Implicit Unconscious Processes, Intersubjective Abilities and Evolutionary Models of the Mind: New Approaches to Understanding Human Nature

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Part I:

A revolution in the way we understand unconscious processes and memory systems

The main contribution of psychoanalysis to the Western intellectual tradition has been an appreciation of the enormous importance unconscious motivation plays in human affairs. One hundred years later, two pillars of Freud's contribution, his view of the unconscious and his theory of motivation has been completely revised by new advances coming from diverse fields such as developmental psychology, cognitive science, neuroscience, evolutionary theory and of course, within psychoanalysis itself. These changing views have been part of a larger paradigm shift toward relational, cultural and intersubjective views of human experience. In this article we will not examine the multimotivational theories that have replaced Freud's dualistic model of human motivation (see Lichtenberg, 1989 and Liotti and Cortina 2007), but will concentrate in showing how new views of unconscious processing, memory systems and the human mind have changed significantly based on an appreciation of their deep social and intersubjective origins.

Freud viewed unconscious processes as based on repressed impulses or needs. For instance, in the *Ego and the Id* Freud says "Thus we obtain our concept of the unconscious from the theory of repression. The repressed is the prototype of the unconscious for us" (Freud, 1923 p. 15). Although Freud thought that some aspects of the unconscious *might* not be repressed, he was dissatisfied with the idea "… when we find ourselves confronted by the necessity of postulating a third *Ucs.* which is not repressed we must admit that the characteristic of being unconscious begins to lose significance for us" (Freud, 1923 p. 18). Plainly, Freud did not give much importance to the part of the unconscious that was not repressed, *except* for the part of the ego that instigated repression—an insight based on the clinical discovery that patients were unaware of their defensive processes—which is what forced Freud to change from a topographical to a structural (id, ego, superego) model of the mind in the first place.

Contemporary views of the human mind and memory systems have greatly expanded our view of the unconscious. In the past few decades it has become clear that defensively excluded experiences, needs and impulses represent only a small fraction of the totality of unconscious processes. Most unconscious processes have an adaptive function, and it is only when these adaptive functions fail that defensive processes emerge. These views are strongly being influenced by contemporary distinctions between implicit/procedural and explicit/declarative modes of processing, coding and storing information into different memory and representational

formats (Tulving, 1972; Schank & Abelson, 1977; Nelson, 1983; Schacter & Moscovitch, 1984; Rubin, 1986; Bucci, 1997; Schacter *et al.*, 2000; Nelson, 2005). These concept have been supported by infant research, particularly its focus on parent-infant interactions whose timing, intensity and turn taking are automatic and pre-symbolic (Trevarthen, 1979, 1980; Stern, 1985; Beebe & Lachmann, 2002; Beebe *et al.*, 2003b; Stern, 2004; Fosshage, 2005).

There are several current relational theories that have embraced this broader understanding of the role of unconscious processes and have contributed to it, such as Donnel Stern's concept of unformulated experience (Stern, 1997), Christopher Bollas's concept of the unthought known (Bollas, 1987), the Boston's Process of Change Group concept of implicit relational knowing (Lyons-Ruth, 1999; Stern, 2004) and Wilma Bucci's concept of the "referential cycle", the transposing information from implicit to explicit levels (Bucci, 1997). Within self psychological and attachment-based approaches to psychoanalysis other examples of authors that have used implicit/procedural and explicit/declarative distinctions to understand clinical phenomena are (Stern *et al.*, 1990; Siegel, 1999; Lichtenberg *et al.*, 2002; Cortina, 2003; Knox, 2003; Fosshage, 2005).

The terms "implicit" and "procedural", as well as the terms "explicit" and "declarative", are not completely overlapping, but for the sake of keeping things simple, we will consider them as being roughly equivalent. The major difference we want to focus on is between implicit/procedural and explicit/declarative types of information processing. The following is a brief summary:

Implicit/procedural systems

- Slow—with the exception of priming—builds gradually and incrementally with learning and repeated practice.
- Reliable, once a skill, habit or interpersonal pattern is learned, it is not easily forgotten.
- Inflexible, activated only when specific skills, habits or interpersonal patterns are being used—priming being the exception.
- Inaccessible to consciousness. Learning from experience during infancy is carried forward as a series of implicit expectations that build up over time. Evidence that these unconscious expectations are remembered becomes clear when they are enacted behaviorally in situations that cue for these memories. A good example is the way one-year-old babies behave in Ainsworth's Strange Situation. Infants with histories of secure attachment "expect well" and will seek the comfort they need after brief separation form their attachment figures. Infants with avoidant histories expect to be rejected, and focus their attention away from attachment figures upon their return. Infants with a history of resistant attachment don't know what to expect, given a history of inconsistent care, and will exaggerate their distress in the hope that the inconsistent parent will respond to their needs. Clinically the importance of this form of implicit relational knowing has become evident by the increased use of the concept of enactments within psychotherapy.

Explicit/declarative systems

- Fast, can be learned in one trial
- Fallible, memory traces of an event can degrade and retrieval failures are common
- Flexible, not tied to specific modality or context.
- Accessible to consciousness, hence can be manipulated non verbally as is evident in nonhuman primates or in toddlers who still haven't mastered a language, or can be expressed in language later in development as autobiographical memory, that is, an explicit language-based way of describing past relational events.

With the emergence of language, *explicit* memory systems and the representational formats that are part of these memory systems become more elaborated. These systems coevolved-ontogenetically and phylogenetically–with the emergence of higher-order forms of consciousness and cultural evolution based on the accumulation of social and technical knowledge (Donald, 1991, 2001; Nelson, 2005).

In a classic 1972 article, Tulving introduced another important distinction between two dif-

ferent types of explicit memories, semantic and episodic memory (Tulving, 1972). Semantic memory refers to a general, atemporal storage of facts or meanings, while episodic memory refers to memory of specific episodes, such as playing peek-a-boo with mommy or ordinary scenes like having family dinners. Tulving's semantic/episodic distinction can be seen as two different forms of explicit memory systems. Nelson further elaborated Tulving's episodic memory by observing that young children have an excellent ability to remember these types of events (Nelson, 1983). As more events are experienced, these memories take the form of prototypical events or scripts (Schank and Abelson, 1977). Event or script knowledge permits young children to develop brief verbal or nonverbal prototypical "stories" that predict what will come next and how to interact with others during specific events. By the age of five or six, and with the development of language, children are able to describe events or scripts verbally, in which events can be seen from multiple perspectives, while offering explanatory formulations linking past, present and future in the form of an autobiographical memory that is fully accessible to consciousness. In these narrations we see the emergence of the person who becomes an active protagonist of the narrative plot and can envision the creation of different stories and different outcomes. According to Bruner the capacity to narrate experience is the single most powerful way humans create meaning (Brunner, 1990)[1]. The significance of having multiple forms in which information is processed and different ways in which memory and representations are parsed has important clinical implications. We will examine a few.

