Investigative Interviewing
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Chapter 12

Investigative interviewing and the detection of deception

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The Improving Interpersonal Evaluations for Law Enforcement and National Security technique

The Improving Interpersonal Evaluations for Law Enforcement and National Security technique (IIE) is derived from observations of real-life field interviews combined with the latest scientific behavioural analysis. It originated in the dissatisfaction of working police towards their interviewing training. This dissatisfaction caused J.J. Newberry (US Bureau of Alcohol, Tobacco and Firearms, now retired) to observe the techniques of the most successful working police officers (those who when they chose to charge a suspect typically obtained a conviction, and who other officers viewed as being the most effective interviewers). These observations were elaborated and refined, based upon close contact with behavioural scientists with expertise in human memory, emotion and expressive verbal and non-verbal behaviour, including deception (e.g. Yuille 1989; Ekman and Frank 1993, Newberry 1999; Ekman 1985/2001; Frank and Ekman 1997, 2004a, 2004b; O'Sullivan 2005). In summary, this approach noted that good police interviewers were excellent communicators. They listened well, built good rapport with their interviewees and they were sharp observers of verbal and non-verbal behaviours, which included being good detectors of deceit. The techniques of these good interviewers were quantified by the behavioural scientists and then developed into training packages that addressed building the individual skills along with full application of the techniques to live interviews.

We will describe here the development of the interviewing training that was combined into what became known as 'analytic interviewing' initially by J.J. Newberry, with the active participation of the authors above, Professors Paul Ekman and Mark Frank, retired police officers such as John Yarbrough, and other scientists and law enforcement officers. As we explain in the conclusion, not all these individuals are continuing to work together, and now there is a choice between two distinct organizations: the Institute for Analytic Interviewing and Improving Interpersonal Evaluations.

The basic assumptions of the IIE interview

First, the IIE makes a few key assumptions about the purpose of doing any interview, be it a suspect, witness or informant. The first assumption is that the purpose of any interview is to find the truth. It defines the truth as what the interviewee actually believes to be true (Newberry 1999). This assumption applies to suspect, witness, or informant interviews, background investigations or intelligence-gathering interviews, or almost any type of interview. This purpose is in stark contrast to what many beginning police officers believe, and on occasion, are formally taught. The IIE instructors note that when they ask a typical group of police officers 'what is the purpose of doing an interview?' a very high proportion of them indicate 'get a confession' as their primary purpose. This is not too surprising, as many techniques taught in law enforcement stress the confession as the goal of an interrogation (Inbau et al. 1986). Although the IIE approach is not opposed to obtaining confessions, it notes that shifting the focus away from the confession and more towards the truth – whatever that might be – would seem to reduce the likelihood of obtaining a false confession (see Dwyer, Neufeld, and Scheck 2000, for a description of false convictions, many involving false confessions). Moreover, the slight shift away from the confession seems to keep the investigator focused on information gathering, rather than rendering a judgment. This is important because it is the information gathered from the suspect or witness that may contradict or be consistent with the physical evidence or other witness accounts, or that will provide clues towards other lines of inquiry and so forth. It is this information that will ultimately convict or exonerate the suspect.

Secondly, the IIE approach assumes that besides knowing *what* a person believes to be true, it is just as important to know *why* he or she believes it. Did he or she read it, hear it, see it or experience it? In order to conduct a proper investigation, one must have the

most accurate information possible. Knowing how the individual received and processed the information will tell the interviewer why the person believes it to be true, and in the process unmask clues as to the accuracy of the statement. Take the example of a witness to a traffic accident who claims to have 'seen the whole thing', although he or she had his or her back to the accident at the precise moment of impact. Careful questioning of such a witness as to why he or she believes one driver was at fault, and why he or she says one car crossed the red light and why he or she was at that location – rather than just what happened – will in all likelihood reveal that the witness first heard the impact, and then turned to look at the scene. This would reveal a witness who could not have actually seen the moment of impact, and thus his or her account up to that moment may not be accurate.

Thirdly, the IIE approach also assumes that people do give truthful information that can be inaccurate. For example, information can become inaccurate through two people having an honest difference of opinion, or a person having a mistaken recall, or having a false memory, amongst others (Haugaard and Repucci 1992). However, people also lie. To distinguish a lie from other forms of inaccurate information, the IIE approach uses Ekman's definition of a lie – a deliberate attempt to mislead, without the prior notification of the target of the lie (Ekman 1985/2001). This means that lies are consciously fabricated, distorted or concealed by the liar. Thus a person who provides factually incorrect information is not necessarily lying, unless the person who delivers it knows it will mislead. If a person truly believes he is Napoleon, he is not lying, although he will be incorrect. If the person knows he is not Napoleon but claims to be, then he is lying. This definition also means that people can give their implicit or explicit approval to be misled for some interpersonal situations, and this would not be lies. For example, we give our approval to being misled when viewing a play or movie, and allow the actor to pretend to be a different person without labelling him or her a liar. Likewise, Ekman (1985/2001) describes how in real-estate negotiations, it is implied that the price of the house is not necessarily the only price the seller will take, and the potential buyer knows that because bargaining situations imply this. Thus, the price listed for a house is not considered a lie – although concealing information or fabricating a story about some serious structural damage would be a lie. If the purpose of any interview is to find the truth, and this purpose is clearly stated to the subject of that interview, then any attempt to conceal, distort or fabricate information would be clearly a

lie in that interview context as there is really no area in the interview proper where an investigator would give his or her consent to being misled.

