Chapter 2

UNCOVERING THE SECRETS OF THE HUMAN FACE: THE ROLE OF THE FACE IN PRO-SOCIAL AND FORENSIC CONTEXTS

Pamela Black, Stephen Porter,
Alysha Baker and Natasha Korva
University of British Columbia – Okanagan, Canada

ABSTRACT

The human face is a dynamic canvas upon which humans voluntarily and involuntarily display their most intimate feelings. Observers scrutinize the faces of others to make inferences about their emotions, intentions and thoughts. They then use the information they glean from the face to make a myriad of instantaneous inferential judgments, including whether the other person is sexually attractive, credible, or trustworthy. Such snap decisions often persist in a confident manner long after the first exposure about others based on facial characteristics and can have serious consequences in applied settings. For example, in legal contexts, initial decisions based on a defendant’s facial characteristics influence an observer’s perception of his/her innocence or guilt, regardless of the physical evidence provided. This places people with particularly untrustworthy-looking facial features at a significant disadvantage within the courtroom. Further, observers also unconsciously use facial expressions to make intuitive judgments about target character traits. Relying on facial expressions to make such decisions, however, is
complicated by the ability humans have to manipulate their face, either by simulating or masking emotions via facial expressions. According to Darwin’s inhibition hypothesis, people are unable to perfectly simulate facial expressions in the absence of the genuine emotion and are unable to completely suppress their true feelings, resulting in emotional ‘leakage’ on the face. This leakage is a result of the direct link between affective regions of the brain and the facial muscles. Recent research indicates that attention to facial cues (e.g., emotional leakage, microexpressions) can serve as reliable indicators of emotional deception, although untrained observers generally are unable to discern such cues. This chapter will discuss the substantial role of the face during interpersonal interactions that are both characteristically pro-social and criminally deviant. Additionally, we explore the important role the face plays in first impressions in everyday life as well as in a legal context, and discuss the implications of making judgments based solely upon facial characteristics and expressions. Finally, this chapter will conclude with a discussion about the types of individuals who are best able to read the human face as well as effectively manipulate their own.

A well-known axiom is that the eyes are the windows into a person’s soul. In fact, research states that while the eyes are involved in facial expressions, it is best to examine the face as a whole for information about a person’s state and trait characteristics (Abdel-Rahman, 2011). For example, observers scrutinize the face to learn more about a person’s age, gender and race as well as their emotional state (Amado et al., 2011). The manner in which the observer behaves during an ensuing social interaction is a direct reflection of the way in which he/she perceived the target’s face. Evidence that the face is an integral aspect of communication lies in the observation that facial musculature is formed and fully functional at birth (Ekman and Oster, 1979). Infants are capable of making facial expressions (e.g., happiness) that are similar to the expressions displayed by adults in order to express their wants and needs without the use of language (Ekman and Oster, 1979).

Not only are humans innately effective at communicating emotions using their face, they also are highly attuned at interpreting others’ facial expressions. There are a number of areas in the brain dedicated to the processing of facial features and expressions (e.g., the fusiform and the occipital facial areas), though there are many other parts of the brain involved in interpreting the wealth of information that the face provides (Fox et al., 2011; Kanwisher, Medermott, and Chun, 1997). Within moments of viewing a human face, the human brain instantaneously and subconsciously evaluates personality characteristics, emotional states, the degree of attractiveness, and trustworthiness (Amihai, Deouell, and Bentin, 2011; Arsalidou, Morris, and Taylor, 2011). This penchant for assigning trait characteristics from facial expressions extends to inanimate objects as well, particularly cars and cell phones. Many people perceive “faces” on the front of automobiles, depending on the shape of the grille and the headlights (Landwehr, McGill, and Herrmann, 2011). It appears that consumers actually perceive cars as ‘friendly’ if the grill is upturned and “aggressive” if the grille turns down at the corners and the headlights are slanted (Landwehr et al., 2011). The perception of friendliness versus aggressiveness may later influence purchasing decisions. This assessment of character traits is quite innocent, but the parallel instantaneous assessment of another’s face during interpersonal interactions may have serious consequences in other situations, such as within the legal system. The goal of this chapter is to explore the ways in which the human face is used to both send and receive pertinent social information in pro-social interactions as well as in legal settings.

