

The role of mirror
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The emerging specialized scientific field applying the principles of neurobiology and psychoanalysis in investigating the development of the human mind and behavior marks a major landmark in the wider discipline of psychology and personality development. In many ways, neurobiological research has taken this science a milestone further ever since the predecessor works by scholars such as Abraham Maslow, Sigmund Freud, and Jean Piaget and the like laid the foundation many years ago. In particular the Freudian theory regarding brain functioning and emotional development is highly credited with laying the foundation of modern psychobiological, neurobiological and psychoanalytical research. On the whole, the study of human behavior and the acquisition of certain values that determine personality dynamics have since moved away from the foundational works of the above-named scholars to specialized neurobiological and psychoanalytic studies (Beebe, B. et al 2003).

In this paper, we are going to focus our discussion on the role played by mirror neurons in emotional development and affect regulation of an individual from infancy and how this contributes to the evolution of the self. The discovery of and experimentation with mirror neurons is key to the understanding of affect regulation and the evolution of the self. This growing field of Psychoanalysis hinges on the fact that mirror neurons are believed by psychoanalysts and neurobiologists to be key in imitation and the evolution of the self. This is a comparatively new area of study that has attracted immense psychoanalytic interest.

However, before we proceed into the dialectics of psychoanalysis, let us briefly look at the significance of neurons in psychoanalytic studies.

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According to modern Psychoanalytic studies, the recent discovery of mirror neurons and their implications for human brain evolution is one of the most important findings in neuroscience in our contemporary times. Neuroscience is a specialized multidisciplinary field in psychology that deals with the study of the functions and anomalies) of the nervous system. According to Gallese, V. et al (1996; 2007) Rizzolatti and other scientists studying the role of neurons in the behavior of a monkey discovered in the macaque monkey brain a class of premotor neurons that discharge not only when the monkey executes goal-related hand actions like grasping objects, but also when observing the same action or actions performed by other monkeys of human beings. The scientists called them “ mirror neurons.”

The human neurological system has several classes or clusters of neurons. However, our focus in this paper is on the mirror neurons. A mirror neuron is a neuron that sparks when animals acts or when the animal sees another perform the action, this is why the neuron is referred to as “ mirror.” Mirror neurons belong to a unique circuitry cluster of neurons located in the premotor cortex of the brain. This specific group of neurons is involved in perception or visual and body movement (motor) functions (Wolf, N. S. et al., 2000). Though they belong to these two cardinal aspects of the human being, Graziano and Gross (1994) state that mirror neurons belong to a larger class of neurons designated as multimodal neurons “ because they contain within them the capacity to be directly activated simultaneously by different sensory modalities (e. g. auditory, somatosensory, visual).

Clinical observations in research have indicated that mirror neurons do not function in isolation. Their functions are regulated by certain parts of the <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

brain in league with specific stimuli from the central nervous system (CNS). Thus, while the eyes provide the receptive response to the stimuli, the CNS organizes and interprets these transmissions between the two sides to make corresponding meaning. Mirror neurons, in turn, provide the capacity for a near instantaneous response on a nonconscious level both to external cues (e. g. the firing of the mirror neuron upon seeing another make the gesture of obtaining food) and to internal cues (e. g. the internal triggering of traumatic flashbacks).” Thus, the neuron mirrors the action of the other animal just like it was the one acting. The process of acting in concert with the stimuli or “ mirroring” as also known as attunement. In their abstract, Gallese, V., M. N. Eagle, and P. Migone observe that:

“ The neural circuits activated in a person carrying out actions, expressing emotions, and experiencing sensations are activated also, automatically via mirror neuron system, in the observer of those actions, emotions and sensations. It is proposed that finding of shared activation suggests a functional mechanism of “ embodied simulation” that consists of the automatic, unconscious, and noninferential simulation in the observer of actions, emotions, and sensations carried out and experienced by the observed.”[1] (p. 131)

The foregoing observations by Vittorio Gallese and his colleagues are important in understanding the crucial role played by mirror neurons in interpersonal communication and affect or emotion regulation. This is because the shared neural activity and the attendant nonverbal communication simulation represent very complex levels of interpersonal communication that is unique to human beings. The patterned simulation
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and corresponding communication suggest that attunement or mirroring can be intentional and at the same time, used as basis of activating, maintaining or relocating interpersonal relations. Growing babies use such interpersonal relations to make distinctions between positive or pleasurable stimuli from facial expressions.