The basic processes of the IIE

The IIE describes the processes by which an investigator can maximize the amount of accurate information, whilst minimizing the amount of inaccurate information obtained in an interview. It is best thought of as a series of steps not too dissimilar to the PEACE model (see Chapters 8 and 9, this volume), although the IIE addresses specific techniques. The IIE uses the first six letters of the alphabet as the memnonic for its process:

- Awareness
- Baseline
- Changes
- Discrepancies
- Engagement
- Follow-up.

Awareness

Awareness in the IIE means that an investigator must become aware of the ways in which information may be inaccurate. Knowing this allows the investigator to take steps and apply techniques for reducing the chances that this will happen. For example, two witnesses to a traffic accident who offer contradictory accounts of the accident does not guarantee that one must by lying. Thus an investigator who knows how human memory can be affected – through simple processing limitations or the biasing affects of closed, ended questions and so forth – can reduce the likelihood of his or her own behaviour biasing the quality of the information.

Awareness also means that the investigators must be aware of their own physical and personality traits. For example, if the investigator is a female who is interviewing a male who subscribes to a brand of fundamentalist religious belief that views females as subservient to males, she may receive a hostile reception from this interviewee. Likewise, a physically big male may generate fear in his interviewee by simply shaking the interviewee's hand. There are age, status, ethnic and other factors as well to consider. An interviewer who is aware of these physical traits and their dynamic impact can take steps to reduce their impact on the interview process. In particular,

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an area that the investigator must become aware of are the cross-cultural dynamics that develop in an interview. For example, many Asian cultures (such as Chinese) demonstrate respect by not looking directly into the eyes of the other. This is in contrast to many western cultures, in which one is expected to look into the eyes of the person one is talking to. Moreover, many of the physical traits described earlier will interact with these cultural dynamics – for example, many cultures apply very strict age, gender and/or generational status rules. Regardless, an interviewer who is aware of these issues will be much less likely to misinterpret the behaviours and accounts presented to him or her.

Similarly, one must be aware of personality traits and particular biases and how they may work against obtaining accurate information. An investigator who is aggressive and high energy may interrupt his or her interviewee too much and thus disrupt his or her account. If an investigator is aware of this trait, he or she can develop techniques to nullify it. For example, investigators may teach themselves to allow for the silence, or to expect it, or they may learn to listen whilst positioning their hand over their mouths and gently grab their lip as a constant reminder not to interrupt. These sorts of skills were observed in the anecdotal study of effective police officers, and laboratory research confirms that more socially competent and sensitive people are more likely not to interrupt others, particularly distressed individuals offering accounts of their problems (Christensen *et al.* 1980). Likewise, an interviewer who is aware of a bias against certain types of people – red-haired people, snobby people or whatever – would be able to take compensatory steps to insure he or she does not treat these individuals in way that may put off the subject and serve as an obstacle to communication.

Baseline

As an investigator becomes aware of these aforementioned factors, he or she should also be observing the normal mode of behaviour for the subject. The normal style of behaviour is referred to as the baseline behaviour. The interviewer should note how expressive the subject was, how much he or she moved his or her hands, feet and head as he or she spoke, what characteristic gestures he or she used, what tone of voice he or she had, what sort of words he or she used, and so forth. This will become the basis for noting the general personality and interaction style of the interviewee, and it provides a clear control sample to compare any behavioural changes in the subject during the interview.

Changes

Ekman (Ekman and Friesen 1969; Ekman 1985/2001) first noted that detecting deceptive behaviours is most effectively done within the subject – i.e. one must compare the subject to the subject (Ekman and Friesen 1972, 1974; Ekman et al. 1976). The IIE approach adopted this idea and built in training techniques to help investigators improve their abilities to note not only the baseline behaviours, but also when behaviours deviate from this baseline. These changes are essential to understanding when an individual is convinced of the accuracy of a statement he or she just uttered, uncertain of that statement or even deliberately misleading with that statement. Moreover, the IIE approach instructs investigators to label these changes from the baseline behaviour as 'hotspots', rather than lies, although research has shown that these hotspots can betray deception or concealed emotion at rates greater than chance (Ekman and Frank 1993; Frank and Ekman 1997; Ekman 1985/2001). At its core, a hotspot means that the topic under discussion, or some segment of it, has caused the subject to experience an emotion, or has caused the subject to have to think hard on his or her feet. The IIE approach recognizes that there are a number of reasons why a person would feel an emotion, or be forced to think on his or her feet, besides lying. This is why IIE stresses the phrase 'hotspot' when these behaviours are noted, rather than lie – to force the interviewer to recognize this topic has caused a reaction and, later, when the moment is right, to address that topic to ascertain why the subject showed such a reaction to it. It could be because the subject is lying, but it could be due to the topic generating an emotion for a different reason. Ekman (1985/2001) describes how a high US government official who was under investigation showed a marked demeanour change when questioned about an important lunch meeting with another official who had violated US law. He pointed out that this change in demeanour could be due to lying, but it could also be due to an argument he had with his wife about lunch-related issues. Thus, the most accurate inference when recognizing a hotspot is that it is strong evidence that the subject is thinking on his or her feet, or is experiencing an emotional reaction to the topic (Ekman 1985/2001). But it is still enormously useful to the investigator who spots it because he or she can then ask questions to ascertain the source of the hotspot, which in turn may reveal an important area of inquiry that the interviewee may be trying to avoid or conceal. The scientific basis for this is discussed shortly.

