

Theoretical Foundations Exploring Deception Characteristics: A Background Inquiry

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This study delves into the multifaceted nature of deception, examining its evolutionary underpinnings and the intricate interplay of psychological, physiological, and cognitive factors. Through a comprehensive review of historical practices and contemporary research, I elucidate the complex characteristics inherent in the act of deception. From ancient methods of detecting deceit to modern advancements in neuroscience and cognitive psychology, the conceptualization of deception has evolved, revealing its fundamental role in social interactions. Drawing upon theoretical frameworks and empirical evidence, this paper highlights the intrinsic connection between deception and human behaviour, emphasizing the necessity of understanding its nuanced manifestations. By integrating insights from diverse disciplines, I aim to contribute to a deeper comprehension of deception's significance in both evolutionary contexts and contemporary society.

Keywords: *deception, communication, interdisciplinary insights, cross-cultural aspects, evolutionary context*

A tanulmány a megtévesztés sokrétű természetével foglalkozik, megvizsgálja evolúciós hátterét, valamint a pszichológiai, fiziológiai és kognitív tényezők bonyolult kölcsönhatását. A történeti gyakorlatok és a kortárs kutatások átfogó áttekintésén keresztül tisztázom a megtévesztés cselekményében rejlő összetett jellemzőket. A megtévesztés felismerésének ősi módszereitől az idegtudomány és a kognitív pszichológia modern fejlődéséig a megtévesztés fogalma fejlődött, feltárva a társadalmi interakciókban betöltött alapvető szerepét. Elméleti keretekre és empirikus bizonyítékokra támaszkodva ez a tanulmány rávilágít a megtévesztés és az emberi viselkedés közötti belső kapcsolatra, hangsúlyozva annak szükségességét, hogy megértsük annak árnyalt megnyilvánulásait. A különböző tudományágak meglátásainak integrálásával arra törekszem, hogy hozzájáruljak a megtévesztés jelentőségének mélyebb megértéséhez mind az evolúciós kontextusban, mind a mai társadalomban.

Kulcsszavak: *megtévesztés, kommunikáció, interdiszciplináris betekintés, kultúrák közötti szempontok, evolúciós kontextus*

Introduction

“Deception is a very deep feature of life. It occurs at all levels—from gene to cell to individual to group—and it seems, by any and all means, necessary.” (2011:6). Trivers’ quote emphasizes the pervasive nature of deception in human interactions and its evolutionary significance -as a result of the competition for survival and reproduction- in social behaviour. Deception can provide adaptive advantages in various contexts but the ability to detect deceit has also evolved as a countermeasure. Being able to expose deception is a widely discussed topic throughout human history, and various means have been discovered since ancient times. All detection attempts focus on psychological and the resulting physiological changes occurring during deceptive behaviour. Most of the tools are electrical instruments, but increased interest turned to speech-based semantical, pragmatical and grammatical cues in psychology, criminology, linguistics and computer science, with promising experimental results.

To create effective means of detection, it is important to know the underlying dynamics of a deceptive intent. This work aims to offer a brief introduction to the basis on which the means of deception detection are constructed. The fundamental origin and characteristics are described in the framework of evolution psychology. Throughout human history behavioural and psychological traits developed as an adaptation to the environment. Both being deceptive and being able to detect deception have been proved adaptive to a certain extent (Tooby and Cosmides 1990; Pléh, Csányi, Bereczkei eds. 2001). Being able to mislead others may provide various advantages for survival and sexual opportunities. However, the stakes are high: if exposed, it damages trust and harms relationships (McCornack and Levine 1990). It threatens with exclusion by the community, which means losing all the social support, along with its material and emotional benefits, which are crucial for survival. On the other hand, being able to detect deception has helped to preserve the assets and possessions acquired so far, furthermore earns respect from the community, which means greater social support and heightened survival success. Interestingly, however, by the 21st century, showing antisocial behavioural traits have become more common and more adaptive in surviving in the capitalist world (Jevtic 2011). At the same time, tools to filter out deceptive behaviour need to advance too.

This work will first give an introduction to the concept of deception from a pragmatical approach, followed by studying the roots and evolutionary benefits in wildlife and human societies in section 2. Section 3. aims to discuss the main motivational factors behind human deception, including cultural effects on the motivations. Section 4 focuses on the inherent physiolog-

ical and psychological changes during a lie or deceitful behaviour. The final, 5th section summarises the key points of the concept of deception, that lead to more accurate detection methods and devices.

