Article

group analysis

Empathy and Group Analysis: An Integrative Approach

Ana Sofia Nava

With the aid of the most recent neuroscientific and psychological investigations, the author proposes an integrative approach of empathy, using this to explore the characteristic way that, in group analysis, empathy is an investigative agent, and, as such, opens a very special pathway to the analysands' intra-psychic lives. It is also proposed that this instrument of investigation is amplified in the group-analytic and psychotherapeutic group contexts. The author subsequently reflects on the manner in which, in group analysis, empathy is also integrated in the therapeutic process itself and the factors that have an effect on the analyst's empathic abilities: familiarity, similarity, learning and past experience.

Key words: empathy, group analysis, neurosciences, perception-action model, mirror neuron

Introduction

The natural human ability that we have and which enables us to perceive another person's emotions and feelings and to go to their assistance is commonly called 'empathy'. Ickes (2003) metaphorically termed this 'everyday mind reading'. In fact, it is an innate ability, which greatly eases life in society and inherently the intersubjectivity. It makes sense that, for the social animal that

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humankind is, natural selection has privileged it with this indispensable tool.

The original German word, *Einfühlung,* literally means, 'feel inside of' (Wispé, 1986). *Einfühlung* would be the result of a process in which the observer would project himself into the perceived object. It is important to take into account that, for some authors, there are various forms of empathy that may roughly be divided into aspects that are more emotional and others that are more cognitive.

Preston and de Waal (2002: 6) clearly set out the following definitions:

1. *emotional contagion* – the subject's emotional state is the direct result of the perception of the object's state; there is no distinction between the self and the object; and there is an inability to help the other.
2. *sympathy* – the subject feels sorry for the object, the focus is directed more towards the situation than to the physical state of the object; there is a distinction between the self and the object; and the ability to help may, or may not, exist.
3. *empathy* – the subject's emotional state is a result of the perception of the object's state, with the distinction between the self and the object; the ability to help the other is present and increases with the familiarity, similarity and exuberance (relevance).
4. *cognitive empathy* – the subject represents the object's state, through a top to bottom process; there is a distinction between the self and the other and it may, or not, culminate in assistance. This process is also known as 'taking into perspective'.
5. *pro-social behaviour* – assuming attitudes in order to reduce the object's unease. There is usually a distinction between the self and the object, and the ability to help is present.

Although various psychoanalytic authors, such as Freud, Reike, Rogers, Melanie Klein, Bion and Greenberg used and defined the term empathy, it was Kohut who investigated this matter in depth (Kohut, 1959, 1984). He greatly emphasized the use of the analyst's empathic capabilities, and affirmed that, although empathy had not been created by the psychology of the self, it broadened its applications and enhanced its theoretical importance.

Kohut (1984) defined empathy as the ability to penetrate, by means of thought and feeling, into the other person's inner life. He maintained that the only two tools on which the therapist may rely to promote the analytic cure (the transforming internalization), are empathy and interpretation. Therefore, we can see how fundamental and decisive the concept of empathy is for the psychology of the self. He clarified the concept of empathy in two levels: (1) abstract; and (2) operational.

Abstract Empathy

Kohut (1959) defined empathy as indirect introspection, seeing that it is from the introspection of our own experience that we can understand how the other person must feel in a similar psychological circumstance.

Later (Kohut, 1984) considered empathy to be a tool, an instrument or a method of observation, with which the science of psychoanalysis gathers its data. As such, empathy assumes a role in the definition of psychoanalysis as a science. Because of this, Kohut considers psychoanalysis to be the only pure psychology, which he defines by means of two components that are essential to any science, i.e. its field of study (the states of the individual's internal world) and its methodology (introspection and empathy).

Operational Empathy

In his later work (Kohut, 1984) proposes a clinical definition, a more pragmatic one, when he affirms that empathy is the capacity to think and feel the other's internal world. Empathy is simply that which allows the individual to reach the other's internal world, without losing his/her own objectivity. He proceeds to explain that empathy should not be misinterpreted with the quality of interaction with another person which we normally identify as love, compassion or any other intense emotion.

The Clinical Use of Empathy

Empathy is of use in two clinical objectives: (1) the comprehension; and (2) the explanation (MacIsaac, 1997: 245–264).

Comprehension: By thinking and feeling the patient's internal world, the analyst perceives what the patient is experiencing at that moment, and communicates, in a verbal or non-verbal manner, that the patient's experience was understood.

