How Do We "Know" What We "Know?" And Change What We "Know?"

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How the implicit and explicit domains of affective/cognitive processing are similar, are different, and interconnect is pivotal for theories of therapeutic action. The specific focus here is on how these systems encode information for processing and memory and how the encoding formats and learning processes of the implicit system affect its accessibility to higher order reflective consciousness and change processes. In contrast to positing that the implicit processing system exclusively uses a non-symbolic format of encoding, the evidence strongly indicates that the implicit system primarily uses, as the explicit system, imagistic and verbal symbolic formats for encoding and processing information. The use of the same symbolic formats, it is proposed, facilitates the fluid interplay between these two systems and their access to higher order reflective consciousness. In addition, a variety of factors contribute to the variability of procedural knowledge (as well as explicit attitudes) to reflexive conscious access. For example, the formative process of implicit procedural memory that begins with an explicit focus is more available to consciousness than those implicit memories formed totally out of awareness. Other factors include the age of onset when the procedure was being learned, frequency of repetition, intensity of affects, degree of emotional trauma, dissociation, and the current analytic intersubjective context. These considerations play a major role in what this author has proposed as two fundamental, interrelated pathways of therapeutic action involving explicit reflective exploration and implicit learning that occur in the psychoanalytic encounter. Rather than change taking place primarily through reflective exploration, the traditional focus, or primarily through implicit relational learning, a more recent proposal, this author is emphasizing the interplay between the implicit and explicit systems for therapeutic change.

Theories of psychological development and therapeutic action require an understanding of how we learn, how we remember, how memory affects ongoing organization of experience, and how past learning, memory and psychological organization are transformed. Over the past quarter of a century, theoreticians working within a psychoanalytic context have been integrating and further expanding the extraordinary findings from cognitive science and neuroscience. We
have been creating new theories of psychological development, transformation and psychoanalytic change. Most revolutionary is the empirical finding that perceptual/cognitive/affective processing occurs simultaneously at two levels of awareness, an unconscious (implicit) as well as conscious (explicit) level. Discovery of the implicit level has expanded the realm of unconscious affective/cognitive processing far beyond Freud’s dynamic unconscious.1

“Contemporary researchers,” Drew Westen (2006) wrote, “recognize that most processing occurs outside of awareness, as the brain processes multiple pieces of information in parallel” (p. 444). In addition to waking cognition, REM and dream research has amply demonstrated that REM and non-REM, and corresponding dream, activity continue cognitive/affective processing during sleep (Fiss, 1989, 1990; Fosshage, 1983, 1997, 2007a; Greenberg, 1987; Hartmann, 1998; Hobson, 1999; Kramer, 1993; Palombo, 1978; Winson, 1985; among many others). Recognition of implicit and dream, in addition to explicit, processing creates a picture of a brain always working on multiple levels. We are now better able to understand how human cognition, not to mention that of other animals, attains such extraordinary complexity.

Most contemporary cognitive science models differentiate between two, at times three, memory systems (Epstein, 1994). The model that differentiates between two domains of learning and memory, the implicit/nondeclarative and explicit/declarative systems (Cohen & Squire, 1980; Schacter, 1987; Schacter & Tulving, 1994; Squire, 1994) has recently received considerable focus in psychoanalysis with significant implications for therapeutic change (Boston Change Process Study Group [BCPSG], 2005, 2008; Fosshage, 2003b, 2005, 2007b; Lyons-Ruth, 1999; Schore, 2003a, 2003b; D. N. Stern et al., 1998; among many others).

Pivotal for understanding the pathways of therapeutic change is how the implicit/nondeclarative and explicit/declarative systems connect. How these systems encode information for processing especially sheds light on their interconnection and transformation. The purpose of this paper is to explore how the explicit and implicit learning and memory systems encode information; how encoding formats and formative learning processes affect higher order reflective conscious accessibility of implicit processing; and the implications of encoding, learning processes, and reflective conscious accessibility in delineating a theory of multiple pathways for therapeutic action (Fosshage, 2003b, 2005; Gabbard & Westen, 2003).

The evidence, to be reviewed here, strongly indicates that the implicit system, as the explicit system, uses predominantly imagistic and verbal symbolic formats for encoding and processing information. Moreover, imagistic symbolic encoding, itself, might be the fundamental encoding format that underlies all affective/cognitive, including language, processing (Damasio, 1999). I have proposed that the use of the same symbolic formats enhances the interconnection and fluid interplay between these two systems and their access to higher order or reflective consciousness.

The neuroscientists, Damasio (1994, 1999) and Edelman (1987, 1989, 1992), refer to two levels of consciousness, a core (Damasio) or primary (Edelman) consciousness and extended (Damasio) or higher order (Edelman) consciousness. The first refers to conscious awareness and the second refers to a more complex reflective awareness with perspectives of past, present, and future; differing states of self and other; and concepts of self and other. I use the term *reflective*

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1 I prefer to describe implicit processing as unconscious rather than nonconscious processing, for unconscious is a better descriptor of the level of awareness. Unconscious processes, thus, include both the implicit realm as well as Freud’s dynamic unconscious, the latter involving repressive processes.
consciousness to refer to the extended or higher order consciousness that makes reflection possible and increases the potential for change in psychological organization.\textsuperscript{2}

In addition to the use of the same symbolic formats, I have suggested that a variety of other factors contribute to the variability in conscious accessibility of procedural knowledge (Fosshage, 2005). For example, the formative process of implicit procedural memory that begins with an explicit focus is more available to reflective consciousness than those implicit memories formed totally out of awareness.

Explicitly learned attitudes, while conscious, also vary in access to reflective awareness and change. While explicitly learned attitudes are conscious in the sense of core consciousness, they can easily be so embedded and experienced as "reality" that they and their origins are not subject to higher order reflective awareness.

Additional factors, such as age of learning, frequency of repetition, intensity of affects, degree of emotional trauma, dissociation, and the current analytic intersubjective context, all affect reflective conscious accessibility of both implicit and explicit learning. How integral implicit and explicit attitudes are to maintaining attachment and selfobject ties and a sense of self substantially affect their access to reflective awareness and change.