Clinical Implications

Defensive processes and dissociation

As is well known by any clinician who has worked with patients with troubled histories, dissociation between implicit and explicit (both episodic and semantic) memory systems can be a key feature of the clinical presentation. Traumatic experience, particularly when it occurs at the hands of caregivers can become dissociated from the stream of consciousness and from event memories, leaving only atemporal traces of certain memories or "facts" (semantic memory) that can be highly confusing (Meares, 2000). As Bowlby (Bowlby, 1980) notes one of the reasons for the discrepancies may be due to:

> "a difference in the source from which each derives the dominant portion of information. Whereas for information going into episodic storage the dominant part seems to be derived from the value the person himself perceives and a subordinate part only from what he has been told of the episode. For what goes into semantic storage the emphasis might well be reversed, and what he is told being dominant over what he himself might think" (p. 63).

A case in point is a young child who witnessed the suicide of a parent with a shotgun (episodic

[1] We would like to draw attention to the similarities between Nelson's and Schank's work on event and script knowledge and Daniel Stern's concept of "now moments". Now moments are the basic fabric of lived experience and are created in continuous small packages of interaction with other minds. They are the smallest possible unit of interaction exhibiting temporal and rhythmic patterning (Stern, 2004). The main difference with Nelson's work is that Nelson's event episodes are operating at a higher level of consciousness—they are larger units of interaction–are explicit and hence potentially *accessible* to consciousness. Stern's now moments are core interactive sequences–they are the smallest molar unit of lived interactive experience–and operate at an implicit/procedural "core" level of consciousness that is *inaccessible* for retrieval. Now moments–as are all forms of implicit relational knowing–are carried forward as expectations that can become evident in behavioral interactions–such as interactions of babies with their caregivers showing anxious and secure patterns of attachment, and as enactments throughout life. The type of "primitive" consciousness associated with now moments has been elegantly described by Edelman as "the present moment" a form of consciousness that only exists in the here and now. In contrast, event or script knowledge operates at explicit and declarative levels and is accessible to consciousness in preverbal symbolic and verbal symbolic forms.

memory). The surviving parent insists that father died in a car accident (semantic meaning) and that the child's memory is false. The child grows up with two incompatible memories, the memory of what he experienced (an event memory) and a general semantic false memory instilled by the surviving parent (Cain and Fast, 1972).

Many survivors of sexual abuse, physical abuse or torture find themselves under similar irresolvable predicaments. The abuser will entice the victim into "keeping their secret" or even threaten their life if they divulge the secret. Subtler but no less coercive and destructive forms of psychological manipulation systematically undermine the child's perceptions and sense of reality. Either way, episodic memories of the abuse might end up being seen entirely from the point of view of the abuser in global semantic terms, while the child's episodic memories will remain unavailable for recall. Another secondary type of dissociative experience may take place during moments of abuse that will allow for recall but only from a distant third person perspective. In this case the victim enters into a hypnotic or trance-like state that helps create a distance between the immediate terrifying and degrading experience (a first person perspective) by resorting to a dissociated trance-like third person perspective. The trance-like state allows the abuse to be seen as taking place from a detached and depersonalized perspective—the only protective mechanism available for the victim in that moment. While this dissociative state protects the victim from the immediate terrifying and degrading experience, it also sets in motion a dissociative process that will be automatically triggered whenever circumstances remind the victim of the abuse or maltreatment. A common occurrence is to relapse into a dissociative state after watching a film or documentary that contains scenes of violence and abuse.

Korsakoff syndrome is a striking example of how the implicit/procedural and explicit/declarative memory systems can become dissociated when there is bilateral damage to parts of the temporal lobe and hippocampus. Some patients with this syndrome may have complete amnesia of having met a person just a few minutes or hours after their encounter–explicit memory is destroyed by the lesions. Depending on whether that person was kind or mean to them during these interactions, patients with this syndrome will have a strong positive or negative emotional response to them in their next encounter–their implicit memory is intact (Damasio, 1999). It is worth noting that implicit memory is best modeled in terms of a massive parallel distributive process that involves all perceptual modalities and has a wide, deep, and complex distribution throughout the brain.

This explains why even extensive lesions of the brain will not damage implicit/ procedural memories. In contrast, declarative and narrative representations are intimately tied to the hippocampus, the temporal lobe and connections with the prefrontal cortex (Siegel, 1999). Selective damage to some of these areas in the brain are accompanied by selective memory deficits.

Development is intimately tied to the ability to regulate and integrate levels of arousal, basic human needs and emotions linked to these needs with growing cognitive complexity (Sroufe and Watters, 1997; Gotlieb, 2002; Sroufe et al., 2005). When the capacity to regulate different aspects of development is taxed or exceeded, experience encoded in different memory systems may be defensively excluded or segregated (Bowlby, 1980; Cortina, 2003). A certain degree of dissociation between the implicit and explicit systems is not problematic as long as there is a smooth transition from experience encoded in these two memory systems and there are no striking contradictions between them. If early experience is benign, the positive expectations emanating from this experience does not have to become conscious in order to be adaptive. If however experience with attachment figures has been rejecting or harsh, an avoidant strategy will develop whereby a defensive exclusion of these moments of need is achieved by focusing attention away from attachment figures towards other motivational systems such as exploration or play. If there is no change in the relational dynamics that lead to this defensive maneuver, this strategy might become a characteristic defensive style of relating in which the need for others is devalued or minimized and experience of the past is "normalized" and/or seen as unimportant (Main, 1995). Nonetheless, experience encoded and

stored in the implicit system is still alive and carried forward as negative expectations in regard to the availability and responsiveness of others, but this knowledge is unavailable for conscious recall. Concomitantly there is an idealization or "normalization" of relational histories within the family and/or a need to dismiss the importance of intimate attachments under the guise of beliefs that emphasize "character forming" attitudes based on compulsive self reliance (Bowlby, 1980).

