

THINKING ABOUT WHAT THE OTHERS ARE THINKING ABOUT: AN INTEGRATIVE APPROACH TO THE MIND PERCEPTION AND SOCIAL COGNITION THEORY

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ABSTRACT: At the very moment a person wonders about: “What is the other thinking about?”, with this remark, he/she becomes, implicitly, implicated in the field of social cognition. It is axiomatic for people to be concerned and curious about the mental states of others for various reasons: (i) defending and controlling the self-image with regard to others’ judgments, or (ii) controlling and manipulating the others, driven by selfish interests and Machiavellian intelligence. In a nutshell, this article deals with the topic of “mind-reading” from an integrative and pluralistic perspective in that we opted for a tripartite levels of analysis: (1) the first level is concerned with behavior-reading which is identified, according to the embedded cognition, as an external manifestation of mind-reading which depends on the visible function of the human body in its environment, (2) the second one is concerned with mind-reading as a cognitive faculty which requires two appropriated cognitive systems: (i) simulation, and (ii) theorization. These two systems work: synergistically, interdependently and alternatively, by mentoring processes that are driven by a psychological mechanism which evaluates ‘distance’ between the self and the other, i.e., if the other is perceived as a close ally activates the simulation mechanism, but if he/she is perceived as a foreigner activates the theorizing mechanism. (3) The third level adopts a neuro-constructivist assumption which stresses that brain-reading is underlined by cerebral plasticity. We believe that our brain-reading faculty is neither modular nor domain-specific neural circuit; rather it is a multipartite neuronal network which encompasses multi-interfaces.

KEYWORDS: Social cognition; Brain-reading; Behavior-reading; Mind-reading

1. INTRODUCTION

At the very moment a person wonders about: “What is the other person thinking about?”, he or she is implicated in the field of social cognition. It is a common presupposition among social cognition theorists that humans and other primates (animals) differ in the ability to construct what is known in the literature as “mind-reading capacity” (Heyes, 2015). Mind-reading inquiry is a sub-branch of mind perception theory developed to investigate how people infer whether the other agents have mental states or not, and how they decide what those mental states might be (Epley & Waytz, 2010).

In this article, we will try to analyse mind-reading capacity as a core concept of social cognition discipline at three levels. The first level is concerned with behaviour-reading (Terada & Yamada, 2017). In this realm, we will try to uncover what kinds of social situations and contexts stimulate our behavioural reading that should be manifested in daily activities as a curious conduct about knowing and reading the mind of the other. Also, we will attempt to make explicit the goals and purposes that guide our behaviour of mind-reading (Realo et al., 2003). To put it bluntly, what kinds of intentions motivate our mind-reading? Are we trying to increase the efficiency of our communication with the other? To provide help, maybe? Or, on the contrary, are we trying to maximize our benefits and even take control over him/her for our selfish goals?

Second, we will try to deal with the cognitive dimension. More precisely, we will try to discern the cognitive operations and strategies we resort to in order to show and expose what the other is thinking about. Needless to say, we will also try to identify the limitations of these mind-reading’s mechanisms and strategies. Third, we will try to focus on brain activities that accompany mind-reading attempts. Specifically, we will discuss two hypotheses: (i) the first one postulates that the individual’s brain-reading activity triggers a modular neuro-activity known as “domain-specific” (e.g., Dehaene 1997; Gelman & Gallistel, 1978; van der Lely & Pinker, 2014; Duchaine et al., 2006; Landau et al., 2005), and (ii) the second hypothesis suggests that the activation’s spill-over effect spreads to the entire brain systems (e.g., Ayoub & Fischer, 2006; Karmiloff-Smith, 2015). Hence, it is a global effect.

2. THE FRAMEWORK, THE SCOPE AND THE LIMITATIONS OF BEHAVIOUR-READING ATTEMPTS

2.1. The framework of behaviour-reading

Working within behaviour-reading inquiry involves us in the field of embodied cognition; that to say cognitive processes underlying behaviour-reading are not only computational procedures operating symbolic mental states as classical cognitive psychology envisaged. On the other hand, we reject the idea of studying internal mental states and processes independently of the body and its environment (Spaulding, 2010).

In this way, we mean by behaviour-reading, observing others' behaviour that permits some grasp of their mental states. Behaviour-reading performance is based on other embodied actions, eye contact, facial expressions, body postures, tone voice, and various embodied cues (Cox et al., 2017).

2.2. The limitations of the behaviour-reading process

Obviously, people are able to introspect about their intentions, desires, purposes, and emotions, but they are very helpless when trying to reveal the other's thoughts, intentions, and emotions. Indeed, we are not telepathic beings. Unfortunately, although human beings have made remarkable scientific breakthroughs in different domains thanks to technological inventions such as 'Telescope' and 'microscope', there is no such invention as 'cognoscope'. As such, any attempt to confront this issue is relative and hypothetical (Epley & Waytz, 2010).

Ironically, people don't blink a second when talking about others concerns, feelings, intentions and attitudes with a remarkable confidence. Indeed, observing others' behaviour doesn't guarantee an unbiased and objective approach to reveal exactly what others are thinking or feeling. In other words, behaviour-reading can't identify precisely the mental and emotional states of others (Khabbache, 2010). According to Jackendoff (1983:94) there is no such thing as reality per se, but there is only a "projected reality", let alone the reality of the other's mental state which exists in a continuous dynamic-flux state.