1. The concept of deception

1. 1. The definition of deception

According to the American Psychological Association, deception is “any distortion of or withholding of fact with the purpose of misleading others.” (APA Dictionary of Psychology, 2021) This definition implies the various forms of deception yet does not expound them. Numerous researchers attempt to give a precise definition and classify the various forms of deception. Bok (1978) focuses only on the manifestation of lying when defining deception. As she describes, it is a statement that the utterer believes to be false but means to make the other believe it is a true statement about the world. Coleman and Kay (1981), as well as Kupfer (1982) describe an agreement with Bok (1978) and introduce the significance of intention. They define deception as a believed false belief stated to the other individual with the intention that that statement is believed to be true by the hearer. Kupfer (1982) somewhat advances the previous descriptions and introduces another level of understanding. He states that a lie is a believed-false statement uttered with the intention to either make the other believe it to be true or make the other believe that the utterer believes it to be true. Ekman (1985) uses deception and lying as synonyms, and classifies deception into two categories: falsification and concealment. Both can only be interpreted as deception, if the individual conceals or falsifies information, without being asked to do that by the hearer, with the intention that the other believe something else. Concealment means withholding information, without verbalizing anything untrue. On the other hand in falsifying the deceiver presents a false information, as it was true to mislead the other. To extent Ekman's findings Kis, Takács, Lieberman and Benczúr (2016) identify two more manifestations of deception. Their findings show that besides concealment and falsification, a secretive verbal attitude (when a person's verbalization in the actual context is affected by concealment of information from a different context) and a pathetic attitude (narrative characteristics of the exposed deceiver) can also be described. Vrij (2000) agrees with Eckman (1985) and do not distinguish between deception and lying either. In his definition lying is an attempt from the speaker to create a believed false-belief in the other person, without prior warning.

Currently deception is used a collective term whose elements can be categorized based on different aspects (Utz 2005, Whaley 1982/1991, Hyman 1989). Since the study of deception was initially aimed at exposing lies (see

Trovillo 1939, Larson 1932), most authors -as we have previously seen- treat the terms deception and lie as synonyms (Bok 1978, Ekman 1985, Buller and Burgoon 1993, DePaulo 1996, Vrij 2000, Erat and Gneezy 2009)¹. Due to the specialization of behavioural research, we have increasing knowledge about the characteristics of deception, so lying has rather become a sub-unit of deception, including silence (concealment), falsification, concealment (disguising the topic), side-talk (Utz 2005). Based on Hyman's (1989) categorisation, some deceptive behaviours are related to the situation, such as joking, pretending, magic, white lies, but also forgery, confidence games, consumer and healthcare fraud, military and strategic deception, tricks in sports and in other games, gambling cheats, and playing pranks on someone. In addition, "fake news" are regarded as an alternative form of deception, which is a news content published on the Internet that resembles the actual and legitimate leading news content aesthetically, but is fabricated or extremely inaccurate (Pennycook-Rand 2021).

2. The evolutionary background of deceptive behaviour

Being able to deceive is our innate ability such as recognising deception in others. However, it is not a human specific trait but rather an evolutionary heritage. Our mental abilities as humans-like all other characteristics of the human phenotype- developed through adaptation to the ancient environmental conditions. The vast majority of our past as human race was spent in hunter and gatherer societies that generated a selective pressure to advance in thinking and reflexion to the world in order to survive and increase the chance of reproduction (Tooby and Cosmides 1990; Pléh et al. 2001). These two factors are considered to be the evolutionary drive for the emergence of deceptive behaviour. Although some forms of deception are present in the flora and fauna, those behaviour are not considered to be conscious and deliberate. Being able to deceive requires the mental ability of *mindreading*, namely recognising and distinguishing mental states of others which is only characteristic of humans and a group of primates (Povinelli and Boysen 1990; Gomez 1996; Hare, Call, Agnetta and Tomasello 2000; Baldwin and Moses 1994, Kiss 2005). For illustrative purposes, let us examine a few examples.

¹ It is worth noting that in Hungarian language the Synonyms and Cognates Database (Szinonimák és rokonértelmű szavak adatbázisa 2010) does not regard lie and deception as synonymous terms. Only in one case are they mentioned as cognate expressions, where sliding (*csúsztatás*) is explained as: Sliding (noun), (priv.): misinterpretation, deception, lie, untruth (SzRSz 2010:164).