Even more problematic are cases in which there is a history of disorganized attachment and trauma where children find themselves in a double-bind. The attachment figure they reach out for in moments of distress is the same attachment figure that is frightened (most of the time without realizing it) or frightens them with their harsh and punitive behavior. This leads to an approach-avoidance dilemma. The result is that young children's behavior will temporarily disorganize and might be dazed or confused, they may exhibit random, overly excited behaviors or hide in a corner, or they may mix avoidant with resistant strategies. It is important to note that all these behaviors only occur in the presence of the attachment figures that are frightened or are frightening (Main and Solomon, 1986; Main and Hesse, 1990; Main, 1995). As these children grow older there is accumulating evidence that the temporary disorganization is transformed into controlling strategies that help children from becoming disorganized whenever the attachment system is activated, but the ability to forestall disorganization comes at a very high price (Main, 1995). The controlling strategies can take two forms, they may be controlling-punitive, in which case the child becomes demanding and bossy toward a parent, or the strategy may become controlling-caregiving, in which case the child inverts roles with the parent and becomes a rescuer or helper of a helpless and insecure parent. In either case, the adaptations can be fragile and may collapse if the dominating or caregiving strategy ceases to be effective and there is no other coping mechanism available to take its place. As these strategies become consolidated in adulthood the controlling caregiving strategy becomes part of a personality that Bowlby described as a compulsive caregiver (Bowlby, 1980). The controlling punitive strategy in adulthood can be a feature of patients with personality disorders that fit the borderline disorder continuum. These patients can be very controlling and demanding in interpersonal situations. They can oppress and exhaust their romantic partners or attachment figures with conditional demands ("either you do what I ask you or I will judge severely or threaten you"). They constantly need to be assured that they are wanted and loved and often test their partners without letting them know they are being put to a test.

When controlling strategies collapse, dissociative symptoms may emerge. The following clinical vignette illustrates this phenomenon well. Diana, a 33 year old physician grew up in a very unstable family. Her mother suffered from bipolar disorder. Children of bipolar parents are at significant risk for developing disorganized attachment. This risk, when combined with traumatic or chaotic family backgrounds put individuals in a developmental pathway that may produce dissociative psychopathology (Ogawa *et al.*, 1997; Carlson *et al.*, in press). Diane fits this developmental prototype. She was also the victim of incest by her father. In response to these traumatic events, Diane not only became very protective of her fragile mother, she also took it upon herself to watch over her younger sister with an eagles eye, and make sure that her sister would not be victimized be her father.

Diane did well academically and her decision to enter medicine were was partly influenced by a controlling caregiving strategy—this strategy corresponds to what Bowlby described as a "compulsive caregiving" personality (Bowlby, 1980). With the exception of recurrent depressive episodes that Diana self-medicated by using antidepressants, she functioned well. This changed rather abruptly when her younger sister asked her if she knew a therapist she could work with. When her sister reveals that her father had abused her sexually during her childhood, Diana begins to have florid dissociative episodes. The compulsive caregiving controlling strategy had "failed" Diane (her sister was sexually abused despite her watchful eye) and the collapse of this strategy ushered the emergence of dissocia-

tive symptoms.

From the point of view of memory systems and mental representations, children and adults with a history of disorganized attachment followed by trauma or chaotic environments often develop multiple, unintegrated representations of self and others, particularly when distressing relational events activate their attachment system (Liotti, 1992, 1995, 2000). Liotti has noted that memory systems can become segregated along different emotional scripts or roles, that of the rescuer, the victim and the persecutor. The re-enactment of these roles in interpersonal relations fits well with Karpman's description of the "drama triangle." Other roles such as the avenger or the seducer may also commingle with the drama triangle. Clinically, the reenactment of these roles is a particularly prominent feature of patients with severe personality disorders. In moments of interpersonal distress when the attachment system is activated, the roles of the rescuer, the victim and the persecutor may appear suddenly and often the patient may switch dramatically between these roles within the same session. Another clinical vignette may illustrate this phenomenon.

John is married lawyer. He comes from a background that included a mother with extreme narcissistic personality traits, who saw her children as an extension of herself and who could become physically and emotionally abusive when her children did obey her. One particular painful memory is of his mother putting him in diapers (kindergarten) over a minor incident of defiance and forcing him to go to school in diapers. A particularly dramatic session takes place immediately following a couples session with his wife (conducted by a colleague). During the couples session his wife lays down an ultimatum: either he changes his verbally abusive behavior toward her and their daughter or she will leave him. John comes in the individual session in a state of panic. During the session he quickly oscillates between feeling victimized by his wife's ultimatum (the victim role), followed by a pang of quilt, remorse and shame over his abusive behavior (the persecutor/abusive role that is now being forced to confront by his wife). He also expresses a deeper sense of remorse and pain when he thinks about his daughter. As he is thinking about her he doubles up in pain as if he received a blow in the abdomen. This pain is accompanied by wishes of wanting to do anything he can to make up for the verbal abuse toward his daughter. He expresses the desire of wanting to rescue her (the rescuer role) from the traits of defiance and helplessness that he sees in her. He is beginning to see that his rage at her is a projection of the powerlessness and rage he feels for being humiliated as a child. In this session, the previously defensively segregated roles of the victim persecutor and rescuer are breaking down and feelings of shame, remorse and quilt that had been mostly absent are emerging in full force. His feeling stunned by his wife ultimatum and the panic is accompanied by dramatic psychosomatic symptoms that represent a reenactment of painful experiences from his childhood—the break down of the controlling strategy.

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Childhood amnesia

Childhood amnesia of the first three or four years of life is based on the fact that interactions

and events experienced with others during the first years of life are encoded and stored at implicit/procedural levels that are not accessible to conscious recall. Declarative memories and symbolic capacities begin to emerge during the second year of life, but are primarily nonverbal. Language begins to take off by the end of the second year of life and re-transcribes preverbal experience into a propositional format. This development, however, is relatively slow and takes two more years before language is sufficiently consolidated for preverbal experience to be expressed in narrative form that incorporates the past, present and future. After the second year of life–and before autobiographical memory incorporating the past, present and future appears during the forth or fifth year–memories are encoded and stored in explicit/ nonverbal symbolic forms that are only available for recall in imagistic formats like dreams and nonverbal signals. In either case, memories of the first four years or life are not usually available for recall in a verbal narrative form that is the hallmark of autobiographical memory.

