophie Van Der Zee, Bruno Verschuere, and Aldert Vrij.

We would like to say a special thanks to the people participating in our special panel and practical sessions. These people committed to the conference before knowing if it would be a success or not, and by doing so have helped us turn this conference into the (hopefully great) event you have just attended. Thank you Bob Arno, Martin S Taylor, Aldert Vrij, Dan Ariely, Steve Porter, Timothy Levine, Jeff Hancock, Judee Burgoon, Bruno Verschuere and Giorgio Ganis.

We would also like to thank Cryptomathic for generously sponsoring the welcome reception, and Thales for sponsoring Monday's poster session. Thales also supplied us with beautiful notepads and pens so we could write down all those questions and ideas that popped into our minds when listening to the talks.

Our last thanks is directed to all the people that helped organise this conference, and who made sure that the event ran smoothly. A grateful thanks to our volunteers, King's College, Churchill College, reception, building management, technical assistant, catering, finance, the print room and many more.

You all helped us make this conference a success!