

IDENTIFICATION: PSYCHOANALYTIC AND BIOLOGICAL  
PERSPECTIVES<sup>1</sup>

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ABSTRACT

In the recent attempt to bring psychoanalysis into contact and shared understanding with other sciences, there have been a number of works explicating neural science concepts and phenomena – affect, memory, consciousness - for the psychoanalyst. These have enriched our field and helped to build a scientific foundation for our theory and practice. The present paper tries to accomplish another related task, namely to take a psychoanalytic concept and see how it relates to other sciences.

Identification has a long history in psychoanalytic theory. We see it in parent-child interactions, in teaching and mentoring relationships, and in psychoanalysis and therapy. We may find information about this phenomenon by looking into other sciences. In neuro-psychology and evolutionary biology, we may gain some information about the phylogenetic precursors of identification. In genetics and infant research we may gain insight into individual identification processes. And in

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neuroscience, particularly the recent studies of *mirror neurons*, we may learn something about the biological mechanisms of imitation and the relationship of imitation to identification. This paper will present findings from these other sciences, hoping to add to our understanding of the phenomenon, and to see how the biological aspects inform us about this major concept in psychoanalytic theory.

## INTRODUCTION

Now that psychoanalysis and cognitive science are beginning to speak to each other, there is a strong wish to find ideas and concepts that will bridge between the two worlds, and allow for conversation and mutual exploration and research. Since psychoanalysis has been traveling its isolated path, increasingly distant from the behavioral and mind sciences, several historical trends in the evolution of psychological constructs have emerged: One is that the same *term* has been used in both realms but in different ways. Examples might be *memory*, not carefully defined or explored in psychoanalysis, but increasingly differentiated into diverse types in cognitive psychology. Or, the concept of the *unconscious*: analysts tend to refer to the *dynamic unconscious*, while other sciences may study the *cognitive unconscious*, unaware of implications of conflict and repression.

Another trend is that a *concept* has developed in one field and not in another. Phenomena such as *conditioning*, *procedural memory* and *priming* have been the objects of intense research elsewhere, but are only now creeping into the analyst's vocabulary. In the other direction the same is true in that some of our concepts, such as *transference* and *internalization*, are unfamiliar, and uninteresting, to non-psychoanalysts. Currently bridges between the two areas are being built. On one hand books such as Pally (2000) and Solms and Turnbull (2002) have presented cognitive science concepts to psychoanalysts. On another, a great deal of research has been done of interest to both sides, for instance the burgeoning infant-observation research, the developments in attachment theories, and the psychological research into psychoanalytic concepts, such as that of Shevrin and his colleagues. (e.g. Shevrin et al, 1996)

A third project, which is only beginning, is that of taking major *psychoanalytic concepts* and connecting them to the outside scientific world, so that on one hand they may be better explained and defined scientifically, and on the other, that they be made intelligible and brought into the dialogue with cognitive scientists.

In this paper I hope to make a preliminary attempt to perform a piece of this third task with the concept of *identification*. First I will briefly review some of the psychoanalytic views on this phenomenon as a subtype of the more general concept, internalization. I will try looking at

some of the information coming from other disciplines that might elaborate our understanding of our concept. In doing this I will be mindful of the fact that when one discusses higher forms of mental function such as the self, internalization, memory, empathy, and consciousness, it is hard to separate one and omit discussion of the others. Each term explains much about the other terms, but it would be a very large book that would try to deal with them all. For example, identification plays a major part in the development of the ego, the self, and object relations. Identification, as well as introjection, is important in the establishment of moral values, the superego. Empathy and identification are closely entwined. These neighboring entities will be mentioned but not fully explored.

In a nutshell my argument is this. We analysts have elaborated several concepts under the rubric of internalization, based on many years of experience with our patients. We have described the phenomena more fully and richly than any other discipline. We may now be in a position to add information about the evolutionary and biological roots of these phenomena. I will argue that the evolution of primates led to a high level of imitative ability in parallel with cortical expansion, which allowed for new forms of memory. The neurobiologist's discovery of the mirror neuron revealed a property of brain by which it perceives by virtually enacting others' actions. In infant development a dyadic interchange takes place involving imitations and attunements, so that the infant takes on

many characteristics of the parent in the process of internalizing behavior, affects, and communicative skills including language. We can speculate that there has been an evolution leading to human identification that would involve (1) the evolution of multiple memory systems, in particular procedural memory, (2) mirror neurons developing in mammals, (3) imitation evolving in mammals and increasing in importance in primates, (4) the prolonged plasticity of human childhood allowing for imitation and attunement, and (5) most recently the advance of mentalism or theory of mind possibly exclusively in humans. The evolutionary push to imitation and internalization may have social roots beyond the value to the individual, particularly in the transfer of culture.

Although I will briefly review some of the psychoanalytic ideas on the subject, mainly in order to introduce the concept, the aim of the paper is to bring in views from other sciences that might enrich our understanding of the phenomenon. There are many different biological disciplines, and their fields of interest often overlap. I will chose from among them a few that have produced information on the topics I want to use in the discussion. I will first draw from cognitive psychology some information on the different types of memory, as well as some data and opinion about types of learning, particularly *instruction*, *practice* and *conditioning*. In order to discuss another term important in the discussion, *imitation*, I will turn to the animal behaviorists who have been working

intensely with primates as well as other animals to understand imitation, and to differentiate it from other forms of learning. In bringing in information about imitation and attunement, now in human infants, I will look to some of the infant observation literature. I will briefly question what is the influence of genetics on the transmission of characteristics we often associate with identification, by introducing some information from genetic research. Finally, I will consult the neurobiologists who have advanced the idea of the *mirror neuron*. Although I am looking at several sciences in a brief and selective way, I hope to gather some findings that may come together to enlarge our view of the concept under discussion.

Most psychoanalytic discussions in this area, begin with the larger concept of internalization, and discuss identification within that context. (i.e. Schafer, 1968, Meissner, 1971) In order to make the topic manageable I will introduce identification under the larger rubric, but then will focus the discussion on identification alone.