Discrepancies

Discrepancies refer to the discrepancy not only within the verbal and non-verbal communication channels, but also between the verbal and non-verbal communication channels. For example, an investigator observes a person issuing a statement about his or her kidnapped child, stating he or she witnessed the kidnapping whilst exhibiting the emotion of sadness. The IIE-trained interviewer would examine this person's expressive behaviour looking for clear evidence of discrepancies in the person's verbal and non-verbal behaviour, or within the non-verbal elements of sadness such as looking for sadness in the face, voice, and body. In a falsified sadness, not all these channels will be consistent with the emotion of sadness. Likewise across these communicative channels, a subject who shows a shrug when he or she states 'I saw the whole thing', is discrepantly non-verbally communicating 'I am uncertain'. Or a subject who says 'no' in response to a question, yet nods his or her head indicating 'yes', is also showing discrepant behaviour. When these discrepancies are noted, they too are classified as hotspots (Ekman 1985/2001). The scientific basis for discrepancies being informative to the investigator will be discussed shortly.

Engagement

Engagement refers to the process by which the interviewer engages the interviewee. The IIE approach addresses the skill set needed to create an environment that makes it as easy as possible for the subject to be truthful and accurate. The observations of good interviewers suggest that they listen more than they talk, and that they create a more comfortable environment by building rapport with the subject. It also means that an investigator must learn how to ask open-ended questions, to phrase his or her questions in a way to foster recall and detail, and not to ask leading questions.

IIE teaches investigators specific techniques for building rapport. Researchers have defined rapport as consisting of a state of similarity, empathy and liking (Bernieri *et al.* 1996), resulting in a feeling of positivity, attentiveness and co-ordination (Tickle-Degnen and Rosenthal 1990). Knowing these building blocks of rapport enables the investigator to adopt the habits that will facilitate similarity, empathy and liking. For example, one technique for establishing similarity is actively to seek out areas of commonality. An investigator and a subject might both have children, or have grown up in the same town, had

the same course of study in school, have followed the same sports or teams and so forth. Thus, in the process of talking with the subject an interviewer would identify areas of commonality as means by which he or she can establish this personal connection with the subject. This then functions as a means to foster conversation between the two. It is astounding how human beings will organize themselves into in and out groups based on even the most trivial characteristics, and that once someone feels he or she has this in-group bond he or she views the other quite differently (e.g. Tajfel 1978). Imagine meeting someone from your home town whilst on holiday in a very remote location. One would typically feel some special bond to this person almost immediately (however, we would not feel this special bond if we met him or her walking down the street of our home town because this similarity would not be salient). Regardless, one can be made to feel some connection to total strangers by finding any thread of commonality. Thus, an investigator who does this creates a more comfortable environment for conversation – and particularly for a truthful person who, odds are, will be nervous if he or she is falsely suspected of a crime.

Another technique to facilitate rapport is mirroring. Mirroring refers to the active effort of the interviewer to match the behaviours of the interviewee. This is based upon the finding that two people in rapport tend to exhibit postural and speech congruence (Charney 1966; LaFrance and Broadbent 1976; Trout and Rosenfeld 1980; Capella 1981; LaFrance 1979, 1985). Some behaviours that an interviewer may mirror include seating posture, resting a hand on the chin or even using the same level of vocabulary. Research shows that when people are mirrored they feel much more comfortable with their interaction partner and like him or her more than when they are not mirrored (Chartrand and Bargh 1999). Moreover, not only do those in rapport show congruent behaviours, but when they are comfortable with the conversation they tend to synchronize their behaviours (Bernieri and Rosenthal 1991). In fact, IIE suggests periodically testing rapport by having the interviewer adjust his or her position deliberately, to see if the subject follows. IIE also warns against being too obvious in doing this, for if a subject thinks an interviewer is simply imitating him or her, he or she may feel mocked, and that will destroy rapport.

Another technique to building rapport – although limited by jurisdiction and local custom – is to touch the subject. This means an occasional gentle touch, in socially appropriate areas like the forearm or upper arm, can facilitate rapport by demonstrating that the interviewer feels empathy and even likes the subject (or at least

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is not repelled by the subject), as research has shown that people in rapport tend to touch each other more (Moore 1985). As stated earlier, though, one must be aware of the cultural implications for a touch, and in some situations it can work against the interviewer (for example, some fundamentalist forms of religions would consider it harmful for a female investigator to touch a male subject). By listening carefully and courteously to the subject whilst building rapport, the investigator increases the chance that the subject will believe the investigator feels empathy for him or her, and does not reject him or her as disgusting or unworthy. This sort of environment is much more conducive to conversation and increases the willingness of the subject to co-operate. Collins *et al.* (2002) tested this by having subjects view a suicide on videotape, and then one third were interviewed by a person who was brusque, one third by someone who was neutral and one third by someone who had built rapport with the subjects (it was the senior author who conducted all the scripted interviews). They then transcribed these eyewitness accounts of this suicide and scored them on the basis of how many correct and incorrect elements were in the account. They found that those subjects with whom the interviewer built rapport recalled approximately 50 per cent more accurate information than the subjects with whom the interviewer was neutral or was brusque. Moreover, there was no difference in the amount of inaccurate information offered by the subjects across conditions. This study shows for the first time that at least as far as witness interviews go, rapport building is an essential element in maximizing the accuracy of the account.