**SIX UNIVERSAL EXPRESSIONS**

Emotions are defined as discrete and automatic affective responses to a personal event (Ekman and Cordaro, 2011). Further, emotions are considered to be involuntary and distinguishable from one another (Ekman and Cordaro, 2011). Facial expressions are the direct physical representation of emotional experiences. These expressions are formed using both voluntary and involuntary muscles in the eyes, forehead, nose region, mouth, and neck, and last on average for one to five seconds (Ekman, 1992). While the muscles of the face can combine in any number of ways to make a multitude of facial expressions, there are six facial expressions that are said to be universal; happiness, sadness, anger, fear, surprise, and disgust (Ekman, Friesen, and Ellsworth, 1972). There also is some evidence for a seventh universal expression: contempt (Matsumoto, 1992; Rosenberg and Ekman, 1995). The confirmed six facial expressions are said to be universal because they are found cross-culturally (support for universal facial expressions has been found in Brazil, Argentina, Japan and the United States) (Ekman, Sorenson, and Friesen, 1969). For example, all human beings contract the same facial features to express happiness, and this expression is reciprocally interpreted as happiness. To find further support for their notion of universal facial expressions Ekman and Friesen (1971) traveled to a remote location in New Guinea to test their theory with individuals who had had no contact with the
of the outer corners of the lips, as well as the inner corners of the eyebrows being pulled together and up (Ekman and Friesen, 1975). While the motion of pulling the inner eyebrows upwards is easily and voluntarily engaged, the contraction of the inner eyebrows (pulling them together) is a more involuntary movement and can be quite difficult to feign when attempting to portray sadness (Ekman and Friesen, 1975). The third universal facial expression is anger. The facial expression of anger is perceived much more quickly than the other facial expressions, likely because of an evolutionary adaptation. For example, those who are depicting an angry expression are likely to be aggressive and perhaps even dangerous, so the human brain has adapted to make a quick decision in order to react accordingly (Amado et al., 2011). Anger is most often displayed by a lowering of the eyebrows and a tightening and pressing of the lips (Ekman and Friesen, 1975). The fourth universal facial expression is surprise. Surprise can be the expression of a negative experience (such as discovering an intruder in your house) or a positive experience (such as walking in to a surprise party hosted in your honour). Surprise is characterized by raising the eyebrows (inner and outer) straight up, creating a wrinkle in the forehead, as well as a widening of the eyes. Surprise is demonstrated in the lower face by an open mouth and a slack jaw (Ekman and Friesen, 1975). The fifth universal facial expression is fear. The expression of fear is triggered by the potential threat of psychological or physical harm (Grillon and Charney, 2011). Fear is expressed in the upper half of the face by a widening of the eyes and a contraction of the inner corners of the eyebrows (upward and together). In the lower half of the face, fear is expressed by drawing back the lips and tightening the sheets of muscle in the neck (Ekman and Friesen, 1975). The expression of fear is commonly confused with the expression of surprise, but can be differentiated from surprise because it often lasts much longer. Further, a key distinction between surprise and fear can be found in the upper face. While surprise involves the pulling up of the inner eyebrows, fear involves a contraction resulting in both an upward and together movement of the inner eyebrow.

The sixth universal facial expression is disgust. Disgust is a visceral reaction to something that is offensive to the senses, such as a foul smell or a disturbing image. The most obvious cue to the expression of disgust on the human face is a wrinkling of the nose (Ekman and Friesen, 1975). The seventh, and often disputed, universal facial expression is contempt. Contempt is similar to disgust in that the individual experiences something offensive, but it is usually the behavior of another individual that precedes contempt. Further, contempt often manifests itself on the face unilaterally (e.g., upwards pull of
only one lip corner). Contempt is often felt when one individual feels superior to another. While the upper half of the face is not significantly involved in the expression of contempt, the lower half of the face reveals contempt when the individual’s lips are pressed tightly together and one side of the upper lip is raised (Ekman and Friesen, 1975). There is less support for contempt as a universal expression because it is very context dependent (Rosenberg and Ekman, 1995). That is, while many people recognize contempt as an emotion when provided with a list of options that the person in the photograph may be experiencing, it is much more difficult to “free label” or deem an expression to be contemptuous without a prompt (Rosenberg and Ekman, 1995).