2.3. What motivates people's eagerness to use their behaviour-reading processes?

Every now and then, humans- relying on observing others conducts- engage in the process of behaviour-reading in order to identify others' mental and emotional states: they wonder whether the other's intentions are honest or deceptive, is he/she a generous and kind person or a greedy and nasty one? Does he/she act spontaneously and innocently, or does he/she have hidden schemes and plots to achieve his/her own goals? (Khabbache, 2010). These mental activities require the mobilisation and consolidation of various cognitive efforts and processes such as: memory, attention, problem solving, and perceptive taking etc (Bailey & Im-Bolter, 2020).

As such, as soon as the mind engages in reading, it starts constructing impressionistic hypotheses: (i) if the other has the same tastes, beliefs, and goals like I do, then he/she is a good candidate to be my friend (ally) and earn my trust, but; in contrast, (ii) if he/she is different from me, suspicion and fear creep into my mind. Hence, these impressions inhibit me from any desire to sympathize with him/her (Khabbash, 2014).

A point is that it's immensely difficult to generalise this analysis to all human beings and to all situations. For example, humans attribute emotional and mental states to non-human agents such as God, angles, machines (My car is angry today), etc. In these cases, we are talking about anthropomorphic behaviour (Urquiza-Haasab & Kotrschal, 2015). In contrast, in discriminatory situations, when others are judged as dissimilar because of ethnical, religious or class reasons, they are considered as mindless or soulless agents (Khabbash, 2014).

Undoubtedly, people always try to learn from each other. Indeed, people become very attentive to what others say and narrate about their experiences (such as divorce, retirement, marriage ...etc.) because they want to avoid the same predicaments of those situations to happen to them. When that's the case people invest all their cognitive, conceptual, and intellectual powers to read the other's mind. It's a kind of indirect learning which permits reducing the risk of having an unfathomable adventure consequence caused by the new and unfamiliar experience (Khabbache, 2007; 2010; 2014).

One study showed that people who belong to high social classes invest less in mind-reading activities than the ones who belong to fragile and low social classes. The study explains this difference between high and low social classes to be the

result of self-autonomy, i.e., the more a person is autonomous the more he/she becomes less interested in what others are thinking about probably because they are able to run their own projects (Fiske, 1993; Galinsky et al., 2006; Goodwin et al., 2000). Conversely, the less they are self-autonomous the more they invest in mind-reading activities; perhaps to compensate for their inability to act independently (LaFrance & Henley, 1994; Henley, 1977; Keltner et al., 2003).

Nevertheless, we can't take these analyses of these studies as social standard because on the opposite side, there is, for instance, another study which demonstrated that in some contexts, socially powerful people mobilized sophisticated cognitive techniques and strategies in their behaviour-reading of others in order to control and exploit them, and even, sometimes just to laugh at them so as to satisfy their self-esteem (Mast et al., 2009).

Furthermore, it's important to realise that what prompts people to engage in behaviour-reading processes depends heavily on the cultural matrix a person operates in. Here we might distinguish between individualists versus collectivists' cultures. The former, represented by the western cultures, consider that helping others to carry out his/her own project on the expense of the personal project may represent a risk to the self. Motivated by this underlying reasoning, people of the western cultures invest less in behaviour-reading of others. In contrast, in collective cultures, sharing things, mutual aid, and interdependent relationships are the dominant characteristics of the daily life activities (Cohen & Gunz, 2002; Wagar & Cohen, 2003; Leung & Cohen, 2008).

It is worthwhile to mention here a study conducted by Wu & Keysar (2007). In this study they demonstrated that the members of collectivist cultures are more prone to mobilize their behaviour-reading by trying to follow the eyes' movements of their interlocutor and to interpret their body movements than do members of individualist cultures.

It's also important to mention that it is not only the type of society that affects behaviour-reading processes, but also the type of family. To explain in detail, some families prompt behaviour-reading by encouraging its members to share things and feelings by exchanging ideas and helping each other. For example, a family with numerous siblings prompts an increased amount of behaviour-reading among children when they are engaged in daily activities (Jenkins & Astington, 1996; Song & Volling, 2017).

Equally, deaf children who received instruction in sign language show more behaviour-reading than those did not have that opportunity (de Villiers, 2005).

3. THE IMPORTANCE OF MIND-READING CAPACITIES, THEIR MECHANISMS AND THE MOTIVATIONS BEHIND THEM

3.1. The importance of mindreading capacities

When dealing with mind-reading capacity, it is very important that we distinguish between two abilities: (i) empathizing, which refers to the ability to read the emotional states of the other and to show compassion with him or her, (ii) the second is mentalizing, which is the ability to read the other's mental states (Cerniglia et al., 2019).

According to Sartre (1976), the other is considered as a mirror reflection of the self. A short glimpse of him/her is sufficient to project the entire I-self upon he/she-self, which triggers a state of "If I were him/her" how would I look like? What would I do in the same circumstances? And how would I react? In a sense, the other becomes an extension of the self because it assimilates us to imagine ourselves in different situations (possible worlds). Hence, the other plays an important role to us in that it provides an opportunity to self-monitoring and self-regulating the self for future and possible circumstances, even if in psycho-clinical contexts (Khabbache et al. 2017; Khabbache et al. 2016).