Explanation: While the first stage is centred on communicating what was obtained from the patient's experience, the second stage uses this comprehension, accumulated over time, to explain the meaning of the patient's experience, correlating it with past experiences, internal impulses and intra-psychic dynamics.

Recent Contributions From The Neurosciences

Functional Architecture Model

The term 'Functional Architecture Model' was created by Jean Decety, Director of the Cognitive and Social Neuroscience Laboratory at the Washington University, and Philip Jackson, a leading neuropsychologist (Decety and Jackson, 2004). Setting out from the humanistic perspective (empathy as an innate ability) and the psychodynamic perspective (empathy as a communication skill), they propose three fundamental components of empathy in human beings:

1. *Affective sharing* between the self and the other, based on the perception-action liaison, that originates shared representations.
2. *Conscience of the self and the other*. Even when some temporary identification exists, there is no confusion between the self and the other.
3. *Mental flexibility* in order to subjectively adopt the other's perspective and regulating processes.

These three components interconnect and should interact with each other, in order to produce the subjective experience of empathy.

Shared Representations Between the Self and the Others

Perception-action Liaison This concept reflects the idea that the perception of a given behaviour in another individual automatically activates the representation of that behaviour in the self

(Knoblich and Flash, 2003; Preston and de Waal, 2002; Prinz, 1997).

Neurosciences have emerged to elucidate the perception-action liaison. Studies of electrophysiological registers in monkeys have demonstrated the presence of *mirror neurons* that discharge in the same mode, whether in situations of actions directed towards an objective, or in situations where the actions of other individuals are observed (Rizzolatti et al., 2001). Studies of functional neuro-imaging in human beings demonstrate that the neuronal circuits involved in the execution of an action, overlap those that are activated during the observation of the same action (Blakemore and Decety, 2001)

This neuronal network involves the pre-motor cortex, the parietal lobe, the supplementary motor area and the cerebellum (Grèzes and Decety, 2001).

Other studies have demonstrated that similar cerebral areas, belonging to the same neuronal network in the pre-motor cortex and posterior parietal cortex, are activated in the following situations:

1. when the individual imagines his own action (Decety et. al., 1994);
2. when the individual imagines the other's action (Ruby and Decety, 2001);
3. when the individual imitates the actions performed by a model (Decety et al., 1997; Decety et al., 2002; Iacoboni et al., 1999).

Other neuroscientific studies use the measurement of the cortical-spinal excitability provoked by transcranian magnetic stimulation. A study by Fadiga et al. (1995) discovered motor-evoked potentials in participants who had been asked to simply observe the hand gestures of other individuals.

In another study, the participants were asked to perform three tasks, i.e. observing, imagining or imitating hand movements, while electromagnetic stimulation was present (Clark et al., 2003). It was found that the greatest intensity of the motor evoked potentials was achieved when the task was the imitation of the hand movements, followed by that of observation and finally by the task of imagining. These extremely interesting results clearly demonstrate the need for identification models

for the learning of physical skills and most likely for other types of skills, namely relational and affective skills.

On the whole, the representations shared between the self and the other at a cortical level were found at the level of *comprehension, pain processing* and *recognition of the emotions*. This mechanism provides the neurophysiological base for the function of social cognition, through the automatic activation of the motor or emotional representations. There is no specific cortical region, for the shared representations, its neuronal base is widely distributed, and the activation pattern varies according to the processed domain, a particular emotion or stored information.

For Decety and Jackson (2004) this evidence offers the functional bridge that would be the base of intersubjectivity. However, the model of empathy that it commends suggests that this mechanism is necessary, but not sufficient.

Conscience of Self/Other

As previously mentioned, this model of empathy implies that there is a clear delimitation between the self and the other. The conscience of the self is not rooted in a specific region of the brain. On the contrary, it depends on the interaction of processes that are found spread throughout the brain, especially on the level of the pre-frontal cortex and the inferior region of the parietal lobe; as it is, the right hemisphere has the preponderant role (Keenan et al., 2003).

The roots of the self are formed in early infancy. The representations of the actions of the self and of the other are simultaneously overlapping and distinct (Rochat and Striano, 2000).

The developmental psychologist Vasudevi Reddy suggests, based on observation studies of new-born babies, that children are conscious of being the object of attention by others, even before they have conscience of the other (Reddy, 2003).

