Testimony

by

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Thank you very much for the opportunity to provide information and testify before your subcommittee about the very important issues involved in TSA's SPOT Program. Here is an **Outline** of my written testimony:

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1 Credentials:

I received my PhD in psychology from Adelphi University in 1958, and after serving for two years as a 1st Lieutenant, U.S. Army Medical Service Corps, Chief Psychologist, Walson Army Hospital, I became part of the University of California Medical School, San Francisco (UCSF) in 1961. I retired from UCSF as a full professor in 2004.

My laboratory at UCSF was supported from 1961 through 1998, without interruption, by **grants** from the National Institute of Mental Health (NIMH), and at times by grants from NSF, and the Markle Foundation, and **contracts** from ARPA, DARPA, and DHS. The contracts from DARPA and DHS were specifically targeted on deception, the other contracts and grants supported basic research with direct application to deception.

I have received the following **honors:** identified by the American Psychological Association as one of the 100 most influential psychologists of the 20th century; Distinguished Scientific Contribution Award from American Psychological Association, 1991, (highest award for basic research); honorary doctoral degrees from the University of Chicago, 1994; University of Geneva, 2007; Adelphi University 2010; University of Lund, Sweden 2011.

My first **article on deception** [i] was published in a peer reviewed journal in 1969. Since then 15 articles on deception in which I am first or second author have been published in peer reviewed journals, and 13 chapters have been published in books on this topic. My **book** TELLING LIES[ii] was first published in 1985. It has never gone out of print in English, has been translated into more than a dozen languages, and is currently in a fourth edition (2009) with four new chapters not part of the first edition. My book WHY KIDS LIE[iii] was published in 1989, and has been translated into more than six languages.

Shortly after my retirement from University of California, San Francisco in 2004 I started a small company (Paul Ekman Group, PEG), which provides training -- through workshops and online tools -- on deception and demeanor and also on emotional skills. My goal was to translate the basic research studies I had conducted at UCSF into tools and workshops that could be of practical use. That intention is also manifest in the title of my book EMOTIONS REVEALED: Recognizing, Faces and Feelings to Improve

Communication and Emotional Life[iv] (2003); second edition with one new chapter in 2007.

I or my company has provided dozens of **workshops to law enforcement agencies** for thirty years, most recently (2010) to the New York Police Department and the Serious Organized Crime Agency (SOCA) in 2011, in London. I have provided workshops on **national security** to various agencies including CIA, FBI, MI-5 in London, and the Israeli National Police.

My focus in all this work is how **demeanor** – facial expression, gesture, posture, voice, gaze and speech – can provide clues to deception and dangerous intent.

While humans do not have Pinocchio's nose, there are signs that may be related to lying that always occur in everyone, what we call '*hot spots'*. These are signs in face, body, voice, speech, or the combination of these signs, that something is amiss, something of importance is happening, more than is being revealed. There are many reasons why hot spots occur, among them are lying about hostile intent. Thus the skilled observer who identifies a hot spot must then explore its nature to determine whether it is disguising some nefarious intention or whether it occurred for some other, non-harmful reason.

Currently my main focus is on the development on **online training** relevant to these topics. The Micro Expression Training Tool (METT)[v] and the Subtle Expression Training Tool (SETT)[vi] are currently available at my website and have been used successfully by tens of thousands of people worldwide. Research has shown that people can learn to spot concealed emotions from these online tools. Five new online training tools are currently under development by my company.

My association with SPOT began in 2003, initiated by an inquiry from Carl Maccario the person who originated the program. On a pro bono basis I observed passengers at Logan Airport and reviewed more than once and gave advice about the SPOT program. Again on a pro bono basis I have met with Behavior Detection Officers (BDOs) at various airports to hear their concerns and give them encouragement. The current contract to provide online training to TSA personnel, see Enclosure 3.

I have also consulted on the FAST programs, DHS's project on **automated physiological measurement** of malintent. If this program is successful I believe it will be a valuable adjunct but not a substitute for SPOT.