As part of the engagement process, IIE also describes techniques for phrasing questions that maximize the elicitation of diagnostic information. For example, IIE warns against asking leading questions, multiple-choice questions, compound questions and so forth, as these can either confuse the subject or reveal case information to the subject such that if he or she chooses to lie he or she can create a more effective false alibi that accounts for the case information. Instead, the IIE approach teaches investigators to allow for an initial uninterrupted account – similar to the PEACE model – and then to ask open-ended questions and to choose carefully words that solicit information, words that command and words that connote detail. For example, solicitation words are those used in common politeness ('could you please', 'would you please', etc.), and these appear to be more effective in obtaining an initial narrative from the subject. Command words are more directed (such as 'tell me about', 'describe your relationship') and, when offered in an open-ended fashion, push

the subject for more detail on specific issues. Words that connote detail encourage the subject to sharpen the topic further, and include words such as 'specifically' (as in 'tell me specifically about') or 'describe in detail your relationship'. The IIE approach also teaches techniques for reviewing the information with the subject, obtaining sequences of events and so forth, including techniques derived from the cognitive interview (Geiselman *et al.* 1986) which have shown to be effective in generating accurate recall.

Follow-up

The IIE approach acknowledges that a confession without corroborating evidence is worthless. Thus after making themselves aware of context and interpersonal variables, and then engaging the subject, observing baseline behaviour, noting changes and discrepancies, and obtaining as complete an account from the subject as possible, interviewers need to follow up on that information so that they can confirm or disconfirm some, none or all the elements of the subject's account. It also suggests what other information can be brought to bear on this account (e.g. are there surveillance cameras in the locations the subject has claimed to have been at the time of the crime? etc.). Although IIE does spend quite a lot of time discussing the importance of behavioural information, these hotspots are best seen as a means towards helping the investigator gather hard information or to identify an account either consistent or inconsistent with the other evidence in the case – a tool in the toolbox approach. IIE recognizes that evidence trumps behaviour – i.e. that ultimately it is this hard evidence, not the behavioural displays of the subject, that will convict or exonerate him or her.

Research supporting the use of changes and discrepancies as hotspot indicators

The IIE approach to identifying hotspots relies upon the scientific analysis of human behaviour when in emotional situations. In particular, it has been based upon Paul Ekman's seminal work on human emotion and deception, and the research streams generated from it.

Ekman's research suggests that two families of behavioural clues betray deception – clues related to a liar's thinking about what he or she is saying, and clues related to a liar's feelings (including his

or her feelings about deception) (Hocking and Leathers 1980; Ekman and Frank 1993; Ekman 1985/2001).

Cognitive clues

For example, in order to mislead someone deliberately, a liar must fabricate, distort or conceal facts, describe events that did not happen or that he or she did not witness or suppress critical information. However, the process of thinking about or creating this misinformation can leave behavioural signs. These signs range from a hesitation in the speech, to a misplaced word or a contradictory statement, to very vague accounts with less logical structure (see DePaulo *et al.* 2003 for a review). These types of clues are particularly evident in situations in which the liar should know exactly what he or she has done without having to think too much about it. A witness who claims to have been present at a crime scene should be able to tell the court, without too much thought, where he or she was standing when he or she witnessed the event. If the witness was not present at that scene, he or she would have to create the details necessary to convince someone that he or she was there. This on-the-spot thinking, research has shown, often manifests itself in many speech hesitations, speech disfluencies and errors, often with fewer of the hand or facial gestures that typically illustrate speech (Ekman and Friesen 1972; Ekman *et al.* 1976; DePaulo *et al.* 1985).

The choice of words can also betray this on-the-spot thinking (e.g. Stiff and Miller 1986). In simple terms, liars are less immediate, use more general, simple words to recall and generate thoughts and use less concrete words (reviewed by DePaulo *et al.* 2003). On top of this, the deceptive witness would have to be very careful not to contradict his or her statements made during his or her initial interviews. In more precise terms, work by Yuille and colleagues on credibility assessment (e.g. Porter and Yuille 1995, 1996; Yuille and Porter 2000) identified a number of characteristics – up to 24 – that distinguished an actual memory of an event from a fabricated memory of an event. One example of a characteristic includes whether a subject spontaneously reproduces dialogue in his or her account – it appears real memories are more likely to feature such elements.

Emotional clues

Not only do witnesses, defendants or victims who are lying have to think out the lie and maintain a consistent story, but often emotions are aroused within them that are associated with these lies. Emotions

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can enter into the lie process in one of two ways – first, the person testifying could be lying about his or her feelings or emotions, or, secondly, the act of lying may produce feelings or emotions within the liar. The same principles apply regardless of how the emotions are initiated. Research has shown that when emotions are aroused, changes are unbidden and occur automatically (reviewed by Ekman 2003). Subjectively people report that they do not *choose* which emotion to experience, but instead report that emotions *happen* to them in specific situations. We know this through our own experience. For example, during times when we may feel blue, we do things that we hope will make us feel better – we go for a walk, eat some calorie-laden food, rent a comedy video – but whether we actually feel happy afterwards is never guaranteed. Likewise, if we have to give an important presentation to the boss, and find ourselves nervous, it is very hard simply to stop being nervous (despite the suggestions of our well meaning friends). These changes occur within a split second and are considered fundamental features of an emotional response (Frijda 1986; Ekman 2003).