Nonetheless, early experience is carried forward in the form of nonconscious, automatic expectations and attributions. Experience is also carried forward as different models of self e.g., whether we assume others will care for us and that we are "lovable" or whether we are anxious or ashamed of our needs and unconsciously expect rejection. Early experience is important for two reasons. It forms the basis for basic prototypes or models of interpersonal relating. When early experience is relatively benign and positive and future development follows this benign course, it will have profound positive effects on the quality of interpersonal and romantic relations later in life, with the ability to cooperate and compete with others adaptively and flexibly, and the ability to parent effectively. While these predictions from attachment theory have face value and intuitive appeal, there is now robust longitudinal data to support these claims (Sroufe *et al.*, 2005). Second, early positive or negative experience by themselves do not necessarily determine outcomes. Outcomes are the result of cumulative experience *plus* current context—rather than the result of single developmental issues playing out over time (Sroufe et al., 2005). Nonetheless, the effects of early experience continue to live with us for better or for worse. For instance, if following a history of early secure attachment, further experience brings adversity and leads to psychopathology, the effects of early positive experiences are not lost. Often they emerge clinically when clinical interventions begin to bear fruit. This is what Hoffman refers to as a "weak precursor" (Hoffman, 1983). That is, the emergence in clinical work of supportive figure(s) from the past in what otherwise appears to be a bleak childhood. See (Sroufe, 2003) for a well illustrated clinical example[2]. Conversely, intrusive, rejecting and/or harsh care early in development will set negative prototypes of relating and affect adversely the quality of romantic relations, peer relations and the ability to parent affectively (Sroufe, 2005). Again, these early negative effects *do not* necessarily determine outcomes, and can be offset when primary caregivers find support in their parenting—the support can be clinical and/or be the result of stable relationships that develop around the primary caregiver (Suess & Sroufe, 2005)

A note on transference, countertransference and enactments

Transference is primarily based on expectations and attributions that originate in childhood and are carried forward during development as relational templates and interactions that are part of the normal events of daily living. Expectations and attributions are encoded primarily at an implicit/procedural level that is not accessible to consciousness. Some of these expectations may also become preconscious or conscious, but generally speaking, most people will take for granted their way of relating to others unless it becomes highlighted or problematic due to clinical issues, cultural differences or social class differences. Transference can therefore be described as "habitual patterns of interpersonal re-

[2] For longitudinal research supporting the existence of positive figures from the past that serve as beacons of hope and as templates for healthy relating in the midst of chaotic and traumatic backgrounds see Sroufe 2005; Suess, 2005.

lating" that are typical for each person (Schacter, 2002). The advantage of viewing transference from this perspective is that it is a parsimonious way of understanding its power without having to assume that transference is limited to repression of unconscious material from the past (Cortina, 2003; Cortina and Marrone, 2003; Knox, 2003). In reality past and present are always mixed together, whether experience has been negative or positive.

This way of viewing transference is similar yet different from Freud's. The similarity is based on the fact that Freud distinguished between negative transferences that are usually manifested as a resistance in therapy, and "unobjectionable positive transferences" that are accessible to consciousness and are based on positive experiences with parents. According to Freud a positive transference is the main basis for establishing a therapeutic alliance with the patient (Freud, 1912). The main difference is that Freud encumbered his view of transference with libido theory, and assumed incorrectly that eventually even a positive transference would become unconscious and repressed due to the fact that the libidinal/erotic positive transference would sooner or later appear and become a source of resistance (Freud, 1912). From our perspective, a positive transference is primarily nonconscious in the sense that people with histories of secure attachment "expect well" (Sroufe et al., 2005). Only when this expectation is violated does a positive transference become fully conscious. This view turns Freud's on its head. Positive transferences are primarily unconscious (is taken for granted) and only become conscious if positive expectations embodied in the transference are violated.

We also think that *which* habitual patterns of relating are used will depend on which motivational system is activated at any given moment (Lichtenberg *et al.*, 1992; Liotti & Cortina, 2006). If the attachment system is active and there is a history of a secure attachment, there will be a positive expectation in regard to the availability of attachment figures. If the caregiving system is active, there will be a desire to help others. If the ranking system is active, the relationship will be seen as competitive, and if the cooperative/play system is active relations will be seen as being equal (Liotti & Cortina, 2006). Needless to say, which motivational system tends to be primarily activated, under what circumstances will vary from person to person and to a large extent defines their personality. This view of transference expands the concept beyond the clinical setting and makes it useful for social scientists that examine work relations, social change, the role of leadership, and the ability to attract followers (Maccoby, 2004).

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Similarly, countertransference can be defined as responses to other people's habitual patterns of relating. In general, these responses will not be noticed or become conscious unless they are unusual. Assuming a psychotherapist is experienced and has a reasonably good capacity for relating to others, unusual responses such as being unduly alarmed or anxious, bored and dreading an appointment with a given patient, often turn out to be extremely useful indicators that these interactions are skewed in ways that need to be explored. These unusual responses have been extensively and productively conceptualized using the language of intersubjectivity and co-constructed enactments (Hoffman, 1983; Aron, 1996; Mitchell, 1997). There is an enormous range of transference-counter-transference enactments. The literature in this area is vast and we will not discuss it any further. What we would like to emphasize is that the encoding of habitual patterns of relating at implicit and subsymbolic levels is part of a multimotivational and intersubjective matrix common to all humans. In this next section of the paper our focus shifts from clinical to evolutionary and devel-

opmental considerations in order to examine the roots of this intersubjective matrix and the enormous role an increased capacity for cooperation and play had during the course of human evolution.