Accordingly, the desire of self-controlling and self-monitoring leads people to make a number of decisions that they think will be beneficial for their future life such as: to get married, take or decline a job, or save (or not) some money for retirement (Wilson & Gilbert, 2005). It's crystal clear that, behind such decisions, there is always an implicit instruction; hence, learning from experiences that others had already went through. In other words, we are dealing here with indirect learning processes. These states of affairs are important to the self because they allow the individual to prepare his/her preventive strategies in order to confront unfamiliar situations and issues (Khabbache, 2010).

Also, the importance of mind-reading capacity displays in its ability to empower communicative exchanges and rectify communicative breakdown. It is evident that being able to read emotional and mental states of others helps us to know his/her opinion about certain subjects and topics, which in its turn helps in

considering his/her point of view. Of course, this endeavour presupposes the mobilisation of various cognitive faculties and systems. From this perspective, it is important to realise that promoting effective communication depends not only on the mastery of linguistic competences but also on understanding the others' intentions, purposes, and mental and emotional states. We are dealing, here, with an appropriation of a perspective-taking ability (Gasiorek & Ebesu Hubbard, 2017). This ability allows the holder to perceive a situation or comprehend a concept from an alternative point of view relevant to another person.

Furthermore, mind-reading capacity seems vital also in managerial contexts. When the manager tries to handle his/her (team) work, it's absolutely valuable to him/her to activate his/her trans-active memory by asking the vital question: "who knows what?" The answer to that question is highly rewardable because it allows him/her to put the right man in the right place (Wegner, 1986; Khan et al., 2020).

The significance of mind-reading capacity becomes clear during the negotiation process between, for instance, two groups. According to Elfenbein et al., (2007), the fact that two groups know the intentions and needs of each other before they start their negotiations optimizes and facilitates their dialogue. It allows them to resolve their differences and issues in a short time and with low cognitive efforts.

In sum, mind-reading capacity draws our attention to an important truism that communication is neither simple nor spontaneous. It is to a certain extent limited by a number of complicated formalities which if ignored leads to conflicts and disputes. From this perspective, both mind-reading and behaviour-reading may guide us to be aware of the belief system of others in order to take it into consideration. Mind-reading and behaviour-reading capacities render our communication more, effective, economical, in that it saves us time and cognitive energy from indulging in unnecessary disputes and unconstructive arguments (Elfenbein et al., 2007; Galinsky et al., 2008).

3.2 Some motivations underlying mind-reading attempts

It is self-evident that mind-reading enactments are motivated by different motivations such as the desire to influence, impress, and, in some contexts, to control the others. Thus, when mind-reading processes are scrutinised, we

discover that people are not usually motivated by good intentions and noble aims- such as the role of a psychologist who is trying to get the other out of his/her misery- but, on the contrary- cunning and Machiavellian purposes such as taking control over the other (Whiten, 2018). Certainly, there are other purposes which don't contradict or are not in contrast with the moral-conduct system of a society such as the search to prove the self and persuade the other of our competence and reliability (Goffman, 1973; 1974). Obviously, because we are afraid that our ego and our self-esteem be hurt, we do not explicitly speak out to the others of our intentions.

The logical and relevant question which has to be asked when the self and the other are engaged in mind-reading dialectic is what happens inside our minds? For example, what are the processes and type of rationality which are triggered in our minds when we are dealing with a situation in which someone is in need of the other? If he/she is allowed to introspect into the mental state of the supervisor, the student would certainly adjust his/her phraseology in a way that make him/her sound more close, appropriate, and even admirable. Ultimately, the student may also wonder eventually whether he/she has left a good impression on him (Ickes, 2011).

In this respect, we think that it's more appropriate to resort to Goffman (1973; 1974) theory in order to approach this phenomenon. This theory states that under the communicative processes underlying mind-reading experiences, there are six submerged major needs which play a key role in mobilizing our cognitive and conceptual abilities. To name them: (1) self-positioning; we use our mind-reading capacity to recognize the borders of others' private space that we have to take into consideration, and also so as not intrude it without their consent. As a reward of this attitude, the others should, in their turn, understand tacitly the boundaries of our private space and respect it. Therefore, mentalizing private space of others helps us know what it's allowed and what is not to say to them, also instruct us how to deal with and adjust our manners and style to them.

Thereby, mentalizing others' private space helps maximize the benefits and minimize the losses in our interpersonal relations, i.e., making more friends and cutting short conflicts.

(2) Self-control; mind-reading capacities allow us to control our relationship with others, by imposing a set of standards and rules that allow, or prohibit, the other from accessing our personal space and engaging with us in intimate

relationship.

(3) Being respected and estimated by others; by mind-reading activities, we are trying to craft an ideal image of the self that has to be spotted and get the attention of the other in order to be respected, take our point of view into consideration. And sometimes, we aspire that the other prefers us and deals with us better than he/she does with the other competitors, such as our colleagues.