Research has shown that anger, disgust, fear, happiness, sadness, and surprise each have unique physiological profiles (Ekman *et al.* 1983); moreover, when subjects are asked to pose facial expressions of anger, disgust, fear, happiness, sadness and surprise, the same patterns of emotion-specific physiology have been found (Levenson *et al.* 1990). This same link between facial expressions and emotion-specific physiology has also been found in different subject groups, such as the elderly (Levenson *et al.* 1991), and in a matrilineal, Muslim, non-western culture (Levenson *et al.* 1992). Research has also found that specific emotions have specific central nervous system (CNS) patterns of hemispheric brain activation, as measured by the electroencephalogram (EEG).

However, part of this emotional response, besides changes in heart rate, blood pressure, and so forth (Ekman *et al.* 1983; Levenson *et al.* 1992), is a change in voice tone (Scherer 1984) as well as a facial expression of that emotion (Izard 1994; Ekman 1994, 2003). In terms of the voice, researchers note particular patterns in fundamental frequency and amplitude that distinguish anger from fear and these emotions from others, and there is some limited evidence that these vocal profiles for emotions are universal across cultures (Scherer and Walbott 1994). For example, in anger the fundamental frequency gets lower (lower pitch), and the amplitude higher (i.e. louder), whereas in fear the fundamental frequency gets higher (higher pitch) and the amplitude softer (i.e. quieter).

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In terms of the face, research has shown that emotions such as anger, contempt, disgust, fear, happiness, sadness and surprise appear on people's faces during an emotional experience, often despite their efforts to hide them (e.g. Ekman *et al.* 1988, 1991; Frank and Ekman 1997). The systematic study of how facial expressions link with emotion originated with the publication of Darwin's book *The Expression of the Emotions in Man and Animals* (1872/1998). In this book, Darwin proposed that humans across all cultures have distinct facial expressions for particular emotions, and that these expressions are produced involuntarily as a result of that emotion (through what he called 'nerve force'). Darwin defined emotions as being behavioural and physiological reactions that have assisted humans and animals survive the various life challenges they faced throughout their evolutionary history. For example, the fear reaction assisted humans and animals to escape danger, the anger reaction assisted humans and animals to fight rivals and so forth. Those who possessed these emotional reactions were more likely to live to reproductive age and therefore pass their genes on to the next generation. What Darwin argued (and elaborated later by others, e.g. Plutchik 1962; Tomkins 1962, 1963; Ekman 1992, Izard 1994) is that social animals, such as humans, must communicate these emotions to others in the group because emotions express imminent behaviour, such as striking out in anger, fleeing in fear, avoiding spoiled food in disgust, approachability in happiness and other action tendencies (e.g. Frijda 1986). The expression of imminent behaviour allows humans to co-ordinate their behaviours in ways to reduce conflict, avoid danger and increase harmony.

The evidence for the universality of the emotions of anger, contempt, disgust, fear, happiness, sadness and surprise is quite compelling, where people from all continents on the planet – including pre-literate and visually isolated societies – agree which emotion belongs to which expression (Ekman and Friesen 1971; Izard 1971, 1994; Ekman 1994, 2003). Parallel evidence for universality came from observations of children who were born blind and deaf. These visually and auditory impaired children experienced spontaneous emotions, and they showed similar expressions of emotion as their sighted counterparts (Eibl-Eibesfeldt 1973).

However, Ekman (2003) and others have stressed that these expressions are not reflexes. In fact, he argued that different cultures and subcultures learn different rules to regulate their expression of emotion – what he called 'display rules' (Ekman 1972). For example, Japanese culture, unlike North American culture, has a display rule

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that prohibits the expression of emotions such as anger or disgust to higher-status people. When Japanese and Americans were secretly observed whilst watching a gory film, both cultural groups showed facial expressions of disgust. When Japanese and Americans were shown this film in the presence of a high status person, the Japanese smiled whereas the Americans still showed facial expressions of disgust – even though both groups still experienced disgust (Ekman and Friesen 1971). Ekman (1972) proposed that these display rules can apply within cultures as well, as in North America, where boys are typically taught to suppress sadness, and girls are taught to suppress anger.

Based on these and other findings, Ekman (1977) proposed his neuro-cultural theory of emotions. This theory argued that certain basic human emotions had specific physiological patterns, and that these emotions produced particular facial expressions that were universal across all cultures, but that the ultimate facial expression of these emotions was modified, exacerbated, suppressed or masked by social learning processes dependent upon cultural or local customs. However, Ekman argued that if the emotional experience is of sufficient intensity, the facial expression for that emotion would 'leak' through and be visible despite efforts by the person to control or hide them (e.g. Ekman 1985/2001). These leaks can be partial or whole expressions, and can often be micromomentary in duration. He called these 'microexpressions' and they have been shown to be useful in uncovering deceit (Ekman and Friesen 1969; Ekman and O'Sullivan 1991; Ekman et al. 1988, 1991; Frank and Ekman 1997, 2005).

