CARL ROGERS MEETS THE NEUROSCIENCES: INSIGHTS FROM SOCIAL NEUROSCIENCE FOR CLIENT–CENTERED THERAPY

Giorgia Silani[1], Alberto Zucconi[2], Claus Lamm[3]

[1]International School for Advanced Studies - SISSA,
Via Bonomea 265, 34136 Trieste, Italy
email: giorgia.silani@sissa.it

[2]IACP
Piazza Vittorio Emanuele 99, 00185 Roma, Italy
email: azucconi@iacp.it

[3]University of Vienna,
Liebigasse 5, 1010 Vienna, Austria
email: claus.lamm@univie.ac.at

preprint of:
Silani, G., Zucconi, A., & **Lamm, C.** (2013). Carl Rogers meets the neurosciences: Insights from social neuroscience for client-centered therapy. In J.H.D. Cornelius-White, R. Motschnig, & M. Lux (Eds.), Interdisciplinary Handbook of the Person-Centered Approach: Research and Theory. Wien: Springer-Verlag.

Empathy, the ability to understand and share the feelings of another person, a major component of what has been termed "social intelligence," is one of the crucial elements of Carl Rogers' Therapy. In the past few years, social neuroscience has started to shed light on the neural mechanisms underlying empathic brain responses, by defining the neuronal networks underlying the cognitive and affective processes associated with this complex social ability. Similarly, cognitive mechanisms such as self-other distinction, emotional awareness, regulation of your own emotion, all concepts postulated in the theoretical framework of the client-centered therapy, have been the focus of interest of social neuroscience in the last decade. In this chapter, we will give an overview of the state of the art of brain research on empathy and related concepts, in order to support the case that neuroscientific research can inform client-centered therapy (and the other way round).

Keywords: neuroscience, empathy, perspective taking, self-other distinction, self-awareness, emotion regulation, client-centered therapy

1 Introduction

In the last few decades, the number of contributions that neuroscience has offered toward the understanding of the critical role of interpersonal relationships has continually increased. Research on the construction of social and interpersonal realities is no more limited to the instruments of social psychology or psychotherapy: neuroscience (in particular the new subdiscipline social neuroscience) has also begun to show that we are constantly engaged in a process of mutual social

adjustment of our mental and biological states (Cacioppo 1994; DeVries et al. 2003; Schore 2002a, 2002b, 2005).

By using the currently available neuroscientific techniques, such as functional Magnetic Resonance Imaging (fMRI), Electroencephalography (EEG) or Transcranial Magnetic Stimulation (TMS), Social Neuroscience has provided alternative methods of investigation and scientific validation of significant socio-emotional interactions - such as those that occur in the relationship between psychotherapist and client. In recent years, this field has produced an increased number of insights into social phenomena from which a new understanding of the human nature and of the enormous power that we use constantly (and often are not even aware of) has emerged. This power is the power of the relationship - how we relate to others, how others relate to us, and how the mutual co-construction of realities literally changes our brains (Motschnig Pitrik & Lux 2008; Lux 2010; Zucconi & Silani 2008; Watson 2011). A new concept has emerged: we now speak of the *social brain,* and we claim that the brain is an organ constructed by social experiences, primarily with care givers, and that these early experiences will later have an impact on aspects such as parenting, education, psychotherapy, and all interpersonal relationships (Schore 2008, 2009; Greenberg, 2008; Cozolino 2010; Decety & Skelly 2011). Therefore, understanding the neurobiological processes behind changes in interpersonal relationships has become of great interest to all psychotherapeutic approaches, and in particular to the ones that put the relationship at the center - such as Client-Centered Therapy of Carl Rogers.

2 Client-Centered Therapy

Client-Centered Therapy is a systemic/holistic approach that focuses on health rather than on disease, on the empowerment of the client rather than on the directivity of the psychotherapist. This approach promotes the development of individuals' and groups' potential through a process that focuses on support and accountability while avoiding the encouragement of passivity and dependence. The central hypothesis of this approach is that humans have innate self-awareness capacities and self-regulatory resources that can be expressed more effectively in relationships characterized by facilitative elements. Carl Rogers postulated – a hypothesis amply confirmed by seventy years of research– that effective psychotherapy is characterized by the quality of the relationship provided by a therapist who sincerely trusts the innate ability of self-awareness and self-regulation of human beings in general and their clients in particular. In this perspective, the effective Rogerian therapist is able to create and manage a setting characterized by acceptance and deep respect, listening, empathic understanding, and genuineness ("congruence", according to Rogers). Based on these premises, the thought of Carl Rogers since the early 40s' had a significant impact in the field of psychotherapy and helping relationships. Rogers formulated hypotheses, to date scientifically verifiable, offering a viable alternative to the prevailing reductionist and negativistic psychology centered on the disease. In fact, a lexicon centered on the dysfunction dominated the language of psychotherapy at his time, and psychotherapeutic theories were theories of psychopathology (Hubble & Miller 2004; Zucconi & Dattola 2007). Even today, such a deficit oriented view on psychotherapy is dominating outside the person-centered approach (see the discussion by Joseph and Murphy in this book).