These considerations play a major role in what I have proposed as two fundamental, interrelated pathways of analytic change: (a) explicit reflective exploratory work, and (b) new implicit and explicit relational experience. While reflective exploratory work and relational experience usually work in tandem, their relative balance varies from moment to moment. When implicit procedural knowledge and explicit attitudes are accessible to reflective conscious awareness, then reflective exploratory work, as part of and along with new implicit and explicit relational experience, facilitates psychological transformation. In contrast, when implicit procedural knowledge and explicit attitudes are inaccessible to reflective consciousness, the primary avenue of change is new implicit and explicit relational experience. \textit{Rather than change taking place primarily through exploration, the traditional focus, or primarily through implicit relational learning, a more recent proposal, I emphasize the interplay between the implicit and explicit systems for therapeutic change.}

In relational psychoanalysis it is important to note that our reflective exploratory work has shifted from the more traditional focus of making unconscious conflicts conscious to identifying primary problematic patterns of organization and their historical origins, that is, implicit and explicit relational knowing.\textsuperscript{3} Recognition of implicit and explicit learning highlights the fundamental importance not only of rendering the implicit explicit but, in addition, of co-creating growth promoting relational experience (new learning) within the psychoanalytic encounter. This second avenue of change implicates the magnitude of the analyst’s participation and the influence of the analyst’s more typical and more nuanced explicit and implicit relational knowing.

I first introduce a clinical vignette, to be used for illustrative purposes of theoretical considerations.

\textsuperscript{2}In a well-known study providing empirical support for reflective capacity engendering change, Fonagy and his colleagues (Fonagy, 2001; Fonagy, Steele, Steele, Moran, & Higgitt, 1991), using their Reflective-Functioning Scale, demonstrated how severely deprived mothers with strong reflective functioning were able with greater probability to alter the usual intergenerational transmission of insecurity and, instead, raise securely attached children.

\textsuperscript{3}I use the term relational psychoanalysis (with a lowercase "r") to refer to all the various relational psychoanalytic approaches and use the uppercase "R" to refer to the American Relational authors (Fosshage, 2003a).
CLINICAL VIGNETTE

Natalie entered analytic treatment 10 years ago in her early 40s to overcome painful states of jealousy, humiliation, and rejection. Rejection themes and sensitivities had spun out of her familial past in which she had experienced her mother as typically emotionally absent, unresponsive, and unable to differentiate meaningfully between her three daughters (her much younger brother stood apart because of his age and gender). Her father, although depressed and typically emotionally unavailable, was experienced as the more dynamic, intellectual, and powerful parent. In the early years Natalie felt a reassuring closeness with her father. This changed when Natalie turned 5 and her sister was born. Her newborn sister captivated her father’s attention, leaving Natalie feeling deeply rejected and abandoned. Simultaneously, both parents, pieced together, subtly and more grossly turned to Natalie to become the caretaker of the baby, her new “parentified” role. During her adolescent years, she experienced her father as especially awkward and avoidant. For example, when they would pass one another in the hallway, he would barely acknowledge her. Natalie developed painful feelings of being unwanted, unacceptable, and, at the worst of times, even avoidant as a person and as a developing woman. Implicit and explicit learning came together in forming highly charged negative self and self-with-other percepts.

This fortunately was not the whole story. Natalie resiliently sought affirmation and love from her parents through being a good caretaker of her siblings and excelling at school. With the aid of a teacher who took a shine to her, Natalie’s academic achievements became a primary source of self-esteem, even though her sense of her intelligence and capability was compromised by the paternalistic attitudes in her family that denigrated women along these dimensions. Nevertheless, Natalie had broken out of the paternalistic mold to become the only woman in her Midwestern family to go to college, not to mention her graduate training and successful academic career. Natalie was married and, when she began treatment some 10 years ago, was raising two teenagers. While she generally thrived as a mother, periodic activation of her negative self-percepts plagued her throughout her marriage, leading to intense attacks of jealousy, of feeling unattractive and unloved, all of which contributed to depressive episodes.

How can psychoanalytic treatment implicitly and explicitly diminish Natalie’s sensitivity, reactivity, and proneness to experience humiliating rejection? How can analytic treatment transform or decrease the activation of her negative implicit and explicit shame-based percepts of self and a rejecting other? How can analytic treatment help Natalie further develop and maintain a more positive, vitalizing sense of self? In other words, how do we understand and explain the implicit and explicit processes that account for therapeutic change?

EXPLICIT/DECLARATIVE AND IMPLICIT/NONDECLARATIVE COGNITIVE SYSTEMS

While the explicit/declarative memory system involves processing information consciously focused on and, subsequently, available to conscious recall, the implicit/nondeclarative memory

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4This clinical vignette is based on an extensive clinical case presented in Fosshage (2007b).
system processes information typically outside an individual’s awareness. Implicit processing includes a number of memory systems—skill learning, priming, classical conditioning, modeling, and procedural learning, all of which are now viewed as complex learning processes. More recently, implicit processing, specifically procedural learning, has been extended to learning patterns of relating (Clyman, 1991; Davis, 2001; Grigsby & Hartlaub, 1994), what the BCPSG (2005, 2008; D. N. Stern et al., 1998) called “implicit relational knowing.”

Implicit and explicit processing occurs simultaneously throughout our waking cycles. Implicit processing is generally conceived to range from registering, organizing, and logging into memory subliminally perceived information, to a more focused parallel processing of information that occupies our explicit/declarative efforts. These two parallel yet interpenetrating systems tend to work in tandem. When creatively writing, for example, we speak of the need for periods of incubation, periods that relax explicit focus and, in turn, facilitate access to unconscious processing that might spring into consciousness as new creative organizations of material. Within the analytic exchange implicit processing emerges spontaneously into consciousness in the form of images and words powerfully capturing an aspect of an analysand or a pattern of interaction. The focus of these systems can also diverge in the creation of our overall experience—for example, while we explicitly focus on the content of an interpersonal exchange, we implicitly register and are affected by the emotional quality of the exchange.