The idea that the face can express deliberate, learned expressions, as well as more involuntary, unbidden facial expressions of emotion is supported by the architectural neuroanatomy of the face. There appear to be two distinct neural pathways that mediate facial expressions, each one originating in a different area of the brain: one pathway for voluntary, willful facial actions, and a second for involuntary, emotional facial actions (Tschaissny 1953; Meihlke 1973; Myers 1976). The voluntary facial movements – along with other voluntary movements – originate in the brain's cortical motor strips. These impulses arrive at the face via the pyramidal motor system. Involuntary facial movements originate in the subcortical areas within the brain. These areas are associated with the production of emotion. These impulses arrive at the face via the extrapyramidal motor system. This dual-pathway hypothesis is supported by clinical reports of patients with lesions on the cortical motor strip, who show

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paralysis when asked to pose an expression such as a smile, but who show perfect bilateral smiles when told a joke that causes them to feel happy (Brodal 1981). Likewise, patients with lesions of the subcortical areas of the brain (such as the basal ganglia) have difficulty showing spontaneous, emotional facial expressions; however, these patients are able to move their facial muscles on command (Karnosh 1945). These facial action observations are so reliable that in the pre-CAT scan era they served as diagnostic criteria for pyramidal and extrapyramidal lesions (DeMyer 1980). Current research is attempting to isolate further areas of production of various facial expressions (e.g. Anderson and Phelps 2000).

Not only do voluntary and involuntary facial actions differ by neural pathway, but the actions mediated by these pathways manifest themselves differently. In a normal person, voluntary pyramidal motor-system-based movements are limited solely by individual effort. A person can consciously move a facial muscle quickly or slowly and hold that action for a brief or long period of time, depending upon the dictates of the circumstance and individual endurance. However, extrapyramidal motor system based facial actions are characterized by synchronized, smooth, symmetrical, consistent and reflex-like or ballistic-like actions on the part of the component facial muscles (reviewed by Rinn 1984). Relatively speaking, these actions appear to be less under the deliberate control of the individual (e.g. Frank et al. 1993; Frank 2003). Moreover, research has shown that facial expressions that are driven by actual felt emotion have different characteristics from those that are mimicked emotions, including subtle differences in the muscles used in the expression (Ekman and Friesen 1982; Frank and Ekman 1993; Frank et al. 1993). These subtle differences have been called 'reliable' behavioural signs of emotion (Ekman 1985/2001) because few people can actually mimic them. For example, when people feel the emotion of happiness their facial expression involves the contraction of the large muscles that surround the eyes (producing a 'crows' feet' appearance) along with an upward contraction of the lip corners (Ekman and Friesen 1982). When people are faking happiness or enjoyment, they will contract their lip corners, but do not – or cannot – contract the large muscles that surround the eyes (Frank and Ekman 1993). Although a large-intensity smile will also generate the 'crows' feet' appearance, at lower intensities 'crows' feet' would be a reliable sign of actual felt enjoyment.

These facial expressions of emotion must have some significance for our species, as recent research with functional magnetic resonance

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imaging (fMRI) has shown that there are specific areas of the brain that respond just to these emotional expressions. When researchers show a photo of a facial expression of emotion (typically the same photos used in the universality studies described earlier), they have found that anger seems to activate the right orbitofrontal cortex and anterior cingulate cortex (Blair *et al.* 1999). Disgust seems to activate the anterior insula and limbic cortico-striatal-thalamic area (Phillips *et al.* 1997). Fear seems to activate the left amygdala (Morris *et al.* 1996; Whalen *et al.* 1998). Happiness seems to activate the left side of the lateral frontal, mid-frontal, anterior temporal and central anterior scalp regions (Davidson *et al.* 1990; Ekman and Davidson 1993). Sadness seems to activate the left amygdala and right temporal lobe (Blair *et al.* 1999). What this means is that humans appear to be biologically wired to perceive these specific emotion facial expressions.

How the expression mechanisms can betray deception

If the situation involves assessing the true feelings of a witness, then the lie catcher should try to observe the presence or absence of as many of these reliable clues to the emotions as possible within the face and voice. In the face, these reliable signs include the narrowing of the red margins of the lips in anger, the upward and inward contraction of the area between the eyebrows in fear, and the upward raise of the inner corners of the eyebrows in sadness (see Ekman 2003 for a more complete list of these behavioural signs of emotions). For example, one of the authors, a retired sheriff's deputy, described how an abusive man claimed he would not harm his wife if she were to return to their apartment to remove her belongings and, as he was making his claims of complete co-operation, the red margins of his lips became more and more narrow. The deputy at the time noted this as a gut feeling. Given that the man said all the co-operative things, the deputy asked the woman to enter the apartment to claim her belongings. When she entered, the man struck her in front of the deputy. In this case, it was the presence of the reliable sign that should have tipped off the deputy that the man was feeling anger but struggling to control it.