The conscience of one's self needs the capacity of secondary representation of an object. These types of skills are developed during the child's second year of life. There is increasingly more evidence that substantiates that at about four years of age, a connection starts to take place, between the development of the capacities of mentalization and self-control (Perner and Lang, 1999). Currently, we know that the development of cognitive control is related to the development of the pre-frontal

cortex (Tamm et al., 2002). The inferior parietal cortex, concerted with the pre-frontal cortex, has a crucial role in the recognition of the self/other and, as such, is fundamental for empathy.

Mental Flexibility and Auto-Regulation

The ability to take into perspective is clearly a fundamental variable for the capacity of human empathy, and is obviously an essential skill for the psychotherapist to be able to enter into his/her patient's reality. Tomasello (1999) discusses that it is this skill that distinguishes us from the other primates, and is an essential element of intersubjective communication.

In spite of this growing ability to get into someone's shoes, human beings also have the natural tendency to deduce that others have the same knowledge and beliefs that they themselves have, even though, rationally they know that they have different points of view (Keysar et al., 2003; Royzman et al., 2003).

This data is consistent with that which was explained in relation to the mechanism of shared representations. Each one sees the other, through their own cognitions, using their own knowledge, the primary base for understanding the others. Self-perspective is the *default mode* of the human mind. Taking this kind of basic functioning into account, it is licit to equate that in order to have an empathic understanding of the other, an adjustment of the shared representations is needed.

We need to regulate our own perspective, which is triggered by the interaction with the other, or even just the act of imagining the interaction. In this manner, empathy requires some kind of active inhibitory mechanism, so that this type of regulation can be made, and the pre-frontal region has a decisive role in this regulatory process (Fuster, 1989). Patients with cerebral lesions in this area demonstrate a lack of empathy, in addition to an incapacity to control their own behaviour.

The more recent advances in clinical neuropsychology and in the neurosciences indicate that the frontopolar cortex is involved in regulatory or inhibitory processes. Decety and Jackson (2004) maintain that this inhibitory process is necessary for regulating and decreasing the self-perspective, in order to allow the evaluation of the other's perspective. This regulation is necessary to the extent that the overbearing self-perspective, which derives from the automatic liaison between the perception and the action, is

the normal method of functioning, and only through its regulation, does it allow cognitive and affective flexibility.

According to this conceptualization, empathy is an intentional and voluntary capacity. When there is no conscience of one's self and no emotional control, there is no real empathy. On the contrary, the mere sharing of emotions only leads to discomfort or to anxiety.

Empathy is not only the resonance of the affect between the self and the other, it also involves the explicit representation of the other's subjectivity.

Preston and de Waal (2002) undertook an exhaustive study on the manner in which empathy may be modified by experience. They carried out a revision of the literature and found various articles, by various authors that investigated this matter in rats, monkeys, apes, human infants, human children and human adults. They concluded that overall these variables may be organized into three categories: 1) familiarity/similarity; 2) past experience; and 3) implicit and explicit learning. These variables produce an increase in empathy, which may be explained by the processes of perception-action.

Reflections on Empathy and Group Analysis

I will speculate on what takes place in neurobiological terms during a session of analysis when empathy is in action, which in some way is equivalent to what happens when a mother takes care of her baby, using her capacity for reverie, her alpha function.

Through the model of perception-action, we know that there are shared representations between the patient's emotions and the analyst's respective neuronal circuits. In other words, the patient's emotion is mirrored, through the *mirror neuron*, in the neuronal circuits that codify the same emotion in the analyst. This process is automatic, the analyst doesn't need to make any conscious effort, he/she just has to let him/herself go, without being defensive. There is an immediate, natural sharing of affections, even before we have any conscience of what is taking place and, without a doubt, it is mirrored on our faces, as are all our emotions (see Nava, 2003). All this may be perceived by the patient in face-to-face therapy and in group analysis. This

phenomenon certainly corresponds to one of the components, which are not yet conscious, of countertransference and is extremely fast. The vegetative and somatic response, corresponding to the patient's emotions, is shared and activated in the group analyst.

The second phase is the conscience of the self and the other, which enables a clear conscience of the limits and makes sure that there is no confusion between the analyst and the patient. It prevents emotional contagion, and ensures that the patients' emotions do not invade the analyst, as if they were his/her own. Obviously, this would hinder the performance of the therapeutic capacities. This level involves conscious processes, thus, the analyst's training as a person and as a professional are very important.

Finally, mental flexibility permits the introduction of inhibitory mechanisms, which restrain the analyst's perspective (his/her life referential, based on implicit and explicit memories, somatic tracers). At this time, regulatory processes come into action, so that the analyst may assume the other's perspective. This part can be altered the most as a result of the analyst's training and, where his/her theoretical formation takes on a more important role. The third component, as Kohut made clear, does not imply direct aid. We are not going to solve the patient's needs directly, the analyst is going to produce an explanation of these needs.