Based on the evolutionary perspective from which Ekman theorized the universal expressions, researchers in the field have proposed a number of other universal facial expressions including jealousy, love (Sabini and Silver, 2005), shame, embarrassment and compassion (Widen, Christy, Hewett, and Russell, 2011). However, when provided with photographs of faces expressing shame, embarrassment and compassion, only a small number of people were able to accurately label the facial expression (when given a list of facial expressions to choose from), and over 80% of the participants perceived these facial expressions as a different emotion (Widen et al., 2011). It appears that these expressions may be socially constructed as opposed to universal.

While the six confirmed emotions are considered to be universal, that is, the same across cultures and races, research has found subtle differences within the intensity of these facial expressions as well as the way the face is scanned in order to determine facial expression across cultures. Despite finding that there were cross-cultural agreements about facial expressions during the numerous experiments conducted by Ekman, he found that there existed cultural differences in the intensity of the facial expression produced (Ekman et al., 1987). The intensity of facial expressions is directly related to the degree of constriction around the eye as well as the degree to which the mouth is open (Messinger, Mattson, Mahoor, and Cohn, 2011). As an example of this cultural difference, when Japanese and American participants were compared on their ability to detect happiness, Japanese participants were more sensitive to the disappearance of smiles in others but not more sensitive to the presence of frowns (Ishii, Miyamoto, Mayama, and Niedenthal, 2011). The authors justify the results of this study by suggesting that those immersed in the Japanese culture are much more anxious to please in interpersonal contexts than Americans and are thus more concerned with expressions of happiness (Ishii et al., 2011).
an example, anger may often be mistaken for sadness but sadness is rarely mistaken for anger. Finally, happiness and surprise are rarely confused for other emotions (Du and Martinez, 2011). Recognizing and correctly interpreting facial expressions is crucial to making accurate assessments about the personality and intentions of others.

**FIRST IMPRESSIONS**

Upon meeting a new individual for the first time, we almost instantly draw conclusions about their state and trait characteristics (Martelli, Majib, and Pelli, 2005). These conclusions largely are based upon the stranger’s facial features. Specifically, observers look to both targets’ facial expressions as well as the structure of their face to infer an array of information including their emotional state, their degree of attractiveness, and whether or not they should be trusted, among other interpersonal characteristics (Abdel Rahman, 2011). The information gleaned from the strangers face directly effects our subsequent interactions with them. This section will discuss the importance of first impressions, as well as the problems with drawing such instantaneous and long-lasting conclusions.

Using the facial expressions of others to determine their emotional state serves an adaptive advantage (Bayle, Schoendorf, Henaff, and Krolak-Salmon, 2011). For example, if a stranger is openly expressing anger it is likely that they will be avoided, and in turn a potentially threatening situation will be avoided (Amado, Yildrim, and Jylilki, 2011). Similarly, if people in the environment are displaying fearful expressions it may indicate that there is imminent danger and steps can be taken to avoid the potentially dangerous situation. A recent study conducted by Bayle et al. (2011) reveals that humans perceive facial expressions more quickly than they perceive gender, and that they have developed an accelerated behavioral response to negative emotions. Further, angry male faces are detected faster than happy male faces and angry female faces because angry males may pose more of a threat (Amado et al., 2011). Reading the facial expressions of others takes only a fraction of a second and can instantly signal a fight or flight response if a negative emotion or threat is detected (Adolphs, 2003; Schupp, Flaisch, Stueckbarger, and Junghofer, 2006). A fascinating study conducted by Stins et al. (2011) examined the behavioral reaction of participants after viewing happy versus angry faces. Findings revealed that participants found it much easier to step toward a happy face and away from an angry face. Further, when asked to step toward an angry face, a significant number of participants displayed hesitation before doing so. This is likely evidence of the body’s instinct to avoid danger by escaping angry and possibly aggressive individuals.