There is evidence that a similar observation/action matching system exists in humans. Human behavior especially that in babies in their first stages of growth has been found to function along certain patterns of imitation and communication. This is a very unique scientific revelation that informs us about the complex relationship between brain and relationship. “ The mirror system is sometimes considered to represent a primitive version, or possibly a precursor in phylogeny, of a simulation heuristic that might underlie mindreading.” (Gallese et al. 1996; Rizzolatti et al. 1996a).

This purposive selection process contributes to the making of the self as individuals learn what to give and receive from their immediate caregivers and mothers or the wider environment (Meltzoff and Moore, 1998; Meltzof, 2002). These attributes and capabilities are not known to exist in all living organisms. They are characterized in primates and in some birds but are said to exist in their highest manifestation in human beings. As mentioned more elaborately elsewhere in this paper, the brain activity that is characterized with mirror neurons is found in the premotor cortex and the inferior parietal cortex.

Indeed, contemporary research and clinical observations by specialized psychoanalytic studies reveal that from infancy, different parts of a baby's

brain respond to different stimuli that regulate the baby's behavior and relationship with its immediate environment and with its mother or caregiver. The ability of the infant to "communicate" non-verbally with its primary caregiver is explained using the Attachment Theory (especially as expounded and developed by Bowlby, J. 1980). Bowlby (1980) applied the concept of nonconscious internal working models to explain the process through which infants attach specific meaning and values to certain facial expressions from the mother.

But it should be noted that not every emotional communication and affect regulation between an infant and the mother are nonverbal. Clinical studies show that affect can be manifested not only through facial expressions but also in voice and tone intonations. Additionally, the posture of the body can also blend with or in most cases; complement the "message" being communicated through facial expressions. Altogether, these forms of emotional communication act so as to regulate affect and the emergence of a collective values or attributes in the baby cumulatively referred to as self.

Psychoanalytic research has identified the brain's right hemisphere as playing a critical role in attachment by an infant to its primary caregiver. According to Allan N. Schore, during the first three years of life, the centers in the prefrontal cortex of the infant's right hemisphere respond to the interaction with the mother's emotions in guiding the infant's own emotional development, the core component of affect regulation (Schore, A. N. 1994).

To cite Schore:

“ This prefrontal region comes to act in the capacity of an executive control function for the entire right cortex, the hemisphere that modulates affect, nonverbal communication and unconscious processes..... In this manner, the child’s first relationship, the one with the mother, acts as a template for the imprinting of circuits in the child’s emotion-processing right brain, thereby permanently shaping the individual’s adaptive or maladaptive capacities to enter into all later emotional relationships.... Indeed, the right brain is thought to contain the essential elements of the self system.”[2] (Schoore, A. N. 1994: 18-19)

A group of renowned neurobiological scientists led by Allan N. Schoore[3] argue that both categorical and primary emotions have a very significant social role because they serve the crucial role of enabling one individual to understand the mental state of another person. They are like essential conduits for transmitting the invisible telepathic communication between two individuals without the benefit of verbalization. The ability to feel another person’s experience has been variedly termed as “ empathy”, “ sympathy”, “ attunement” and “ mirroring.” Whichever term one may choose in explaining this, it is extremely important to note that the capacity of an individual to “ enter” into another person’s “ world” so as to feel what they are feeling is very central to human society. This is because the process helps separate individuals to “ link up” in a continuous cycle while seeking to embrace values and aspects that are acceptable to all and discarding those that are objectionable or undesired. This is the self in the making. For any emotional connections to be attained within the ambit of empathy or

mirroring, it is essential that certain internal feelings or states find a way of being expressed externally.

Compared to other living organisms, only primates possess unique set of extended facial muscles that can be manipulated to give a wide range of facial expressions that carry an equally diverse range of emotional “ messages” or communication. Human beings thus have the capacity to perceive communication by virtue of eye contact and facial expression. This unique communicative capacity between primates using facial expressions is facilitated by the central nervous system and neuronal groups in their brain that are specialized in responding to such stimuli. Neuronal groups have been identified to reside in the value system circuits of our brains particularly the amygdala and orbitofrontal cortex (Wolf, N. S., et al 2002).