At this point, I would like to further explore the first component of empathy – the shared representations – in group analysis.

As previously explained, the *mirror neurons* are activated by visual perception and are immediately activated and mirrored. They mimic (imitate) what is being seen – in other words, the circuits that correspond to what is being observed, are activated. We have also seen that some investigations have demonstrated that this phenomenon is more complete and more intense when a model is being observed, but it is also activated when the individual imagines the other person's action or when he/she imagines his/her own action. In analytic terms, this data leads us to new reflections about the following particularity. In group analysis, the analysands see the analyst – something that has already been commented upon by some group analysts (Nava, 2000; Neto, 2002).

The Mirror Neuron Seen In Group Analysis

The Group Analyst and The Mirror Neuron

The group analyst has a greater capacity to understand his/her group analysands because he/she is observing them. He/she is face-to-face with them and may look straight into their eyes. The perception-action model enables us to conclude that the level of shared representations reach greater intensity, therefore the group analyst has a greater empathic capacity, precisely because he/she is face-to-face. The intensity of the brain processing is greater than when the analyst does not see the patient, and merely uses his/her hearing. Nowadays we know that this is what happens, because the emotions have a corporal component that can only be seen entirely in a face-to-face situation, due to the system of shared representations. This then enables the group analyst to capture the emotions of his/her analysands, automatically and with much greater intensity.

This is the secret of the primary mother–infant relationship. It is the way that biology discovered, to enable the existence of harmonious communication between the mother and her baby, so that, without the use of words, the mother may empathically receive (by the shared representations that are mirrored), the emotions, feelings and the needs of her baby. In fact, a great part of the formation of the personality of our patients was created in the primary relationship with the objects of the self, and probably, the best way to reach it is through an empathic investigation, recreating the same pattern, and taking full advantage of our biological capacities.

Observation of Relational Phenomena in the Group

When the analysand relates an episode of his/her life, one that took place outside the analytic setting, his/her therapist may imagine what happened and, as we know, this activates the circuits of shared representations of empathy on a smaller scale. However, when the analyst observes a similar episode within the group, through the way that the group analysand relates to the other elements in the group, the analyst reaches a greater level of shared representations, therefore a greater degree of empathic capacity, in the sense of an increased investigative capability. Adding to this phenomenon, we should not forget that

When a patient relates an episode of his/her life, frequently and unconsciously, he/she distorts it, which does not happen when he/she is living it *in loco*, in the analytic group.

As mentioned, various studies with animals, children of various ages and adults, have confirmed that the greater the familiarity and similarity with the object, the representations that the subject has of the object are richer by involving more associations, thus, creating more complex, more elaborate and precise patterns of activity. This pattern is encrypted based on the reference of personal experience as well as the object's experience.

Thanks to the perception–action liaison, the similarity allows the emotional expressions, of the subject and the object, to be convergent. This will originate a more direct mapping of the perception–action and a better understanding.

Based on what has been presented, we may infer that the similarity between the analyst and his/her patient is a factor that may determine an increase in the empathic capacity. I believe that this variable is especially significant during the first contacts which are of great importance for the establishment of the therapeutic alliance. This is especially true because this situation is bilateral. On the one hand, the analyst feels more empathy towards the patient; on the other hand, the patient may also feel greater empathy towards the analyst.

This characteristic is also important in the course of an analysis, due to the fact that the more the shared representations overlap, the greater the amplification of the process of understanding the other. This process become faster, more focalized, and more detached from the underlying noise that is always present in a group. In this similarity, besides the more obvious variables such as race, sex, age, etc. there are the variables present in the specific situation of analysis, i.e. personality structure and main defence mechanisms.

With my clinical experience, it is easy to see that I quickly understand those defence mechanisms that are similar to mine, and that I am able to identify during my personal analysis. On the other hand, I am rapidly contaminated with certain defence mechanisms that I use on an unconscious level, and that I am only capable of identifying *à posteriori* after the work of elaboration.

Conversely, I have more difficulty identifying defence mechanisms and forms of mental functioning that are very different from my own. It may happen that I do not understand them easily, or I feel the need to defend myself (I get sleepy, lose my concentration, or look for many theoretical explanations).

Overall, there are probably certain personality structures that we understand better than others. This may be related to our own structure, or those of our parents, with whom we dealt with for so many years.