In addition to using a stranger’s visible displays of emotion to make a quick decision about their mental state and personality characteristics, humans also use the face’s structural features such as the jaw line and brow bone. One of the more obvious conclusions that can be drawn from the human face is attractiveness. Unlike facial expressions, attractiveness is a culture-specific construct, that is, what may be considered attractive in one culture may not be considered attractive in another (Hochschild and Borch, 2011). With that said, there are three traits that most cultures deem to be attractive: sexual dimorphism (e.g., uniquely female features such as full lips and high cheekbones), averageness (prototypical features as opposed to unique or striking features), and facial symmetry (symmetrical faces are preferred) (Gangestad, and Scheyd, 2005). People often use the degree of attractiveness to make a number of inferences about the person’s personality. Evolutionarily, healthy, strong and intelligent individuals were considered to be the most attractive and desirable and were most likely to pass on their genes (Buss, 1987). In fact, recent research supports this inclination towards attractive females as attractive physical features have been associated with better health and genetics (e.g., Moore, Smith, Taylor, and Perrett, 2011). This notion of attractiveness and intelligence persists today and influences the way that attractive people are treated. For example, a study conducted by Hochschild and Borch (2011) investigated this attractiveness bias by studying the career trajectories of attractive versus unattractive sailors. They discovered that the attractive sailors were believed to be more intelligent and have better leadership qualities than their unattractive counterparts as rated by their colleagues. Further, the attractive sailors moved higher in the ranks more quickly than their unattractive counterparts.

Another assessment derived from the face that occurs rapidly upon meeting an individual for the first time is their level of trustworthiness (Debruille, Brodeur, and Hess, 2011). Similar to the interpretation of facial expressions, making quick decisions of trustworthiness is evolutionarily advantageous (Gordon and Platek, 2009). In an attempt to understand how quickly these decisions are made, Willis and Todorov (2006) asked participants to view an image of a face for 100ms, 500ms, one second, or an unlimited amount of time. After viewing the photograph, the participants were asked to evaluate the subject’s trustworthiness, likeability, and aggressiveness among other traits. The results of this study revealed that while participants
felt more comfortable making a judgment after viewing the image for an extended period of time, they were easily able to reliably evaluate trustworthiness within 100ms. While this ability to assess trustworthiness likely stems from the dangerous situations faced by our ancestors we continue to use this information even in relatively benign situations such as asking a stranger on the sidewalk for directions (Willis, Palermo, and Burke, 2011).

There are a number of structural features of the face, such as the jaw line and the brow bone that are associated with trustworthiness. Specifically, individuals who have a strong jaw line and a strong brow bone are often perceived as more aggressive and less trustworthy (Maccapagal, Rupp, and Heimann, 2011). There are also face "types" such as the 'babyface', that affect the way that others perceive them (Sparko and Zebrowitz, 2011). Research has shown that individuals who have "babyfaces", faces that are rounder and more cherubic, are perceived as warmer and less dominant than their peers with more mature (and defined) faces (Montepare and Zebrowitz, 1998). An example of an individual with a "typical" baby face is Bernie Madoff. Madoff used his trustworthily-looking qualities (round face and upturned eyebrows) to impersonate an investment advisor and gain the trust of his clients. Unfortunately, their initial assessments of Madoff were severely misguided, as he was revealed to be a successful scam artist who stole millions of dollars from his clients. Interestingly, a recent study conducted by Zebrowitz et al. (2011) discovered that individuals who have facial characteristics similar to those of a lion, a dominant and aggressive species, are perceived as more dominant than individuals who more closely resembled Labrador Retrievers, a common breed of dog that are perceived as more warm and caring. These studies provide evidence for the theory that stable facial traits are taken into consideration when making assessments of character.

Although it appears that people make instantaneous judgments of trustworthiness, relatively little research has been conducted to determine whether these evaluations are accurate. To address this issue, Porter et al. (2008) presented participants with two groups of strangers’ faces (Nobel Peace Prize winners and Most Wanted criminals) and asked them to rate their trustworthiness. The results of this study revealed that the participants were only able to discriminate between the two groups slightly above the level of chance. Thus, while instantaneous judgments are effortlessly made, they are not always reflective of the stranger’s actual level of trustworthiness. Unfortunately, one's original evaluation of trustworthiness appears to be long lasting and difficult to alter.