(4) The need to maintain a positive self-image; for example in work places, people try to maintain a positive image of the self that had been crafted in the mind of the others by investing in seriousness, polite behaviour in the onset of our work experience. As such, people feel frustrated when described by negative traits because their reputation, hence their selves, is questioned.

(5) Self-distinction need; sometimes we use mind-reading as a strategy to persuade others that we have a special personality which they have to accept and consider probably as a model to be followed.

(6) The need for integration; as a matter of fact people like to enjoy membership of any type (party or association). To this end, people use mind-reading capacity in order to persuade the leaders and members of the party to be treated not as novices and beginners, but as prominent persons, or, at least, to be considered as equal to the rest of the group (Marc, 1992).

The problem, there, is that the strong desire to be integrated rapidly in the club with ambitious people to own an advanced social position, incites some individuals to try to do anything to demonstrate their faithfulness to the principles and the identity of the group. Like participating in hazing ceremonies in order to prove that they are part of the group (McCreary & Schutts, 2019).

As we mentioned above, mind-reading is sometimes motivated by selfish and Machiavellian reasons such as framing others. In some cases, mind readers use their talents to collect delicate information and use it- in unethical manner- to prevail over potential competitors and opponents.

In his famous book “The Prince” (1532/1980), Machiavelli stated that for a person to make allies and be able to manipulate them, he/she must first pretend to play the role of a guardian angel of probity and honesty, and then he/she must always accord with the other opinions and attitudes. Hitherto, Machiavelli’s piece of advice invokes a real psychological dilemma: (i) being faithful to one’s own personal believes and principles without caring about others’ perspectives, or (ii)

adopt others' attitudes and beliefs but discount his/hers. In the first case we are dealing, in the first case, with what Synder (1974) named a bad-self monitoring personality, in the second, with a good-self monitoring personality.

To explain in detail, the defining characteristic of a bad self-monitoring person is his/her continuous struggle to balance his/her beliefs and moral conduct with the ones of the others. The mind of a self-monitoring person always verifies (and hence computes) his/her actions and conduct in accordance with an ideal and normative value system. That is to say, he/she reasons according to dichotomies (decent versus indecent; good versus bad). Because the holder of this type of personality refuses to adjust (when in conflict) his/her position and attitudes to others, he/she becomes introverted, reserved, and even less concerned to read the others' minds.

In comparison, the good self-monitoring person has a tendency to adjust his/her beliefs and attitudes according to the situation and to other's perspectives. The pragmatic traits of the good self-monitoring person permit him/her to modify and update his/her behaviour easily. It is quite usual to see him/her regulating his/her expressions in order to align with others. As a consequence, he/she spends high cognitive efforts to read others' minds. He/she is liable to negotiate his/her personal values and even sacrifice them in order to satisfy the others. He/she also tries to solve his/her conflicts by compromises.

Yet even though he/she looks an open minded and a helpful person, he/she is an exemplar of a Machiavellian intelligence. Possessing such highly sophisticated mind-reading skills; a person who has a good self-monitoring personality always gropes for the opportunity to use others as malleable objects to achieve his/her selfish goals (Gruenfeld et al., 2008).

3.3. Mind-reading Mechanisms

The debate over the underlying mechanisms of mind-reading is propounded by two major approaches in modern psychology. One of them advocates the idea that mental simulation is the only mechanism that may allow a person to reason about others' minds by using the self as a reference (Humphrey, 1986; Gordon, 1986; Goldman, 1992; 2002; Goldman et al., 213).

The other approach supports the idea that theorizing is the unique mechanism to which the person resorts so as to conceive the other's mind, i.e.,

people formulate, in analogy to what happens in scientific inquiry, intuitive theories (Premack & Woodruff, 1978; Gopnik & Wellman, 1994; Wellman, 1990).

As a wise step, it makes sense to opt for a synthetic approach that supposes that mind-reading activity lends itself to a variety of mechanisms such as simulations, theorization (Epley & Waytz, 2010; Keysers & Gazzola, 2007) and even derogatory mechanisms like prejudices and stereotypes. The choice of one of these mechanisms depends on the person's mood, mental state, the context in which the agents are and, not to forget, the type of relationship between the individuals (proximity, closeness versus farness, remoteness) (Khabbache, 2010). In the next sections, we will try to uncover the type of contexts and psychological conditions that trigger these mechanisms.

3.3.1. Simulation mechanism

To start with, it's significant to mention that the concept of simulation, which is widely used in modern psychology, had been earlier introduced in the Ancient Greek philosophy by Protagoras (c. 490 - c.420 BCE) who stated that "Man is the measure of all things", developed in a modern philosophy by Malebranche (1674), who mentioned that knowing the other mind is a conjuncture affaire based on our self's mental and emotional state, and revised by contemporary philosophy with Russell (1984) and Quinn (1999). According to Russell (1984), simulation mechanism takes the form of an argument form analogy, based on the similarity between the self and the other.