And Rogers was right: it is not the therapist who treats the patient, as stated by the paternalistic and mechanistic-reductionist view. Current research shows that the variables ascribable to the clients influence the results of psychotherapy from 40% to 87%, while the various psychotherapeutic techniques account for only 5% to 15% of a therapy's success (Miller et al. 1997; Duncan & Miller, 2000; Wampold 2001).
According to Rogers, a relationship that facilitates growth is characterized, on the psychotherapist's

side, by his real capacity to accept the client, in the sense of a deep respect for the experience of the person, including the absence of any moral judgments. Listening and empathic understanding consists in the ability to understand how the client lives his or her experiences and in being able to effectively communicate that understanding. The authenticity / congruence of the psychotherapist consist in the ability to be in contact and to symbolize his or her own experience without having to resort to defensive distortions and suppressions. A relationship characterized by these elements provides the client with a "safe harbor", a space where he or she can trust, lower his/her defenses, get in touch with uncomfortable and/or unknown aspects of the self, and reach new ways to build realities and to explore new ways of satisfying his/her needs.
Clinical experience and research shows that the process of change in psychotherapy is co-constructed: in fact, the three relational qualities of the psychotherapist are able to promote self-awareness, self-understanding, self-regulation in the client (which translates into more effective connection with himself, the others and the world) only if accompanied by three additional conditions related to the presence in the client of a minimum capacity of contact with his own experience. These conditions are the motivation to change, which can initially be represented by the painful perception of a lack of consistency, the ability of a psychological contact with the therapist, and the capacity to perceive the relational qualities expressed by the therapist.
(Rogers 1959a, 1961, 1967; Norcross 2011),

The effectiveness of a good relationship between client and professionals is not only evident in the psychotherapeutic setting, but in all helping relationships (Larson 1993; Barrett-Lennard 2005; Anfossi, Verlato, Zucconi 2008). In the relationship between doctor and patient or between health worker and client, the quality of the relationship is an important variable for the outcome of the treatment, as it affects the levels of compliance, the immune response, user satisfaction, the results of drug treatment, and placebo effects (Krupnick et al. 1996; Zucconi and Howell 2003).
The conditions postulated by Rogers, which he defined as necessary and sufficient, appear effective not only to its paradigm, but in all psychotherapeutic approaches and in any helping relationship. They are the basis of what much later gave rise to the concept of therapeutic alliance, which consists of the relational qualities postulated by Rogers and concepts added later that were already implicit in the formulation of Rogers, as the agreement between therapist and client on the goals of psychotherapy, or the ability of both to repair their working alliance in cases where it is damaged (Horvath & Greenberg 1994; Horwath 2001, 2011; Norcross 2011).

3 The Client-Centered Therapy from a Neuroscientific Perspective

In recent decades research in the field of social neuroscience has started to provide insights into the validity of some of the hypotheses proposed by Rogers. As already mentioned, the neurosciences are beginning to find evidence that appears convincing about how the quality of our relationships and social reality influences our brain and our physiology and vice versa
(Cacioppo et al. 2002, Cacioppo, Berntson & Decety 2011; Decety 2011).

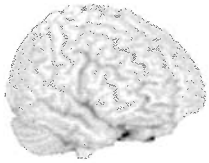
.

For example, Cozolino (Cozolino 2010, p. 30) states: "... The acceptance and respect that characterize the work of Carl Rogers are the ideal interpersonal conditions for the initial development of the brain and for its further development in later stages of life and: "... What could happen in the brain of a typical client in a Client-Centered therapy? In the Rogerian interpersonal context a client, with the support of an empathic listener, would experience a wide range of emotions, the activation of neural networks associated to the emotion would allow the feelings and emotional memories to be accessible and become reorganized. The non-directivity of Rogers would engage executive networks and self-reflexive ability. Empathetic understanding and support also

would promote executive functioning. This simultaneous stimulation of cognitions and emotions, emotional regulation, and enlargement of perspective offered by the psychotherapeutic relationship may provide an optimal environment for the neuronal changes" (Cozolino 2010 p. 38).
A growing number of authors propose models that associate the development of an optimal human body and also his mental health with an optimal neural integration and growth, and on the other hand associate psychopathology to a lack of development, integration and coordination of neural networks. Psychotherapy is seen as a relationship that promotes the creation, reparation and coordination of the different neural networks involved (Cozolino 2010, Schore 2003a, 2003b).
In other words, the effectiveness of a psychotherapeutic relationship could depend on the ability to promote processes in clients which develop and modify the neuronal structure of the brain and promote integration of the neuronal networks disconnected after trauma and relational deficiencies. The human brain is considered a social organ and it is assumed that safe and supportive interpersonal relationships provide the ideal climate for the development of social skills and learning, and that an empathetic connection with your therapist creates a biochemical environment that promotes optimal neural plasticity (Cozolino 2006, 2010, Elliott & Zucconi 2009; Greenberg 2008; Schore 2003a, 2003b; Watson 2011).

.

Having discussed the possible contributions that neuroscience can (hopefully) provide to the understanding and validation of the client-centered therapeutic approach, in this paper we will consider the specific contribution that Social Neuroscience gave in the understanding of the physiological mechanisms underlying some concepts theorized by Rogers. In particular, empathy and congruence (two fundamental conditions in Rogers' theory) will be described in the following sections using a terminology of cognitive processes (emotional resonance, self-other distinction, emotional regulation) and their neurophysiological substrates, as well as of "bottom up" (from the periphery to the center) and "top-down" (from center to periphery) neuronal mechanisms (see figure below).