Part II:

The evolutionary and developmental origin of the intersubjective abilities

The moment we can share common subjective experiences with others and are able to reflect on this experience and empathically imagine the world from another person's perspective we live in a full-fledged intersubjective world. Over the past thirty years there has been a major shift in psychoanalytic theorizing toward relational (Mitchell, 1988; Mitchell and Aron, 1999) and intersubjective perspectives (Benjamin, 1992; Stolorow and Atwood, 1992; Gerhardt et al., 2000, 2001, 2003). The relational and intersubjective turn in psychoanalysis has been driven by a need to correct the one sided philosophical and scientific commitments of the intrapsychic perspective and by a need to provide a more authentic, experience-near account of clinical exchange.[3]

Similarly, interest in social cognition and intersubjectivity has also emerged as one of the hottest topics within evolutionary psychology and neuroscience during the past two decades. Attention has shifted toward viewing the emergence of unique human capacities for symbolic and cultural forms of meaning as being a consequence of adaptations to complex social environments that characterized hunter-gatherer groups during the course of hominid evolution (Tomasello and Call, 1997; Rizzolatti and Arbib, 1998; Boehm, 1999; Gallese, 2002; Bjorklund and Rosenberg, 2005; Gallese *et al.,* 2005; Gardner Jr, 2005; Malle and Hodges, 2005; Richerson and Boyd, 2005; Tomasello *et al.,* 2005). More purely "cognitive" advances such as the consolidation of declarative representational systems, increased capacity to imagine events and manipulate the object world also most have made independent contributions. But all these cognitive advances are closely tied with the increase of social complexity that characterizes human evolution and can not be separated. Advances in social cognition must have co-evolved with more sophisticated cognitive manipulation and understanding of the object world.

[3] The intellectual roots of the concept of intersubjectivity can be traced to continental phenomenology, particularly as represented by Husserl, Merleau-Ponty and Heidegger. The phenomenological project was in part aimed at overcoming the legacy of Cartesian thinking concerning the mind-body split. Descartes saw the world as being divided into two realms, an immaterial (mental) substance *(res cogitans)* that is conscious, free, indivisible and indestructible and a material substance, the body *(res extensa)* that has spatial characteristics, is determined, divisible and destructible. Husserl's work, *Cartesian Meditations* (1950, English translation 1993), approaches intersubjectivity as a way to transcend the Cartesian *cogito* and establish the base for an intersubjective understanding of the world. In his fifth meditation Husserl says "I experience the world (including others) according to its experiential sense, not as my *private* synthetic formation (so to speak), but other than mine alone *(mir fremde),* as an *intersubjective world,* actually there for everyone, accessible in respect to its objects for everyone" (p. 91). According to Husserl the ego (what we would now call the self) knows the other through an associative and analogizing process, an assimilation or pairing of one body to the other. An active and animate body knows the other through this process of pairing, an ego that coexists simultaneously in a *here* mode and in a *there* mode *(Cartesian Meditations* p. 116-120).

Merleau-Ponty is the most distinguished Western philosopher in giving the body a privileged status, a tacit *cogito* that knows the world of others implicitly (Merleau-Ponty, 1964). Reviewing some neurological conditions, Merleau-Ponty had noted that "concrete movements and acts of grasping enjoy a privileged position for which we need to find some kind of explanation" (p. 118). According to Merleau-Ponty grasping movements only take place when we anticipate its goals. Some actions seem to automatically convey the goal of the action (p. 119). He refers to this characteristic of action as a "motor intentionality." This magnificent analysis and observations fit perfectly well with what we now know of the mirror neuron system, that only fire if there is a specific goal associated with certain movements such as grasping movements (Gallese *et al.,* 1996; Rizzolatti *et al.,* 1996; Boehm, 1999; Gallese and Metzinger, 2003)

We think the crucial, most important adaptation that created the evolutionary basis for advanced forms of intersubjectivity was an extraordinary increase in the level of cooperation that took place among hominids during the Pleistocene era and early Holocene (1.8 million years to 10,000 years ago (Hamilton, 1975; Boehm, 1999; Gintis *et al.*, 2003; Richerson & Boyd, 2005; Tomasello et al., 2005). This prosocial shift toward altruistic behaviors and greater cooperation probably coevolved with the development of cultural norms that reinforced these prosocial attitudes and favored groups (Boehm, 1999; Boyd & Richerson, 2005; Bowles, 2006) and created an intersubjective ability to identify and communicate with others (Hobson *et al.*, 2006)

We think a fundamental shift occurred during the course of hominid evolution from a social organization based primarily on competition and dominant hierarchies—observed in all nonhuman primates—to a social organization based on equality and cooperation, observed among modern bands of nomadic hunter-gatherers (Boehm, 1999). Which social organization will predominate or what mixture of social forms eventually develops among humans will depend on a complex array of ecological, cultural, technological, and historical factors. While it is a stretch to think that hunter-gatherer societies studied by anthropologists during the last 100 can be used as a social model for Pleistocene hunter-gatherers, a number of similar characteristics and conditions such as patterns of radiation, hunting for large mammals, unpredictable food supplies, investment in technologies that reflect seasonal changes and tools use ("gadget technologies") point to a common matrix (Kuhn & Stiner, 2001). Moreover, Boehm's review of the anthropological data shows that the egalitarian organization can remain pervasive as long as hunter-gatherer societies continue a nomadic existence (Boehm, 1999). At any rate it is clear that as a species we are an ambivalent primate that has strong competitive and agonistic tendencies motives in relationship with others, as well equally strong cooperative, empathic and altruistic motives.

Cooperation and altruism toward *nonkin* is an extraordinarily rare evolutionary occurrence. What could have been the biological basis for this shift? The most common explanation for the evolution of altruism *among kin* is based on Hamilton's concept of inclusive fitness, renamed by Maynard Smith as kin selection the name that has stick. Basically the idea is that the closer the genetic relatedness to conspecifics (members of the same species) the greater an altruistic act will benefit its descendent. That is, the cost of altruism is offset by the greater fitness it confers to its descendent. This allows altruism to spread among closely related individuals and hence become part of the gene pool (Hamilton, 1963). This explanation, however does not account for how altruism and cooperation might have spread in human populations that were not kin members (but see Bowles 2006, for recent evidence showing that hunter-gatherer societies are more closely related that what was thought). The most frequently cited explanation for the emergence of altruism and cooperation among *nonkin* is Trivers' concept of reciprocal altruism based on game theory (Trivers, 1971; Axelrod & Hamilton, 1981; Maynard Smith, 1982). Reciprocal altruism can me modeled on a tit for tat exchange in which cooperation is based conditioned on the behavior of the other "I will cooperate with you as long as you cooperate with me", but either player will resort to selfishness at the first signs of noncooperation. Notice that this form of reciprocity is a conditional strategy that is not truly altruistic but based on self interest. While it is likely that cooperation might develop from these conditional strategies, we think these strategies do not account for the type of altruism seen in humans. Conditional strategies do not fit well with observations made by developmentalists that show that the delight of intersubjective sharing among infants and their mothers (Trevarthen, 1988). Nor do conditional strategies explain the spontaneous helping gestures that 18 month-olds exhibit toward strangers. It is important to note that these spontaneous gestures are *not* based on rewards (Werneken & Tomasello, 2006). Also experiments using different types of games that test the degree of reciprocity in *adult* populations show that humans exhibit a form of "strong reciprocity". This strong form of reciprocity is based on a sense of fairness that often defeats