## IDENTIFICATION AND INTERNALIZATION

In psychoanalytic thinking, the term internalization has a long and rich history. From Freud's use of the terms identification, introjection and incorporation to current use of these concepts, there has been a focus on the apparent fact that representations of objects and object relations, are stored in the mind, and that they exist not only as percepts or stored

images, but that they alter the person and structure the personality. For analysts the concept of internalization has a robust and almost unquestioned validity and usefulness in clinical work. When we see a person acting, often unconsciously, just like her mother or father, we have no hesitation in referring to identification with, or internalization of the parent.

However, in many areas of the world of cognitive science, the term internalization seems to have very little use. I have asked a couple of memory researchers about the term and they had never heard of it, and when it is explained to them, they find it mildly interesting but of no particular relevance to them. I have found this fact curious and disturbing. My point is that here is a useful and meaningful concept that analysts have been working with for about a century, and that the brain researchers have not taken into account and have not considered worthy of research. If we are to bring our concept into the wider world, it will be helpful if we can relate it to the language and research of the brain sciences. We may learn something about our concept and find it more scientifically validated, and the brain scientists may see our concept as potentially worthy of further investigation in their particular disciplines.

Let us focus in closer on our use of the concept of internalization. Schafer (1968) has given a classic and still useful set of definitions for most of the terms surrounding the concept. He describes a basic triad.

*Incorporation* involves a kind of fantasy of taking in the object in a way that resembles eating it. The fantasy is of taking in the whole object, which one may then identify with. *Introjection* is the taking in of the object as a kind of fantasy and retaining that object in a virtual inner space such that one can have a dialogue with it. This may more accurately be described as internalizing the object *relationship*, in the form of a virtual dyad. In the relationship mental space, the introject remains other; it may be a source of self-criticism, self-admiration, advice, warning, generally feeling like an internalized parent. Thus introjection is one of the central mechanisms for the internalization of moral values.

*Identification* is the modification of the self to resemble the other; with identification the object does not remain as an inner other.<sup>2</sup>

The history of the concepts has been much more complex than the above suggests. There have been other definitions of the terms. For instance Loewald (1973) saw identification as an early phenomenon, pre-individuation, so that the infant and parent are one. Subsequently the forms of internalization may be defensive in nature as attempts to repair the awareness of the loss of an object. Loewald and others have seen internalization as a taking in of regulatory mechanisms, which are at first provided to the infant from parents, and which later serve as internal

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<sup>2</sup> In the analytic tradition the three forms of internalization tend to be seen in a hierarchy, with one type replacing another in a linear progress. An alternative model is a parallel process where the three kinds of internalizing processes follow independent developmental lines, possibly based in different brain structures, each having particular functions.

regulators in an autonomous individual. Important to him is that identification is a primitive pre-differentiation state, which may persist into adulthood. In analysis a patient may start out in that state or regress to it. For Loewald internalization was a developmental end result, in which the self separates intrapsychically from the object to form an autonomous self. "In internalization it is a matter of transforming these relations into an internal, intrapsychic depersonalized relationship, thus increasing and enriching psychic structure: the identity with the object is renounced." (p. 15) Etchegoyen (1985), in his comprehensive review, speaks of primary and secondary identification, the former being a pre-differentiation phenomenon, the other being a taking-in of the other after the other has become a separate object.

Schafer himself radically reviewed the concepts in his paper, *Internalization: Process or Fantasy?* (1972). In his attempt to clarify analytic concepts using Action Language, he imposed a behaviorist scheme on our vocabulary, attempting to root out the many reifications of abstract concepts that infest our language. The various forms of internalization came under this knife in the attempt to get rid of the somewhat mystical or ghostly aspects we give to "introjects" and "identifications." He concluded that the only real entity that could be salvaged was the fact that people do *fantasize* that they have incorporated another person, or that they are speaking to an internalized other.

Although analysts still seem to use internalization concepts in this reified way, and sprinkle the terms liberally in their case reports, Schafer's attempt was useful in at least pushing us to try to clarify these complex concepts.

When we look at how the term is used we see there are two major subtypes. One might call incorporation and introjection "ingestive" or "interiorizing;" they involve the idea of taking another personal object inside some kind of space. This differs from identification, which has to do more with imitation, taking on the characteristics of the other. We might say that one is a fantasy of taking in the body of the other, while the other is taking on the form or the identity of the other.

## IDENTIFICATION

Now to bring the focus onto the phenomenon of identification. This term also has many meanings, some of them confusing and mutually contradictory. Many analysts see identification as the process of changing the self to resemble the other, consciously or non-consciously. This may be for a child identifying with parents, for friends or spouses identifying with each other, or patients identifying with analysts.

Identification also can be thought of as a process and as a result. (Hartman & Loewenstein, 1962) The *process* implies the verb "to identify," and that itself has two meanings. One involves imitation,

conscious and unconscious, as well as more practical aspects of learning procedures and patterns of behavior that resemble the other. One may identify also with the goals and values of the other, and take one's life in the direction of achieving those goals. A second meaning of the term is as an influence on perception; it is apprehension of the other as similar to oneself. Analysts sometimes use the term in the sense of thinking of oneself as like the other, often inappropriately so, as in "pathological identification," or "over-identification" - thinking one is more like the other, or that the other is more like one, than one really is.

There are also important differences with respect to the nature of the *object* identified with. We think of identifying with beloved objects, certainly common in childhood and with lovers, mentors, leaders, and friends throughout life. There is also identification with the lost object, described by Freud, Bowlby and many others. This is usually seen as a defensive measure, a way of - in fantasy and imitative action - trying to reverse the loss. This seems to be a necessary step in the process of mourning. A third is identification with the aggressor. Anna Freud and others saw this in children of the holocaust. A classic paper by Emch (1944) posits that in some cases, where one or both parents are "unknowable," because of chaotic, violent, or unpredictable behavior, or prolonged absence, the child may imitate the most salient behaviors with the unconscious aim of providing some predictability in the child's

troubled life. Coates and Moore (1997) have written about this in abused children where the imitation and identification with the terrifying opposite-sex parent is so intense that it can lead to extreme identification resulting in gender identity change.

Now let us turn to other disciplines and see how some of their findings may help illuminate our topic.