 Rogers' concepts	 Cognitive processes	 Brain areas
Empathy	Emotional sharing Self-other distinction Perspective taking	AI, MCC TPJ, PFC MPFC, TP, TPJ
Congruence	Self awareness Self-other distinction	MPFC, TP, TPJ TPJ, PFC
Acceptance	Emotion regulation	DLPFC, OFC

AI: anterior insula, MCC: mid cingulate cortex, PFC: prefrontal cortex, MPFC: medial prefrontal cortex, TP: temporal poles, TPJ: temporo-parietal junction, DLPFC: dorso-lateral prefrontal cortex, OFC: orbitofrontal cortex

4 Empathy as Shared Networks Between Self and Other

Among the necessary conditions for a satisfactory and effective therapeutic relationship, empathy (a complex form of emotional resonance with others) has recently received much attention in Social Neuroscience. According to Rogers (1959, p. 210), the term empathy is defined as "To perceive the internal frame of reference of another with accuracy and with the emotional components and meanings which pertain thereto as if one were the person, but without ever losing the "as if" condition". At a phenomenological level, the concept of "empathy" expresses a sense of sameness, a sharing between one's own feelings and those expressed by another person (Thompson, 2001), and at the same time implies a cognitive mechanism that keeps track of the source of the emotional state, and thus differentiates the self from the other.

The initial component that precedes empathy is based on the concept of somatic imitation, also known as "emotional contagion", which is the tendency to automatically simulate the expressions, vocalizations, postures, and movements of another person and, consequently, to synchronize emotionally with others (Hatfield, Cacioppo, Rapson 1993). It has been suggested that, initially, unconscious imitation has evolved as a mechanism to promote survival and conservation of the species, allowing the development of communication skills. The pioneering work of Rizzolatti and coworkers (Rizzolatti & Craighero 2004, for review) has revealed some of the putative neurophysiological mechanisms of our ability to resonate with other people's intentions and actions. Through electrophysiological recordings in monkeys, as well as neuroimaging experiments on humans, it has been shown that the mere observation of actions performed by others activates in the person who observes the action the cortical areas involved in the planning and initialization of the same action. This has led to claims that humans and monkey possess a so called *mirror neuron system* which mainly includes the inferior parietal lobe and the inferior frontal gyrus (pars opercularis) and enables us to mirror the actions of others.

This mirroring mechanism seems to have adaptive value for the survival of individuals. For

example, it has been shown that the observation of bodily fear not only produces greater activation in brain areas associated with emotional processes, but also in sectors connected with the representation of action and movement. This mechanism could therefore be interpreted as an automatic response of our brain in the event of perceived danger, allowing an immediate and hard-wired preparation for protective action (de Gelder et al. 2004).
To date a growing amount of literature suggests that the same neural circuits are also recruited during the direct, first-person experience of an emotion, and its vicarious response to the same emotion resulting from the observation or imagination of others. For example, it has been shown that the anterior insula, a region in charge of the elaboration of bodily changes following the perception of an emotional stimulus (pleasant or unpleasant), is active in response to the presentation of facial expressions of disgust in a similar way as during the first-hand experience of disgust (Wicker et al. 2003). Similarly, the observation and the direct experience of touch are subtended by common neural networks (Keysers et al. 2004).
The perception-action mechanism also seems to underlie our ability to perceive the pain of others. Singer and collaborators investigated the neural responses of participants using functional magnetic resonance imaging receiving a painful physical stimulation alternating with trials in which they observed their partner receiving the same type of painful stimulation (Singer et al. 2004). While only the primary experience of pain was associated with activation of the somatosensory cortex that encodes the sensory components of the noxious stimulus, both the first-hand experience and the observation of the partner's pain activated a shared network consisting of the medial cingulate cortex (MCC), and the anterior insula (AI) – which are cortical structures encoding the affective and motivational components of painful experiences. These initial data resulted in the hypothesis of a strong overlap between brain regions that respond to the first-hand experience of pain and the perception of pain in others, a hypothesis that has received today a growing validation as a result of similar findings reported by several research groups (e.g., Morrison et al. 2004; Jackson et al. 2005; Avenanti et al. 2005; see Lamm et al. 2011, for recent meta-analysis). These results suggest that even if we cannot literally feel the pain of others (as neuroimaging studies indicate only a partial overlap of self and others' experience of pain in the anterior insula and MCC), we seem to be equipped with a mechanism enabling us a fast and effortless sharing and understanding of the affective states of others.

5 Perspective Taking and Empathy

In the nineteenth century, the philosopher and Scottish economist Adam Smith (1759) hypothesized that through imagination we are able to perceive and experience the situation of another as if we were in his or her shoes, becoming somewhat the same person. Through our imaginative capacity we are able to experience feelings that are similar, though generally weaker than those of the other person. In the same way, as noted above, Rogers (1959) states that empathy "means to sense the hurt or the pleasure of another as he senses it and to perceive the causes thereof as he perceives them, but without ever losing the recognition, that it is as if I were hurt or pleased" (p. 210).
Unlike mimicry and emotional contagion, the ability of perspective taking, which is a fundamental tool for the therapist, emerges later in ontogeny and relies upon higher executive functions (processes which serve for monitoring and controlling thought and actions, including self-regulation, planning, cognitive flexibility, response inhibition, and resistance to interferences) which develop in parallel to the development of the prefrontal cortex that continues to mature from birth to adolescence (Russell 1996; Zelazo 2004).
The ability to adopt the perspective of the other, in other words to overcome our usual egocentrism, allows to adapt our behavior and to create satisfactory interpersonal relationships (Davis 1994). In line with this reasoning, Social Neuroscience has shown that when individuals are invited to adopt the perspective of others, common neural circuits are activated (e.g., Decety & Grèzes 2008). At the