According to Triesch, Jochen et al. (2007), the role of mirror neurons in the development of the self can be best perceived through a model of gazing. ‘ The model also offers a parsimonious account of how these and possibly other mirror neurons may acquire their special response properties. In this account, visual representations of other agents’ actions become associated with pre-motor neurons that represent the intention to perform corresponding actions. The model also demonstrates how this development may be obstructed in autism spectrum disorder, giving rise to specific physiological and anatomical differences in the mirror system.”[4]

As discussed in detail elsewhere in this paper, facial expressions play a central role in the emotional development and self-regulatory roles of the individual. The Heinz Kohut is among the contemporary neuropsychologists

that have investigated the role played by early relational affective transactions with the social environment have facilitated the development and or emergence of self. In investigating this aspect, Kohut presented perhaps one of the most striking contemporary contributions to the understanding of the development construct of selfobject. Kohut concluded that “ parents with mature psychological organizations serve as selfobjects that perform critical regulatory functions for the infant who possesses an immature, incomplete psychological organization. The child is thus provided, at nonverbal levels beneath conscious awareness, with selfobject experiences that directly affect the vitalization and structural cohesion of the self.” (Kohut, Heinz, *The Restoration of the Self* . 1977, p. 191)

The development of the orbitofrontal region(key prefrontal region of the brain for encoding information) , the cerebral cortical area concerned with involvement in the regulation of subcortically generated affect is experience-dependent, this “ experience” is socio affective because it is fixed in stimulation given in the relationship between the infant and mother. “ The most significant relevant basic interactions between mother and child usually lie in the visual area: The child’s bodily display is responded to by the gleam in the mother’s eye” (Heinz Kohut, 1971). An essential question is therefore precisely what kinds of early stimulation are required for the maturation of affect systems in which specific critical periods? The infant is now conceptualized to be more of a sensoriaffective than a sensorimotor being (Stechler & Carpenter, 1967).

There is evidence to demonstrate that a detailed type of visual information that passes the mother’s affective response to the infant is essential to the
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advancement of socioemotional development. " When a mother holds a mutual gaze transaction the mother's facial expression excites and increases the strength of positive affect in the child, the inner happy state of the child is sent back to the mother and in this mutual stimulation both members of the dyad experience an association intensified by positive affect. This mechanism is important to an imprinting phenomenon in the child's developing right hemisphere." (Shore, A. N. 1994)

Reflecting on the argument by Allan Schore (2002) and Vittorio Gallese etc. al., (1996), it is discernible that for human beings to develop the self, they need points of reference, in this case, the objects. Once identified and acquired in this sense, the various " objects" become the blueprint upon which the individual propagates his experience. In addition as Wolf (1988) observes: " The most fundamental finding of self psychology is that the emergence of the self requires more than the inborn tendency to organize experience. Also required is the presence of others, technically described as objects, which provide certain types of experiences that will evoke the emergence and maintenance of the self." (p. 11). A series of these objects thus become like an assembly line for regulating the self of the individual. In such ways thus, do mirror neurons act as to influence emotion regulation and the origin of the self in human beings.

Emotion plays a central role in the process of affect regulation. The human brain is specially structured with an in-built innate capability of modulating emotion and organizing the brain's states of activation, a condition also known as" affect regulation." The condition of affect regulation is key to neurobiological and psychoanalytical studies because it is the backbone to <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

the cumulative internal (emotional) structure and the nature of interpersonal functioning of an individual. Affect regulation is also the foundational key to self-regulation. According to Allan Schore self-regulation is the specialized complex manner through which the process called the “ self” takes on an additional role of regulating its own processes. To achieve this high level of self-control, self-regulation must also control emotion, given that emotion comprises the core of the entire process of affect regulation. One can refer to affect regulation as the “ engine” of an individual’s overall manifestation in society (Schore, A. N. 1994; 2002; Kohut, 1977; Beebe, B. 2002).

Research and clinical observations have demonstrated that the development of the “ self” in human beings is a complex emotional process that begins at infancy. While responding to various stimuli from their mothers or caregivers, infants have been observed to begin the cumulatively qualitative process of creating a difference between animate and inanimate objects in their environment, to which the infants also learn to attribute intention and emotional responses respectively.

Essentially so because human beings are not only gregarious in nature but are also mutually socially reciprocal and our existence is, at the most, symbiotic. According to Siegel, J. D. (1999), “...the ability of one mind to perceive and then experience elements of another persons’ mind is a profoundly important dimension of human experience. We are a social species, and having the ability to “ mind-read”, or having “ mindset”, lets us rapidly detect the emotional state of another.”[5] (p. 148). This process is extremely important in the emotional development and regulation of an individual because it is essential in human interaction to have the correct
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response to another person's state of the mind. For instance, mirroring or attunements helps us respond with sympathy when our friend is experiencing death or other life crises. Similarly, we should be able to join in joyful celebration with a friend over good things such as winning a lottery.