## THE VIEW FROM COGNITIVE PSYCHOLOGY AND MEMORY RESEARCH

The branch of mind science that deals with mental phenomenology, derived from the clinical examination and psychometric testing of patients is usually referred to as cognitive psychology or neuro-psychology. This discipline took some of the first great steps towards the association of behavioral pathology and lesions of the brain. In so doing much of the brain was mapped out during the 19<sup>th</sup> and 20<sup>th</sup> centuries. With respect to neuro-psychological investigation and memory there is the classical example of the case of HM, in which the patient underwent surgery for the bilateral removal of his hippocampus and later revealed a severe amnesia. (Scoville & Milner, 1957) This led researchers to the association of the hippocampus and *episodic memory* for recent events, and the separation of this function from the learning of skills and habits, now referred to as *procedural memory*. Solms and Kaplan-Solms (2001) have recently made a

major contribution in this tradition in relating brain anatomy to higher mental functions of particular interest to psychoanalysis. Until recently this *clinico-pathological method* relied on autopsy studies to confirm the anatomical correlations with pathology. In recent years much of that work can be done using imaging technology.

The procedural subtype of memory may be an important aspect of the identification process, because it is habits and skills and behavior patterns that we imitate in taking on the characteristics of the other.

#### PROCEDURAL MEMORY

Procedural memory has come forward in recent years as one of the types that may be particularly relevant to psychoanalysis. Clyman (1991), in a by now classic paper, has described a kind of emotional procedural memory, that represents the emotional schemas developed in childhood, and which becomes a building block of transference in later life. This has shown promise of being a kind of bridge between memory research and the basic concepts of psychoanalysis. How are procedures learned?

We might consider that procedures are learned from several sources, which have been studied by neuro-psychology; let us look at some of the more important ones: *instruction, practice, conditioning and imitation.*

*Instruction.* Instruction may be a uniquely human phenomenon since most definitions of instruction involve language. This part of the process may itself be conscious, since it is partly verbal and often the result of a deliberate conscious wish to learn. Primatologists have studied chimpanzees to find evidence of actual instruction in the sense of the adult actively teaching an infant, and have found very little. A mother may facilitate the learning of nut-cracking by doing it in the presence of the infant, but there seems to be nothing like the human activity of deliberately showing and helping to learn. This fact goes along with the notion that as far as we know chimpanzees do not develop a theory mind as it is conceived by students of human development. In human teaching, the steps of a procedure may be spoken aloud and may be memorized in words. These words can guide behavior into channels where only practice will make perfect.

*Practice.* An important way to learn a procedure for humans is to start with the instructions and keep trying until one goes beyond them to a “feeling” that one has mastered it. This feeling of mastery, derived from getting the piano piece or the golf stroke just right, lies in the behavioral realm and is usually beyond words. As in the case of instruction, non-humans don’t seem to explicitly use practice to improve a skill, although they do “try and try again,” and such repetition may improve performance.

Less familiar to us as sources of procedural learning are *conditioning*, and *imitation*. The first is the *primary source of learning* in most animals. As we will discuss later, imitation has emerged as very important in higher primates. And as recent work has shown they are not always easy to distinguish from each other, with some workers holding that conditioning is the only form of learning in non-human species.

## CONDITIONING

I use this term to refer to the forms of learning that are “consequence contingent” - forms which rely on reward and punishment. Classical behavioral theory distinguished two major types of conditioning. One, made famous by Pavlov, is *respondent* or *classical* conditioning. In this form, two stimuli are paired such as food and a bell. Pavlov found that after some experience with dogs with such a pairing, the dog responded to the bell as well as to the food, with an expectant salivary response and other indications of expecting something to eat. The other form is operant conditioning in which the animal is “rewarded” by doing certain things. In the classical experiment a rat would tend to push a lever after finding by accident that after it pushed the lever, food would appear. Operant learning is thought to be important in much procedural learning.

The literature on imitation and conditioning is often confused because what looks like imitation in one person’s definition is actually

conditioning in another's. The difference between the two is quite important. Conditioning may be the earliest form of learning, available even to paramecia; imitation seems to be a recent achievement, some would say available only to humans. If we turn to the animal behaviorists we can gain more insight into this phenomenon.

#### THE VIEW FROM ANIMAL BEHAVIOR RESEARCH.

Another discipline that has contributed information relevant to our subject is the group of sciences of animal behavior, including evolutionary biology, physical anthropology, and primatology. From them a great deal has been learned about imitation.

#### IMITATION

Byrne's (Byrne & Russon, 1998) rigorous definition of imitation is the *learning of novel behaviors by way of observation*, in a process that can be differentiated from the complex set of other behavioral learning modes. Imitation itself is a complex phenomenon as yet not well understood. The process of copying would seem to be straightforward. In fact, we may see an imitation-like phenomenon in newborn infants, who stick out their tongues in apparent imitation of another person (Meltzoff, 1990). Children seem to learn much of what they do by this method, most obviously language. Smith (2001) points out that

the phenomenon is not limited to children. His description of the way residents in his class began to shuffle in their gait and tend to smoke pipes, in imitation of their charismatic mentor, is a striking example in adults.

#### APING IN APES

Franz DeWaal who runs the Yerkes Primate Center in Atlanta, has made intensive study of the higher cognitive abilities of apes. His recent book title, *The Ape and the Sushi Master* (2001), refers to the lore that an apprentice sushi master spends many years doing scullery work in the Master's kitchen before being allowed even to touch a knife. After all these years he is ceremoniously given a knife and is an expert, simply because he has been watching the master at work.

Curiously, deWaal (2001) uses the term "identification," but in not quite the same way as do analysts. In his usage, the term relates to the intense bond between one primate and another, or a non-human primate and a human. His concern is the nature and in fact the actuality of culture in monkeys and primates. Much of culture is passed on through generations by various forms of learning by imitation. He denotes this phenomenon using the acronym, BIOL – Bonding and Identification-based Observational Learning. He points out that, in the past, people have described apes as *merely* imitating, as though this is an inconsequential capacity. We now view it as a high level function. He says, "Think about

it: how does one get from watching another individual's actions to performing the same actions for the same purpose? Imitation requires that visual input is converted into motor output, telling the body to re-enact what the eyes saw." (deWaal, 2001; p.219) There are countless examples of complex imitation by primates, especially primates raised by humans. The imitation often has no obvious reward. Russon (1996, p. 166) describes an orangutan imitating the entire process of brushing teeth, using a toothbrush to mimic this human activity. Another example is represented in a photograph taken by Robert Yerkes in 1923; in the picture we see a young bonobo, Prince Chim, sitting with a book in hand looking convincingly as though he is reading intently. ( in deWaal, 2001, p. 222) Some imitations, such as those which yield food from cracked nuts, or from a refrigerator, yield obvious rewards. But many, such as the "teeth-brushing" and the "reading" yield no apparent immediate benefits.