2 My Research on Deception and Demeanor

From the start of my research in 1967 it has differed from most other scientists studying deception and demeanor by focusing on **high stake lies**, in which the person lying has a lot to gain or lose by success or failure. Most other research on deception and demeanor have examined lies in which there is not much to lose or gain. My very first experiment took on the challenge of detecting a lie in which life itself was at stake – suicide. It was in my study of films of suicidal patients in the late 1960's that I uncovered the nature of **micro** facial expressions, very brief (1/25 second), expressions that leak concealed emotions.[vii] The research I designed studied the ability to conceal extremely unpleasant emotions, with the threatened punishment for failure -- the loss of professional career.

The next set of studies grew out of the consultations and training I was then providing to law enforcement and national security agencies in the late 1980s and 1990s. We specifically patterned the deception situations we employed after the types of criminal or intelligence gathering situations these agencies faced. For example, we gave volunteers the choice about whether to take or leave $50 in cash, and then lie or tell the truth about this theft, or we asked strong believers to lie or tell the truth about their strongly held opinions about a social issue (e.g. death penalty). This latter situation is comparable to the informant who tries to convince an intelligence officer of his true loyalties. In both scenarios, if they succeeded in deceiving the interviewer (who was me) they could earn $50, if they chose to tell the truth and the interviewer believed them they would earn $10. However, if the interviewer judged them to be lying, whether or not they were lying or telling the truth, they would receive no money, and they were threatened with severe punishments – locked in a totally dark room the size of telephone booth, subjected to 10-40 110 db blasts of white noise at random intervals - as loud as a firecracker, but just below the level that might cause hearing damage. Note that although we gave a sample of this punishment to each volunteer, we did not actually have to punish anyone. (I also note that this work was approved by the Institutional Research Board at my University complying with all federal guidelines about the ethical treatment of human subjects.)

This study and those that followed are unique in resembling the real world in three ways: (1) the research subject decides whether to lie or tell the truth. He or she is not ordered what to do by some authority figure (the experimenter). This is important because our early research suggested that different kinds of people choose to lie or be truthful. It is also important because it is a deliberately chosen act; in the real world, people choose to commit crimes or commit terrorism, they are not randomly assigned to

do so. (2) The punishment threatened is severe, realistic, and believed by the subjects, just as it is in criminal or terrorist situations. (3) Anyone judged to be lying faces punishment, regardless of whether the person actually lied or told the truth. As in real life, the innocent truthful person faces punishment if judged to be lying.

If these three features are not incorporated in a research study the findings are irrelevant to real world high stakes lies like those that SPOT is aimed to detect.

Our research program provided evidence very relevant to the **scientific underpinning of the SPOT** program. We found that the behavioral signs relevant to distinguishing lying and truthfulness are the same r*egardless* of what the lie is about as long as there was a threat of severe punishment. The behavioral *hot spots* were the same regardless of whether the lie was about strongly felt unpleasant emotions, strongly held opinions or stealing money[viii]. This finding supported my prediction[ix] that when the stakes are very high, especially the threat of severe punishment if the lie is detected, it overloads a person's capacity to think clearly and regulate demeanor *no matter what the lie is about*. To repeat: we found that some basic core clues to deceit are not lie-specific but are the same across very different lies as long as there was a threat of severe punishment. Based on this evidence we expected the **terrorist** would show the same behavioral clues to deceit that we have identified in these other high stake lies.

The next study was specifically designed to provide information that would be most relevant to identifying terrorists. We [x] involved members of national security organizations in the U.S., England, and Israel in 2004 to advise us on designing research that would provide information *they* wanted to know. They all had personal experience dealing with terrorists; this included personnel from US Military intelligence, CIA, Scotland Yard, and Israeli National Police. .