2. 1. Deception in wildlife

Regarding plants, researchers have identified about 7,900 species capable of deception. The mechanism is that plants are sending false olfactory signals to insects imitating rewarding conditions for pollination, such as food, mating opportunities or shelter. These are mostly orchid species that emit scents that are similar to the mating (Spaethe et al., 2010) pheromones of the insects that help pollinate them, or – in the case of carnivorous plants – to the scent of the insect's food (Givnish, 2015).

In the animal kingdom, different species have developed different methods for their survival. In the case of visual deception of butterflies, for example, evolutionary selection favoured the development of wing patterns that deterred avian predators. The most common is that the pattern of the wings imitates the eyes and head of a large bird.



Figure 1. Visual deception (camouflage) of butterflies (Tonner et al., 1993)

The deceptive behaviour of one octopus specie yet suggests some goal orientedness, when the skin pattern is mimicking a seasnake for territorial defense (Norman et al 2001).

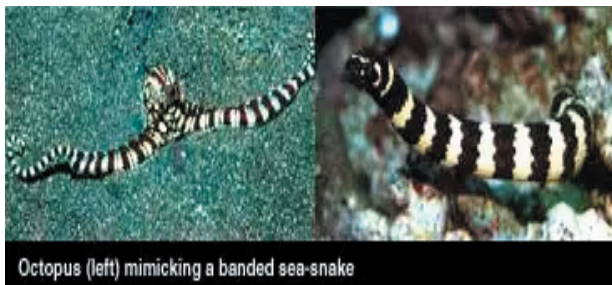


Figure 2. The octopus (left) mimicking a seasnake (right)

On a higher stage of phylogenesis we can observe deceptive behaviour in response to the threat of predation. Thanatosis or tonic immobility (also known as 'playing dead') is a strategy of diverse prey animals to inhibit the likelihood of further attack and make the predator loose interest in the prey (Humphreys and Ruxton 2018). The behaviour of the animal is reminiscent of the dead individuals of that species.

Another example when the chances of survival are highly enhanced in the interaction with the environment and predation is the nest building technique of a weaver bird (Crook 1963). The nest is constructed to present a false entry, while the real entry to the nest stays hidden, therefore the eggs and chicks are protected from snakes.

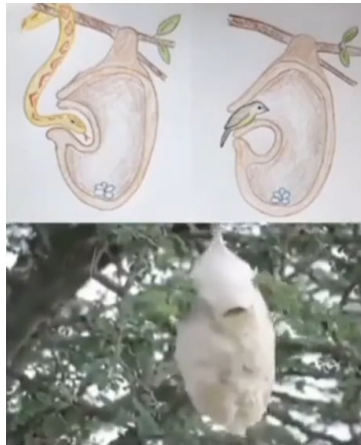


Figure 3. Weaver bird builds a false entry to its nest to protect its eggs (Crook, 1963)

The observations of deliberate deception began with testing the complexity of mental representations of anthropogenic mammals. Many observations show (Povinelli and Boysen, 1990; Gomez, 1996; Hare et al., 2000; Baldwin and Moses, 1994) that the mindreading abilities of primates correspond with mindreading abilities of an eighteen-month-old human child. They conclude primates do not possess the ability to attribute knowledge, intention, and belief to other mates, but representation is set on a primary level, such as modelling the visual perspective of others. Gomez (1996) supports the concept that primates have implicit mindreading abilities, which means that they cannot recognise and understand mental states independent of them but conclude knowledge and intention from the behavioural reaction of the other. Humans, on the other hand, are able to create secondary representations, derived only from the situation, and independent of the behaviour of the other. For exam-

ple humans can conclude sadness in the other in a context of losing a loved one, even if these feelings are not explicitly shown at that moment.