DeWaal's view is that in primates a *primary drive to imitate* is at work, its reward being the sense of conformity in a group. In a relatively strict view of imitation it is learning new behavior - not just stringing together known behaviors - by copying a model, a parent or a peer, *the goal being secondary in importance to the act of copying itself*. Implied in this is an emotional bond between the mentor and pupil, such that the pupil wishes to imitate the mentor in order to be like that person, or to enhance the bond with that person.

His version of the evolutionary development leading to human culture holds that early monkeys and later primates evolved imitative skills, which have led to (non in-born) cultural advances. Examples are the learning to wash sand-covered potatoes in Japanese macaques, and the cracking of very hard nuts by chimpanzees.<sup>3</sup>

When primates are raised by humans their mimicry abilities are given full reign because now they have much more complex beings to copy. Thus, human-raised chimpanzees and bonobos have shown advances in communication and language skill that are astounding. There are now two interpretations of this phenomenon. Tomasello (1999) who has raised chimpanzees and written about the differences between them and humans with respect to intentionality and theory of mind, views the imitative capacity as one that is engendered by being raised in human company. In other words a new capacity has emerged in the new environment. DeWaal (2001) disagrees and feels that imitation begins with early primates and occurs in the wild, and expands when they are raised by humans because, in their earliest most plastic phase, they form intense attachments to humans. This motivates them to use their already extant imitative ability

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<sup>3</sup> There is a large controversy, beyond the scope of this paper, concerning the status of imitation as a form of learning separable from behavioral conditioning. Byrne & Russon (1998) explicate the arguments against this differentiation. Many imitative behaviors can be explained as stimulus-response learning. DeWaal's dissenting view is that an imitated behavior is not driven by the particular reward of that behavior, i.e. as when one learns to shell a nut, one gets to eat the nut. However, a behaviorist might argue that imitation itself is a form of behavior, and the *operant reward* is the enhancement of the social bond.

to mimic human culture up to their physical and neurological potential capacities.<sup>4</sup>

What has become clear is that this *plastic* phase really is plastic, and allows for impressive environmental influence. Apes raised in the wild do show a culture learned from their fellows. But put them with humans, and they take impressive further steps in cognitive and cultural abilities. The “poster boy” of this enterprise is Kanzi, a male bonobo raised and taught by Sue Savage-Rumbaugh at Georgia State University. (Savage-Rumbaugh & Lewis, 1994; Shanker & King, 2002). The surprising thing about this story was that Savage-Rumbaugh had for some time been trying to teach an adult female, Kanzi’s adoptive mother, to learn and use linguistic symbols. The mother did very poorly, and the teaching was finally brought to an end. Only then was it discovered that the infant Kanzi, who had been present during all the lessons, suddenly demonstrated that he had learned most of what was being taught. Now Kanzi may be the world’s leading ape linguist.

## MINDING IN HUMANS

Michael Tomasello (1999) has written an important book based on research in both primates and human children, describing a great deal of

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<sup>4</sup> Imitation seems to have evolved in the mammal line, up to its high point in humans. Other species have also been studied for their imitative capacities. Impressive are those in birds (Moore, 1996; West et al, 2003), and cetaceans, (Whitehead, 2003).

work showing the similarities and differences in cognitive abilities and social skills at the two evolutionary levels. His central argument is that in the first year of life the human infant develops a unique cognitive ability, namely an ability to sense the intentionality of another person, to sense that the other person has goals and a causal will like one's own. In his view, this revolution, occurring at about nine months of age, does not happen in any other primate.

The key observation with children in the end of the first year is that they find the need to share experience. They point to objects to draw them to another's attention, they hold things up for show, they bring others to an object to see it, and they demonstrate actions to show others. This inherently social capacity, lays the groundwork for much of the evolution the human is heir to. One important ability is the understanding of causality, which Tomasello attributes to the extension of the sense of the other's intentionality to explain forces and causes in the inanimate world. This would be expected to enhance the ability to make and use tools and develop technology.

The nine-month-old's appreciation of another's intentionality is part of a series in the ontology of interpersonal understanding. He describes three levels. The first is in young infants: understanding others as "animate beings," appreciating behavior and even goal-like direction of motion. This capacity is present in all primates and many other mammals.

The second is the appreciation of intentionality in the nine-month-old. The third occurs at about four years of age when others are understood as “mental agents.” With this third stage the child not only understands the other as having an interior self and will, but also begins to understand what the other may know or be thinking.

With respect to imitation, there is something that should be mentioned about evolutionary “advance.” Deacon (1997) has made the point that in order to learn to symbolize, hominid species may have had to *lose* some of their talent for operant learning. Trial and error learning is a high art among other primates. He feels that in order to move beyond the immediate reward system, and into symbols, we had to become worse at operant learning; we had to be able to distance ourselves from immediate contingency or consequences of behavior in order to let the symbolic world take shape. This is a hard concept to grasp. But an experiment by Tomasello (1999) and colleagues may show an apposite point, in that all human capacities may not be simply bigger and better. In an experiment comparing the learning of certain tasks by chimpanzees and young children, tasks that *required operant learning more than imitation* were learned *faster* by the apes. Human children tended to use somewhat slavish imitation, while the chimps were quicker to modify technique to

achieve certain goals.<sup>5</sup> This supports the argument that imitation serves a social purpose. It also suggests that the new skill might not be in itself, in the short run, more adaptive for the individual; and, the finding may in fact clarify Deacon's point. A more accurate way of saying this might be: as we became more social, social skills, including imitation, became increasingly important - relative to operant learning - for survival in the group, and indeed for the survival *of* the group. The evolving brain then enhanced imitative skills relative to, or possibly at the expense of, operant-associative learning skills. Thus as human cultures developed we might expect that *imitation of rituals*, in themselves not beneficial to the individual, would be supported because they enhance the group's purposes, and its communal identity.