CONVERGENCE OF CONCEPTS ACROSS DIFFERENT DISCIPLINES

The concepts of implicit processing and implicit mental models that have emerged out of cognitive science, converge with the neuroscience concept of neural memory networks or maps, that is, those that are established at an implicit level (what LeDoux, 1996, and Bucci, 1997b, call emotional schemas) and with a number of psychoanalytic concepts. The psychoanalytic concepts that refer to implicit memory patterns include internal working models (Bowlby, 1973), principles or patterns of organization (Fosshage, 1994; Sander, 1997; Stolorow & Lachmann, 1984/85; Wachtel, 1980), RIGs (D. N. Stern, 1985), pathogenic beliefs (Weiss & Sampson, 1986), mental representations (Fonagy, 1993), expectancies (Lichtenberg, Lachmann, & Fosshage, 1996), and implicit relational knowing (D. N. Stern et al., 1998). The conceptual convergence across different disciplines of implicit learning (cognitive psychology), neural memory networks (neuroscience), and patterns of organization (psychoanalysis) leads further validation to these concepts.

Integrating this conceptual convergence we can explain that the continuity and intractability of organizing patterns is related cognitively/affectively to their long-term or permanent implicit and explicit memory status, neurologically to the establishment of primary neural memory networks, and psychologically to their past and current adaptive value (including maintenance of self).

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5In serving these various functions implicit processing during waking parallels the well-researched organizing functions of dream mentation (see Fosshage, 1997, 2007a). Dreaming could be viewed as the continuation of implicit (unconscious) processing while asleep (keeping in mind the differences that sleep makes, for example, the reduction of external input). Both implicit processing and dreaming use imagistic and verbal symbolic encoding and processing, to be discussed.
CLINICAL IMPLICATIONS OF RELATIONAL LEARNING MODELS

In contrast to the intrapsychic models in our field that privilege drive-related universal fantasy distortion of life's events, relational models emphasize learning through lived experience, occurring at implicit and explicit levels of awareness. For example, Natalie's devitalizing self and self-with-other psychological organizations were formed (learned) on the basis of implicit and explicit experience within her familial system.

Learning, of course, involves a range of complex processes. Relational learning is variably (i.e., at a microlevel each person's contribution varies from moment to moment) co-created through implicit and explicit interactive engagements within relational contexts. Within family contexts, for example, learning situations range from implicit or explicit observations to more active interactions. The parents' and child's shifting motivational priorities (Lichtenberg, Lachmann, & Fossahge, 1992, 1996, 2002, 2010), previous experience and learning, temperaments, variable self states and specific contexts, all variably enter into shaping ongoing relational experience. Importantly, all of these factors contribute to the ongoing process of parent and child making implicit and explicit inferences about the interaction, further shaping what is learned, what is committed to memory (see inferences; Lichtenberg et al., in press). Repetitive and/or intensely affective relational experience establishes primary patterns of organization.

Once established, primary patterns of organization, variably activated in different situations, function in the following ways: (a) activation of expectancies, (b) selective attention to cues that correspond with the expectancies, (c) attribution of meanings that are in keeping with the expectancies, and (d) interacting in such a way as to confirm the expectancies (Fossahge, 1994). How we contribute to the construction of our relationships, how we come to relate to one another in all of its intricacies, involves complex, implicit, and explicit learning processes. How we tend to express love and anger emerges out of relational experience. For example, a male patient's peremptory style implicitly learned from his successful authoritarian father contributed to the patient's entrepreneurial success (confidence and leadership) but could easily be experienced in love relationships as disruptively controlling. While problematic patterns of relating can be transformed by subsequent experience, those patterns that are shaped through repetitive and/or traumatic experience become etched in our memory and serve adaptively to anticipate, construct, and negotiate future interaction. For these reasons, these patterns typically cannot be changed by new experience alone, but require a reflective awareness to deactivate and transcend the patterns (to be delineated).

What I refer to as a relational learning-based model, in my view, enhances our understanding of patients' development and current experience as well as frames exploratory and interpretive explanations that are potentially less accusatory as well as more palatable and usable to patients. While intrapsychic models attribute the responsibility for the genesis of psychopathology primarily in the patient, relational learning models conceive of pathogenesis as emergent out of experience within relational systems. During a couple's session, for example, a woman was strenuously objecting to her husband's screaming at her when he was angry rather than expressing his anger in lower decibels. At one point I asked, "How did your father express his anger

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6. All relational models conceive of the genesis of psychopathology as an emergent property of relational systems. Relational theorists, however, vary as to placing the emphasis on learning versus the vicissitudes of aggression and defensive operations, what I consider to be remnants of intrapsychic drive and ego psychological models.
toward your mother?" He stated matter-of-factly, "He screamed at her." His spontaneity and intonation communicated that this was, for him, the usual and natural way to express anger. My formulation that he had learned (modeling as an implicit learning process) from his father this way of expressing anger toward women initiated a reflective process for both marital partners. Reflecting on his own experience of what it was like as a child to hear his father’s anger toward his mother, my patient began to take seriously and better understand his wife’s objections and to consider alternative ways of expressing his anger. His wife, understanding the origins of her husband’s expression of anger, was, in turn, better able not to respond with a provocative counteraggression. As the decibel level decreased in response to these new understandings, they then could begin to discuss what his anger was about.

Theoretical models emphasizing implicit and explicit learning based on lived experience facilitates hearing, believing and recognizing a patient’s thematic experience and corresponding expectancies (explicit and implicit relational knowing). Relational learning models assist in extricating us from an attitude of skepticism (i.e., an attitude of disbelief) toward a patient’s articulations that has emanated from intrapsychic models of universal fantasy and defensive distortion that historically has so commandeered the analyst’s perception of the patient’s communications. For example, Natalie had expressed how important it was for me to have a good marriage, making clear that she did not view my wife as a competitor, rather striking in light of her competitive and jealously themes. Traditionally Natalie’s statement would most likely not be believed at face value and, instead, viewed as a defense against her oedipal wishes. In contrast, using relational learning-based models, in this instance attachment theory (Holmes, 2001; Lichtenberg, 2003; Main, 2000; Wallin, 2007), better positions us to believe Natalie’s statement—her expression of a desire for an intact family, a secure base, sorely lacking in Natalie’s experience (what Lichtenberg, Lachmann, and I, 1996, have called “the message contains the message”; p. 94).