Being able to deceive and being able to attribute mental states to others are not the same, however. The American philosopher, Daniel Clement Dennett (1996) distinguishes between the forms of intentionality, which contribute to the misleading of others. Zero intentionality does not possess premeditation, but a result of natural selection. For example, on the wings of some butterfly and moth species, the pattern resembles a huge eye, which serves the purpose of deterring or stopping birds who are hunting for nutriment. Primary intentionality is based on an association learning process, as the cat moaning in front of the door takes the place of its owner in front of the fireplace. Deliberate misleading is connected to secondary intentionality, when one manipulates the other by making it think a false belief, thus reaching its own goal. Examinations under clinical conditions with chimpanzees (Woodruff and Premack 1979; Povinelli and Boysen 1990) show that social factors play a dominant role in deliberate deceiving actions. Chimpanzees are able to distinguish between cooperative and non-cooperative humans and deceive accordingly. In their experiment the leading researcher placed food under only one box from several boxes. The chimpanzees quickly learned to show the place of the food for an uninitiated person. Furthermore, when the animals did not see where the food was placed, they asked the “knower” to show it to them. Later two other experimental “knowers” were introduced, a “selfish” and a “sharing” one. The selfish one did not share the food with the chimpanzee, after the animal showed the place of the food to him, but the sharing experimenter did. Results showed that chimpanzees did not accept the answers from the selfish “knowers”, when inquiring about the whereabouts of the food, but accepted the answers from the sharing ones. In fact, they learned to mislead the selfish experimenters: while showing the place of the food to the cooperative ones, they refused to give information or deliberately pointed to an empty box for the selfish. These findings were later supported by observations of Byrne (1995) conducted in the animal's natural habitat, a reserve in Gombe. Chimpanzees were fed from a box in a forest clearing. One time, a chimpanzee saw the box was open as he was walking by and was just about to take the food out when he noticed a dominant chimpanzee was approaching—who never shared food with him. He quickly looked elsewhere from the food and the dominant chimpanzee walked past but hid behind a nearby tree. After the chimpanzee took the food from the box, the dominant one suddenly jumped there and took the food from him. Researchers concluded that these behavioural manifestations were more complex than simple learning and required the attribution of mental state of the other. As described above, primates presumably do not possess the ability to attribute

more elaborate mental states (like wishes, knowledge or beliefs) that cannot be derived from behaviour. Their mindreading abilities are set on a primary level, based on the direction of the other's attention, visual perspective or maybe expectation.

2.2. Deception in human societies

Extending the results of animal observations, Humphrey (1976) defined the idea of the social intelligence hypothesis from a neurobiological viewpoint. It suggests that the complexity and variability of the social environment produced such pressure in selection that resulted in the rapid development of intelligence. The fact of animals belonging to the same group living on the same resources favoured the development of manipulative strategies on one hand, and the advancement of protective and defensive mechanisms on the other. From this Humphrey concludes that the larger cerebrum and cognitive skills of the anthropogenic developed primarily to help with social problem solving. The adaptation to the ecological environment was only a secondary drive. Furthermore, he states, that the technical skills (like creating tools) developed at a later stage of evolutionary development, than social skills (the cognitive skills that manage social relationships). As Smith (1987) and Trivers (2011) later describe it, there must be "a coevolutionary struggle between the deceiver and the deceived. There is an evolutionary arms race to develop better deception tactics and subsequently the pressure to develop better deception detection devices" (Smith 1987, p. 59.). An experiment by Byrne (1995) supported this idea: he observes significant correlation between the ratios of group size, neocortex and manipulative strategies. Dunbar (2002) later added a distinction between non-human and human primates, and emphasised the role of the increased frontal lobe (prefrontal cortex—where the neocortex can be found mainly) in the latter, which is found responsible for mindreading, social and sexual behaviour, judgement, impulse control, as well as emotions and "personality". These findings were supported also by using brain imaging, where a greater activity in prefrontal brain regions (anterior cingulate, dorsolateral prefrontal, and inferior frontal regions) is detectable, compared to truth telling activities of the same area (Abe 2011; Christ et. al, 2009).

These findings are significant in explaining the complexity of social behaviour, yet critiques argue, that ecological environment can be just as much complex and unpredictable as the social environment, thinking of the natural disasters of the 20th. Century (Gigerenzer 1997). Another fact that needs further observation is that the anthropogenic live in same size and complexity groups as the primate species, thus the theory of the correlation

between group size and increased cortex do not explain the differences in cognitive abilities between the two species (Gibson 2002).

According to a different approach to understand competing behaviour in communities Whiten and Byrne (1988) introduces the Machiavellian intelligence hypothesis. The definition refers to Niccoló Machiavelli, the Italian writer, politician, and philosopher, who in his work *Il Principe* (1513, 1978) describes what makes a monarch. From an evolutionary perspective Machiavellian intelligence means that individuals show cooperation and friendship, to influence (manipulate) others or turning against others according to their own interest. It includes all the behavioural strategies that increase reproductive success and access to resources at the expense of others.