In 2005, supported by DARPA, we (Professor Mark Frank, then at Rutgers, with myself as a consultant) recruited as research subjects members of **extremist** groups in the U.S. many of whom believe it is justified to break the law for their goals. They were given the opportunity to take a $100 check made out to a group that opposed them. If they took the money and succeeded in their lie, convincing an interrogator (usually retired FBI) that they did not take the money, the opposing group did not receive the money and their group did. In addition they personally received $75. They could also choose not to take the other group's money and if the interrogator believed they were telling the truth, the other group received $25, their group received $25, and they received $25. But if the interrogator disbelieved them, regardless of whether they were lying or being truthful, they were threatened with severe punishment and received no money.

Combining the measurements of face and body yielded a very high level of accuracy in identifying whether someone was lying or truthful; and replicated many of the same behaviors we identified in the earlier work. Although the findings are just now being submitted for publication, I have included excerpts from that publication (leaving out the academic and historical issues) as Appendix e.

The contract officer at DHS, who funded some of the analyses, required that the raw data from this study be given to the American Institute of Research – a nonprofit, independent research organization – so they could analyze and evaluate the methods and the data independently. They obtained the same very high level of accuracy in detecting lies from demeanor. It is rare – I know of no other example in any previously published behavioral study – when such independent scrutiny and verification of results is sought and obtained. Even though this work has not yet been submitted for peer review (but it will be shortly), I believe these findings should be regarded as solid.

I served only as a consultant on the next study carried out by Mark Frank now at the University of Buffalo, in which a situation closely resembling an **airport check point** was constructed, and people who belonged to political groups lied or told the truth about what they intended to do. (In the extremist study they lied or told the truth about what they had already done). As they waited in queue, a uniformed police officer passed by the queue and looked at each person. Frank analyzed the reactions of these people using some of the same behavioral measurement as in the extremist study, and found that these behavioral clues again distinguished the liars from the truth tellers, and overall at a slightly higher rate. Thus this evidence shows, as I predicted, that these behavioral markers can be useful even in situations where the person has yet to commit an illegal act. Those findings have not yet been submitted for publication, but a summary of the work is included in appendix f. We also note that the methodology of this study was also independently reviewed and approved by the American Institutes for Research.

I am currently developing a new test of the ability to catch a liar and an online training program to improve performance. Research to evaluate the impact of the training is planned. A second research project in development is to identify potential assassins in a crowd, and if that research is successful to then develop online training tools for alerting those doing surveillance to such persons.

3 What is the Basis for the SPOT Check List?

The check lists contains many of the behaviors which we have found in our studies of different types of lies – lies about emotions, strongly held opinions, taking money, and to deprive an opposing political group of income. Our research (see second full paragraph at the top of page 5) has shown that clues to deceit are **not lie-specific** but are the same regardless of what is being lied about, as long as the stakes are very high. Since these behavioral clues have been identified in multiple separate studies over a 30 year period, and since those in one of the studies were verified by an independent research group, to the extent that SPOT used our findings, we believe that part of the check list is on solid ground. All other behaviors listed on the checklist have been shown to differentiate liars and truth tellers in at least one published study, most of them by more than one. Rarely do applied materials in law enforcement settings contain as much scientific backing as this checklist.

I have been asked, would it not have been better to gather data on **how terrorists behave in airports**, and build the SPOT check list on that basis? Even if it was possible to mount surveillance cameras in every major airport in the U.S., it would have taken decades to accumulate enough behavioral records to analyze scientifically, since, fortunately, terrorism is a very rare event. For example, we know of 6 terrorists among the 29 million travelers who passed through Newark Airport in 2001. However, a place with more frequent terrorist concerns – Israel –were the creators of the behavioral observation system that eventually became SPOT. An Israeli who works in airport security has told my colleague that they based some of their system on my previously published work. And twelve years ago I taught Israeli security about my findings. The Israelis still use this system to date.

Some have wondered why research is not done to evaluate SPOT using people who **role play** being a terrorist, and see if they get through? The problem which renders that approach useless is that if the stakes are not very high, which they aren't in most role playing, the behaviors that betray a lie – many of them involuntary reactions - won't be generated. For example, my work 30 years ago showed that most people cannot raise the inner corners of their eyebrows on purpose. Yet, when people feel distressed, as liars often do, those movements will happen involuntarily. In the study of extremists (Appendix e.), there were 19 instances of this expression, and 16 of those 19 occurred in the liars.