**ENCODING: IMAGISTIC AND VERBAL SYMBOLIC FORMATS**

How information is encoded and processed in the implicit and explicit systems is centrally important in understanding their interplay in therapeutic change. Cognitive scientists (Bucci, 1985, 1997b; Paivio, 1971, 1986, 2007) have amply demonstrated that both the implicit and explicit systems use imagistic and verbal symbolic formats for encoding and processing information. Using the same symbolic formats, I suggest, increases the interconnection, bidirectional influence and fluid interplay between these two systems and access of implicit processing to higher order or reflective consciousness—all crucially important for therapeutic action. For example, subliminal processing springs into consciousness in the form of a patient’s new awareness of a parental attitude; an analyst’s intuitive, enlightening “hunch” about a patient; or a spontaneous exchange of humor between patient and analyst, involving the interplay between these two systems. Conscious access to implicit messages and learning enables the patient to bring to bear their reflective processes to further psychological reorganization.

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7The traditional manifest/latent content distinction, an assumption that the manifest content is always the product of defenses and is a compromise formation provides the underpinning for a skeptical attitude toward a patient’s articulations.
My early work on dreams (Fosshage, 1983, 1997; Fosshage & Loew, 1978, 1987), with Freud's and, even more, Jung's considerable assistance, made clear to me that images register experience and meaning and that sequencing of images creates a narrative and is a form of thinking. I redefined Freud's primary and secondary processes as imagistic and verbal symbolic modes of encoding and processing, respectively (Fosshage, 1983). Imagistic symbolic encoding and processing, I proposed, refers to thinking in images based on any one of our sensory modalities—visual, auditory, olfactory, tactile, proprioceptive, and taste—as well as motoric and visceral information. Somatic memories refer to memories that are primarily comprised of bodily sensations and experience.

Subsequently I became aware of the developments in cognitive psychology, especially Paivio (1971, 1986, 2007) and Bucci (1985), who had developed a dual coding model. Paivio was the first to make the distinction between what he also called imagistic and verbal symbolic formats, followed by Bucci who uses the corresponding terms nonverbal and verbal symbolic formats.8

Images refer to mental images or mental patterns. Images are symbolic in that they are "discrete entities," like words, "that refer to or represent other entities and may be combined following systemic processing rules" (Bucci, 1997a, p. 154). Cognitive learning theorists now "interpret classical and operant conditioning as being mediated by internal representations that function like images" (Paivio, 2007, p. 27). For example, Pavlov's dogs salivated to a tone because it activated an image of food. Human beings at times process solely imagistically. My 2½-year-old grandson, for example, had learned through watching his father how to lock his complex and, for me at that time, difficult-to-master car seat belt—an example when my grandson's implicit and explicit systems converged in focusing imagistically on solving the problem. On several occasions when my grandson saw me struggling, he would take over, saying, "Here, Papa, I'll show you how." He knew imagistically and communicated his images through gestures; words played no part.

Cognitive scientists generally agree that imagistic symbolic encoding is available at birth and is utilized by both implicit and explicit memory systems. When language developmentally comes on board beginning around 18 months, encoding and thinking involves two distinct cognitive symbolic subsystems, an earlier functioning imagistic system involving sensorial based perceptions and mental images and, subsequently, a verbal system involving language.9

According to the dual coding model, experimentally and theoretically developed by Paivio (1971, 2007), Bucci (1985, 1997b), and others, both systems are generally involved in thinking. "The verbal system dominates in some tasks and the imagery system in others. Thinking is a variable pattern of the interplay of the two systems" (Paivio, 2007, p. 13). While imagistic thinking is more prevalent in emotionally based, right-brain functioning and verbal processing dominates analytic left-brain functioning (Ornstein, 1997; Schore, 2003a, 2003b), apparently each cerebral hemisphere shows some capacity in the nondonnant encoding format. Paivio (2007) wrote,

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8I prefer the term imagistic, instead of nonverbal, to refer to this format of symbolic processing. "Imagistic" is more descriptive; "nonverbal" only says what it is not. In addition, I wish to avoid confusion with our use of the term "nonverbal" to refer to the whole realm of communication that involves gestures, facial expressions, tonality, and so on.

9In keeping with the traditional emphasis on words in psychoanalysis, the emergence of symbolizing capacity often is erroneously paired in our field with the onset of language. Imagistic symbolic capacity, a capacity that is present at birth, is quite frequently overlooked.
The left hemisphere controls speech and dominates in comprehension and other language tasks, and the right hemisphere dominates in certain tasks involving nonverbal information, such as rotating or otherwise manipulating objects “in the mind’s eye.” Up to a point, however, the speechless right hemisphere can recognize and comprehend language and the language-dominant left hemisphere can generate mental images. In brief, both hemispheres are differentially involved in both verbal and nonverbal thinking and behavior. (p. 15)

While imagistic and verbal functioning occur as dominant in the right and left hemispheres, respectively, each hemisphere recognizes the other hemisphere’s dominant form of processing, more intricately connecting imagistic and verbal processing. In addition, with imagistic thinking dominant in right brain functioning, images, as compared to words, are more affect loaded, explaining why imagery in dreams or conscious reverie carries such emotional potency and provides access to affective experience.