same time, however, taking into account the perspective of others involves the activation of specific parts of the frontal cortex that are involved in executive control and the sense of "agency" (which is associated with the sense of being the source of an action or representation; Decety & Jackson, 2004). It has been hypothesized that the right inferior parietal cortex, on the border with the posterior temporal cortex (temporoparietal junction, TPJ) (see also following paragraph) may serve to keep the two perspectives of self and other separate, while the frontal lobes help to resist interferences from one's own perspective (Decety & Jackson 2004). Of particular interest are observations in social psychology documenting the difference between imagining others vs. imagining oneself to be in a certain situation. These studies (Lamm et al. 2007; Jackson et al. 2006) demonstrate that the first case mainly generates empathic concern (defined as a response oriented towards the other, congruent with the difficulties of the person in need), while the second also induces personal distress (which is an aversive self-related response, like being anxious or agitated as a consequence of the other's predicament; see also Decety & Lamm 2008). This observation may help explain why empathic concern and sympathy are such important elements in helping behaviors (notably, empathic concern and sympathy have to be separated conceptually from empathy; see, e.g., Singer & Lamm 2009). If the perception of another person's state of emotional or physical pain arouses personal anguish, the observer would be unable to participate fully in the experience of others and, consequently, this would reduce the likelihood of helping behaviors. Lamm and coworkers recently examined the distinction between empathic concern and personal distress (Lamm, Batson, Decety 2007). If observing the pain of others from an explicitly self-related (first-person) perspective, this resulted in lower empathic concern responses and higher personal distress, as compared to a third-person perspective in which participants focused on the other person's affective responses rather than on their own. The first-person perspective also evoked a stronger hemodynamic response in brain regions involved in encoding the motivational-affective dimension of pain, such as the insular cortex, and furthermore resulted in increased activation in the amygdala - a subcortical structure critically involved in emotional arousal, including fear-related behaviors (LeDoux 2000).

Overall, these empirical results demonstrate that overlapping ("shared") activations in neural circuits during both direct and vicarious experiences of emotions underlie our ability to empathize with others, and that different perspective taking manipulations can trigger and specifically modulate activity in these circuits. However, it is important to note that this overlap is by no means complete. In fact, there are more significant differences in the neural systems involved in direct and vicarious personal experiences than similarities (see next paragraph). This emphasizes the importance of self-awareness and the ability to track who is the "agent" of a state / action. These are key functions for empathy and for appropriate therapeutic responses, as it is important at any point in time during a social interaction not to (con-) fuse the emotions originating in the other with those originating in the self.

6 Congruence and Empathy

Empathy is a complex social emotion that goes beyond mere emotional contagion, but in addition requires higher order cognitive processes such as the ability to differentiate self-related from other-related representations as well as being aware of your own emotional experience. According to Rogers (1959, p. 206), his definition of congruency includes: "when the self-experiences are accurately symbolized (in awareness), and are included in the self-concept in this accurately symbolized form, that the state is one of congruence of self and experience" A prerequisite for an effective psychotherapeutic relationship is therefore that the two agents can preserve their individuality and each of them are in contact with their inner worlds. As highlighted in the previous paragraph, a complete overlap between self and other in the case of emotion sharing would induce an aversive emotional response, or over-arousal - which is detrimental to empathy as it will result in

self-centered regulatory responses (Batson et al. 1997). When the therapist feels empathy towards the client, he or she must therefore be able to distinguish his or her feelings from the feelings shared with the client.

The sense of "being an agent" is a crucial aspect in representing self and other-related states. This requires the ability to perceive the self as an independent entity from the outside world (Jeannerod 2003). It allows the existence of a selfless interest in others rather than a selfish desire to escape aversive feelings.

Data from numerous neuroimaging studies as well as studies of neurological patients indicate that the temporoparietal junction (TPJ) plays a crucial role in the distinction between sensory signals arising from the self from signals generated by the social environment (Blakemore & Frith 2003; Jackson & Decety 2004). TPJ is a hetero-modal association cortex that integrates information arising from the lateral and posterior thalamus, as well as portions of the visual, auditory, and somatosensory cortex. It is reciprocally connected to prefrontal and temporal lobes (Decety & Lamm 2007). Because of these anatomical features, this region is a hinge at the end of multisensory integration of information on bodily sensations, and setting up the phenomenological experience of self (Blanke& Arzy 2005). A lesion in this cortical area can produce a variety of disorders associated with body awareness, such as asomatognosia (lack of awareness of the condition of all or parts of your body) or somatoparaphrenia (delusional convictions about their body) (Berlucchi& Aglioti 1997).

The attribution of actions to another agent, which essentially requires the distinction between the behavior of self and others, has also been associated with right TPJ (Farrer et al. 2003; Farrer &Frith 2002; Leube et al. 2003), and this area shows also increased activity in tasks of mutual imitation where it can be difficult to keep track of who is the agent of an action (Chaminade, Decety 2002; Decety et al. 2002). The mental simulation of the behavior of self and other involves a similar mechanism of self-other discrimination. For example, the right TPJ is specifically involved when participants have to imagine how another person would feel in real life situations that elicit social emotions (Ruby and Decety 2004) or experience painful events, but not when they have to imagine these situations for themselves (Lamm, Batson, Decety 2007; Jackson et al. 2006). These results stress the similarity between the neural mechanisms underlying proper attribution of actions, emotions, and thoughts to their respective agents when such actions or emotional experiences are experienced in oneself or merely encountered in another individual. Self-awareness is also a necessary condition to make inferences about mental and emotional states of others (Gallup 1982). In two studies involving subjects with alexithymic traits (alexithymia is a sub-clinical phenomenon marked by difficulties in identifying and describing feelings (Nemiah, Freyberg, & Sifneos, 1976), one of the authors recently tested the mechanisms underlying the ability to understand one's own emotions, and its relationship to the ability to empathize (Silani et al., 2008, Bird et al. 2010). Notably, she showed that deficits in the understanding of one's own feelings are associated with hypoactivation of AI both when inferring one's own emotional state and when empathizing with another's emotional state, suggesting that a lack of the "embodied simulation" could cause a reduction of empathic behavior. This is in line with Rogers' work: "Proposition XVIII: When the individual perceives and accepts into one consistent and integrated system all his or her sensory and visceral experiences, then he or she is necessarily more understanding of others and is more accepting of others as separate individuals."(1951, p.XXX). To summarize, self-other distinction and self-awareness play fundamental roles in every social interaction, and thus also in empathy. These mechanisms also allow, on a conceptual level, to distinguish emotional contagion from empathy. While the former heavily relies on an automatic link between emotion perception and emotional experiences, resulting in a largely shared emotional experience by means of bottom-up (sensory-driven) processes, a genuine empathic response requires in addition a mechanism that is aware of and keeps track of the source of the emotion felt by the empathizer.