In order to understand the conceptual change that happened in philosophy, concerning how to know the other, it's important to mention Descartes (1629–1649) whose philosophy was dominated by Solipsism. However, later with Malebranche (1674), the philosophy started to get rid of the solipsism shell. With this new momentum Malebranche (1674) claimed that analogical reasoning is the pivotal process leading to know the others' minds. However, the outcomes of those attempts remain always conjectural and speculative because, for him, it's impossible to get a clear vision of what's going on in the other's mind. In other words, answering the question what's happening in the other's consciousness requires analogically answering the same question about what had already happened in our consciousness. In his turn, Russell (1984) stressed that the resemblance in people's behaviour is the basis upon which they construct their

reasoning about others' mind, i.e., analogical reasoning is the bridge towards the other's mind (Epley, 2008).

In the field of psychology, simulation is a kind of mechanism which permits the attribution of mental and emotional states to others by using our minds as models. It implies that we have to replicate and imitate the other's mental state, beliefs, intentions, and perceptions. This mechanism is a sort of metaphorical projection of the self upon the other which is based on the idea of how I would think and act if I were the other (Harris, 1995). Also, it is important to mention here that this mechanism of simulation is used by children at an early age to read the minds of others. Meltzoff (2007) captured the meaning of this mechanism in his phrase "you are like me". One of the great advantages of this process of simulation is that it keeps us away from indulging in harmful and risky situations. Thus, it fosters a kind of indirect learning (Olsson et al. 2007).

Clearly, as argued by Russell (1984), the biological and behavioural resemblances between people help them to abstract the similarities of their mental and emotional states. So, it is upon this premise that the use of simulation processes to read the others' minds is initiated. We have to start by knowing deeply our self and our mental and emotional states first, i.e., it's a kind of self-reflection based on a deep introspection (Tanaka, 2019). It supposes that we are aware of our mental and emotional states before we compare and project them upon others' minds, the state which demands high cognitive effort and energy (Khabbache, 2014).

These cognitive efforts are maximized in the contexts in which we take things personally and ask the question: what would I do in this terrible situation if I were in the same position as my colleague is? In consequence, you might initially understand his/her mistakes, then, probably forgive them, and even ultimately, defend them. In short, understanding leads to sympathy and sympathy leads to empathy. To explain, sympathy is a shared feeling, usually of sorrow, pity or compassion for another person. Empathy is stronger than sympathy. It is the ability to put oneself in the place of another and understand someone else's feelings by identifying with them (Epley & Waytz, 2010; Decety & Jackson, 2004).

Nevertheless, it is important to recognize that the mechanism of simulation-which is based on the centrality of the self in defining the other- is limited because it leads to a progressive elimination of any distinctiveness and individuality

between the self and the other. If not cautious, our egocentrism bias may lead us in the intricacies of simulation processes - to even think that the other is a copy and reduplication of the self; which would put the entire concept of self-autonomy in jeopardy. To tackle this issue, Wallin (2011) proposed the concept of “reality biases”, i.e., elaborations, explications, and theories about the other have to be based on real facts and not just pure speculations. Yet, this concept brings forward a serious question: to what extent the theorizing mechanism, which is based on observable facts solely, may permit us to access and conceive the others’ mental states?

3.3.2. Theorizing Mechanism

Referring to Heider’s theory (1958) each individual is a scientist by default. Like a sociologist or a psychologist, a perceiver likes to control his/her social world and to perceive it as a harmonious world, i.e., stable, coherent, and void of unforeseen circumstances and events. People in general refuse to see disorder and chaos in the social world. For them, it is governed by laws and rules. Hence, in their conception, people assume that behind every human’s mental state or emotion there is a cause; being it internal (psychological) or external (social). Certainly, people learn new things about how others’ minds work, and over time, they construct an intuitive understanding (theory) on the psychology of others. This mechanism of theorizing leads people to construct repertoires about the individuals’ characters. These repertoires are used to categorize other people later.

Thus, Heider (1958) added that the perceiver formulates what may be called “a naïve psychological theory”. This latter allows him/her to explain and frame the other’s behaviour into cause-effect rationality. The child, in his turn, behaves like a little scientist who learns about mental states by advancing and testing his/her theories about behaviour of others in social environment (Gopnik, 1994).

A point is; if the simulation mechanism is generated by the ability to perceive similarities between the self and the other, it is important to recognize that the ability to perceive the difference plays a major role in activating the theorizing mechanism (Epley & Waytz, 2010). In situations where introspective processes are weak or ambiguous, or where there is not enough information about the other, the perceiver doesn’t activate a simulation mechanism or empathy, but- like a

scientist- he/she takes distance between the self and the other. This situation is similar to the benevolent neutrality between the psychologist and the patient in psychoanalysis (Heider, 1958).

In the reading process, the perceiver makes a hypothesis or an assumption such as “Maybe this man is a good guy”. Then, he/she starts collecting information about the target person and even subjects him/her to few tests. The collected data and the result of testing the target person will confirm the rightness of the assumption.

Ultimately, the assumption shall be entrenched in the perceiver’s belief system as a principle that might be generalized to every individual in the set. More than that, he/she won’t stop at this generalization, but also, he/she might attempt to predict his/her future behaviour. In some exaggerated cases the perceiver might even try to be “self-fulfilling” (Epley, 2008).

Within the framework of this experience, i.e., the sense of distant feeling from the other (rather than being in his/her shoes) is clear evidence that we are not dealing with the simulation mechanism because this would require egocentrism bias (Epley et al., 2004). Thus, as long as it is that the case (the feeling of distance between the self and the other) it’s safe to conclude that we are working within the intuitive and naïve theory which requires, in contrast, allocentric bias (Hu et al., 2018).