I have also been asked: **why are felons and smugglers not terrorists being identified by SPOT?** The behavioral clues, or hot spots, are not specific to what the lie is about. A

basic set of core clues to deceit are the same regardless of what the lie is about if the threatened punishment is severe. The research evidence strongly suggests that there are no behavioral clues unique to terrorists that will not also be shown by a murderer, rapist, money smuggler, etc.

I was given the opportunity by English colleagues to view the surveillance videotapes of the London bombers taken shortly before they struck. Although the videotapes are of poor quality, what I was able to see suggested to me that SPOT personnel would have identified them. And the accounts from those who were at the feeder airport where the leaders of 9/11 boarded their flights to Logan airport, also suggested that they showed behaviors which would have been identified by SPOT if it had been in place at that time.

Some commentators on the SPOT program have claimed that those whose physical appearance and/or name suggests they might be from the Middle East might be apprehensive when entering an airport and therefore be more likely to be picked up by SPOT even though they are perfectly innocent. SPOT personnel are aware of this hazard. They know this is a behavioral profiling **not** a **racial profiling** program, and take account of the anxiety that might be felt by someone Middle Eastern in appearance. Also note that not all the behaviors on the SPOT list are anxiety based. Some years ago I suggested to the former director of TSA that research in airports should be done to insure that no racial profiling occurs. The idea was appreciated, the funding was lacking.

I have also been told by critics of SPOT that TSA should have first done observational research in airports, and the type of experimental check-point study carried out by Mark Frank and colleagues at Buffalo (on which I consulted; see page 6 and Appendix f.) before creating the SPOT program. That would be a great plan if Al Qaeda and associates agreed to a three year vacation, during which the American people would not need the layer of security provided by SPOT.

TSA was not groping in the dark when it initiated SPOT. It reached out for the best evidence available that would allow them to introduce this layer of security without delay. They came to me and my colleagues, based on their perusal of the scientific literature; I did not reach out to them to sell them anything. We were able to provide relevant information because our research showed that hot spots are useful clues that are not lie-specific but are present in all high stake lies when there is a threat of severe punishment. And finally, keep in mind that these behaviors do NOT trigger an arrest. They trigger a conversation, usually around 30-90 seconds in length, during which the Behavior Detection Officers attempt to ascertain why this individual showed the behaviors they did. At times they uncover malfeasance, at times they find an innocent

reason, at times they find a stressful but not illegal reason (e.g., a philandering traveler sneaking off to cheat on their husband or wife).

4 What is the evidence for the effectiveness of the SPOT program?

An extraordinarily impressive validation study was commissioned by Science & Technology of TSA, carried out by American Institute of Research, it is said that this report will be released April 1, 2011. I have not seen this report before submitting my testimony. And of course, deadlines for release of reports are not always met. I have been told about the report and I will describe below what I have been told.

In this huge study, 72,000 passengers who were selected at random (using an elaborate procedure that should have eliminated any bias in who was so selected), were compared to 23,000 passengers identified by SPOT. Malfeasants (felons, smugglers, etc.) were identified more than 50 times as often by those selected by SPOT. This finding provides **very important evidence for the validity of SPOT.** These findings also indirectly show that SPOT is alert to at least some of the right behaviors, for they would not have succeeded in this validity study if they were not doing so.*

The question should no longer be whether SPOT is effective – this report establishes that – but what can be done to make SPOT even more effective? In particular, are there any leaks in the system which can be identified – and then plugged – to provide even greater assurance that a terrorist will not get through.

5 Can SPOT be improved?

The answer is probably yes. Although my knowledge of what TSA is undertaking is by no means complete I do know that they are working on two very important issues: selection (how to identify for recruitment those most likely to perform SPOT best) and training (increasing substantially the amount of training provided to Behavior Detection Officers (BDOs). Establishment of a panel of expert advisors on how to improve the program is also underway.