While the operation of imagistic and verbal symbolic formats is now generally accepted, some neuroscientists (Damasio, 1999) and cognitive scientists (McNeill, 2005) believe that imagery serves as the unitary basis of all thought and that language is inseparable from imagery. In a similar vein, Einstein claimed to think first in “certain signs and more or less clear images” and subsequently translated into words (Hadamard, 1945, p. 142). Damasio (1999) posited that images are “the currency of our minds” (p. 319). He wrote,

The words I am using to bring these ideas to you are first formed, however briefly and sketchily, as auditory, visual, or somatosensory images of phonemes and morphemes, before I implement them on the page in their written version. Likewise, those written words now printed before your eyes are first processed by you as verbal images before they promote the activation of yet other images, this time non-verbal, with which the “concepts” that correspond to my words can be displayed mentally.

In this perspective, any symbol you can think of is an image. (p. 319)

Damasio’s persuasive description of images as primary and fundamental to all thinking creates an even closer linkage between verbal and imagistic symbolic processing, potentially increasing, in my view, the similarity of encoding and processing used by the implicit and explicit systems even further. Additional confirmation of this position emerges in McNeill’s (2005) study of gestures and thought in which he delineates how “gestures are part of language” (p. 4). He believes that imagery is “embodied in the gestures that universally and automatically occur with speech” (McNeil, 2003, p. 4).

In contrast to the dual coding model just described, the BCPSG (2005, 2008; D. N. Stern et al., 1998) proposed that the implicit system primarily uses throughout life a nonsymbolic format, called “enactive representations” (Lyons-Ruth, 1999). The BCPSG posited that the implicit and explicit systems, using different encoding formats, essentially function in parallel and are less interconnected (Lyons-Ruth, 1999; D. N. Stern et al., 1998). They argued that these memory systems, therefore, require different change processes in the psychoanalytic arena. The primary locus of change is in implicit relational knowing, the “how to” patterns of relating. In their most recent publication (BCPSG, 2008), while they delineated a more complex interpenetration of the implicit and explicit, using the term “reflective-verbal” for explicit, they maintained that “the implicit knowings governing intimate interactions are not primarily language based and are not routinely translated into symbolic form” (p. 129). Note that the imagistic symbolic format is absent in their considerations and that “symbolic” is reserved for language-based encoding.
While the BCPSG (2008) recently delineated an embodied mind model in which the implicit and explicit, presymbolic and symbolic, and nonverbal and verbal “share the same root origins in common body experience” (p.136), bringing it potentially closer to my position, the BCPSG, in marked contrast to my view, does not place an importance on making the implicit explicit through reflective exploratory processes.

Some cognitive scientists postulate a third form of processing referred to as “connectionist,” Parallel Distributing Processing, or what Bucci (1997a, 1997b), in her development of a multiple code theory, calls subsymbolic processing. It is thought that symbolic processing cannot account for extremely rapid parallel processing required for spatial judgments and motoric actions, for example, the driver quickly computing distances between cars, the ice skater making quick adjustments to avoid the wall, and dancers creatively moving to music together. In addition, Bucci (1997b) stated that subsymbolic processing “provide a basis for incorporating systematic somatic as well as motoric and perceptual functions into an emotional information-processing theory” (p. 13), utilizing LeDoux’s (1996) neuroscience-based postulation of an implicit emotional memory system. LeDoux suggested that the brain consists of a variety of different memory systems:

Conscious, declarative or explicit memory is mediated by the hippocampas and related cortical areas, whereas various unconscious or implicit forms of memory are mediated by different systems. One implicit memory system is an emotional (fear) memory system, involving the amygdala and related areas. (p. 202)

The “trigger” in a conditioned fear response is “remembered” and the question remains as to what the encoding format is—a primitive form of imagistic processing or, as Bucci proposed, subsymbolic representations. Therapeutic action, Bucci believes, requires that subsymbolic representations or emotional schemas (Le Doux, 1996) must be connected (what Bucci calls a referential process) first to nonverbal symbolic images and then to language for full integration to occur. Bucci, thus, fundamentally differs from the BCPSG and their position that changes in implicit relational knowing can occur without conscious utilization of language. In contrast to Bucci, I believe that the implicit system uses primarily imagistic and verbal symbolic encoding. While we agree that articulation of imagistic symbolic processing furthers what Edelman and Damasio call the higher order reflective conscious processing, I believe that, in this instance similar to the BCPSG, that there are occasions when changes in implicit relational knowing can occur through new implicit procedural learning.

In contrast to Paivio’s dual coding model and Bucci’s multiple coding model, some infant researchers posit an altogether different form of encoding utilized by the implicit system. They argue that this form of encoding occurs “at a presymbolic level, prior to the capacity to evoke images or verbal representations of the ‘object’” (Lyons-Ruth, 1999, p. 586), what Lyons-Ruth (1999) calls “enactive representation” and what Beebe and Lachmann (2002) referred to as “presymbolic representations.” Whereas Beebe and Lachmann posited that the implicit system uses a presymbolic form of encoding prior to the availability of symbolic encoding (language dominated), Lyons-Ruth, a member of the BCPSG, suggests that nonsymbolic enactive representation remains throughout life as the primary form of encoding within the implicit memory system. The BCPSG (2008) recently stated that language is used in implicit relational knowing as well but is not “primary” (pp. 128–129). These theorists, in contrast to the cognitive scientists that I have cited, argue that symbolic processing is not available at birth. The infant researchers have demonstrated the encoding of interaction patterns, the “how to” patterns of relating beginning
shortly after birth. In explanation of these patterns they bypass the availability of imagistic symbolic encoding at birth and posit, instead, another form of encoding, a presymbolic encoding, the particularities of which, in my view, are not well delineated.

EMERGENCE OF IMPLICIT AND EXPLICIT PROCESSING

Cognitive scientists (Bucci, 1997b; Paivio, 1971, 1986, 2007; Rovee-Collier, Hayne, & Colombo, 2000) generally agree that the symbolic capacity to image is available at birth and is utilized by both implicit and explicit memory systems. Evidence from infant and REM research suggests that imagistic symbolic learning begins in utero. In the well-known Dr. Seuss study (DeCasper & Spence, 1986), a pregnant mother repetitively read a particular Dr. Seuss story during her last month of pregnancy. Shortly after birth, when the baby heard mother’s reading on tape this and another Dr. Seuss story, the baby recognized and preferred the original story, demonstrating that the baby in utero had logged into memory “something,” most likely subtle auditory variations in rhythm, intonations, and other phonetic components of speech. These auditory images (image as a mental pattern) stored in memory auditory affective experience. They are symbolic in that they are “discrete entities,” like words, “that refer to or represent other entities” (Bucci, 1997a, p. 154), that is, in this instance referring to particular affective auditory experience.