## INFANT OBSERVATION

At this point we have taken an evolutionary approach up to the development of the human infant. This brings us to the science of infant observation, wherein the ontogeny of identification may be observed. That

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<sup>5</sup> Tomasello describes the experiment: The experimenters “ presented chimpanzees and two-year-old human children with a rake-like tool and an out-of-reach object. The tool could be used in either of two ways leading to the same result of obtaining the object. For each species one group of subjects observed a demonstrator employ one method of tool use (less efficient) and another group of subjects observed the other method of tool use (more efficient). The result was that whereas human children in general copied the method of the demonstrator in each of the two observation condition (imitative learning), chimpanzees did lots of different things to obtain the object, and these were of the same type no matter which demonstration they observed (emulation learning, i.e. they tried different things more with an eye to achieving the goal, and less to imitating the demonstrator). The interesting point is that many children insisted on this reproduction of the adult behavior even in the case of the less efficient method – leading to less successful performance than the chimpanzees in this condition.” (p. 29-30)

body of information is too vast for this paper, and I will only point to some findings that will most likely be relevant to a more complete description of the process.

The phenomena of imitation in humans have been intensely studied by the recent generation of infant observers, including Stern (1985), Beebe and Lachman (1988,1994), and others. One impressive phenomenon is the interaction between mother and infant under the concept of attunement. These researchers have described in detail the kinds of imitative and reactive, contingent interactions that go on all day in the life of an infant. There are imitations particularly of rhythms, of expressions, of sounds in a process of turn-taking that seems a prototype for later conversation and empathic intercourse. This is one of several aspects of human infancy that seems not to be shared with other mammals. One quality of it is its multi-modality, so that a rhythm may be manifested by a rattle in the baby and hand-clapping or body movements in the mother. The process seems to include practice in integrating multiple sensory modes as well as internalizing aspects of the dyadic process.

However, as we learn more about the early infancy experience from the infant observation researchers, we have to deal with a kind of phenomenon different from simple imitation. With Stern's attunement experience there is a trading back and forth of different sensory-modal expressions, which seem to set up an integrated inter-modal experience, leading to results that would seem to be internalization at a very fundamental

level. It seems that the infant is being introduced to human experience itself, to the rudiments of taking in the world in a complex multi-modal way, apparently different from the upbringing of other primates. This occurs in a creature that develops into a complex social, symbolic, linguistic being orders of magnitude beyond the pongids.

This interactive biofeedback process must be the first form of internalization in the baby's life. It is an exchange of signs, whose "meanings" develop in the very process of exchanging them. Several workers have described the result of these interactions as a kind of internalization. Bowlby used the term "Internal working models," mental entities representing the dyad as an internal set of expectations and procedures. Stern used a similar concept, the "RIG" or "representation of interactions that have been generalized."

## THE EFFECTS OF THE GENES

Now let's look to an account from the point of view the science of genetics and the inter-generational transfer of traits and behavior patterns. There is considerable research showing the immense influence of the genes. Biological science seems to go through phases wherein the gene becomes all-important. Fonagy (2002) points out that the pendulum has recently swung far in this direction. One argument from this perspective is that one reason children appear to internalize and identify with parents is that they share similar genes. In this way of thinking, the fact that an abused child grows up to be an abusing parent indicates mostly that that child inherited major traits genetically from the parent. There are also

many studies of twins that show uncanny similarities in adult twins who were raised apart in very different circumstances. Does this mean that all this discussion of identification is currently irrelevant, since this mechanism might account for only a tiny, possibly insignificant, portion of what is passed down from the parents?

It does complicate the picture, since twins raised apart also do have differences. The picture may be partly clarified if we see that certain genetic configurations seem to have effects on the identification process itself. As Kandel (1999) has argued, experience can alter gene expression. For example, a recent New Zealand study (Caspi, 2002) showed that in a prospectively observed group, followed from childhood to adulthood, one genetic configuration predicted greater similarity in parents and offspring. A sub-group of the children carried a gene coding for a monoamine oxidase that was a variant from the rest (MAOA). Of the whole group, some of the children were seriously physically abused by their parents. Either the nature theory or the nurture theory could predict that those children would become violent abusers. However, it turned out that those with the MAOA variant who were abused were more likely to become abusers, while those who did not have it were not more likely to show that behavior. And those with the variant gene who grew up in non-violent homes were *not* more prone to violence. Here is a complex interaction between gene and environment that seems to influence the tendency to

identify. In other words it may be that some people identify with certain traits more than others, depending on genetic make-up.

## NEUROBIOLOGY AND MIRROR NEURONS

Let us now turn to see what we can learn from another science about internalization, the fertile field of neurobiology. A new viewpoint on imitative learning and some other types of motor learning, including language, makes use of the recently described phenomenon of mirror neurons.<sup>6</sup> The work of Rizzolatti and others has demonstrated this entity in monkeys. (Rizzolatti, et al, 1996; Gallese & Goldman, 1998) A monkey, in their experiment, wears an array of microelectrodes that record the activation of individual neurons in the cortex. When the monkey picks up a morsel of food and puts it in its mouth, a characteristic read-out appears, one aspect of which is a recognizable neuronal activity in the pre-motor cortex. The pre-motor cortex has been known for years to be where co-coordinated actions are generated, in contrast to the motor cortex, which controls individual muscle contractions. Therefore this finding was no surprise. However, it was discovered almost accidentally in one experiment, that when the resting, motionless monkey *sees* an

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6. This discovery has had a big impact in neuro-biology circles. V. S. Ramachandran has declared, "I predict that mirror neurons will do for psychology what DNA did for biology: they will provide a unifying framework and help explain a host of mental abilities that have hitherto remained mysterious and inaccessible to experiments." (Ramachandran, 2000, p.5)

experimenter do the same thing, namely pick up a food morsel and put it in his or her mouth, the *same* cortical read-out occurs in the monkey. In other words, in the experience of viewing a motor event of another, there seems to be a virtual pre-motor-cortical event in the viewer. The same cells fire that would fire had the observer performed the same action.