The Truth Default Theory constructed by Levine (2014) offers a competing view to Smith's (1987) on the evolutionary development of the relationship between society and deceiver individuals. Humans are social by nature, and social success or appropriate social functioning requires effective communication (Hymes 1972). Levine suggests that individuals interpret communication as truthful by default, even though the presumption of honesty raises the vulnerability of social exploitation. On the other hand the net evolutionary advantage of communicational success and social effectiveness outweigh the cost of the possibility of occasionally getting deceived.

To be effective in both communication and deception, the preponderance of sincerity is needed, that is, it is stated as essential that the communication is true and taken as true. Chronic suspicion cannot prove to be effective because it would hinder efficient social functioning. Similarly deception cannot become normative in a society because after some time targets would unlikely to be misled (Trivers 2011). Thus the evolutionary selection process favoured that social systems discourage deceit, and human cultures are likely to socialise members to value honest communication and punish to avoid deceit. Deception prevention is more efficient than real-time detection. Observations with children show that at the ages when the ability of mindreading is formed (between ages 3 and 5) children apply lying spontaneously in their communication when truth interferes with their goal (Peskin 1992). When the detected deception is punished, individuals learn to prefer honesty and deceive others on rare occasions, and as a consequence the frequency of lying decreases with age (Levine 2014). Honesty seems to be nearly universal when the truth helps or not hinders goal attainment, while lying requires a reason or a psychopathological condition. In summary the main claims of the Truth Default Theory are that individuals are truth biased, avoid deception when the truth is viable and there is always a definable reason behind a deceptive act.

Human deception is a complex behavioural manifestation, requiring a series of advanced cognitive operations. A large number of studies prove that

lying requires more cognitive effort than truth telling (Vrij, Fisher, Mann and Leal 2006; Zuckerman, DePaulo and Rosenthal 1981). Behavioural studies show longer latencies of response and higher error rate during dishonesty compared to truth telling (Verschuere and De Houwer 2011), as a signal of a more demanding cognitive process, such as the results of brain imaging procedures.

3. The motivation behind human deception

The principle of veracity by Bok (1989) in communication shows resemblance to the Gricean maxim of quality (Grice 1975). Both emphasise that in our utterances we are biased or expected to communicate truthfully. All can be derived from the fact explained above that societies tend to direct individuals to engage in communicative situations with sincerity, and people always lie for a reason. Levine (2010) underlines that individuals use deception as a tactical or strategical mean for goal attainment and -with the exception of psychopathological case manifestations- it is not the goal in itself.

Several classification concepts have been developed by researchers about the underlying motivation for dishonesty. One of the first was constructed by Turner and his colleagues (1975) based on analysing 130 dyadic conversations. They concluded that despite social inhibition, deception is a necessary, in fact mandatory element in conversations and as such it is frequently employed. In their work, five motivational factors were identified: 1) to save face, 2) to manage relationships, 3) to exploit, 4) to avoid tension/conflict, and 5) to control situations. Hample (1980) and Metts (1989) set the focus point on the locus of primary benefit (self, other, relationship). Eckman (1991) elaborated an extensive list of why children lie: 1) to avoid punishment, 2) to get something, 3) to protect friends, 4) to protect one's self, 5) to win admiration, 6) to avoid social awkwardness, 7) to avoid embarrassment, 8) to maintain privacy, and 9) for power over authority. In a study Nábrády (2014) found -based on a journaling task- that the most significant motivational factor behind deception is to deny or change the deed disapproved by parents or prestige, secondly when the individual does not want to engage in something but says the contrary (or the opposite: wants to do something but says otherwise), and thirdly to cover for someone. The additional reasons she identified were: to spare the other, to deceive an office or an official, to avoid conflicts, being unfaithful, dishonesty regarding sexuality (e.g.: virginity, pregnancy) and intimacy, manipulating relationships of others, lies about material matter, to get rid of someone, lie as a joke, to seem different or better, to state or deny an emotion or opinion, not to share confidential information, to conceal opportunity from the other or to hide a family secret. Seeing these results we

may agree, that all motivational factors are socially rooted, and opt to control the social situation to the deceiver's favour, may it be pro- (e.g.: "covering from" or "sparing someone") or antisocial (e.g. to exploit) in nature. These studies also reflect on the pan-cultural and universal nature of the underlying motivation for dishonesty, at least for Western and European societies.