7 Acceptance

The therapist's ability to relate to the client with deep respect - accepting him or her as he or she is - is another of the three relational conditions postulated by Rogers that define the therapist's acceptance as a powerful agent of change. If our own personal experience already tells us that feeling to be accepted and respected is important in a relationship, recent findings in neuroscience provide further evidence how costly it is for our mind and body to be the object of judgment. For example, recent neuroimaging studies of social rejection have convincingly shown that networks active during the experience of physical pain (AI, MCC) are also involved when experiencing the social pain of being rejected by others (Eisenberger et al. 2003; for review, see Eisenberger 2010). If we then consider that psychotherapy is a learning process, neuroscience could give us further evidence as to how the fear of being judged and excluded from social groups hinders the individual's learning and adaptation process (Elizuya & Rochlofs 2005).

8 Emotion Regulation (Deep Respect and Acceptance)

The ability to regulate one's own emotions has a clear adaptive function in social interactions for both the individual and for our species as a whole. The concept of emotion regulation is defined as the process of initiation, inhibition, retention, and/or modulation of the shape, intensity, and/or duration of an emotion (Eisenberg et al. 2004). It has been shown that people who can regulate their emotions are more likely to have feelings of sympathy, and also to implement prosocial behaviors (Eisenberg et al. 1994; Derryberry, Rothbart 1988). In contrast, people whose capacity for modulating their emotions, especially negative emotions, are exposed to greater personal distress as well as aversive emotional reactions such as anxiety when detecting the emotional state of another person (Eisenberg et al. 2001).
"Top-down" cognitive mechanisms seem to be at the base of emotional regulation. A region of the rostral medial prefrontal cortex (mPFC) appears to play an important role in this modulation (Wiech et al. 2005), and different cognitive strategies to regulate emotions have been documented. For example, taking the position of a detached observer when expecting self-related stressful events (such as a painful shock) reduces the subjective experience of anxiety and pain. Recent fMRI studies have identified a limited number of regions in the anterolateral and medial prefrontal cortex which appear to mediate this function (Kalisch et al. 2005). Another strategy is the emotional re-evaluation ("re-appraisal") of an event that involves a reinterpretation of the significance of a stimulus in order to change the way we react to it. This process is of considerable importance in promoting changes in psychotherapy (Cozolino 2010).
Overall, the ability to regulate our emotions is an important aspect of our ability to interact effectively with other people. The prefrontal cortex is highly differentiated in terms of cellular structures and patterns of interconnectivity with other cortical subsystems. In line with this, neuroimaging studies suggest that these systems interact in specific ways to implement a balanced cooperation between cognition and emotions. However, we have only begun to understand these processes and their complexity. In this regard, we allow us to hypothesize that the therapist's unconditional acceptance of the client's person and his/her experiences may facilitate the client to non-judgmentally perceive and accept these experiences. In this way, person-centered psychotherapy may foster emotion regulation and integrative processes (Cozolino 2010) which are probably of major importance for the Rogerian paradox of change: "when I accept myself just as I am, then I change" (Rogers 1995/1961, p. 17).

9 Conclusions

Models of emotional and social connection have been widely discussed by people working in philosophy of mind and for decades have been the subject of investigation by social psychologists as well as developmental psychologists. More recently, neuroscientific research has begun to unravel the neural systems that support the processes involved in the experience of empathy, including the sharing of emotions, perspective taking, the sense of agency, and emotion regulation. In a period of exuberant theoretical and clinical developments, the neurosciences offer us new possibilities for the understanding of psychotherapeutic processes and the development of new clinical procedures. What would be the position of Rogers if he were still with us? One of the authors who has had the opportunity of knowing him as a student and then as a colleague for seventeen years is convinced that Rogers certainly were interested. Already in 1958 he cited the research of Dittes on the measurement of galvanic skin responses of clients in psychotherapy (Rogers 1958). But in addition to his interest, it is easy to assume that Rogers would have considered it important to be sensitive and alert to any danger of mechanistic reductionism (Zucconi 2008).

He would certainly have had a positive view on the assertion that the neurosciences are entering a season of remarkable development and rich in potential contributions to other fields. However, Rogers would have agreed with those who consider it necessary to develop, in parallel to the neurosciences, modern social epistemologies (Goldman 2008), to update the ethical codes of various professions, and to facilitate a process through which it is possible to reach a thoughtful social construction of a neuro-ethics that involves clinicians, scientists, philosophers, lawyers, judges, and legislators in the debate (Merkel et al., 2007).

Rogers would have agreed with Cacioppo (2002, p.21) when he states that "... the mechanisms underlying the mind and behavior will not be fully explainable only by a biological or sociological approach."