The phenomenon of the mirror neuron may be less surprising than it at first appears. After all we have to have some way to recognize actions just as we need to recognize objects. When we recognize an object we use our primary sensory cortex to form an iconic representation of the sense datum. For instance when one sees a square, there is first a square outlined in activated neurons on the retina, and then again there is a retinotopic, square-shaped activation in the visual cortex. Eventually a complex neuronal pattern is recognized as an object, say a hammer or a squirrel, by way of the temporal cortex. But how do we recognize an *action*? There are cells in the visual cortex that represent motion. However, the representation of an action, such as putting food in your mouth, is much more than motion. It is a temporal sequence, with objects, actors and purposes. Thus, the activity of the mirror neurons is part of the process of *perception*. The only way we can recognize an action is to play it out in the brain. This takes us back to Piaget for whom the sensori-motor realm is the basis of perception and representation. (Piaget and Inhelder, 1971) It also reminds us of the work by Pulvermuller (1999) that

suggests that the neurological activation required to produce a verb, an action word, like “walk” or “climb,” in language, includes the pre-motor cortex. In other words a concept of a motor act needs to include a pre-motor activation.<sup>7</sup> So, in order to perceive an action, and in order to symbolize or speak of an action, we draw in the frontal, motor part of the brain. An *action* is a holistic or integrated concept of a piece of behavior; this may be at the same level of complexity as the concept of an *object*.

In pursuit of the argument that an *action* is an important biological concept, these researchers have noted that for mirror neurons to fire during the perception of an action, it must be a recognized action with a beginning and ending, and possibly with a purpose. As with an object it may be that, for this kind of recognition, it must have been seen before. In the experimental situation with the monkey, if the other simply lifts and lowers a hand with no apparent purpose, the neuronal mirror reaction will not occur. Similarly, when the person picks up a nut with a pair of pliers for the first time, that too will not be recognized. After several such events, the monkey will have a mirror- neuron response to the action with the pliers.

Recent research has fleshed out the mirroring function in dramatic and useful ways. After much work on the macaque motor neuron mirroring

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<sup>7</sup> Why does this activation not lead to the same *action* in the observer? There must be some inhibition of action that may well be learned and that has not yet been opened to research. In patients with echopraxia, it is possible that this inhibitory function has not been learned, or has been lost because of organic brain damage..

it became natural to ask if other phenomena are mirrored in a similar way. A number of researchers into the cognitive and neural science of social behavior have been teasing out some of the details. (Carr et al, 2003; Decety & Chaminade, 2003; Gallese et al, 2004; Leslie et al, 2004) Iacoboni (2003), in a detailed paper on the subject has described a “minimal architecture for imitation.” This includes areas in the temporal, parietal and frontal lobes; it is a kind of circuit that “codes” for three components: the perception of another’s action, the motor specification for the action to be imitated, and the goal of that action.

Another large issue that is biologically closely related to identification is *empathy*. Recently emerging from this research is the finding that the appreciation of *affects* functions in a similar way. Imaging studies show that certain areas are stimulated and activated when one perceives the affect of another. In simply observing another’s emotional state, areas are activated, the same areas that light up when one has that emotion oneself.<sup>8</sup>

What is striking is that perception has more to it than iconic representation. Perception is “being there.” Especially with interpersonal perception and recognition, one does not simply perceive, one *becomes*. In this model the visible actions and expressions of the other seem to some

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<sup>8</sup>The theory has grown that deficits in these mirroring functions are an important part of the autistic syndrome, in which the mirroring system does not function, rendering the person unable to understand or empathize with the other. (Williams et al, 2001)

extent *invasive* and *controlling*. One replicates or simulates the external world internally, and only in this way can one understand.

## THE PERCEPTION-ACTION MODEL

In the psychological theory of the past century there have been several theories of perception. There is no room to review these theories. But it should be noted that the findings described above tend to support a perception-action model. In an extensive review article presenting a theory of empathy, Preston and de Waal (2002) describe the model. "According to the perception-action hypothesis, perception of a behavior in another automatically activates ones own representations of the behavior, and output from this shared representation automatically proceeds to motor areas of the brain where responses are prepared and executed." An early version of this theory was proposed by Theodore Lipps, who applied it to perception of both action and emotion. The theory was pushed aside during the days of behaviorism and cognitivism, but now seems to be gaining respectability derived from some of the recent findings described above. In turn, the model encourages the thinking of interpersonal theorists. The dramatic import lets us focus on the permeability of individuals. What I perceive makes automatic and involuntary changes in my brain, in which I simulate what I am perceiving. The most dramatic form of simulation occurs when I experience the affect of the other, because of automatic mirroring of the other's expressions. This model is particularly apt for any transfer of qualities from one to another. Such transfers occur in emotional contagion, empathy, identification and imitation.

## SUMMARY AND SOME POSSIBILITIES

In our brief look at other sciences, what have we gleaned? From the *cognitive psychologists* we have a differentiated view of memory and its subtypes. We can see where identification might fit into this. This may give us a perspective on identification as memory. In the future there may be new information about brain structures that are centrally involved in this function.

From the *animal researchers* we have evidence of evolutionary precursors to identification, particularly the emergence of imitation as a skill in higher primates, leading to its pre-eminent role in *Homo sapiens*, possibly contributing both to identification and to the evolution of human culture.

The *infant observers* have pursued imitation, along with the interactions of mirroring, attunement and attachment phenomena, all of which seem to contribute to identification. They have also, in company with some of the primatologists, developed the notion of *theory of mind*, and its stages of development. Fonagy, Target, Gergely and others have envisioned a staged scheme in children, similar and more detailed than Tomasello's. (Fonagy, et al, 2002; Gergely & Watson, 1999)

Recently the *neurobiologists* have discovered the mirror neuron, which has contributed to a revolution in our thinking about perception and

the virtual recreation of the external world in the brain. In addition, the mirror neuron may play an as yet unclear role in the evolution of the capacity to imitate, and therefore in the capacity to identify.

At this point it is too early to put these various scientific inputs together into a coherent theory. I hope that the project of this paper, bringing these strands together in one train of thought, might in time lead to new models, and to hypotheses as to their possible integration in a future theory.