* Critics have claimed that a terrorist was not identified at JFK, ignoring the fact that there were no SPOT personnel on duty at that time. Regrettably, there are not enough Behavior Detection Officers to observe all lines at all major airports.

There are many other steps that could be taken if there was the funding and the manpower. One study that especially interests me would reveal how often people who show many of the behaviors on the SPOT check list are **not** identified by the BDOs, essentially slipping through the net. If this occurs with any frequency, we need to know whether it is a function of the time of day, the number of hours a BDO has been working, the experience of the BDO, etc. Such a study would not demand very large resources, but this is only one of many research studies that could enhance SPOT, and investment in such research has to be balanced against other investments such as increases in training, increasing the number of BDOs, etc.

[I thank Professor Mark Frank for having critically reviewed my testimony and suggesting many useful additions and clarifications]

6 Appendix

There have been various reports and public statements criticizing the scientific basis for the SPOT program. I will briefly address some of them here.

a. GAO report

I was interviewed more than once by the authors of the report who I believe tried to provide a thorough evaluation of SPOT. However, I believe my views of SPOT as they emerged in the report were incomplete. Although my suggestions for further research were amply reported, my description of the evidence for the SPOT check list (see Section 3 of this report) were not adequately reported, creating the impression that I have serious doubts about the program and don't believe it is evidence based. I thought I made clear that in my judgment SPOT was the best that could be done given time urgency and financial constraints. Scientists enjoy spinning various new ideas for research, and I did that in my meetings with the GAO authors, perhaps unwittingly creating the impression that without that research SPOT was not on solid ground. Let me set the record straight. There is strong evidence, all of it published, some of it verified by other independent scientists, for the validity of the SPOT check list (Section 3 above); and, there is strong evidence that the SPOT program is effective (Section 4).

b. NRC report on the Polygraph

I was a member of the NRC panel, and I believe it is a superb evaluation of the validity of the polygraph in national security (there is no evidence of validity). The report much more briefly, and in a cursory fashion, considered

other approaches to detecting national security threats, including my work on demeanor. When that was considered I was absent due to prolonged illness. I believe the NRC report on deception and demeanor, the basis for SPOT, is not thorough, and the report writers did not have access to the information presented in sections 2 and 3 of this report.

c. Jasons Report

Although I have twice reported to the Jason's at separate meetings, I have not been given a copy of the 2008 report which is said to be critical of the science behind SPOT: "No scientific evidence exists to support the detection of inference of future behavior including intent". That quote, reportedly from a 2008 Jasons report, was in a 2010 *Newsweek* article. Note that the quote is about **future** behavior; there is a great deal of evidence about demeanor measures identifying lies about past behavior (section 2 and 3 of this report). At the time the Jason's report was written Mark Frank's study (described in section 2) had not yet been performed, which we now know did show success in predicting future behavior.

d. Maria Hartwig's criticisms

While Hartwig's own research has made some commendable improvements in research design on the issues of who can catch liars, and the strategies for doing so, she has dealt with low -not high- stake lies which have little relevance to my work or to the situation faced in SPOT.

In a 2011 TV interview Hartwig said: "The scientific research shows that it's very hard to detect whether somebody's up to no good just by looking at their behavior." She certainly is correct if the stakes are low; research by O'Sullivan, Frank, Hurley and Tiwanna [xi] has shown that when the stakes are low, law enforcement officers are not any better at detecting liars than laypeople. However, as I predicted, when the stakes are high these law enforcement officers clearly outperformed laypeople, likely due to the presence of many of these involuntary behaviors. Hartwig's research, as mentioned above, along with other deception research has usually dealt with low stakes lies and therefore likely did not elicit such behavioral clues. Jousting is not an academic sport I enjoy so I will go no further.

e. Detecting lies in a counter-terrorism scenario: Body Language

I have abridged this report, with Professor Frank's permission, excluding much important material, which is primarily relevant to an academic and/or scientific audience not a policy audience. Please contact mfrank83@buffalo.edu for the full report as it submitted for publication in an academic journal.