conditional strategies based on self interest (Gintis et al., 2003). Moreover, strong reciprocators tend to punish individuals that resort to self interest in these games by refusing proposals that are blatantly based on self interest. What's more, they will even refuse the offer even if that means that they will be deprived of significant benefits if they were accept to greedy offer (Gintis et al., 2003). This form of strong reciprocity has been demonstrated in many different human groups and cultures and is a stable strategy that will evolve when group norms support prosocial values (Henrich *et al.*, 2005).

The most likely explanation for the degree of altruism and cooperation exhibited by humans is probably based on group selection e.g., selective pressures acting at the level of groups (sometimes referred to as demes in evolutionary theory). Simply put, in competing against other groups, hunter-gatherer bands with more cooperative and altruistic members will out-compete groups that are less cooperative and altruistic. The emergence of culture and an egalitarian ethos among *H. sapiens* (and perhaps our ancestral humans) supported this development by making it less costly for any single member of the group to accept the egalitarian ethos by having these values become normative, that is, part of a shared cultural belief system. In a recent article Bowles provides theoretical tools and empirically data so support this view (Bowles, 2006). Normative values that support cooperation and altruisms are described in evolutionary theory as "leveling mechanism" that can be thought as a cultural "tax" imposed on an all members by producing adherence to group norms (Richerson & Boyd, 2005; Bowles, 2006). Based on a comprehensive survey of extant hunter-gatherer and tribal societies Bowles also shows that frequent contests between groups are common, and that the degree of mortality involved in these battles is considerable (Bowles, 2006). This new evidence is important because mathematical modeling indicates that frequent contest *between* groups (leading to differential reproductive success) is important condition for group selection to overcome the pull favoring individual selection favoring free loaders and selfish individuals *within* groups. Once altruistic cooperative groups begin to succeed in contests with groups that are less cooperative and altruistic one has to add the survival value of benefiting from the ability to colonize territories gained in these battles. In short, the combined effect of an egalitarian ethos (that reduces the cost of individual altruism *within* groups by inducing conformity of the altruistic ethos), together with frequent contest *between* groups make it very likely that group selection played an essential role in the evolution of altruism and cooperation.

Emphasizing the importance of genuine altruism and cooperation evolving through group selection during human evolution is not, as some critics contend, a rosy and naïve view of human nature that ignores self interested and competitive motives. A multilevel view of selection of altruism clearly views competition between self interested strategies playing out *within* groups and altruistic, cooperative strategies playing out in contests *between* groups. Competitive and cooperative strategies leading to survival are not unique to the evolution of altruism; these themes are pervasive in the evolution of life forms. Moreover, group selection has a dark side. Once competition moves from contests between individuals—which in nonhuman primates is kept from becoming too violent by means of dominance-submissive rituals—to competition between groups, the potential for violence escalates and can become deadly, and in extremes genocidal.

The rehabilitation of group selection, and more generally a multilevel that views natural selection acting often simultaneously at many levels (genes within individuals, individuals within groups and groups within a metapopulation of groups) has become one of the most important developments within evolutionary theory during the last few decades (Sober & Wilson, 1998; Gould, 2002; Richerson & Boyd, 2005; Bowles, 2006; Nowak, 2006). While in evolutionary circles a multilevel view of selection has come to age—see Boyd's recent commentary in *Science* (Boyd, 2006), this news has not reached the social sciences. To the extent that the debate is mentioned at all it is usually followed by a cursory dismissal citing expert

opinions against group selection theories[4].

This debate is not just an academic exercise. It has enormous ramifications in terms of our understanding the evolutionary origin of altruism, but goes beyond it. Taking group selection seriously forces us consider that our success and survival as a species depended not only in forming strong attachment, caregiving and sexual bonds with other individual members of our species. We also survived and succeeded as a species by developing strong attachments and identities toward groups and relationships with others that can be cooperative or competitive in nature—the "we versus them phenomena". The issues touch on the vary nature of being human and how we might have became such a gifted, ambivalent, conflict-ridden, hyper-social, meaning-making primate. A primate capable of the most noble, compassionate and selfless attitudes and gestures toward kin and nonkin alike, as well as some of the most horrendous, genocidal and cruel acts, unequal in magnitude to anything seen among other primates[5].

Once the dust has settled over this rancorous, passionate and muddled debate, it becomes clear that the multilevel level theory never was never an alternative to a gene's eye view or to the traditional emphasize in selection at the level of individuals. The beauty of a multilevel view is that is a unifying theory that incorporates many of the advances made in the last 50 years in understanding the origin of altruistic and cooperative behaviors (a gene's eye view of selection, kin selection, game theory and group selection), but puts these insights into a general framework that allows us to see the dynamic interaction between all these different processes and levels of selection (Sober & Wilson, 1998).

The connection between group selection, cooperation and intersubjectivity

Not only did selective pressures operating at the level of groups promote greater cooperative behavior and the ability to achieve shared goals, but we believe this development co-evolved with an expansion of intersubjective abilities that included the capacity to develop a sense of shared intentions and shared goals (Tomasello, 1999) and being able to identify with other members of the group (Hobson et al., 2006). A shared intentionality and shared plans of action operating in conjunction with group selective pressures were probably the single most important biological adaptation that paved the way toward a full-fledged, cultural and symbolic form of intersubjectivity (Tomasello, 1999; 2005; Cortina, 2006; Stern, 1997).