Psychoanalytic studies have present several reasons why this process is important. In the first instance, it is observed that empathy and affective communication are essential in our interaction because they enable us "read" into the person's or persons' minds and others and thus we are in a position to make appropriate decisions and responses. On his part, Siegel J. D. (1999) asserts that " This form of communication allows us to perceive the intentions, attentional focus, and evaluation of events in others; it therefore allows us to understand social interactions and anticipate their behavior of other people. Our minds are capable of detecting the nonverbal signals of others, which reveal these internal aspects of their states of mind."[6] (p. 148). The ability to develop and know the correct response in this manner entails the core process of affect regulation and helps individuals to cumulatively "gather" values and attributes that go into the making of the "self."

Second, and following from the first observation, it is discernible that if human beings can make correct readings of the inner feelings or conditions of other human beings, then this is an invaluable asset in terms of developmental psychology. For instance, if a child expressed inner danger or insecurity or pain, a parent able to "read" such signals can attend to such conditions and thus give the baby a higher chance of survival. The protection role played by the parent is very significant in developing a bond of and the <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

initial layer of trust and security between parent and child. This process is central in affect regulation because it is from these initial bonds that the child builds successive layers of internal and external security upon which reciprocal relations with world phenomena is established. In turn, this helps the child to develop the capacity of understanding others in as much as being understood.

This emotionally reciprocal relationship between the child and the outer world also enables the growing child to seek to be understood in as much as to understand others. Altogether this lays the foundation of the capacity of the child to adapt to diverse environmental challenges and stimuli, developing the self in the individual. The child learns to engage in a selection process of picking those positive and acceptable attributes and values while discarding those that are not acceptable. The result is that the child systematically and gradually develops a “ bundle” of emotional attributes that regulate their interaction and communication with both their inner and outer worlds, also cumulatively termed as the self. To cite Siegel, “ The experience of being understood develops a mental model or inner expectation that needs are important and goals are achievable. Also, the child’s system requires the parent’s attunement to help organize the child’s own mind. Positive emotional states are amplified and negative ones modulated within these attuned communications. As the child grows, these repeated alignments of mental states allow him to develop a self-organizational capacity for autonomous state regulation. Human infants have profoundly underdeveloped brains. Maintaining proximity to their caregivers is essential, both for survival and for allowing their brains to use the mature <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

states of the attachment figure to help them organize their own mental functioning. "[7] (Siegel, D. J. 1999, p. 149.)

Similarly, if certain environmental conditions or objects can cause pain and hurt to the infant, the child will tend to develop sensory consciousness to avoid such phenomena, thus increasing their chances of survival. Painful or negative experiences in babies are responsible for the physical traumatic symptoms and emotional effects witnessed throughout the child's development stages. Traumatic symptoms evident in conditions characterized by stress, depression, anxiety, phobia, withdrawal, and emotional instability are cumulatively referred to as psychopathogenesis (Schore, Allan N. 2002, p. 12-14). The circumstances that lead to infant traumatic experiences can be studied by applying the theory of trauma as stipulated and expounded by Kohut, H. (1971). Altogether, such aspects go into the cumulative emotional development of the individual and can regulate his or her self.

But the development of a child's emotional relationship and the later capabilities of adaptive (or maladaptive) characteristics do not evolve in isolation. Simultaneous with this process is the crucial role played by the development of complex passive interactive communication between the baby and its mother through maternal attachment and facial expressions. Clinical Psychoanalytic observations have shown that a mother's face and emotional expressions are key to the emotional development of the infant. The face of a mother, in particular her eyes, is said to be the most robust stimulus in an infant's environment.

Complex non-verbal communication between infants and their mothers (or caregivers) through a process called interactive mutual gazing is responsible for triggering off very high levels of what Allan Schore terms as endogenous opiates in the child's growing brain. To cite Hurley, (1991): " The infant's initial relationship with the mother acts as the template because it will indelibly molds the particular capabilities to enter into all later emotional interactions. These early actions or occurrences will shape the development of a unique personality, its adaptive capabilities and also its vulnerabilities to resistances against particular forms of later disorders. This interaction intensely affects the immediate organization of a combined system that is both stable and adaptable, thus the formation of the self." It is therefore correct to say that this imprints or images and behavioral adaptation transferred from the child's mother integrally affect the self, where as aforementioned that we can see some behaviors of children that may be similar to those of the parent, this imprints definitely affect the formation of the self.