Another perspective is that familiarity can supplant similarity, probably when a strong emotional connection exists (de Waal, 1997; O'Connel, 1995; Temerlin et al., 1975). In this sense, the familiarity that is created during group analysis is extremely important. Being with a person three times a week, over many years (usually a minimum of six years), is extraordinary. It is quite unlikely that we can have this level of familiarity with our friends. Obviously, in a weekly session of group psychotherapy, this level of familiarity cannot be reached and, as such, in this case similarity is perhaps the most important factor achieved in the empathy.

The effects of past experience can also be explained by the same principles of familiarity and similarity. If the subject needs to accede to the representations of a certain internal state, to be able to understand the object's situation, he/she will be all the more empathic if he/she has already experienced these situations or these states, to some extent.

From the foregoing, it may be inferred that the empathic capacities of the group analyst will be directly influenced by the degree of similarity, familiarity and past experience that he/she shares with the members. This elucidates the subjective experience that we have with certain patients, for whom we have greater empathy, and amongst those we are able to understand the ones that are more like us, or those that had similar life experiences, far better.

Finally, the learning factor seems to be extremely important. It is the variable that is generally connected to the cognitive dimension of empathy, and the one that the analyst can and should perfect. I believe that this exercise can be achieved through the following aspects:

Personal Analysis

Only by going through this process can we learn the empathic capacities in practice. Just as babies learn the capacity of reverie, and the alpha function with their mothers, and one day put it into practice with their own children, the future analysts learn analytic empathy with their own analysts.

Life Experiences

The analyst, completely enclosed in his/her consulting room, limits his/her relational pattern to the situation in which he/she possesses the ascendancy of the analyst, an 'as if' father/mother figure, who does not relate to his/her peers. This, without a doubt, limits his/her empathic capacity to one very special situation. I believe that it is important for him/her to continue developing his relational and empathic capacities in the real world, integrated in restricted or expanded groups – family, friends, his/her professional group or other social groups. If this does not occur, his/her life experiences cease to exist, and he/she will not be able to understand his/her patients' experiences effectively since, in this case, he/she would only have access to distant memories.

Theoretical Formation

Theoretical knowledge is essential in the moments in which the regulatory mechanisms are being used that enable the analyst to assume the other's perspective. It is the more elaborate and specialized dimension of the cognitive level of empathy. It is used in a non-automatic way, and is voluntary and conscious. Theoretical knowledge enables the explanation of the patient's emotions and sentiments; in other words, it allows the communication of the empathic understanding that Kohut conceptualized as being a therapeutic agent.

Supervision

Supervision is the practical complement of the theoretical training. It is the ideal 'setting' to complement theoretical knowledge, but also allows the analysis of some of our blind spots. During

supervision, counter-transferential aspects and empathic flaws that are not conscious to the analyst may be discovered.

Learning From The Experience Of Being An Analyst

We cannot expect our analyst, our supervisor and the literature to do all the work to discover our faults. There is a very important amount of personal work to be done, based on learning with experience. The maintained capacity of empathic investigation enables us to make important clinical revelations concerning the type of patients and pathologies that reach us. In other words, our own clinical investigation provides us with the data with which we can deduce new theoretical conceptualizations.

References

Blakemore, S.J. and Decety, J. (2001) 'From the Perception of Action to the Understanding of Intention', *Nature Reviews Neuroscience*, 2: 561–67.

Clark, S., Tremblay, F. and St.-Marie, D. (2003) 'Differential Modulation of the Corticospinal Excitability during Observation, Mental Imagery and Imitation of and Actions', *Neuropsichologia* 42: 105–12.

de Waal, F.B.M. (1997) *Bonobo: The Forgotten Ape*. London and Berkeley, CA: University of California Press.

Decety, J., Chaminade, T., Grèzes, J. and Meltzoff, A.N. (2002) 'A PET (Positron Emission Tomography) Exploration of the Neural Mechanisms Involved in Reciprocal Imitation', *Neuroimage* 15: 265–72.

Decety, J., Grèzes, J., Costes, N., Perani, D., Jeannerod, M., Procyk, E., Grassi, F. and Fazio, F. (1997) 'Brain Activity during Observation of Action: Influence of Action Content and Subject's Strategy', *Brain* 120: 1763–77.

Decety, J. and Jackson, P. (2004) 'The Functional Architecture of Human Empathy', *Behavioural and Cognitive Neurosciences Reviews* 3(2): 71–100.