Often inaccurate judgments based on non-valid cues, such as trustworthiness, can have disastrous effects within the legal system. Even though research has demonstrated that evaluations of trustworthiness are not valid, these involuntary judgments may lay the foundation for a series of questionable decisions that have the potential to change a person’s life forever. This decision-making process, known as Dangerous Decisions Theory (DDT; Porter and ten Brinke, 2009), postulates that upon seeing a defendant’s face, an interpersonal judgment of trustworthiness immediately occurs. Depending on the way that the accused is initially perceived, one might develop a bias based on their initial impression that leads them to make “dangerous” decisions. Similar to a confirmation bias, jurors and judges may experience "tunnel vision" that influences the way that they perceive the evidence presented at trial and their subsequent opinions of guilt (Meissner and Kassin, 2004). To directly test the validity of DDT, Porter, Gustaw, and ten Brinke (2010) presented participants with written vignettes of the same crimes accompanied by a photograph of the “defendant” in a mock jury design. The faces in the photographs had been previously rated as either high or low in perceived trustworthiness. The results of this study revealed that the mock jurors required less evidence in general and less incriminating evidence to convict a defendant with an “untrustworthy” face of murder. Further, when the mock jurors were presented with strong exonerating evidence, such as DNA that implicated another individual, the participants changed their guilty verdict to “not guilty” 84% of the time for trustworthy-looking defendants but only 42% of the time for the untrustworthy-looking defendants. Similarly, Dumas and Teste (2006) reported that individuals with faces that are considered to be congruent to the crime are more likely to be found guilty. An example of this is the belief that people have “the face of” a murderer, rapist, or armed robber (Bull and McAlpine, 1998). Unfortunately for those who are believed to have the “face of a murderer”, they are much more likely to be convicted if they are ever charged with homicide. Conversely, baby-faced individuals are more likely to receive more lenient sentences, and defendant’s who are physically attractive are more likely to be found not guilty, receive shorter sentences when convicted, and are considered to be less dangerous in general (Bull and Rumsey, 1988; Downs and Lyons, 1991; Eades and Webster, 1988). While this paradigm has never been studied in a real courtroom setting, there is sufficient evidence to suggest that judges and jurors rely on “gut feelings” to make interpersonal assessments of trustworthiness and credibility (see R. v. Meyrin, 2003), which may have dire consequences, including wrongful convictions.
USING THE FACE TO DETECT DECEPTION

Just as humans have evolved to rapidly detect facial expressions and evaluate trustworthiness in others, they also have evolved to disguise their true emotions to deceive those around them. The first person to theorize about deception detection, and more specifically the concept of using the face to detect deception was Charles Darwin (1872). He proposed his two-pronged inhibition hypothesis; which posited that people are unable to adequately simulate facial expressions in the absence of the genuine emotion and are unable to completely suppress their true feelings, resulting in emotional ‘leakage’ on the face. For many decades, Darwin’s inhibition hypothesis received little empirical scrutiny, despite its popularity in media and academia; however, recent research has lent empirical support and continues to expand on Darwin’s original theory. The following section will discuss the role the face plays in deception.

While lying has become a ubiquitous feature of society (with estimated rates of twice per day) (DePaulo, Kashy, Kirkendol, Wyer, and Epstein, 1996; Trivers, 2011), humans are not able to accurately detect deception among others (Porter, ten Brinke, and Wallace, 2012). Complicating the detection process, humans alter their non-verbal behavior, speech, and most importantly their faces in order to deceive others. More specifically, liars must adequately control their facial expressions in order to conceal their true emotions. There are three main methods used to control facial expressions when lying: simulating (expressing an unfelt emotion), masking (covering a felt emotion with a false expression), and neutralizing (concealing a true emotion by appearing neutral) (Ekman and Friesen, 1975). As proposed by Darwin (1872), the large majority of human beings cannot completely falsify their emotions without showing some signs of their true feelings (Hurley and Frank, 2011; Porter and ten Brinke, 2008; ten Brinke, Porter, and Baker, in press). This involuntary leakage of true emotion (also referred to as microexpressions) is often subtle, lasting less than a second. Further, research has suggested that they do not manifest across the entire face but rather, are expressed in either the upper or lower face (Ekman, 1992; Porter and ten Brinke, 2008). As an example, an individual attempting to appear sad, while actually experiencing happiness, may be able to maintain the genuine expression of sadness in the eyes but involuntarily leak a small smile.