Keeping this in mind, it's legitimate to say that Social Neuroscience will (hopefully) play an important role in shedding light on the complex social, psychological and neurophysiological mechanisms underlying social interactions in general and psychotherapeutic ones in particular - with the ultimate aim being a far-reaching understanding of the complexity of these phenomena.

References

Anfossi, M., Verlato, L.M., Zucconi, A. (2008). *Guarire o Curare?* Bari: La Meridiana.

Avenanti, A., Bueti, D., Galati, G., Aglioti, S.M. (2005). Transcranial magnetic stimulation highlights the sensorimotor side of empathy for pain. *Nature Neuroscience*, 8, 955–960.

Barrett-Lennard, G.T. (2005). *Relationship at the Centre: healing in a troubled world.* London: Whurr/Wiley.

Batson, C.D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., Dawson, K. (1997). Is empathy-induced helping due to self-other merging? *Journal of Personality and Social Psychology*, 73, 495–509.

Berlucchi, G., Aglioti, S. (1997). The body in the brain: neural bases of corporeal awareness. *Trends in Neurosciences*, 20, 560–564.

Bird, G., Silani, G., Brindley, R., White, S., Frith, U., & Singer, T. (2010). Empathic brain responses in insula are modulated by levels of alexithymia but not autism. *Brain* 133(5): 1515–1525.

Blakemore, S.-J., Frith, C.D. (2003). Self-awareness and action. *Current Opinion in Neurobiology*, 13, 219–224.

Blanke, O., Arzy, S. (2005). The out-of-body experience: disturbed self-processing at the temporo-parietal junction. *Neuroscientist*, 11, 16–24.

Cacioppo, J.T. (1994). Social neuroscience: Autonomic, neuroendocrine, and immune responses to stress. *Psychophysiology*, 31, 113-128.
Cacioppo, T.J., All Eds (2002). *Foundations in social Neurosciences*. Cambridge: The MIT Press, Mass.
Cacioppo, J.T., Berntson, G.G., Decety, J. (2011). Social neuroscience. In A.W. Kruglanski & W. Stroebe (Eds.), *Handbook of the History of Social Psychology*. New York: Psychology Press.
Chaminade, T., Decety, J. (2002). Leader or follower? Involvement of the inferior parietal lobule in agency. *Neuroreport*, 13, 1975–1978.
Cozolino, L. (2006). *The Neuroscience of Human Relationship. Attachement and the Developing Social Brain*. N.Y. N.Y., Norton & Co.
Cozolino, L.J. (2010). *The Neuroscience of Psychotherapy. Healing the social brain. 2nd ed.*, N.Y. London, W. W Norton & Co.
Decety, J., Chaminade, T., Grèzes, J., Meltzoff, A.N. (2002). A PET exploration of the neural mechanisms involved in reciprocal imitation. *Neuroimage*, 15, 265–272.
Decety J, Grèzes J. The power of simulation: imagining one's own and other's behavior. *Brain Research*. 2006 Mar 24;1079(1):4-14
Decety, J., Jackson, P.L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, 3, 71–100.
Decety, J., Keenan JP. (2006). Social Neuroscience: a new journal. *Social Neuroscience*, 1, 1-4.
Decety, J., & Lamm, C (2007). The role of the right temporoparietal junction in social interaction: How low-level computational processes contribute to meta-cognition. *The Neuroscientist*, 13, 580-593.
Decety, J., & Lamm, C. (2009). Empathy vs. personal distress. In J. Decety & W. Ickes (Eds.), *The Social Neuroscience of Empathy*. Cambridge: MIT Press.
Decety, J. (2011). *The neuroevolution of empathy*. Ann. N.Y. Acad.Sci. 1231, pp. 35-45.
Decety, J., Skelly, L. (2011). The neural underpinnings of the experience of empathy: Lessons for psychopathy. In K. Ochsner and S. Kosslyn (Eds.), *The Oxford Handbook of Cognitive Neuroscience*. New York: Oxford University Press.
de Gelder, B., Snyder, J., Greve, D., Gerard, G., Hadjikhani, N., 2004. Fear fosters flight: a mechanism for fear contagion when perceiving emotion expressed by a whole body. *Proceedings of the National Academy of Sciences*, 101, 16701–16706.
Derryberry, D., Rothbart, M.K. (1988). Arousal, affect, and attention as components of temperament. *Journal of Personality and Social Psychology*, 55, 958–966.
DeVries, A.C., Glasper, E.R., Detillion, C.E. (2003), Social modulation of stress responses. *Physiology and Behavior*, 79, 399-407.
Duncan, B.L., Miller, S.D. (2000). *The heroic client. Doing client-directed, outcome-informed therapy*. San Francisco: Jossey-Bass.
Eisenberg, N., Fabes, R.A., Murphy, B., Karbon, M., Maszk, P., Smith, M., O'Boyle, C., Suh, K. (1994). The relations of emotionality and regulation to dispositional and situational empathy related responding. *Journal of Personality and Social Psychology*, 66, 776–797.
Eisenberg, N., Cumberland, A., Spinrad, T.L., Fabes, R.A., Shepard, S.A., Reiser, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, 72, 1112-1134.
Eisenberg, N., Smith, C.L., Sadovsky, A., Spinrad, T.L. (2004). Effortful control. In: *Handbook of Self-Regulation*. Baumeister R.F. and Vohs K.D. New York: Eds. The Guilford Press. pp. 259–282.
Eisenberger, N.I., Lieberman, M.D., & Williams, K.D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302, 290-292.
Eisenberger, N. I. (2012). The pain of social disconnection: Examining the shared neural underpinnings of physical and social pain. *Nature Reviews Neuroscience*.