Identification occurs as the self takes on characteristics of the other, by way of emulation or imitation. True imitation involves an accurate motor or thought program that copies the other. Mirror neurons may be involved since they are probably involved in the perception and understanding of the other's behavior. They may have evolved as a brain mechanism for the recognition of actions, in a complex sense including the goals and intention of the actor. This could have been a building block towards intentionality, identification and theory of mind.

The novel phenomenon in human primates is the sense of the dyad and the relationship within it. This is a precursor to the appreciation of the other as an intentional and representational mental agent. During the same period of evolution, *Homo sapiens* became the *symbolic species*. (Deacon, 1997; Olds, 2000, 2002) This meant that this whole process involving imitation and the passing down of culture, seen in primitive

form in the pongids, exploded in complexity when new levels of semiotic capacity including language became possible. Also during the same evolutionary era, there developed human consciousness as we know it. It is difficult to separate individual entities from this phalanx of human co-evolved capacities – which includes imitation, identification, causality, language, sociality, and consciousness.

Identification then is the result of a group of functions operating in a complex system. In the process of phylogeny these functions have co-evolved in dynamic relationships with each other. In the individual's ontogeny the same is true; the genetic base and constitutional givens, the behavioral learning environment, the personalities of the parents, chance events, the tendency to imitate, all collaborate in a not quite predictable way.<sup>9</sup>

The evolution of the human function of identification seems to have required (1) several kinds of learning, particularly the procedural; (2) mirror neurons contributing possibly both to the capacity to imitate, but also to understand another's actions and develop a theory of mind; (3) the ability and the drive to imitate, in humans providing capacities to develop a theory of mind, to identify, and to transmit culture. Among the primates,

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<sup>9</sup> This is an example of complex system development, in which so many phenomena are evolving at the same time that although causality is maintained, predictability is not. Attempts to understand such complexity have been made by dynamic systems theorists, some of whom have written for a psychoanalytic audience: (Galatzer-Levy, 1985, 2002, 2003; Harris, 2004; Palombo, 1999; Piers ();Pincus et al, 2003;

as the period of infantile plasticity increased in length, the opportunities increased for the ontogeny of identification, through imitation and attunement. In parallel with the capacities for imitation and attunement, grew the ego capacities allowing for the development of mentalism and the understanding of the other as a causal, intentional and representational being. It is not clear yet how theory of mind and identification emerged together. They may require each other. One may need both the capacity to imitate and the capacity to understand the mind of the other, in order to identify with the other. Research into psychopathology, particularly that of autism may shed light on this question. It seems likely that imitation, attunement, and theory of mind, co-evolved with identification, but how they interacted in this process is still far from understood.

## SOME IMPLICATIONS FOR PSYCHOANALYSIS

What does all this do for the psychoanalyst? Our discipline has limned out the concept of identification, independently of neighboring disciplines, finding it useful in understanding child and adult development, as well as the changes that take place in clinical psychoanalysis. In our developmental theories we have found identification a very useful concept. Most of this essay has tried to trace out some of the components of an identification process that leads to the maturation of the individual. In our theorizing and in our thinking about the development of individual patients, it seems useful to understand the ways in which traits, patterns and behaviors are passed through the generations.

In our clinical theory, we have long held that the analysand identifies with the analyzing function, and adopts certain new behaviors having to do with thinking rather than acting, introspecting rather than externalizing, questioning what is said, looking for associations and symbolic meanings, becoming more aware of subjective feelings, and seeking evidence of transference and even of the analyst's counter-transference. Imitation and conditioning would seem both to play a part. When the patient shows instances of introspection and self-reflection there is, often a rewarding word or other encouraging sound from behind

the couch. Papers have been written about the operant control in the analytic situation. (Schwartz, 1988) But even for the patient to adopt these behaviors there must be the *ability to imitate* the analyst. It is frequently noted that patient and therapist in a vis a vis situation often find themselves in mirroring postures. With some patients this occurs more often than in others; one could speculate that this would be evidence of a more intense, positive or intimate relationship. But one could also imagine that this mirroring could be defensive. I am not aware that this has been researched. On the couch the vis a vis is mostly absent, giving much less opportunity for visually mediated imitation. In fact there we might expect to see more operant conditioning (responding to reward) compared with imitation. However, there are more abstract kinds of imitation, largely of thinking processes, problem-solving habits, and even theoretical biases. There is the lore that patients eventually justify their analyst's theory, and even that they produce dreams most relevant to that theory.

Another common form of internalization in the analytic situation is the introjection of the analyst so that there are inner dialogues between patient and analyst. In these the analyst may be offering advice, criticism, support or argument. The analyst may appear in imagination as an approving or disapproving presence. There is a growing and promising research thrust into the nature of patients' representations of their

therapists. (Orlinsky & Geller, 1993a, 1993b). In this work a number of questionnaires have been developed to elaborate the ways in which patients bring their therapists to mind between sessions, during therapy, and during the months and years after therapy. They have differentiated types of patterns, such as “supportive guiding representations” and “conflict containing representations,” and correlated these with certain kinds of affect during sessions and with certain kinds of therapeutic relationship. Descriptively this research says more about *introjection* than *identification*. It may be that this phenomenon of representation is a part of the process of identification with the analyst. There is suggestive data that there may be correlations between these representations and therapeutic outcome.<sup>10</sup>

These issues relating to the internalization of the analyst have been important as well as troubling to analysts because of the concern about *suggestion*. There has been a general conviction that suggestion is bad, and that it undermines the claims for efficacy made by analysts. Freud differentiated analysis from hypnosis on the basis of the non-directive non-suggestive nature of analytic process. At the same time analysts have looked with favor on the idea that identification takes place in analysis. Is that not a form of influence or even suggestion? One reason for the

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<sup>10</sup> In similar work on supervision, Geller and Schaffer (1988) found a positive correlation between a benign supervisory alliance and the tendency to evoke the supervisor in dealing with therapeutic crises.

avoidance of suggestion as part of technique is that the power differential, which is inherent in the authoritative relationship in any directive form of psychotherapy, *enacts* a certain kind of transference and renders it unanalyzable. If that is the case then how do we handle the issue of identification? We say it is the accepting of the analytic method on the part of the patient in identification with the analyst. It means the patient has to enact the role of analyst, by assuming a kind of neutrality to the extent that one can step back from one's self and allow parts of that self to negotiate with each other at a psychic bargaining table. This must be particularly complex and important with respect to the training analysis, in which there is both the above-mentioned identification with the process for one's own treatment, but also the identification with the analyst as mentor and professional model.