Although it is clear that most people are poor at completely controlling their facial expressions when attempting to deceive others, research suggests that there exists a group of individuals who appear to be better able to suppress emotional leakage on the face (Porter, ten Brinke, Baker, and Wallace, 2012). Psychopaths (please see the following section for a more detailed description of psychopathy) are particularly skilled at interpersonal manipulation and appear to have a heightened ability to control their facial expressions when lying, although they too, are not able to completely prevent emotional leakage (Porter et al., 2012). This reduction in emotional leakage may be a result of their widely addressed emotional deficits (Hare, 2006). Similarly, individuals who have a high degree of emotional intelligence (EI; an increased ability to recognize emotions in others) were better able to feign an emotion that they did not feel; however, in accordance with past research, those high in EI also exhibited emotional leakage (Porter et al., in press).

The face is arguably the richest source of emotional information (Ekman, 2001). To complete the puzzle, the question remains whether the human eye can pick up on these subtle cues of deceit. The numerous studies evaluating the ability to detect deception reveal that on average, humans perform at the level of chance, that is, they are no more accurate at detecting deception than simply flipping a coin (Ekman and Friesen, 1974; Ekman and O’Sullivan, 1991; Hess and Kleck, 1994; Porter and ten Brinke, 2009; Porter et al., 2012; Vrij, 2008). Interestingly, though the face provides the most cues to deception, Ekman and Friesen (1969) determined that participants are able to more accurately detect deception when they could not see the target’s face. Although existing research suggests that people are poor at detecting deception, credibility assessments conducted by untrained individuals continue to be conducted within the criminal justice system.

In fact, credibility assessments are an integral part of the criminal justice system. Police attempt to detect deceit when interviewing suspects, judges and juries assess the credibility of the defendant at trial and psychologists may assess credibility when assessing an inmate for release. An emotional state often assessed when making these important decisions is remorse (e.g., Wood and MacMartin, 2007). Remorse is related to feeling guilt and regret for behaving in a way that violates one’s moral code, and is often associated with deceit, intentionally harming someone or committing a crime (Tangney and Dearing, 2002). Remorse is assessed because it is believed that the presence of remorse makes an offender a better candidate for treatment and eventual rehabilitation. Indeed, offenders who express a lot of emotion at trial are less likely to be convicted and, if convicted, more likely to receive shorter or more lenient sentences (e.g., Heath, Grammennann, and Peacock, 2004). Oddly enough, research has revealed that expressed remorse is not related to recidivism (e.g., Hanson and Bussière, 1998). It is likely that no relation was
found between expressed remorse and re-offense because offenders are aware of the positive effect of demonstrating remorse at trial or parole hearings, and falsify this emotion to receive lighter sentences. To determine whether individuals are able to effectively falsify remorse, ten Brinke, MacDonald, Porter, and O’Connor (2011) recorded participants while they recounted a true personal transgression and then expressed either genuine or false remorse. A detailed analysis of these videos revealed that those expressing false remorse demonstrated a greater range of universal emotions (such as expressions of happiness and surprise) and that falsified expressions of remorse are in fact a combination of deliberate falsified expressions and involuntary leakages of other expressions. While these findings suggest remorse may be a particularly easy emotion to detect as deceptive, humans remain unskilled at detecting false remorse, as well as all other forms of deception in the face. Despite the wide breadth of research concerning facial expression and cues to deception, as well as the knowledge that human instinct is not a valid gauge of deceit, law enforcement professionals including police officers, lawyers, judges, and jurors continue to rely on their (unsubstantiated) intuition when making credibility assessments (Porter and ten Brinke, 2010). Similar to the injustices that may occur when judges and jurors rely on intuitive trustworthiness assessments, the reliance on intuition in credibility assessment in the justice system has the potential to be problematic.