This simulation mechanism- understanding other’s mind by theorizing- requires high cognitive efforts and energy because it implies many cognitive operations such as focusing the attention on the target person’s behaviour across time and situations, collecting data about him/her, comparing his/her behaviour with others’ people, testing hypotheses pertinent to him/her by invoking particular tasks and situations, attending to available evidences, and at last but not least trying to be accurate at the level of generalisation of the result and the expectations about the future. To conclude this section, it is important that we know why this mind-reading mechanism is qualified as “naïve and implicit theory” and, it’s also essential, to our regard, to discern its limit (Wegener et al., 1998; Epley, 2008).

According to Epley (2008) and Epley & Waytz (2010), this mechanism is named as naïve theory because the perceiver does not (always) engage in an extensive scrutiny testing of his/her own hypotheses, analyses, and data

collection. Also, the perceiver is usually unaware that he/she holds this kind of theory to explain the world that he/she is surrounded by.

On the other hand, the limits of the naïve psychological theory may be summarized in two points. Firstly, when the expectations and predictions which are based on the theorizing mechanism turned to be true, the perceiver might start to believe erroneously that he/she is “self-fulfilling”, i.e., he/she owns some sort of prophecy skills and abilities (Epley, 2008). Secondly, naïve theory might in many circumstances be erroneous and dangerous because it leads to overestimation, and over-generalization which in its turn increases negative stereotypes and legitimizes the use of derogatory strategies as acceptable mind-reading strategies (Khabbache, 2014).

3.3.3. Derogatory mechanism

As already mentioned, the use of simulation mechanism or theorizing one depends on the perceiver concept of “proximity”, i.e., we tend to use the former mechanism in cases where we perceive the other as close, similar, because he/she belongs to our group, or share with us common things like (memory, family, religion,etc.). On the other hand, we tend to use theorization in cases where the perceiver conceives the other as distant from our self. Taking everything into account, proximity has cognitive costs. In order to put ourselves in the other’s shoes, the simulation mechanism requires mobilising various metacognitive processes, such as introspection, self-awareness and projection. Theorizing mechanism implies, in its turn, a lot of efforts. Mainly, when the self, intends to detect what differentiate himself/herself from others.

Nonetheless, in case we consider the other as an enemy or a rival, we believe that we (the perceiver) use derogatory mechanism which, presumably, uses low cognitive efforts. At this juncture, we believe that there are two important reasons which minimize the cognitive load in derogatory mechanism: (1) Meritocracy; we believe that the other does not deserve, for good or bad, our attention, care, and mental investment, (2) Mental schemes; in less congenial situations derogatory strategies thrive, i.e., the perceiver retrieves readymade prejudices or stereotypes from his/her repertoire (Waytz & Epley, 2012).

It is important that people seek some sort of caution when derogatory strategies are used in public spheres because they may lead to dehumanizing of

some individuals and groups such as cultural and ethnic minorities; for example, considering them as mindless objects (Khabbache, 2014). This conduct may threaten the *concordia* of society by spreading discriminative attitudes and even racial behaviour (Khabbache, 2014).

To ponder more on this point, at the individual level, we would like to mention the results of a case study which demonstrated that the use of the simulation mechanism and empathizing processes contributes in reducing the magnitude of activation of the derogatory mechanism. For instance, the researchers have noticed that individuals who overestimate their relative competence, possess narcissistic manners, or lack any form of empathy *vis-à-vis* the others, achieve the worst performance in social judgment and mind-reading (Ames & Kammrath, 2004; Khabbache, 2016).

On other hand, even if we admit that the use of the simulation mechanism is important in restricting the magnitude of derogatory mechanism, we should note that the simulation mechanism is used mostly with close, similar, and a person who belongs to the group. That opens the question about how shall we deal with the foreigner, the dissimilar and the outsider? How can we avoid, in this case, derogatory strategies? We think that the solution lays in the extension of the simulation mechanism (empathizing performance) which should enclose everybody and not only those in relations with us. As a case in point, the study of Vladimíra et al., (2011) revealed that person engaged in pro-social behaviour, lives the extension of empathy with others.

In brief, the mechanism of simulation may, in specific situations as it is the case where the other is considered as dissimilar to the self, diverge to display as derogatory strategy. Equally important, the theorizing mechanism may shift to a derogatory strategy in some specific situations. To name some strategies below:

(1) The theorizing state of the perceiver about the other is incomplete, or he/she holds inaccurate beliefs, or his/her deduction is imperfect.

(2) In an experiment in which “bogus pipeline” was used Yzerbyt et al. (1998) demonstrated that naïve theory (theorization mechanism) increases stereotypes and enhances the use of judgements in contexts that do not favour social judgments so much. Similarly, through using sample questionnaire to elicit why MBA student have average level, Krueger (1998) concluded that there is an increased percentage in the use of stereotypes about the issue of inquiry. As a

matter of postulation, the theorizing-perceiver resorts, while encountering people, into building mental repertoires which categorise them into groups (Barsalou, 2008). Those categories are referred to in order to identify and classify the other by labelling him/her in one of them, the fact which leads to stereotyping him/her (Lieberman et al., 2017).