Frank, M.G.; Hurley, C.M., Kang, S., Svetieva, E., Sweet, D.M., Kim, D., Pazian, M. & Ekman, P.

Terrorism at its core is a human endeavor which can be successfully executed only if the terrorist escapes detection. This means a terrorist must successfully deceive a number of individuals along the way, including family, neighbors, local police, and security officers.

Counter terrorism scenario.

We derived the essential elements of our counter-terrorism situation based upon a two day meeting with working and retired counter-terror professionals from the USA, UK, and Israel, all of whom had previously spoken face to face with terrorists. We designed this scenario to match those sit down interviews they had each performed in the past. We identified a number of key characteristics that made this deception scenario novel in the research literature.

Group rewards and punishments. First, we recognized that religious terrorism, as that which occurred on September 11th, involves individuals who have different 'world views' than their opponents (REF). This means that the terrorist believes in the divine justice of his or her cause and group, whereas the opponents of the terrorist are not just infidels but directly defy the Supreme Being. This also means that the terrorist is concerned more about how his or her actions affect his or her group than how it affects him or herself. The way we imported these concepts into the laboratory was to recruit subjects who belonged to politically active groups, and told them that their interviewers were members of their arch rival group. So if the participant belonged to a pro-life group, then the interrogator belonged to, or was sympathetic to, a pro-choice group. This created the oppositional world view relationship. We then tailored the rewards and punishments to the group, and to a lesser extent, to the individual. The participants were asked to engage in an act hostile to the interests of their arch rival group – they were asked to steal a $100 check made out to their arch rival group, and then lie to an interrogator about the theft. If they were able to fool the interrogator, they were able to tear up the $100 check, and instead $100 would be directed to their own group. They would receive an additional $75 for their personal use. If they were not able to fool the interrogator, then they were told that the $100 would go to their arch rival group, and they would not receive any money, and they would be detained and face 30 minutes of loud startling blasts of noise. If they did not steal this $100 check, and were believed by the interrogator, they would receive $25 for their group, $25 would go to their archrival group, and they would receive

$25 for their personal use. If they did not steal this check, but they were disbelieved by the interrogator, they were told that their group would receive no money, they would receive no money, and they would face the noise blast punishment. They were also told that their arch rival group would receive an unspecified lesser amount of money. Thus we created a high stakes situation where the lie was designed to harm the oppositional group, help their own group, and subsequently themselves.

Choice. A lie is defined as a deliberate attempt to mislead, without prior notification (Ekman, 1985/2001). A liar who chooses to tell a lie, versus being assigned to tell a lie, would likely bear different feelings about the lie.

We predict that in this high stakes counter terrorism scenario, liars will show more **incongruous** behaviors – facial expression of emotions or symbolic gestures that do not fit with the words – than truth tellers. We consider any expressed emotion that does not accompany a statement referring to that emotion as incongruous. For example, the facial expression of fear is congruous with the statement "I was afraid of getting caught," whereas it is incongruous with the statement 'I just put the check back in the envelope.' We consider a symbolic gesture (like the A-OK finger to thumb) incongruous when the gesture means the opposite of the words spoken.

Method.

Participants. Our sample consisted of 132 participants (75 female and 57 male) who volunteered for a study entitled "Communication skills experiment." They all belonged to politically active groups who were identified on campus of a large public University in the Northeastern USA.

Procedure.

. The interrogators were male retired FBI or other law enforcement whose questions were scripted by the research team. We used these men because they spent their lives doing such interviews, and thus effected the behavioral disposition of a real law enforcement/terrorism interview.

Results.

Facial analyses. Table 1 shows the breakdown of participants who showed at least one or more negative facial expressions such as fear, distress, contempt, and disgust, which was incongruous with the words, by whether they chose to take the check or not the results were (75%; X^2 *(1) = 33.53, p < .001;*). We note that this accuracy based on the presence or absence of incongruous emotional expressions was just as high for truth tellers (79%) as it was for liars (72%). Thus, when answering a question in which a participant tells a confirmable lie, the presence or absence of a negative emotion can be very diagnostic of deception.