However, studies on a wider cross-cultural aspect on motives prompt that deception and deception motives may be universal, but the situations in which these motives become salient and be hindered by the truth are culturally different. Levine, Ali, Dean, Abdulla and Garcia-Ruano (2016) asked participants from Egypt, Guatemala, Pakistan, Saudi Arabia and the United States to recall a recent instance of deception and describe it (in writing) in great detail. They found that the leading motives are personal transgression, economic advantage, non-economic advantage of self and avoidance across the cultures, but the triggering circumstances appeared to be different. For example heterosexual infidelity counts as personal transgression to Guatemalan participants, but for participants in Saudi Arabia it is drinking alcohol or attending parties. Thus results also reflect the effect of the restrictive nature of a culture in deception motives.

The relationship between the individual and the group can also be important in underlying deception motives. Triandis and his colleagues (2001) compared individualist (USA, Australia, Netherlands, Germany) and collectivist societies (Hong Kong, Japan, Korea, Greece). Participants were asked to take part in a scenario where they are chief negotiators of a company with the authorisation of corruption (bribing). Then were asked to answer questions on 9-point scales, in the form of both first and third person singular (e.g.: „How likely would it be for most chief negotiators in a similar situation to use this money as a gift for the Y chief negotiator?", Triandis 2001:78). Results show that regardless of the social order, participants experienced shame, guilt and disgust about having lied, especially when they lied a lot (outstandingly Korean and Japanese participants). Participants from individualistic cultures showed more competitiveness that correlated with the tendency to deceive. Individuals from collectivist countries expected and perceived the other negotiator as likely to be misleading. Although within a culture, idiocentric people were more likely to lie than allocentric people. Chen, Hu and He (2016) examined the perception of the deception in collectivist and individualistic societies. They asked Chinese and American participants to answer a Questionnaire where 9 scenarios were described, divided into 4 groups (joking, politeness, the lie benefits the listener, the lie benefits the speaker/self). The participants needed to decide how lie-like the message was, and how acceptable it is morally.

6. A professor misspelled a word on board. After a student pointed it out, he said, jokingly: "Oh, I was just checking your spelling." Was he lying and do you find what he did objectionable?	YES	NO	YES	NO
	5-4-3-2-1-0		5-4-3-2-1-0	

Figure 3. Example question from the questionnaire. Source: Chen, R., Hu, C., and He, L. (2013): Lying between English and Chinese: An intercultural comparative study. *Intercultural Pragmatics*. 10 (3): p. 399.

Results show that both cultures found the lie benefiting the self the most objectionable. American participants judged a statement morally more unacceptable the more lie-like it was, while Chinese participants displayed more tolerance toward truthfulness overall.

4. The concomitant psychological and physiological manifestations of deception

Focusing on the deceiving individual several characteristics have been identified throughout human history about the accompanying phenomena of this communicational act. These are both psychological and physiological and are strongly correlated: if a change occurs in one, there will most likely be an alteration in the other as well.

It is well documented, that the stress caused by dishonesty results in physiological changes, which can be detected or measured. Physical changes have been considered to be of diagnostic value since the ancient times. Ancient Chinese for example carried out a test to unmask deceit by making the deceiver eat a handful of rice powder. If the flour has not been wetted, was a signal that the individual was lying (Trovillo 1939). A different form of this test was used during the Inquisition, where suspects had to chew on a piece of bread and cheese, and if that stuck on the individuals palate would indicate deceit (Larson, 1932). By today we have scientific evidence that increased stress level inhibits saliva flow, however these practices suggest an implicit understanding of the connection between deception and emotionality. The first attempt to introduce physiological changes to the scientific discourse belongs to Cesare Lombroso, who implemented monitoring the changes of the pulse to determine criminality (Larson, 1932). After that, the research of the psychological correlates of deception advanced alongside with the improving objective of the polygraph device. Based on Lombroso's findings Martson created the first version of a lie detector, called "systolic blood pressure decep-

tion test" in 1915 (Larson 1932, Lykken 1959). Influenced by his works, Larson, a forensic psychiatrist, started research about blood pressure and respiratory changes during police questioning, and based on his observations he created the first modern polygraph that recorded blood pressure, heart rate and respiration. In 1939, Keeler added a fourth factor to the measurements, the galvanic skin response (Lykken 1959), which was believed to be a signal of the higher stress, because a truthful person sweats less than a dishonest person. At that time, he argued that sweat would decrease skin resistance due to the accumulation of negatively charged chloride ions on the surface of the skin, but according to the current viewpoint it is more believed to be the consequence of the increased activity of sweat glands (Sullivan, 2001; Grubin, 2005).