(3) The attempt to over-generalise and over-estimate the outcomes of theorizing mechanism, and using that extensively as cues to predict the future leads to prejudicing people and to producing negative stereotypes. Even when denying prejudicing, the individual slips in prejudices and stereotypes as soon as he/she starts generalizing some traits to specific people from specific countries- “Swiss people are nice people, or the Germans are hard-workers”, he/she begins prejudicing because at the very moment the perceiver attributes those positive traits to those people he/she denies those traits to other individuals/people from other countries (Durrheim et al., 2006).

To conclude this section, it’s important to admit that there is an intersection and interplay among the three mechanisms. That is to say, people are looking for individuation of the self via theorizing mechanism, or seeking resemblance via simulation mechanism. This state puts us in a predicament in dealing with “egocentric anchoring” even with the theorisation mechanism, which has a realistic basis, because we are resorting to egocentric assessment, and illustration to the self as the only guide. This demonstrates the fact that people are seeing the world through their own eyes and understanding others from their own perspective.

Furthermore, we consider the self as a different entity from the other wherein theorizing or as cognate wherein simulating. That is to say, we are only noticing ourselves, our contribution, and our private thoughts and experience more than the other’s will. Certainly, this egocentric bias in attention can lead many people to overestimate their mind-reading capacity by exaggerating, for instance, the difference between the self and other, and also between the self-representation of “in-group” and the self-representation of “out-group”. To resolve this dilemma, it seems pertinent to have recourse to “perception taking” which refers to the ability to recognize another person's point of view, as an alternative point of view. That permits to understand the other as he/she is and not as we want him/her to be (Galinsky et al., 2005).

3.3.4. An integrative approach of an alternative model

Undoubtedly, accomplishing mind-reading performance needs an information-processing cognitive system. Assumingly, this system consists of two sub-systems: one is responsible for theorizing processes and the other for simulation processes. That means we agree with many theorists who consider that people may have both theorizing and simulations strategies available (Carruthers & Smith, 1995; Currie & Ravenscroft, 2002; Nichols & Stich, 2003; Apperly, 2009). We presume further that the two sub-systems are interdependent on each other in the manner that the simulation subsystem needs theorization in order to recognize the difference between the self and other and also to adjust its assumptions with the external reality. In its turn, theorization sub-system needs simulation processes to recognize the resemblance between the self and the other when developing its elementary assumptions about the other's mental state.

Obviously, the simulation sub-system uses induction to conceive the unobservable mental state of the other by quantifying over the self's mental state, i.e.:

I experience an X mental state.

The other has a similar isomorph experience like me.

Therefore, the other experiences the same X mental state.

Inductive reasoning is indeed so important to the theorization sub-system to posit its initial hypotheses about the other. That means that we are dealing here with a dual-processing model in addition to an alternating executive control that guides the switching between the two subsystems (Mounoud, 1994; 1999; Lautrey, 1991; 1990).

Opting for such an integrative approach of an alternating model for mind-reading may help us understand how people appear to be able to use both simulation and theorisation in their daily lives, and also to know when people mobilize one rather than the other, or some sort of combination of both. With this alternative model, we disagree with Epley et al. (2008), who argued that reasoning about the other's mind through theorisation requires more cognitive efforts and more collaboration among the processes than, through simulation,

which is automatic and less controlled.

On the other hand, according to the alternating model we agree with Lautrey, (1991), Mounoud (1999) and Spaulding (2010) in presuming that, at a given time, the simulation processes guide the theorisation sub-system, there, the simulation processes will be more deliberate; need control processes and effortful attention. However, in another time and when the theorisation processes are the guide, it will generate more attention and control.

The interdependent relationship between theorisation and simulation is an evidence that different mind-reading processes work synergistically and complementarily. Thus, for the brain to be able to orchestrate this processing synergy, it should activate a bundle of networks and cortical circuits rather than confining to a lateralised cognitive region. Accordingly, the next section will elaborate more on this topic of delocalisation of brain-reading processes.

4. BRAIN-READING AS A DELOCALISED NEURONAL NETWORK

It was remarkable that the mainstream tendency of social cognition in the nineties had stressed the static neuropsychological approach. This tendency presumed that there is a genetic code, namely the MOA-A, that can express itself as a local hard-wired connection in the brain and which can be mapped to a specialized domain of social cognition (Depue & Collins, 1999). The impairment of the domain can lead to autism and to psychopathic disorders (Blakemore, and al. 2002). This reveals that the mainstream tendency of that epoch maintained that the function of each specific gene can be linked to a specific cognitive-system. Autism, accordingly, is explained as a deficit in an innate and specialized module that handles the theory of mind (Leslie, 1991). Eventually, each specialized module, which is responsible for certain social cognitive outcomes, is expressed at the brain-reading level as a localised neuronal circuit.