However, research has been undertaken into the face and voice when the stakes are high – i.e. where the liar faces benefits for successful lying and punishments for unsuccessful lying (Ekman 1985/2001; DePaulo *et al.* 2003). For example, research has shown that facial expressions of fear, distress and disgust distinguish liars and

truth tellers at over 76 per cent accuracy (Frank and Ekman 1997); when voice measures are added, this accuracy rises to 86.5 per cent (Ekman *et al.* 1991). Even more recent work by Frank and Ekman (2005), using a counterterrorism paradigm, has pushed this up to 90 per cent accuracy. These behavioural signs are often obvious but, at other times, occur so fleeting as to be micromomentary. Ekman and Friesen (1969) called these micromomentary expressions of emotion 'microexpressions', and the evidence suggests that they can be as brief as ¼ of a second. It also appears that only expert lie catchers detect these microexpressions with any accuracy, whereas average to poor lie catchers miss them (Ekman and O'Sullivan 1991; Ekman *et al.* 1999; Frank and Ekman 1997; Frank 2005). These expressions are often micro because in a situation where someone is motivated to lie, they will attempt to manage their facial behaviour so as to not look 'guilty'. Thus, a 'tug of war' over control of the face ensues between the subcortical, emotional regions and the cortical motor strip. This attempt to squelch the expressions minimizes their scale and duration. These microexpressions were first discovered using Ekman and Friesen's Facial Action Coding System – a laborious technique for reliably coding all visible muscle movement, not just that presumed to be related to emotion (Ekman and Friesen 1978). It involves careful, back and forth viewing of behaviours that can take up to 3 hours of coding time to code one minute of behaviour. However, this hard work did identify these emotional displays that people with the naked eye did not see. Moreover, with as little as 30 minutes of training, people can be taught to improve significantly their abilities to spot microexpressions in real time (Ekman 2005; Frank and Ekman, 2005).

How emotions can betray deception

There are situations in which lies are betrayed by people who falsely portray an emotion. One of the most argued-about aspects of the *Menendez* case in California – where two brothers killed their well-to-do parents but claimed to have been driven to that act by their parents' relentless physical and sexual abuse – involved whether the displays of sadness by the two brothers when they described their actions were real or feigned; that is, whether their sadness was a genuine display of remorse over being forced, due to the years of abuse, to kill these evil parents before their parents killed them; or whether it was the simulated sadness of two culpable siblings designed to gain sympathy from the judge and jury so they could collect their sizeable inheritance.

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Another way in which understanding emotions can help is to identify the current states of mind of subjects. For example, one of the authors viewed a videotape of a walk-through with a subject suspected of murdering his parents. As the subject described finding the bodies of his father and mother, he showed sadness. However, only when describing his mother did he show signs of sadness featuring the reliable facial muscles. This provided an important clue as to how he felt about each parent and his relationship with each, and would be useful information to an interviewer who later interviewed this suspect.

Other lies do not necessarily involve the topic of what one truly feels but, instead, involve how the lie itself generates an emotion within someone. A witness may conceal the fact that his or her friend actually threw the first punch in an assault, or the witness may conceal the fact that he or she never saw the dispute, but was simply parroting the alleged victim's account. However, this witness may feel guilt about making up the account of the assault, or he or she may feel fear of being jailed for perjury or he or she may feel enjoyment at the fact that he or she has outsmarted the police into believing his or her account of the assault. Thus lies can produce emotions independent of the act in which the lie was designed to conceal or falsify. Once these emotions are involved, they must be concealed if the lie is not to be betrayed. There are many emotions which could be involved in deception, but three seem most intertwined with deceit – fear of being caught in the lie, guilt about lying, and delight in having duped someone (Ekman 1985/2001).

Fear of being caught

Low levels of fear may help a liar get away with his or her deceptions by maintaining the liar's alertness. In moderate and high levels, fear can produce behavioural signs that can be noticed by the skilled lie catcher (e.g. Frank and Ekman 1997; Ekman, et al. 1999; DePaulo et al. 2003). There are a number of factors that can influence fear of being caught – for example, if the lie catcher has a reputation for being tough to fool, the liar may feel more fear. If the liar has not had much practice at telling and getting away with the lie, then his or her fear of being caught would increase. Conversely, a lying witness who has been able to convince police investigators of his or her fictional account of a crime would gain confidence and would not feel as fearful of being caught (after all, he or she hasn't been caught yet). Likewise, this practice enables the liar to anticipate other possible questions, and thus further reduce the fear of getting caught. Finally,

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besides the fear of being caught, a lying witness may show fear of punishment – that is, punishment for the act upon which the lie was designed to conceal. In other words, the stronger the punishments for the crime, for perjury or getting caught in general, the more fear a deceptive witness is likely to show (e.g. Frank and Ekman 1997).

Deception guilt

Deception guilt refers to a feeling about lying, and not the legal issue of whether someone is guilty or innocent. Deception guilt refers to the guilt felt when lying; for example, a witness may feel happiness at helping out a friend by claiming that the defendant threw the first punch, but later may feel guilty about lying. This situation can be reversed as well – he or she may feel guilt about helping out the friend, but feel no guilt about lying about it (or some can feel guilt for both, and some for neither). What is important is that it is not necessary to feel guilty about the content of a lie in order to feel guilty about lying. Like fear of being caught, deception guilt can vary in strength. For example, severe guilt can be a tortuous experience, undermining the sufferer's most fundamental feelings of self-worth (Ekman 1985/2001).