Cognitive abilities are also inevitable factors in connection with deceit, since the same cognitive abilities are needed to be successful in communication and in deceiving. As a result of technical progress, through brain imaging procedures we are able to get more insight about what happens in our brain during dishonesty. Concerning localisation it is believed that lying takes effort and the individual firstly needs to suppress the truth and subsequently construct an alternative (Vrij, Fisher, Mann and Leal, 2006; Zuckerman et al. 1981; Walczyk, Roper, Seemann, and Humphrey, 2003). Research show that even thinking of a lie (before stating it), activates more areas of the brain, when telling the truth (Abe, 2011; Christ, Van Essen, Watson, Brubaker, and McDermott, 2009), and realistic knowledge enters working memory initially before responding deceptively (Walczyk et al., 2003). Especially affected is the frontal lobe (anterior cingulate, dorsolateral prefrontal, and inferior frontal regions specifically) and the left mediotemporal cortical area. However, Carrión, Keenan and Sebanz (2010) have discovered, that the same mediofrontal activity was recorded both when telling a lie and when telling the truth but with deceptive intent. This finding also suggests that the increased latency of response does not result from truth inhibition, but rather from the fact that individuals need to keep the mental state of others in mind while deceiving them inflicts a cognitive conflict. Being dishonest requires keeping our own knowledge and the assumed knowledge of others apart, which increases the need for cognitive control and requires higher proportion of our mental capacity.

5. Summary

The nature and destructive potential of deception has long been of interest to researchers and laymen alike. Although scholars use the terms deception and lie as synonyms (Bok 1978, Ekman 1985, Buller and Burgoon 1993, DePaulo 1996, Vrij 2000, Erat and Gneezy 2009), lying has now become a subunit of deception (Ekman 1985, Kis 2016, Utz 2005, Hyman 1989, Pennycook-

Rand 2021). A deceptive message does not only have to be untrue (Bok), indirect (Levine and Kim 2010), high context (Levine and Kim 2010), false or ambiguous (McConack et al. 1992), the message needs to be intentionally (Coleman and Kay, Kupfer) misleading (Levine and Kim 2010), without prior warning (Vrij 2000)

The capacity for deception is intrinsic to us humans, just as is our ability to discern deceit in others. The ability to deceive is not exclusive to humans; it is also observable in nature. But what makes human deception different: 1) intentionality (Humphry 1984), 2) elaborate communicative competence (Hymes 1972) and 3) the ability of mind reading (Povinelli and Boysen, 1990; Gomez, 1996; Hare, Call, Agnetta and Tomasello, 2000; Baldwin and Moses, 1994, Kiss 2005). Deception -apart from certain psychopathological conditions- never comes out of the blue, but is applied when telling the truth prevents the speaker from achieving an important goal (Levine 2010). Cross-cultural studies show that while deception and deception motives are universal, the situation in which these motives become salient are culturally variable (Levine et al 2016, Triandis 2001). Throughout human history, various characteristics of deception, both psychological and physiological, have been observed in individuals engaging in this communicative act. These traits are closely intertwined, with changes in one often coinciding with alterations in the other. Lombroso's pioneering work on monitoring pulse changes for determining criminality laid the groundwork for later advancements in detecting deception, including Martson's creation of the first lie detector. Subsequent research, notably by Larson (Larson 1932), expanded the understanding of physiological indicators of deceit, leading to the development of modern polygraph devices. Cognitive abilities are also integral to deception, as successful deceit requires cognitive skills akin to effective communication. Brain imaging studies have shed light on the neural processes underlying dishonesty, revealing increased activity in areas associated with cognitive control and mentalizing. Additionally, research suggests that the cognitive demands of maintaining deceptive narratives contribute to delayed response times and heightened cognitive conflict. Overall, deception involves a complex interplay of psychological, physiological, cognitive and social (cultural) factors, with advancements in scientific understanding continually enriching our knowledge of this phenomenon.

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