**Reading faces**

While mounting evidence supports the theory that most people are not particularly adept at making accurate judgments about others based on their facial structure or an emotional expression, research shows that some are better than the average person – and that some are worse. An excellent example of a type of person that is better at interpreting a range of cues from the human face is the psychopath. Psychopathy is characterized by poor interpersonal skills (e.g., being deceitful and manipulative), a disturbed affect (e.g., the inability to feel empathy and/or remorse), and behavioural problems (e.g., being impulsive and committing crimes) (Hare, 2003). This lack of "conscience" and penchant for antisocial behavior leads psychopaths to engage in a wide range of criminal acts that are often violent in nature (Hare, 2006). Research conducted by Woodworth and Porter (2002) revealed that psychopathic men are more likely to commit premeditated, goal-driven homicides. So, while they often act impulsively, they are also able to plan and execute crimes targeted against specific individuals (Woodworth and Porter, 2002). It is likely that they target specific individuals based on their level of vulnerability to victimization. Just as the hungry lion attacks the weakest gazelle in the herd, psychopaths possess a knack for picking out the most vulnerable individual in their surroundings and preying on this weakness. Currently, the method that psychopaths use to select victims is not completely understood but recent research provides evidence that these individuals use non-verbal behavior and facial expressions to determine the weakest link. As an example of this keen ability to detect vulnerability, a study conducted by Wilson, Demetrioff and Porter (2008) revealed that psychopaths are better able than the general public to detect vulnerability from a still photograph and subsequently recall details about the person in the photo. A similar study conducted by Bock, Quinsey, and Langford (2007) revealed that psychopaths are better able than the general public to accurately gauge the intensity of emotion on the face from still photographs and are better able to pick up on fearful expressions in human faces. Further, when provided with short videos showing an interpersonal interaction, psychopaths could more accurately determine the individual’s level of assertiveness, a trait that is closely related to vulnerability (Bock et al., 2007). While the cues that psychopaths use are not clear at this time, the authors believe that it is likely that they take cues from state and trait characteristics of the human face. Currently, the first two authors of this manuscript are conducting research to explore victim selection by predatory personalities more thoroughly.

Although it is concerning that individuals who are most likely to victimize others also appear to be the best at detecting vulnerability, recent research has revealed that non-psychopathic individuals are becoming more adept at protecting themselves by detecting predatory tendencies in others before they are victimized. To expand on our earlier example, this means that the weak gazelle is able to spot the hungry lion and prepare to defend itself before the lion attacks. As previously discussed, people make instantaneous judgments of trustworthiness upon meeting someone for the first time. A study conducted by Gordon and Platek (2009) on the ability to detect individuals who are characteristic of the Dark Triad reveals that this judgment of trustworthiness may be particularly sensitive to threat of victimization by predatory personalities. The Dark Triad is a set of three personality constructs: Machiavellianism, subclinical narcissism, and subclinical psychopathy that are deemed to be socially aversive (Paulhus and Williams, 2002). Individuals who possess characteristics of any of the three personality constructs of the Dark Triad are likely to be selfish, possess a grandiose sense of self-importance, and
be manipulative and exploitative (Lee and Ashton, 2005). Specifically, Machiavellianism is best represented by an individual who is manipulative, more interested in him/herself than others, and willing to use deception and manipulation if it will benefit him/her (Jakobowitz and Egan, 2006). Individuals who possess characteristics of narcissism are likely to feel dominant, grandiose and superior to others; they also often have an increased sense of entitlement (Paulhus and Williams, 2002). As previously discussed, personality traits commonly associated with psychopathy are high impulsivity, thrill seeking, low empathy and anxiety, and emotional coldness (Hare, 2003). The participants in this study were required to view a number of faces, some of average individuals and some of individuals who possess characteristics of the Dark Triad, while undergoing an fMRI (Gordon and Platek, 2009). The results of the study revealed that the amygdala, the area of the brain responsible for social and environmental vigilance, received significantly more blood flow when viewing the faces of those high in psychopathy and Machiavellianism than when viewing the average human beings. They believe that the brain did not show the same pattern of blood flow to the amygdala when viewing images of narcissistic individuals because of the three Dark Triad personality traits, they are the least likely to victimize others, thus perceived as less of a threat (Gordon and Platek, 2009).