There are a number of factors which function to increase the amount of guilt a liar might feel. First, it seems that there are people who are particularly prone to guilt – for example, those who suffer from generalized anxiety disorders. These individuals often have very strict upbringings and have been severely punished for lying, or have been led to believe that lying is one of the most severe sins. Conversely, psychopaths – who have been reported to show no remorse or shame and an incapacity for love – may be much harder to detect than the average person due to their limited capacity to feel guilt (Hare 1970). Secondly, a close relationship between the liar and the target of the lie, such that they share values, respect each other and so forth, also functions to augment guilt feelings. Conversely, a liar who does not share values with the target would feel less guilt; and a witness who despises the legal system may not feel guilty about lying in court, much the same way in which a spy or terrorist feels no guilt about lying to a representative of an enemy government. Finally, if the target of the lie is impersonal or anonymous, then less deception guilt is generally felt. A witness who lies to a videotape camera or in an affidavit may feel less guilt than if he or she lied to an actual person. However, guilt often causes people to rationalize their deceits, so the witness may convince him or herself that the defendant had always been a troublemaker and deserved to be arrested, even though the defendant was not responsible for initiating the current altercation.

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Duping delight

Lying can produce positive as well as negative emotions. The lie may be viewed as a proud accomplishment. Peter Sutcliffe, the man convicted of being the Yorkshire Ripper, expressed his delight whilst he was twice interrogated and then dismissed by the police before ultimately being caught. There are a number of factors that may cause an increase in duping delight – if the target is hard to fool, or if there is an audience who is aware of the deception and enjoying the performance. Thus, a lying witness may enjoy the fact that he or she is sitting in centre stage of the courtroom, in front of his or her friends, whilst he or she regales them with his or her bogus account of an assault.

It should be noted that these emotions can occur simultaneously or in any combination. For example, witnesses may feel guilt over producing a bogus account of the assault, or fear being caught perjuring themselves, as well as a certain delight in being able to pull off the lie in front of all these supposedly important legal professionals.

Cautions

It must be noted that these thinking and feeling clues are just that – clues that witnesses, defendants and victims are thinking, or clues that they are feeling or concealing some emotion. To date no one has been able to identify a human equivalent of a 'Pinocchio response' – that is, there is no one behavioural sign or constellation of signs that, across every person, in all situations, indicates that a person is lying. Thus, a lie catcher who identifies the behavioural clues described above must always infer why a witness would show guilt, or fear or delight, or why a witness would mull something over. This is why the concept of calling these incidents of emotional or cognitive leakage 'hotspots' rather than lies is the preferred notation in IIE. Someone who judges leaked emotions or cognitive efforts as a lie may be right, but may be wrong, as there can be other reasons why someone would feel fear or enjoyment besides lying. Someone who judges these same behaviours as hotspots will be much less likely to be wrong, and can use this evidence to gather even more evidence. Moreover, the interviewer who judges hotspot, rather than liar will be more likely to continue to ask questions and gather information, rather than succumb to the human tendency to assume if he or she caught the person lying that person must be guilty – and this premature conclusion can result in more haphazard and incomplete information collection from that point.

Conclusions about detecting deception

The IIE approach suggests the most effective way to detect deception from behaviour is to look for changes in baseline – an expressive person suddenly becomes much less expressive for a particular topic, but then becomes expressive again for different topics – and/or to note when the verbal and non-verbal information do not match – subtle or micro happiness when talking about a murder, or fear when talking about an innocuous topic like lunch, or even micro shrugging, which indicates uncertainty, when talking about something he or she claims he or she definitely did. The IIE approach trains investigators to recognize these changes in baseline – or times when the verbal and non-verbal behaviours are discrepant – and teaches investigators to understand thoroughly why the person is showing these hotspots. However, the IIE approach discourages investigators from making a judgment of 'lie' when he or she sees these changes or discrepant behaviours but, instead to make a judgment of hotspot. Given that there are no universal clues to deceit, an investigator who renders a judgment of 'lie' might be wrong; however, given the years of work on emotion and cognition, an investigator who instead renders a judgment of 'hot spot' will not be wrong. Moreover, a judgment of hotspot encourages the investigator to keep gathering information, whereas we have noted in the past that investigators who make a judgment of liar tend to slack off in their information gathering, because now they assume they have the right person – despite evidence that shows most people, including trained law enforcement officers, should exercise caution about their abilities to spot lies (Kraut and Poe 1980; DePaulo and Pfeifer 1986; Ekman and O'Sullivan 1991; Ekman *et al.* 1999).

The IIE approach recognizes that an oppressive, pressured push towards a confession does not generate the best information or make the strongest cases as they are put forward in a court of law. It recognizes the importance of uninterrupted accounts. It recognizes a careful consideration of the means of putting forth questions to the subjects and also recognizes the use of behavioural indicators to help generate areas of inquiry and to facilitate the vetting of such information. However, as stated earlier, it views these behavioural indicators and techniques to be a means towards helping the investigator gather information, and not as evidence in and of itself. The only way to know with 100 per cent certainty is to have unimpeachable corroborating evidence. That sort of evidence is only gained by a close examination of the physical evidence, and through

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a comparison of the stated account of the suspect/witness/informant to the physical evidence and other statements.

Epilogue

In 2005 the scientists (deception experts, Ekman, Frank and O'Sullivan, and memory and verbal statement expert, Yuille) and most of the law enforcement officers (Fretter, Harms and Yarbrough) formed a separate organization called 'Improving Interpersonal Evaluations for Law Enforcement and National Security', with the acronym IIE. The primary focus continues to be on interviewing and combining scientific knowledge with law enforcement experience. J.J. Newberry continues to direct the Institute of Analytic Interviewing, but without the participation of the individuals named above.

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