If this line of evolutionary reasoning is correct, intersubjectivity may be regarded as coextensive with higher order states of consciousness (Edelman, 1989) and the emergence of culture (Donald, 2001; Richerson & Boyd, 2005). According to Edelman human consciousness emerges with the evolution of a uniquely complex brain organization that allows for the capacity to distinguish a personal social self from the non-social self. In contrast birds and most

[4] The issues are complicated, but one of the reasons this news has not reached the social sciences has to do with a methodological individualism that still pervades many sectors of the social science; namely the belief that self interest is the master strategy-motive involved in economic and in evolutionary theory. See (Wilson & Sober, 1994) excellent target article in *Behavioral and Brain Sciences* ensuing commentary.

[5] In a recent book the outstanding primatologist Frans de Wall argues that the combined chimpanzee and bonobo behavioral repertoire (our closest relatives) can been seen as precursors from which to view human behavior. Bonobos are an extraordinary cooperative, gentle and peaceful primate. In contrast, chimpanzees are not only very despotic and power driven, but are also capable of becoming quite violent when they clash with other groups of chimpanzees (de Wall, 2005). Humans, says de Wall exhibit some characteristics of these two species. These similarities must not obscure differences. Bonobos dominant hierarchy is organized around females, while chimpanzee hierarchies are dominated by males. Human hierarchies can be female (rarely) or male dominated, but we can also relate as equals. Bonobos manage most of their conflicts and tensions through sex by copulating promiscuously and frequently with each other, heterosexually and homosexually. The importance of sex in bonobos sociability extends to how the great each other by touching their genitals. Human sexual behavior tends to be serially monogamous (with important variations) and is less promiscuous and frequent than observed in bonobos. Bonobos are hands down, the sexiest primate!

mammals endowed with primary but not with higher-order consciousness, can distinguish between self and non-self only at a *biological* level.

The role of cooperation and altruism among human and nonhuman primates

Tomasello and Trevarthen have convincingly shown that humans show a remarkable capacity to cooperate together and exhibit altruistic behaviors toward kin and nonkin beginning in the second year of life (Trevarthen, 1979, 1988; Tomasello, 1999; Tomasello et al., 2005; Werneken and Tomasello, 2006). Nonhuman primates also show a remarkable degree of cooperation (de Waal, 1982; de Waal, 1989; de Waal and Lanting, 1997), yet they are not so motivated to engage in cooperative tasks or able to coordinate plans of action as well as humans (Call and Tomasello, 2003). After reviewing the evidence comparing developmental data from human and nonhuman apes Tomasello et al., summarizes the findings:

> "The overall conclusion would seem to be that although apes interact with one another in myriad complex ways, they are not motivated in the same way as humans to share emotions, experiences, and activities with others of their kind. They do not look at others and smile in order to share experience triadically, they do not invite others to share interest and attention via declarative gestures, they do not inform others of things or help them in their efforts, and they do not engage them in shared goals and joint activities" (Tomasello et al., 2005, p. 20).

This extraordinary capacity to cooperate on equal grounds, share plans of action and exhibit altruistic behaviors as early as the second year of life is one of the defining characteristics that make humans a unique species. These developments would not have been able to emerge had humans not also evolved a greater capacity to communicate intentions and emotional states. Again, we are not unique in the capacity to understand the intentions of others. Other primates are able to understand intentions, emotions and behavior of members of their same species (de Waal, 1989; de Waal and Lanting, 1997). Humans, however, have taken this ability one step forward and are able to understand these communications not only implicitly and automatically as other great apes do, but with the further development of language we are not limited to the here and now and we are able to explicitly describe, name and conceptualize intersubjective communication at a new level. In the next section we put forward an intersubjective schema based on some of these considerations.

Different levels and forms of intersubjectivity

Wilma Bucci has put forward a view of cognitive and emotional development in which information is encoded at three different levels: An implicit subsymbolic level, an intermediate symbolic, nonverbal level and an explicit, verbal level (Bucci, 1997). Once these different systems emerge during development they are all active. In Bucci's model the symbolic, nonverbal level is an intermediate phase that bridges information between the implicit subsymbolic and explicit verbal systems. She calls this bridging function "the referential cycle" that recursively transfers information bidirectionally between the implicit and explicit systems. While Bucci's model was not developed within an intersubjective tradition, it can easily be transposed into different levels of intersubjective experience and communication. Indeed, Beebe *et al.,* speak in terms of different forms of intersubjectivity and make the distinction between implicit and explicit forms of intersubjectivity (Beebe and Lachmann, 2002; Beebe *et al.,* 2003a; Beebe et al., 2003b). We follow Beebe *et al.,* but propose not two, but three levels of intersubjectivity *a la* Bucci. We also suggest that Bucci's non verbal symbolic level as imagistic in nature and not fully symbolic in nature.

An implicit form of intersubjectivity

This level is nonconscious and allows human and nonhuman primates–as well as other very social animals like dolphins and wolves–to automatically understand the intentions and emotions of members of the same species at a nonconscious level. This form of intersubjectivity is based neurologically on a mirror neuron matching system that creates a virtual image of others' intentions, emotions and behaviors by modeling intentions and emotions. That is, the mirror neurons that fire when we execute goal-directed movements and when we emote are the same mirror neurons that are activated when we just observe these intentional movements and emotions in others.[6] The mere perception of an action in others is equivalent to internally simulating it, as if we had a virtual knowledge of the others' actions and intentions (Iacoboni *et al.,* 2005). By virtue of this process of modeling (embodied simulation), when we plan an action, we immediately have an implicit automatic knowledge of its expected behavioral consequences and we can also forecast within ourselves the actions performed by others. Mirror neurons allow us to penetrate the world of others by means of this embodied simulation of intentionality. By means of this process of embodied simulation we can automatically establish a direct experiential link with others at an implicit level (Gallese, 2002).