This observation is based on the theoretical perspective embracing affect regulation. In this paper, we adopt Allan Schore's perspective of the regulation theory based on the observation that regulation in human beings takes place in the right hemisphere of the brain. This is the part of the brain that is responsible for organizing and synchronizing the pattern and rhythm of interaction between the growing human brain and other organisms.

Essentially, the centrality of this theory is the fact that mutual interaction between organisms is based on regulated biological synchronicity between organisms. (In other words, just as a mother can develop unique non-verbal

communication with her infant using facial expressions, so can a human being develop similar interactive behavior with a pet such as a dog or cat even though that in the latter case, the behavior aim at eliciting more of reciprocal behavior than basic communication reciprocity).

In addition to the nonverbal interpersonal communication between the baby and its mothers, extensive research has revealed a strong co-relation between the mother's physical and emotional availability or unavailability on the emotional regulation of the baby. In this instance, Tiffany Field (1994) observes that since emotion regulation in an infant develops within the ambit of mother-infant interactions, the physical and emotional presence of the mother is very crucial. It is crucial in the sense that both the mother and the infant take on diverse roles in the interactions and together, they develop attunement. She argues: " Emotion dysregulation can occur when the mother is either physically unavailable, as during early separations, or, even worse, emotional unavailable, as, for example, if she is depressed. Physical or emotional unavailability of the other contributes to dysregulation because the mother can no longer act as optimal stimulator and an arousal regulator for the infant"[8] (p. 208).

Psychoanalysis has demonstrated that the rise of dysregulated behavior in human and primates emanate from the presence of stressful conditions in the realm of infant-mother attunement. This adds credence to the long-known wisdom that children who grow up without maternal care tend to develop anti-social behavioral characteristics. This explains why in studies on separation in both human and primate show that separation from the mother is directly linked to entire spectrum of changes observed in the behavior of <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

the infant encasing play and activity patterns and intensity; sleeping patterns, pulse rate, eating and feeding patterns; overall health status, general emotional and functional responses of the immune system (see for instance, Field & Reite, 1984; Reite & Harbeck, 1982).

In conclusion, it can be stated that the neurobiological and psychoanalytical study of mirror neurons has greatly enriched our understanding of the complex processes of imitation, mirroring, and affect regulation and how they contribute to the origin of the self in individuals. Psychoanalysis has enabled us to dissect the complex layers of the processes involved in the evolution of the self to the extent that we now know that the self exists as a representation and also as an agent of self-regulation. Most significant is the revelation that emotional development and affect regulation do not take place in a vacuum but in a complex, plural environment with others, in particular, parents and caregivers whose influence appears to take place at least partially through internalization.

Internalization is a multi-facted process that takes on varied formations such as identification. Thus, through various levels of identification, imitation, internalization and association, children sequentially imitate and take in those attributes that make them acceptable and recognized while systematically discarding the opposite. This is the core drive that leads to the concretization of the self. Prof. David Olds captures this complex process by stating thus: " Imitation may have contributed to the passing down of complex rituals and culture, and is involved in identification, empathy, and language learning. ...The mirror neuron may be the instrument of inner stimulation of action and affect that has been crucial for the complex forms <https://assignbuster.com/the-role-of-mirror-neurons-in-affect-regulation-and-origin-of-the-self-essay-sample/>

of learning and cultural transmission in the human repertoire. Imitation may be a capacity added to the other modes of learning, one that is driven by the need for social bonding" (Olds, D. D. 1994, p. 42)

This is very significant in the study of human psychoanalytic development and the entire scope of the affect behavior phenomenon. Using the scientific observations from such behavior scientists can evaluate to what extent mirror neurons can provide a connection to the development of the self, in relation to mother and infant. Vittorio Gallese states thus: " our social mental skills are not confined to a declarative, conceptualized, and objective perspective. Usually, we are not alienated from the actions, emotions and sensations of others, because we are *attuned to the intentional relations of others*. By means of intentional attunement, " the others" are much more than being different representational systems; they become *persons* , like us."

Today, mirror neurons play a major explanatory role in the understanding of a number of human features, from imitation to empathy, mind reading and language learning. It has also been claimed that damages in these cerebral structures can be responsible for mental deficits such as autism. In some parts of the world like the US where there is an extremely high prevalence of autism in children, such behavior stimuli discoveries are of immense value to scientists especially now that there is no known cause or cure of autism.

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