Symbolic gesture analysis. We only coded the yes and no gestures(head shakes and nods) as that allowed clear comparisons to affirmations and negations in the text. Table 2 shows that the pattern of incongruent gestures, and shows a significantly higher proportion of them when an individual was lying (X^2 *(1) = 10.47, p < .001*). We found that 78% of all incongruent symbolic gestures in this study occurred in the liars.

Combined analysis. Finally, we examined the interaction of the two types of incongruent expressions – facial expression of emotion and gesture to see how that affected classification accuracy.

We tabulated this by counting those participants show showed either a negative emotion, or an incongruent symbolic gesture , and compared them to those who showed neither. Table 3 shows that when we do that, accurately distinguish liars and truth tellers at 78%. When we add other measues we have of voice, speech and gaze we will be able to push this percentage up more than 10 points.

Table 1. *Presence or absence of fear, distress, contempt, or disgust that does not fit the spoken word by veracity.*

	Truth teller	Liar	Total
Negative emotion absent	48	20	68
Negative emotion present	13	51	64
	61	71	

X^2 (1) = 33.53, p < .001 75% correct classifications

Table 2. *Presence or absence of an inconsistent head gesture by veracity*

	Truth teller	Liar	Total
Inconsistent gesture absent	58	52	110
Inconsistent gesture present	3	18	21
	61	70	

X^2 (1) = 10.47, p < .001

f. Deceiving about intentions in a security setting.

I have again abridged this report with Professor Frank's permission, excluding details that are the same as in Appendix e., and also matters which are relevant primarily to an academic and/or scientific audience not a policy audience. Please contact markfrank83@buffalo.edu for the full report.

Frank, M.G., Hurley, C.M., Maroulis, A. Kim, D. [Paul Ekman served as a consultant]

This is the first experiment to test whether behavioral clues betray deception in a high stakes lie in which the individual has not yet not committed an act about which s/he will lie.

SUMMARY: In a situation set up to resemble an airport security context, we could predict at 90% accuracy who intended to lie about an action which s/he had not yet taken. This was accomplished by analysis solely on their emotional reaction, eye contact, and nervous body behaviors. These are the types of actions security officers look for in behavioral observation programs. These results are the first study to show that intentions can be detected from behavior.

The deception situation was patterned after an airport security checkpoint, where participants wait behind security lines, and then get approached by a security officer who passes by and looks at each of them. As explained in Appendix e, we once again recruited participants who were politically active, and again they had the opportunity, if they were successful in lying, to deprive an opposing group of receiving money and benefit their own group. (See Appendix e, page 19 for the details). Unlike the prior experiment, in this experiment they decided what they intended to do on the other side of the checkpoint. They had to pass through a stand up, check point screening, with the possibility of being either detained, sent to a secondary sit down interview, or allowed to pass through. After they had 10 minutes to think about the task, they would be asked to go into a room alone, and speak to a video camera outlining what they intended to do (i.e., to try to steal the check if they make it through, or to not try to steal it). This was patterned after the suicide bomber videos, which are used to help insure that the intentions are acted upon.

Method

Participants. The participants were 26 male and 15 females recruited from in and around the University at Buffalo. They all belonged to political advocacy groups,

Procedure. Participants and confederates (the participants did not know the other people in the lineup were employees of the research team) lined up, so that the participant was always second in the queue. They were told to wait until the security officer entered. The waiting area had a belt stanchion, and a metal detector that they would have to pass through before stepping up to a small podium to face the checkpoint officer. They waited approximately 10 minutes until the checkpoint officer emerged. These officers were active or retired police officers, all dressed in their uniforms. These officers emerged from a room approximately 5m in front of the queue, and the officer then walked toward the queue, approached

within 1-2m, and then looked at each of the 3 to 4 individuals in the queue as he walked down the line from the end to the beginning (thus looking at a confederate, a confederate, then the participant). The security officer then went behind the podium and called for all individuals in the queue to take out their ID's, and to remove any metal on their persons. An experimenter showed up then and collected the metal, as the confederates/participants walked through the metal detector. None of the security officers or members of the experimental team knew whether the participant had the intention of taking the check until after the entire experiment was over.