According to many authors, including Blakemore et al. (2004), brain-reading activity is bounded to special “mirror neurons” whose activation is restricted to pre-motor cortex. Thus, brain-reading activities are tied with lateral and invariable neuronal circuits. To prove his point Blakemore gave the example of macaque monkeys; whose neurons in the pre-motor cortex become activated when the monkey executes grasping actions or when it observes another monkey doing some action of grasping. However as we will try to demonstrate in the

following paragraph, brain-reading function is not limited to the mind imitation of others' actions, but it involves diverse activities which imply a large neuronal network and not only pre-motor cortex (Spaulding, 2012).

Clearly, with this perspective, Blakemore continues to adopt the classical neuropsychological approach. Like Fodor (1983) in his modularity theory, he refuses to admit any interaction or direct connection between the modular cognitive domains. This proves the static neurology assumption and the double dissociation argument which could be illustrated by aphasia; an inability (or impaired ability) to understand or produce speech due to a specific and local part of the brain damage "Global, Broca's, Wernicke". This damage touches upon only linguistic skills and it has no effect on other cognitive skills which remain intact. That means with double Dissociation, scientists are able to determine which areas in the brain are specialized into particular cognitive function and responsible of this deficit (Chen & Bates, 1998).

On the other side, the neuro-constructivists believe that the static neurology approach is a simplistic theory for the simple reason that the brain is a unified complex and dynamic network rather than a modular and invariable one. With the new cognitive genetic results, it is difficult to maintain the assumption that we can match a single gene to a local neuronal-connection in the brain, and to a specific cognitive domain. It is important to recognise that 40% of the genes are uniquely expressed in the brain and the majority of these genes are polymorphic (Scerif & Karmiloff-Smith, 2005). It's a scientific decline if we continue imagining that there is specialized genetic code that can express itself phylogenetically in a hard wired cortical circuitry responsible about brain-reading processes (e.g., Tharp et al., 2017; Tooby & Cosmides, 1992).

In line with the neuro-constructivists approach, we stress the existence of interaction among the set of genes (polymorphism: Multiple variants of genes at particular locus), cognitive development, and the environment throughout brain life. These interactions contribute to brain plasticity within and across individuals (Changeux, 1985; Edelman, 1987). Obviously, there are specialized cognitive domains and cortical pathways, but they are not invariable, and they are the product of development rather than initial separate pre-wired modules (Frith, 2008).

The brain plasticity hypothesis refuted the double dissociation hypotheses, by

giving the example of the aphasic person who recovered his/her language deficit. The case experienced the emergence of a new part of the brain which was not specialized for linguistic activities to fill in the damaged area (Frith, 2008; Heiss et al. 1999).

Also, according to recent brain imaging studies, there is a large neurological network which includes a huge part of the brain responsible of brain-reading activities, we can mention the Mirror Neuron System, the bilateral frontal areas (Yıldırım et al., 2020), the temporal partial junction (Wu & al., 2020), the Orbitofrontal cortex, the Ventromedial prefrontal cortex, and amygdale (Decety, 2010).

Based on the explorations of brain imaging sciences, it seems absurd to maintain that the local neuronal-connections are responsible for brain-reading activities. On the other hand, it's plausible to assume that brain-reading activities are mapped by a large neuronal network, depending on the context and the task.

5. CONCLUSION AND FUTURE DIRECTION

It is self-evident that reasoning about other's mind is an inevitable aspect of daily life. Yet, the major concern of this article was not to discover the magic stick that will make you a fortune-teller, but merely to provide a comprehensive and pluralistic explanation to this concept. Thereof, we did not restrict ourselves to a particular approach and perspective, but we proposed an integrative and reconciling approach among several schools and currents of thought. As such, we did not confine ourselves to the cognitive approach which maintains that reasoning about other's mind is a pure computational system of symbols operating on internal mental states and processes. On the other hand, we have supported the embodied cognition perspective that behaviour-reading- the external manifestation of mind-reading- is an embedded skill that depends on the human body in its environment.

Along with social cognitive theories, we believe that mind-reading in addition to being an embodied skill in space and time, it's also influenced and guided by social and cultural constraints, some of which impose on us some behaviour traits *inter alia*, defending and controlling the self-image with regard to others' judgements. On the other hand, when being driven by some pragmatic interests, some people appeal to their Machiavellian intelligence, in order to control and

manipulate the others.

Taking into account all the complexities of this concept- be it its cultural, social or embedded aspects- we propose that mind-reading mental activities require a special cognitive processing system that capitalises on two (higher order) cognitive processes namely simulation and theorisation. More specifically, we stress that these two processes are working in synergistic, interdependent and alternative manner.

In congruence with this perspective, we have adopted the neuro-constructivist approach (Karmiloff-Smith, 2009) which is based on the assumption that brain-reading is underlined by cerebral plasticity. In this way, we have rejected the idea that our brain-reading skill is modular and dependent, in its function, on a local neural circuit in the brain, instead of neuronal network which encompasses large brain surfaces. Hence, we believe that brain-reading calls for an integrative model as already unfolded in this article.

As a future direction to this article, we believe that it is recommendable to develop pedagogical programs for improving mind-reading skills in classroom, among students and teachers. We believe that many pedagogical problems that affect negatively the efficiency of communication between teachers and students and relations among students are due to poor mind-reading practices. Equally important, we claim the same recommendation for managerial sciences and human resources management; notably, the significance of mind-reading capacities in personnel development sciences can contribute to happiness and well-being.

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