Elliott, R., Zucconi, A. (2006). Doing research on the effectiveness of Psychotherapy and Psychotherapy Training: A person-centered/experiential perspective. *Person Centered, Experiental Psychotherapies Journal*, Vol. 5, Number 2, 82-100, Summer.
Elliott, R., Zucconi, A. (2009). Organization and Conceptual Framework for Practice-Based Research on the Effectiveness of Psychotherapy and Psychotherapy Training. In M. Barkham, G. Hardy, & J. Mellor-Clark (Eds.). *A core approach to delivering practice-based evidence in counselling and the psychological therapies*. Chicester, UK: Wiley & Sons.
Elizuya, B., Rochlofs, K. (2005). Cortisol –Induced Impairments of Working Memory Requires Acute Sympathetic Activation Behavior. *Neuroscience*, 119, 98-103.
Farrer, C., Frith, C.D. (2002). Experiencing oneself vs. another person as being the cause of an action: the neural correlates of the experience of agency. *Neuroimage*, 15, 596–603.
Farrer, C., Franck, N., Georgieff, N., Frith, C.D., Decety, J., Jeannerod, M. (2003). Modulating the experience of agency: a positron emission tomography study. *Neuroimage*, 18, 324–333.
Gallup, G.G. (1982). Self-awareness and the emergence of the mind in primates. *American Journal of Primatology*, 2, 237-248.
Goldman, I.A. (2008). *Social Epistemology: Theory and Applications*. U.K.: Royal Institute of Philosophy.
Hatfield, E., Cacioppo, J.T., Rapson, R.L. (1993). Emotional contagion. *Current Directions in Psychological Science*, 2, 96-99.
Horvath, A.O., Greenberg, L.S. (Eds.) (1994). *The working alliance: Theory, research, and practice*. New York: John Wiley, Sons.
Horvath, A.O. (2001). *The Alliance. Psychotherapy: Theory/Research/ Practice/Training*, 38, 4, 365372.
Horvath, A.O., Del Re, A., Flückiger, C., Symonds, D. (2011). Alliance in individual psychotherapy. In J. C. Norcross (Ed.), *Psychotherapy relationships that work* (2nd ed.). New York: Oxford University Press.
Hubble, A.M., Miller, D.S. (2004). The Client: Psychotherapy Missing Link for Promoting a Positive Psychology. In: Linley P. A., Joseph S. Eds. *Positive Psychology in Practice*. New York: Wiley.
Jackson, P.L., Decety, J. (2004). Motor cognition: a new paradigm to study self other interactions. *Current Opinion in Neurobiology*, 14, 259-263.
Jackson, P.L., Meltzoff, A.N., Decety, J. (2005). How do we perceive the pain of others: a window into the neural processes involved in empathy. *Neuroimage*, 24, 771-779.
Jackson, P.L., Brunet, E., Meltzoff, A.N., Decety, J. (2006a). Empathy examined through the neural mechanisms involved in imagining how I feel versus how you feel pain. *Neuropsychologia*, 44, 752-761.
Jackson, P.L., Rainville, P.,Decety, J. (2006b). To what extent do we share the pain of others? Insight from the neural bases of pain empathy. *Pain*, 125, 5-9.
Jeannerod, M. (2003). The mechanism of self-recognition in humans. *Behavioral and Brain Research*, 142, 1-15.
Kalisch, R., Wiech, K., Critchley, H.D., Seymour, B., ÒDoherty, J.P., Oakley, D.A., Allen, P., Dolan, R.J. (2005). Anxiety reduction through detachment: subjective, physiological, and neural effects. *Journal of Cognitive Neuroscience*, 17, 874-883.
Keysers C, Wicker B, Gazzola V, Anton JL, Fogassi L, Gallese V (2004), A touching sight: SII/PV activation during the observation and experience of touch, *Neuron* 42: 335-346.
Krupnick, J.L. et al. (1996). The role of therapeutic alliance in psychotherapy and pharmacotherapy outcome: findings in the National Institute of Mental Health Treatment of Depression Collaborative Research Program. *Journal of Consulting and Clinical Psychology*, 64, 532-539.
Lamm, C., Batson, C.D., Decety, J. (2007). The neural basis of human empathy – effects of perspective-taking and cognitive appraisal. *Journal of Cognitive Neuroscience*, 6, 1146-63.