The segment that was analyzed for this project was the period of time marked by the opening of the door that exposed the presence of the security officer to the confederates and participant, until the point at which the security officer went behind the podium, This time period ranged from 15 to 44 seconds in length. There was no dialogue between the participants/confederates and the security officer.

Coding. The participants' behaviors in that 11-44 second critical period were coded by 2 expert FACS (Facial Action Coding System) coders who looked for Action Units associated with anger, contempt, disgust, fear, happiness, sadness, and surprise. They categorized the presence or absence of these emotions. They also coded the presence or absence of any self manipulative movements, including nervous hand wringing or tapping, and scored whether the participant made eye contact or averted his or her eyes, when the security officer looked at them.

Results.

There were no detectable sex differences, so we collapsed across that variable. When we summed across contempt, disgust, and fear, we found that negative emotions predicted who intended on taking the check, and who did not, at 85% accuracy; this pattern was statistically significant;(see Table 1.) Breaking that down further by emotion, we found that contempt/disgust only occurred in those intending on taking the check (8 out of 21), but never in the truth tellers (see Table 2). We found that fear reactions alone also occurred in 18 of the 21 participants who intended to take the check, and in only 3 of those with no intention (see Table 3).

We also examined nervous/fearful actions expressed in the body through hand wringing or tapping, manipulators, or gaze aversion. We found that 47.6% of the intention participants showed some hand wringing or tapping movements, whereas only 15% of the no intention participants showed these behaviors (see Table 5). We found that 38% of the intention participants avoided eye contact with the security officer on his pass through, whereas only 10% of the no intention participants avoided eye contact (See table 6).

Discussion.

The results showed clearly that one can detect the intention to steal a check from nonverbal behavior only. In a situation set up to resemble an airport security context, we could predict at 90% who intended to take the check, and who did not, based solely on their emotional reaction, eye contact, and nervous body behaviors. These are the types of actions security officers look for in behavioral observation programs. Thus, it is possible to show that intentions can be detected from behavior.

Table 1. Number of participants who showed contempt, disgust, or fear reactions by those who intended to take the check or not take the check.

	Intention	
	Take check	Not take check
Presence of negative emotion	18	3
Absence of negative emotion	3	17
Total participants	21	20

85.4% correct; (χ^2 (1) = 20.50, p < .001)

Table 2. Number of participants who showed contempt or disgust reactions by those who intended to take the check or not take the check.

	Intention	
	Take check	Not take check
Presence of contempt/disgust	8	0
Absence of contempt/disgust	13	20
Total participants	21	20

68.3% correct; (χ^2 (1) = 9.47, p < .003)

Table 3. Number of participants who showed fear reactions by those who intended to take the check or not take the check.

	Intention	
	Take check	Not take check
Presence of fear	18	3
Absence of fear	3	17
Total participants	21	20

85.4% correct; (χ^2 (1) = 20.50, p < .001)

Table 4. Number of participants who showed hand wringing or tapping reactions by those who intended to take the check or not take the check.

	Intention	
	Take check	Not take check
Presence of body actions	10	3
Absence of body actions	11	17
Total participants	21	20

65.9% correct; (χ^2 (1) = 5.03, p < .026)

Table 5. Number of participants who showed gaze aversion by those who intended to take the check or not take the check.

	Intention	
	Take check	Not take check
Gaze averted	8	2
Eye contact maintained	13	18
Total participants	21	20

63.4% correct; (χ^2 (1) = 4.39, p < .04)

7 References to Paul Ekman's Written Testimony

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viii. Frank, M.G., & Ekman, P. (1997) The ability to detect deceit generalizes across different types of high-stake lies. *Journal of Personality and Social Psychology 72,* 1429-1439.

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x. I and Mark Frank, a former post doctoral fellow who then took an academic post at Rutgers, worked jointly in designing this research and in planning data collection and analyses. Frank carried out the study, I advised on data analyses.

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