A similar study conducted by Fowler, Lilienfeld, and Patrick (2009) revealed that participants were able to discern psychopathic individuals from non-psychopathic individuals from thin slices of video. Just as the cues that psychopaths use to detect vulnerability, the cues that average people use to detect psychopathy is also currently unknown. However, these two studies provide evidence that psychopaths also display subtle cues that are dangerous, and it is likely that a number of these subtle hints come from the face. Just as there are those that are particularly skilled at reading faces, there are a number of disorders that negatively impact an individuals to perceive facial expressions. Specifically, individuals diagnosed with autism have a particularly hard time understanding and behaving appropriately in relation to another individual’s facial cues (Balconi, Amenta, and Ferrari, 2012). Another disorder that is detrimental to the perception of social cues provided by facial expressions is schizophrenia (Laroi, Fontenot, Moulal, and Raballo, 2010). When compared to a healthy control group, individuals diagnosed with schizophrenia made significantly more errors when identifying the six universal facial expressions; and were particularly poor at accurately interpreting expressions of happiness and surprise (Laroi et al., 2010).

Individuals diagnosed with schizophrenia have particular difficulty recognizing and identifying facial expressions and this is detrimental to their social interactions (Laroi et al., 2010). Finally, although not technically a disorder, those who are under the influence of cannabis are slower at detecting facial expressions (Platt, Kamberi, Morgan, and Curran, 2010). Further, individuals who reported being heavy cannabis users required increasingly intense emotional displays to even discern a facial expression from a neutral expression (Platt et al., 2010).

Although this chapter emphasizes that humans make instant judgments about others based on state and trait characteristics of the face, it is also highlighted that these quick assessments often are inaccurate. Specifically, human beings are quite poor at identifying when they are being lied to, partially because they rely on non-valid cues to deception, and partially because human beings are much more efficient liars than detectors. Fortunately, facial training programs exist that teach professionals whose jobs require them to perform credibility assessments, such as police officers, lawyers, and judges to identify micro-expressions and emotional leakage on the face when conducting assessments of credibility. For example, a micro-expressions training program administered to department store employees resulted in employees being able to more quickly and more accurately identify micro-expressions than the employees who did not receive training (Matsumoto and Hwang, 2011). The individuals trained in micro-expressions remained more accurate and faster at identifying emotions than their counterparts two to three weeks after the initial training session (Matsumoto and Hwang, 2011).

A similar training session developed by the second author (S.P.) of this chapter along with a senior graduate student (Leanne ten Brinke) teaches individuals about the mistakes that people often make when attempting to detect deception (such as relying on common stereotypes such as gaze aversion) as well as the right cues to look for and how to go about using facial expressions to detect deception. This training program has been delivered to many professional groups across Canada including worker’s compensation agencies as well as legal professionals, such as police officers and lawyers. An examination of a shortened version of the training program was conducted to determine whether brief training in this area would help medical professionals to better detect deception (Porter, Juodis, ten Brinke, Klein, and Wilson, 2010). After only 3 hours of training the medical professionals had improved a significant, although modest, from 51.2% accuracy to 60.7% accuracy (Porter et al., 2010).
CONCLUSION

As highlighted by the wealth of information discussed in this chapter, the face plays an important role in the majority of social interactions. Although there are an infinite number of emotions that the face can display, there are six universal facial expressions that are present in all cultures across the globe (Ekman et al., 1972). It is believed that understanding these specific facial expressions have become an evolutionary advantage as they give clues to a person’s emotional state as well as the environment that they are in. Not only are people adept at reading fleeting facial expressions, they also use the structure and shape of the face to draw conclusions about the individual’s state and trait characteristics. For example, humans require as little as 38ms to reliably evaluate trustworthiness in an unfamiliar human face (Bar, Neta, and Linz, 2006). This instantaneous judgment and the subsequent perception of the individual is useful for avoiding dangerous individuals, but can also be detrimental when it occurs in legal settings (DDT).

The face also can be actively manipulated to deceive others. There are a number of ways one can conceal or alter facial expressions, but brief emotional leakages of genuine emotion are often evident in the upper or lower half of the face during the lie. Although lying is a common occurrence, and people are subjected to deceptive faces on a daily basis, the average human can only detect deception 50% of the time. That is, they are no more accurate than simply flipping a coin. A wealth of information is known about the human face but there still is much to learn about the dynamics, patterns, and social impairments of facial expressions.

REFERENCES


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