REM begins in utero during the last trimester. Research has amply demonstrated that REM sleep processes information, enhances learning and, very likely, contributes to the establishment of neural memory networks (Breger, 1977; Fosseshage, 1983, 1997; Meissner, 1968; Reiser, 1990). The combined evidence of the onset and function of REM sleep and the Dr. Seuss study suggests that the fetus during the third trimester begins to log into memory some auditory, proprioceptive, and tactile sensory experience, lending further support to the availability of imagistic symbolic encoding at birth.

Is the explicit/declarative system available at birth? Some infant researchers have suggested that the implicit and explicit memory systems mature at different rates during infancy, claiming that the more advanced explicit processing begins around 9 months of age (Rovee-Collier et al., 2000, p. 97). After reviewing the research, Rovee-Collier et al. concluded, however, that the “data reveal that the memory systems that support implicit and explicit memory are both present from early infancy” (p. 188). The research findings, noted by Beebe and Lachmann (2002, p. 68), that an infant within the first 15 hours can focally attend, distinguish, and prefer the mother’s voice (DeCasper & Fifer, 1980), smell (MacFarlane, 1973), and face (Field, Woodson, Greenberg, & Cohen, 1982) to those of a stranger suggest a combination of early forms of implicit and explicit processing. While neurophysiological maturities vary at birth, some babies seem to be quite alert and able to focus explicitly and declaratively shortly after birth, keeping in mind that explicit declarative focus, that is, core consciousness, at this time, does not include a higher order reflective awareness.

ACCESSIBILITY TO REFLECTIVE CONSCIOUSNESS

Recognition of implicit processing has catapulted the question of reflective conscious accessibility into the forefront in considering avenues of therapeutic action. By reflective conscious
accessibility I mean the capacity consciously to recognize and reflect on what were previously implicit patterns of organization. When these patterns, evident in waking and dream narratives, are accessible to reflective consciousness, analytic reflective exploratory work further illuminates these patterns and their origins, creating a perspective that undermines their inherent assumptions and felt "reality." Reflective awareness disrupts the automatic "flow" and gradually builds a reflective capability to intervene and deactivate or suspend oneself from the grips of a procedural pattern. Just as explicit focus can disrupt a tennis stroke (procedure), so can it disrupt a relational procedure. This explicitly reflective process, in turn, enables an individual to integrate new relational experience occurring within the analytic and other relationships and gradually establish in long-term memory new patterns of organization (e.g., new images of self and other). While new relational experience typically includes the exploratory process itself, it always includes much more (e.g., the co-creation of the analyst's respect for and liking of the patient). A dual pathway of reflective awareness and new relational experience increases the possibility for change. Yet this process is gradual and takes considerable time.

A variety of factors contribute to the variability of procedural knowledge to reflective conscious access (Fosshage, 2005). They include whether or not the implicit was originally explicit and subsequently became implicit, the age of onset when the procedure was being learned, frequency of repetition, intensity of affects, degree of emotional trauma, dissociation, and the current analytic intersubjective context. For example, an analytic context in which the analyst listens closely and resonates with the patient's affect and understands from within the patient's frame of reference creates an atmosphere of safety that enhances fluidity between the implicit and explicit.

In the more difficult situations, when procedures are learned at an early age, frequently repeated, severely traumatic, and dissociated, access to conscious recognition and reflection diminishes. When a traumatic procedure is inaccessible to reflective consciousness, then the analyst's and patient's co-creation of new relational experience that gradually through repetition establishes new implicit and explicit relational knowing becomes the sole avenue for analytic change.

Similarly, when explicit attitudes, although conscious, are learned at an early age, frequently repeated, traumatic and involve intense affects, it can preclude their accessibility to higher order reflective consciousness. How integral explicit (and implicit) attitudes are to maintaining attachment and self/object ties and a sense of self also substantially affect their access to reflective awareness and change. When explicit attitudes are deeply embedded, all evidence that contradicts them is rejected. These attitudes can only be gradually transformed through a gradual establishment of reflective understanding of their origins and/or through repetitive new relational experience.

**IMPLICIT PROCEDURES AND ENACTMENTS**

Recognition of implicit relational knowing has important implications for the concepts of enactments and dissociation that American Relational theorists have so meaningfully delineated to explain the clinical phenomena and treatment of dissociated self states.

Bromberg (1998, 2006) and D. B. Stern (2004) argue that the dissociated states are unsymbolized and unformulated and, therefore, accessible primarily, if not exclusively through enactments.
Dissociated states are played out in a complex interaction (enactment) so that, as the analyst is able to overcome her dissociation and help the patient do the same, the dissociated "not me" becomes symbolized, crossing the barrier of dissociation.

By unformulated and unsymbolized Bromberg and Stern mean unarticulated, that is, not yet formulated in words. In my lexicon, dissociated self states are variably organized symbolically, imagistically and/or verbally, and dissociated self states can include consciously articulated components. The dissociated barrier is between different states of mind. When in the grips of a dissociated self state, reflective awareness of that and other states is lacking. Further articulation of a "not-me" experience, as Bromberg and Stern indicate, promotes reflective awareness.