Decety, J., Perani, D., Jeannerod, M., Bettinardi,V., Woods, R. Mazziotta, J.C., Tadary, B. and Fazio, F. (1994) 'Mapping Motor Representations with Positron Emission Tomography', *Nature* 371: 600–602.

Fadiga, L., Fogassi, L., Pavesi, G. and Rizzolati, G. (1995) 'Motor Facilitation during Action Observation: A Magnetic Stimulation Study', *Journal of Neurophysiology* 73: 2608–11.

Fuster, J.M. (1989) *The Pre-Frontal Cortex*. New York: Raven.

Grèzes, J. and Decety, J. (2001) 'Functional Anatomy of Execution, Mental Simulation, Observation, and Verb Generation of Actions: A Meta-analysis', *Human Brain Mapping* 12: 1–19.

Iacoboni, M., Woods, R.P., Brass, M. Bekkering, H., Mazziotta, J.C. and Rizzolatti, G. (1999) 'Cortical Mechanisms of Human Imitation', *Science* 286: 2526–2528.

Ickes, W. (2003) *Everyday Mind Reading*. New York: Prometheus.

[illegible], J. P., Gallup, G.G. and Falk, D. (2003) *The Face in the Mirror: The Search for the Origins of the Consciousness*. New York: HarperCollins.

[illegible], B., Lin, S. and Barr, D.J.(2003) 'Limits on Theory of Mind in Adults', *Cognition* 89: 25–41.

[illegible], G. and Hush, R. (2003) 'Action Identity: Evidence from Self Recognition, Prediction and Coordination', *Consciousness and Cognition* 12: 620–32.

Kohut, H. (1959) 'Introspection, Empathy and Psychoanalysis: An Examination of the Relationship between Mode of Observation and Theory', in P.H. Ornstein (ed.), *The Search for the Self* (Vol. 1, pp. 205–232). New York: International Universities Press.

Kohut, H. (1984) *How Does Analysis Cure?* Chicago, IL.: University of Chicago Press.

Maclean, D.S. (1997) 'Empathy: Heinz Kohut's Contribution', in *Empathy Reconsidered: New Directions in Psychotherapy*, Arthur C. Bohart and Leslie S. Greenberg (eds), pp. 245–64. Washington, DC: American Psychological Association.

Nava, A.S. (2000) 'Grupanálise em Carne Viva', *Revista Portuguesa de Grupanálise* 2: 59–91.

Nava, A.S. (2003) *O Cérebro Apanhado Em Flagrante*. Lisboa: Climepsi.

Neto, I. (2002) 'To See and be Seen: "The Added Value" of Group Analysis'. Unpublished paper presented at the 12th European Symposium in Group Analysis, Bologna.

O'Connel, S.M. (1995) 'Empathy in Chimpanzees: Evidence for Theory of Mind?' *Primates* 36: 397–410.

Perner, J. and Lang, B. (1999) 'Development of Theory of Mind and Executive Control', *Trends in Cognitive Science* 3: 337–44.

Preston, S.D. and de Waal, F.B.M. (2002) 'Empathy: Its Ultimate and Proximate Bases', *Behavioural and Brain Sciences* 25: 1–72.

Prinz, W. (1997) 'Perception and Action Planning', *European Journal of Cognitive Psychology* 9: 129–54.

Reddy,V. (2003) 'On Being the Object of Attention: Implications for Self-Other Consciousness', *Trends in Cognitive Science* 7: 397–402.

Rizzolatti, G., Fogassi, L. and Gallese, V. (2001) 'Neurophysiologic Mechanisms Underlying the Understanding and Imitation of Action', *Nature Review Neuroscience* 2: 661–70.

Rochat, P. and Striano, T.(2000) 'Perceived Self in Infancy', *Infant Behaviour and Development* 25: 513–30.

Royzman, E.B., Cassidy, K.W. and Baron, J. (2003) 'I Know You Know: Epistemic Egocentrism in Children and Adults', *Review of General Psychology* 7: 38–65.

Ruby, P. and Decety, J. (2001) 'Effect of Subjective Perspective Taking during Simulation of Action: A PET (Positron Emission Tomography) Investigation of Agency', *Nature Neuroscience* 4: 546–50.

Tamm, L., Menon,V. and Reiss, A.L. (2002) 'Maturation of Brain Function Associated with Response Inhibition', *Journal of American Children and Adolescent Psychiatry* 41: 1231–38.

Temerlin, M.K. (1975) *Lucy: Growing up Human*. Palo Alto, CA: Science and Behaviour Books.