An explicit nonverbal symbolic form of intersubjectivity

We think that the evidence comparing primate cognition and the evidence from developmental psychology support the idea that there are intermediate levels between implicit intersubjective states that are automatic and inaccessible to consciousness, and explicit intersubjective states that are language-based and fully conscious. Karmiloff-Smith has proposed a similar mechanism of representational re-transcription to account for the representation of implicit knowledge at declarative and explicit levels (Karmiloff-Smith, 1992). Mandler's concept of image-schemas serves a similar purpose (Mandler & McDonough, 1995; Mandler, 2004). We will briefly summarize the evidence for an intermediate level of intersubjectivity:

1. The evidence comparing primate cognition. Great apes, despite lacking language, are nonetheless able to conceptualize their interaction with others. While their conceptual framework might be limited by their inability to generalize and transmit knowledge culturally, like humans they nevertheless show superior social-cognitive capacities, such as the ability to deceive others, form alliances, cooperate in hunting activities with members of their own band and use tools instrumentally (de Waal, 1982; de Waal, 1989; de Waal and Lanting, 1997; Call and Tomasello, 2003).
2. The evidence from developmental psychology. Infants show evidence of advanced cognitive and social skills long before language takes off during the end of the second and third year of life. By 12 months infants are goal-directed and can reach a goal by different means (Csibra et *al.,* 1999; Tomasello, 1999). By 14 months they can collaborate with their caregivers by making plans in order to achieve a common goal (Tomasello, 1999; Tomasello et al., 2005). They understand intentions of their caregivers and look to them for cues of how to respond to novel circumstances, a phenomena referred to as "social referencing" (Emde, 1992). They also begin to share with others interesting objects by pointing toward the object (Tomasello, 1999). They have the ability for deferred imitation, that is, they can imitate an interesting gesture or action weeks after first seeing it, which clearly shows the ability to represent mentally the

[6] Mirror neurons (MNs) were discovered by accident in rhesus monkeys, first in the prefrontal motor cortex and then in the inferior parietal cortex (Gallese *et al.,* 1996; Rizzolatti *et al.,* 1996). MNs are activated with specific movements like grasping or tearing. The same MNs are activated whether monkeys or humans use their hands or their mouth to grasp an object. The same movement performed with mechanical appliances does not activate MNs. Mirror neurons only fire when a specific action is associated with biological movement that is goal oriented, like reaching for food or cracking a peanut with the intention of eating it.

object over time (Meltzoff, 1988; Meltzoff and Moore, 1998).

All this would seem to support the view that intersubjective experience can be processed symbolically and conceptually without language. Whether as Bucci believes, this non verbal bridge is truly symbolic is another matter. As mentioned earlier Mandler's work suggest that the image schemas might be building blocks that language later appropriates in order to give symbols there conceptual power. Image schemas were first proposed by the distinguished linguist George Lakoff as stepping stones toward the development of language (Lakoff & Johnson, 1980).

An explicit, verbal form of intersubjectivity

By the time young children are two years old, language capacities begin to develop rapidly and this growth continues to accelerate at a very rapid pace during the next few years (Tomasello, 2003). Language brings with it many new capacities that profoundly affect cognitive and social development. Language is not only an extraordinarily effective mode of communication, it also greatly enhances conceptual abilities that infants already possess. This cognitive function is inherent in language and has been described in the linguistic and philosophical literature as a propositional form of logic based on sentences, by which sentences or statements are joined together to develop more complicated propositions in regard to our relations to the world and to each other. The unit of analysis in a propositional logic is a sentence with a subject and predicate. As we use language and string together sentences, an emerging capacity to describe the world in narrative form emerges that far exceeds cognitive nonverbal capacities. Narrative schemas based on language exponentially expand our ability to understand complex causal relations at a new level.

Language allows humans to conceive and communicate about the past and the future, whereas human infants and the great apes are limited to the here and now. Events can be seen from multiple perspectives and worlds imagined that do not exist. In turn, these developments supported group life and increased the level of social complexity far beyond any other species. Language is the base from which humans can create and explore the meaning we give to events and to our history. Language allows us to look at these meanings from different perspectives creating a veritable "fusion of horizons" to use Gadamer's felicitous phrase. As Roy Rappaport (Rappaport, 1999) notes in his magnificent opus on ritual and religion:

> "To 'explore' these worlds is not simply to *discover* what is there. It is to *create* what is there. Language does not merely facilitate the communication of what is conceived, but expands by magnitudes what can be conceived... As such, language and protolanguage before it, have been absolutely central to human evolutionary success. It would not, indeed, be an exaggeration to claim that humanity is their creation." (p. 5.)

Conclusion

In this paper we bring together three strands coming from different fields of knowledge. The first strand looks at our changed views in regard to unconscious processes, memory systems and the human mind, while exploring some of the clinical implications. A second strand explores modern evolutionary and developmental perspectives, emphasizing the importance of social cognition, particularly the role of greater cooperative abilities as a key development during the evolution of hominids. A third strand attempts to integrate our current views of unconscious processes and the human mind and the emergence of social complexity with a communicative model of intersubjectivity that develops in three phases. Each phase adds something new to intersubjective communication and once each emerges they remain active throughout the course of life. These phases mark the vicissitudes of intersubjectivity, from (1) its origin based on mirror neurons and the embodied simulation of experience to (2) an intermediate phase that is conceptual, imagistic but nonsymbolic to (3) the development of a full-fledged symbolic, lan-

guage-based system that enormously expands our capacity for meaning and is the base for the emergence of symbolic cultures and ongoing socio-cultural change.

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Abstract. *Freud viewed the unconscious as being roughly equivalent to dynamically repressed wishes, needs and motivations. Findings from developmental psychology, cognitive psychology and neuroscience over the past forty years have dramatically changed our views of unconscious processes and the human mind. It is now clear that Freud's dynamic unconscious is only a minor segment of information that is processed unconsciously and that most of what we perceive and process is done at unconscious, implicit automatic and subsymbolic levels. Only a fraction of this information is further processed at explicit conscious levels. We examine some clinical implications of these views. In the second part of the article we examine intersubjectivity from the perspective of implicit and explicit systems of encoding and storing information. In the second part of this article we put forward an evolutionary hypothesis based on group selection explaining how this implicit mode of understanding become transformed in humans into fully symbolic, cultural and language-based forms of intersubjectivity and consciousness. We think that an increased capacity for cooperation and play had an enormous important during the course of hominid evolution, promoting higher-order forms of intersubjectivity and consciousness. In turn this increased capacity for cooperation favored the survival of groups with prosocial and altruistic values. Since we think that the process of natural selection operating as a competition between groups is essential for understanding human evolution, we show that group selection, in its current modified and more scientifically rigorous reincarnation, is a thriving theory that is essential to understand the origin of altruism and human cooperation. Unfortunately within the social sciences (psychoanalysis is no exception) the awareness of group selection as a fact of life continues to be summarily rejected.*