These authors have meaningfully developed the concepts of dissociation and enactment to explain the clinical phenomena and treatment of dissociated self states. I suggest, however, that these concepts do not cover a vast range of unconscious processing, that is, implicit processing and relational knowing, that might or might not involve dissociation. Implicit procedures, we have learned, have a feeling of automaticity and unawareness. In contrast, dissociative self states, depending on their severity, create a sense of separate, disjunctive states of mind that, although variably conscious, are mutually inaccessible. Implicit learned procedures, I argue, are primarily, perhaps not exclusively, encoded symbolically, making them more accessible to reflective conscious awareness. With implicit relational procedures, patient/analyst interactions (enactments) also provide an important avenue to increasing, at times hard won, reflective awareness, yet, in these instances, fortunately, without having to overcome dissociative barriers.

I, thus, define the term enactment more broadly to refer to "poignant interactions," involving implicit and explicit relational procedures that can be vitalizing or devitalizing (Fosshage, 1995). At times, enactments (my definition), as Bromberg and Stern have delineated, involve trauma-based dissociated self states; at other times, enactments involve implicitly learned procedures that might involve trauma or not, but not dissociation. These distinctions, in my view, aid us in capturing the complex range of unconscious processing occurring in the analytic arena.

**IMPLICIT AND EXPLICIT DOMAINS: TWO FUNDAMENTAL PATHWAYS OF CHANGE**

I have proposed (2003b, 2004, 2005) that the two fundamental pathways of change are the explicit reflective learning that occurs through the more traditional psychoanalytic emphasis on reflective exploration and expanded reflective awareness and the new implicit procedural learning that occurs through relational processes often out of awareness. While reflective exploratory work and relational experience usually work in tandem, their relative balance varies from moment to moment.

Using the same imagistic and verbal symbolic formats, I argue, increases the fluidity in the intricate interconnection between the implicit and explicit systems. In other words, the use of the same imagistic and verbal symbolic encoding by both the implicit and explicit systems, not requiring translation from nonsymbolic to symbolic formats, enhances the potential of bringing implicit learning into higher order consciousness. Also affecting reflective conscious accessibility are the different formative processes of establishing implicit relational procedures as well as a variety of other factors, such as age, repetition, intensity of affect, trauma, and so forth. These
considerations have played a major role in what I have proposed as two fundamental, interrelated pathways of change involving explicit reflective exploration and implicit learning that occur in the psychoanalytic encounter. Rather than change taking place primarily through exploration, the traditional focus, or primarily through implicit relational learning, a more recent proposal, I am emphasizing the interplay between the implicit and explicit systems for therapeutic action.

Recent neuroscience findings support this integrated top-down as well as bottom-up approach to treatment (see LeDoux, 1996; Schore, 1994, 2003a, 2003b). Top-down refers to movement from the "higher" cortical/left hemisphere down to the "lower" subcortical/right hemisphere of the brain and vice versa for bottom-up. For example, as Wallin (2007) reported, subjects shown distressing images and instructed to talk about what they were seeing showed less activation of the amygdala than those who viewed the same images without instruction to verbally describe (Hariri, Bookheimer, & Mazziotta, 2000; Harri, Mattay, Tessitore, Fera, & Weinberger, 2003). In other words, verbalizing helped to regulate the anxiety, a top-down brain activity. In contrast, helping a patient to focus initially on their bodily feelings starts with the "lower" subcortical/right hemisphere and through articulation of those feelings we work our way up including cortical/left hemisphere activity. While the right brain and its emotional-laden imagistic thinking is crucial for psychotherapy (Schore, 1994, 2003a, 2003b), so also is the verbal, analytic thinking of the left brain (Bucci, 1997b; Fosshage, 2003a, 2005; Paivio, 1971, 2007).

When implicit mental models are potentially accessible to reflective consciousness, a "spirit of inquiry" (Lichtenberg et al., 2002) can expand conscious awareness of these procedures. Over time, a patient acquires the reflective capacity to deactivate or suspend a problematic organizing pattern, followed by co-creating and logging into memory new implicit and explicit relational experience. The exploratory process itself contributes to new relational experience.

Intractable trauma-activated procedures that are frequently activated, for example, Natalie's powerful humiliating negative self and self-with-other schemata, require both conscious reflective awareness and repetitive new explicit and implicit relational experience to overcome the grips of these painfully humiliating patterns of organization and to establish on the basis of new relational experience new images of self and self-with-other (Fosshage, 2005). In a similar vein, encumbering attitudes of the explicit memory system must be highlighted, along with their historical origins, to develop a reflective capacity for reassessment and change, in part based on new explicit and implicit relational experience. Exploratory work and relational experience work in tandem, each augmenting the other in this pathway of therapeutic action.

Does that mean that all primary implicit themes are accessible to reflective consciousness? While this remains an open question, I believe, on the basis of my clinical experience, that the patient and analyst facilitate reflective awareness of most primary problematic implicit organizing themes within a sufficient analytic process.

In some instances implicit relational procedures, however, never see "the light of day" (i.e., conscious awareness is never brought about through an exploratory process) and are gradually altered through repetitive new implicit relational experience. I suggest that this sort of change pertains not to primary problematic themes but to subtle and more intricate procedures of relating. Attitudes, certain ways of thinking, specific ways of relating, self-regulating strategies and even mannerisms are learned and become part of the analysand's implicit relational knowing without explicit focus and articulation.
CLINICAL VIGNETTE: TO RETURN TO NATALIE

Natalie desperately wanted my affirmation and love; just as desperately, she wanted to avoid life-crushing, humiliating rejections. She approached our relationship with expectancies of hope for the developmentally needed affirming and loving relational experience and with expectancies of dread that I would find her to be burdensome and tragamatically reject her. During the 10 years of analytic treatment, Natalie had become remarkably capable of openness and accessibility that enabled us to co-create moments of a close, intimate, loving relationship—new explicit and implicit relational experience. These loving moments, however, were frequently disrupted by painfully deflating experiences of rejection. Gradually we became aware that the loving moments themselves generated anxious anticipation of their disruption that, internally, activated the old scenario and, interpersonally, a subtle protective withdrawal. We also more recently discovered that the rupture/repair cycle was a procedural pattern itself involving ruptures and subsequent resilient intrapsychic efforts to repair. Additionally, external factors, for example, a female patient (a younger sister) leaving my office or my momentary preoccupation, fatigue, or less-than-full presence could easily trigger the deflating scenario. In those instances involving external factors, Natalie repeatedly and ever so sensitively picked up cues and attributed meaning to those cues that, to her, confirmed her dreaded expectancies that I felt negatively toward her. Natalie, on these occasions, became painfully emotionally convinced that I preferred someone other than her and, moreover, that I really could not stand being with her. Unraveling the interaction frequently required exploration of our respective subjective experiences. We discovered that our different attributions of meaning to the cues often accounted for the differences in our experiences. This explicit focus provided a wedge into Natalie's conviction when she was in the grips of feeling rejected. Understanding the genesis of her emotional conviction (Bucci, 1997b; LeDoux, 1996; Orange, 1995) was crucial. In addition, close tracking of the triggers that activated the pattern and illuminating the differences in our attributions of meaning were pivotal for gradually creating a new understanding and release from her emotional conviction.