Lamm, C., Decety, J., Singer, T. (2011). Meta-analytic evidence for common and distinct neural networks associated with directly experienced pain and empathy for pain. *NeuroImage*, 54, 2492-2502.
Larson, D.G. (1993). *The helper's journey: Working with people facing grief, loss, and life-threatening illness.* Champaign, IL: Research Press.
LeDoux J.E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience*, 23, 155-184.
Leube, D.T., Knoblich, G., Erb, M., Grodd, W. Bartels, M., Kircher, T.T.J. (2003). The neural correlates of perceiving on ès own movements. *Neuroimage*, 20, 2084-2090.
Lux, M. (2010). The Magic of Encounter: The Person-Centered Approach and the Neurosciences. *Person-Centered & Experimental Psychotherapies*, Volume 9, number 4, p.276.
Miller, S.D., Duncan, B.L., Hubble, M.A. (1997). *Escape from Babel: Toward an unifying language for psychotherapy practice*. New York: Norton.
Merkel, R., Boer, G., Fegert, J., Galert, T., Hartmann, D., Nuttin, B., Rosahl, S. (2007). *Intervening in the Brain. Changing Psyche and Society*. Germany: Springer, Heidelberg.
Motschning-Pitrik, R., Lux, M. (2008). The Person - Centered Approach Meets Neuroscience: Mutual Support for C.R. Rogers's and A. Damasio's Theories. *Journal of Humanistic Psychology*, Vol. 48 N. 3 pp. 287-319.
Morrison, I., Lloyd, D., di Pellegrino, G., Roberts, N. (2004). Vicarious responses to pain in anterior cingulated cortex is empathy a multisensory issue? *Cognitive, Affective and Behavioral Neuroscience*, 4, 270-278.
Nemiah, J. C., Freyberg, H. & Sifneos, P. E. (1976) *Modern trends in psychosomatic medicine.* Hill, O. W. (ed.), pp. 430-439 (Butterworths, London).
Norcross, J. (2001). Empirically Supported Therapy Relationships. *Psychotherapy*, Vol.38, 4-Winter. American Psychological Association. (Trad. it. Relazioni Terapeutiche Empiricamente Supportate, Integrazione, 15/16, 2004).
Norcross, J. (ed.) (2002). *Psychotherapy relationships that work*. New York: Oxford University Press.
Norcross, J.C. (Ed.). (2011). *Psychotherapy relationships that work (2nd ed.)*. New York: Oxford University Press.
Rizzolatti, G., Craighero, L. (2004). The mirror-neuron system. *Annual Review in Neuroscience*, 27, 169-92.
Rogers, C.R. (1951). *Client Centered Therapy; its current practice, Implication and Theory*. Boston: Houghton Mifflin..
Rogers, C.R. (1959). A theory of therapy, personality, and interpersonal relationships, as developed in the client–centered framework. In: Koch S. (ed.). *Psychology. A study of a science. Vol. III: Formulations of the person and the social context*. New York: Hill, 184–256.
Rogers, C.R. (1961). *On Becoming a Person*. Boston: Houghton Mifflin.
Rogers, C.R. (1965). A Humanistic Conception of Man. In: Farson, R. (ed.) *Science and Human Affairs*. Palo Alto: Science and Behavior Books.
Rogers, C.R. (1967). *The therapeutic relationship and its impact: A study of psychotherapy with schizophrenics*. Madison: University of Wisconsin Press.
Ruby P., Decety, J. (2004). How would you feel versus how do you think she would feel? A neuroimaging study of perspective taking with social emotions. *Journal of Cognitive Neuroscience*, 19, 988-999.
Russell, J. (1996). *Agency and Its Role in Mental Development*. Psychology Press, Hove.
Schore, A.N. (2002a). The right brain as the neurobiologicalsubstratum of Freud's dynamic unconscious. In D. Scharff (Ed.), *The psychoanalytic century: Freud's legacy for the future*. NewYork.The Other Press.
Schore, A.N. (2002b). Advances in neuropsychoanalysis,attachment theory, and trauma research: Implications for self psychology. *Psychoanalytic Inquiry*, 22, 433-484.

Schore, A.N. (2005). Attachment, affect regulation, and the developing right brain: linking developmentalneuroscience to pediatrics. *Pediatrics in Review*, 26, 204-212.
Silani, G., Bird, G., Brindley, R., Singer, T., Frith, C. & Frith, U. (2008). Levels of emotional awareness and autism: an fMRI study. *Social Neuroscience,* 3, 97-112.
Singer, T., Lamm, C. (2009). The social neuroscience of empathy. *Annals of the New York Academy of Science*, 1156, 81-96.
Singer, T., Seymour, B., O'Doherty, J., Kaube, H., Dolan, R.J., Frith, C.D. (2004). Empathy for pain involves the affective but not the sensory components of pain. *Science* 303, 1157-1161.
Smith, A. (1759). *The Theory of Moral Semtiments*. Edited by Sálvio M. Soares. MetaLibri, 2005
Thompson, E. (2001). Empathy and consciousness. *Journal of Consciousness Studies*, 8, 1-32.
Wampold, B.E. (2001). *The great psychotherapy debate: Models, methods, and findings*. NJ: Erlbaum, Mahwah.
Watson, J.C (2011): The Process of growth and transformation: Extending the process model. *Person-Centered & Experiential Psychotherapies*, 10:1, 11-27.
Wicker, B., Keysers, C., Plailly, J., Royet, J.P., Gallese, V., Rizzolatti, G. (2003). Both of us disgusted in my insula: the common neural basis of seeing and feeling disgust. *Neuron*, 40, 655-664.
Wiech, K., Seymour, B., Kalish, R., Stephan, K.E., Koltzenburg, M., Driver, J., Dolan, R.J. (2005). Modulation of pain processing in hyperalgesia by cognitive demand. *Neuroimage*, 27, 59-69.
Zelazo, P.D. (2004). The development of conscious control in childhood. *Trends in Cognitive Science*, 8, 12-17.
Zucconi, A. e Dattola, G. (2007). La relazione terapeutica nella terapia Centrata sul cliente. In: Petrini P., Zucconi A. Ed. *La relazione che cura*. Roma: Alpes.
Zucconi, A. (2008). Effective Helping Relationships: Focus on illness or on health and well being? In: B. Lewitt (Ed.). *Reflections of Human Potential: The Person Centered Approach as a positive psychology*. U.K.: PCC Books.
Zucconi, A., Silani, G: (2008). Le conferme delle neuroscienze alle ipotesi della Psicoterapia Centrata sul Cliente di Carl Rogers ed alla teoria dei fattori comuni delle psicoterapie. *Idee in Psicoterapia*, Vol. 1, N. 3 Dicembre 2008.