Some critics of the analytic method see the use of the couch by analysts as a deprivation that weakens the process. Those who feel that therapy is a "communication between right brains" (Schore, 1994) know that much of that communication is through visual, non-verbal cues and expressions. Why then give up one of our major assets? Our discussion of imitation and mirroring may provide one suggestion. We have discussed that there is a tremendous pull to involuntarily respond to the actions and the affect states of the other, to actually *have them*, and to some extent *become* the other. It is similar to the above-mentioned phenomenon of

adopting similar postures. The control or influence of the other by one's own expressions is powerful and goes both ways in the dyad. The intuition of Freud, who felt he did not like being observed all day by his patients, turns out to have been prescient; he was not really doing it just for his own convenience. The interactive and mutual control by non-verbal expression may indeed interfere with free association and with the flowering of the transference. But of course transference interacts in extremely complex ways with identification. In becoming the patient who is identifying with the analyst, the transference must change; and as the transference changes so may the identification. And this in both meanings of the term: both in the sense in which the patient believes he is like the analyst, and also in the sense in which he changes himself to resemble the analyst. This phenomenon must be very important in the match between a patient and a particular analyst. The analyst has the same experience in reverse, with identifications interacting with transference and counter-transference.

I've tried to limit this discussion to identification. What becomes clear is that that is hard to do. The higher brain functions, such as consciousness, empathy, identification, self, all co-evolved, each one supporting the others, and leading to a complex of emerging functions that led to the explosion of human mind and culture. It may be impossible to focus on one function while ignoring the others, but this was an attempt to do just that.

For psychoanalytic theory, the mirror-neuron information may also shed light on the somewhat controversial concept of *projective identification*. One problem with this concept, in which the intense feelings of one person are “projected into” the other, is that there is a kind of metaphoric, almost mystical, “beaming” or forceful transmission of the affect into the other person. The mirror neuron phenomenon may allow for a more parsimonious explanation, namely that all emotions may be communicated via verbal and non-verbal means; and, when they are perceived by the other person, that person has at least a signal form of the emotion. In intense situations such as those in which the concept of projective identification is invoked - most commonly a highly charged but possibly disavowed situation in psychotherapy - the heightened sense of anxiety, or fear, or anger in the therapist, leads to some blurring of ego boundaries, and to the therapist’s ownership, and possibly enactment, of the feeling that is being involuntarily and possibly unconsciously mirrored. Although this is quite speculative, it suggests that the contagion of the affect may derive from the therapist’s transient loss of ego boundary in such an interaction.

A further speculation might provide a hypothesis for some future research. DeWaal’s view of imitation as an evolved capacity essential to the transmission of

culture, and the view in this paper that imitation is an important part of the process of identification, may lead to some insight into the counterintuitive and counterbehavioral phenomenon, the *repetition compulsion*. According to most versions of behavioral theory such a compulsion should not exist. It is a phenomenon with no apparent rewards that could re-enforce it in the usual modes of conditioning. Our theories have worked around the problem by saying that there is an unconscious reward, for instance a reduction of guilt or a reduction of a greater fear, a plea-bargaining with the super-ego. With the view of imitation being discussed here, we now have the added form of reward: this is deWaal's proposed advantage of enhancing the interpersonal bond and the integration into the social nexus. This model could include identification with the aggressor, which responds to the possibility that even the aggressive, abusive parent is needed for the infant's continued existence, and therefore the bond with an abuser may at least seem the only way to survive. (Although, as we mentioned above in the Caspi study, even here there is a complex interaction with gene expression.) Again we encounter a complex phenomenon, wherein imitation, having it's own primary evolved purpose - to maintain social bonds, to the enhancement of the community - leads both to identification and to the repetition compulsion, often to the detriment of the individual. Thus identification with the aggressor may enhance the unity of the family, and in the larger social sphere, may, by way of imitation and ritual, enhance the stability of the community.

In review:

1. Psychoanalysis has developed a complex idea of the self, both as a representation and as an agent or ego-like entity. This self develops in an environment of others, particularly parents, whose influence seems to occur at least partly through internalization processes.
2. In this paper I have focused on the process of identification, a mode of internalization, looking at mostly the unconscious, implicit aspects derived from animal models. In humans this process may lead to the formation of the self.
3. Of the forms of memory in current thinking, *procedural memory* bears some resemblance to our concept of identification. As we have seen there are a number of different processes that contribute to procedural memory, including *instruction, practice, behavioral conditioning and imitation*. And, all of these interact in complex ways with *gene expression*.
4. In the evolution of human mental functions, we may have *imitation* as a newly evolved capacity. This innovation has multiple results as the capacity becomes integrated with others. Imitation then may have contributed to the passing down of complex ritual and culture, for the process of identification, of empathy, and for the learning of language.
5. Although imitation appears to have evolved in other species, particularly birds, it is in humans that it has gained it's fullest fruition.

6. It is conceivable that the *mirror neuron* may have been a precursor that joined with other precursors to produce the capacity for imitation. The mirror neuron may be the instrument of inner simulation of action and affect that has been crucial for the complex forms of learning and cultural transmission in the human repertoire.
7. Imitation may be a capacity added to the other modes of learning, one that is driven by the need for social bonding. That need may supercede other forms of reward, so that one may imitate and identify with a hostile object, or may engage in painful forms of ritual to the individual's own detriment. This may be relevant to certain forms of masochism, and other kinds of self-destructive behavior.
8. The implications of this model for the theory of analytic technique may be profound, and could help in our understanding of elements of the method, such as frequency, abstinence, and the use of the couch, as well as theoretical issues having to do with intersubjectivity and the one-versus-two-person model. The model may also help in understanding certain theoretical concepts such as masochism, the repetition compulsion, and projective identification.
9. What I have described represents some aspects of mental function that could help build a model of identification congenial to both psychoanalysis and the cognitive sciences. By beginning with the analytic concept and tracing its history and possible biological roots,

we may learn much about the concept and ground it in the world of the sciences.

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