Timing, of course, was critical. Revelation of my subjective experience too quickly Natalie could easily experience as my not listening and invalidating her experience. Remaining too long in her world, however, Natalie could easily experience as confirming of the meanings she had attributed to her experience, for I had not countered it. The key to finding an optimal time for revealing my experience became my inquiry as to whether or not it might be useful for me to share my perspective.

The story, of course, was more complicated. The repetitive nature of Natalie's feeling of rejection and articulation of my failures at times triggered in me feelings of accusation and pressure either to validate her perceptions, that is, to say that I couldn't stand her, or to invalidate her perceptions, that is, to say it wasn't so and that I did love her. When feeling accused or pressured, I at times reacted by emotionally shutting down, either with obvious frustration or, as Natalie helped me to become aware of, with a subtle pulling back. Subtle or not, my reactions confirmed her expectancies and emotional conviction of my dislike and rejection of her. While this feedback loop is an example of how Natalie and we all interactively construct our worlds, in this case it also, as it so often does, tapped into my reactivity when feeling accused or pressured, creating an intersubjective interlocking. This devitalizing (for both of us) enactment (a poignant interaction that, in this instance, did not tap dissociation) involved problematic implicit/explicit themes of patient and analyst.
Over time Natalie and I learned that the only way to extricate ourselves from the clutches of repetitive enactments was to investigate openly and collaboratively in detail as to what was taking place. Reflective exploration rescued us. The cues that Natalie picked up I needed to acknowledge and understand from her perspective. To understand the events and meanings from her perspective was necessary, however, insufficient. She, and we, needed to know how I was experiencing her in the interaction. And she, and we, needed to know what was occurring in me as well in order for us to understand the interaction. We needed to know what was going on within each of us and who was contributing what to our negative interaction. Over time we both grew—Natalie did not feel so desperate and I did not feel so easily accused or pressured.

When entering analysis, patients, of course, vary as to their reflective awareness of their organizing themes, understanding their origins, and understanding how these themes continue to shape their current lives. Natalie had become all too aware of these painful themes and had considerable understanding of their origins, but she did not have the reflective awareness of how these themes continued to perpetuate themselves in her current life. For her, the current thematic experiences were “reality,” for example, how the analyst felt negatively toward her. When in the grips of a primary organizing theme, she was reflectively unaware of her contribution through her particular pattern of organization and her interaction.

During the analysis, her problematic implicit relational knowing gradually became more and more available for conscious reflective exploration. Both reflective exploration and implicit and explicit new relational experience, in my view, were required to help to free her from the dominating organizing patterns that shaped her life. Gradually she became less often gripped by the primary theme of my rejection of her; was able, often with my help, more and more quickly to deactivate the theme; and was better able to take in our co-created loving relationship for longer periods of time. Simultaneously I became less easily accused or pressured. In Natalie’s analytic treatment, reflective exploration and new implicit and explicit relational learning were intricately intertwined, working in tandem to create change.

IN CONCLUSION

Recognition of the implicit/nondeclarative learning and memory system has expanded exponentially the range of unconscious perception, processing and remembering. We now view patients’ implicit and explicit “knowing,” not as primarily intrapsychically generated but as learned through variably co-created relational experience. How the implicit and explicit domains of affective/cognitive processing are similar, different and intersect is pivotal for theories of therapeutic action. The specific focus here has been on how these systems encode information for processing and memory and how the encoding formats and learning processes (memory formation) of the implicit system affect its accessibility to reflective consciousness and change processes.

Drawing on cognitive science, neuroscience, dream research, infant research, and psychoanalytic theory and practice, I have presented evidence indicating that the implicit and explicit systems use primarily imagistic and verbal symbolic formats for encoding and processing information. Moreover, it is probable that imagistic symbolic encoding is the fundamental encoding format that underlies all affective/cognitive, including language, processing. I have argued that the use of the same symbolic formats enhances the interconnected and fluid interplay between the implicit and explicit systems and their access to higher order or reflective consciousness.
In addition, I have suggested a variety of factors contribute to the variability of implicit procedural knowledge, as well as explicit attitudes, to reflective conscious access. For example, the formative process of implicit procedural memory that begins with an explicit focus is more available to reflective consciousness than those implicit memories formed totally out of awareness. Other factors that affect access to reflective awareness of implicit and explicit knowledge include the age of onset when the implicit procedure or explicit attitude was being learned, frequency of repetition, intensity of affects, degree of emotional trauma, dissociation, and the current analytic intersubjective context.

These considerations play a major role in what I have proposed as two fundamental, interrelated pathways of analytic change: explicit reflective exploratory work and new implicit and explicit relational experience. While reflective exploratory work and relational experience usually work in tandem, their relative balance varies from moment to moment. When implicit procedural knowledge and explicit attitudes are accessible to reflective awareness, then reflective exploratory work, as part of and along with new implicit and explicit relational experience, facilitates psychological transformation. In contrast, when implicit procedural knowledge and explicit attitudes are inaccessible to reflective consciousness, the primary avenue of change is new implicit and explicit relational experience.

Recognition of implicit and explicit relational learning highlights the fundamental importance of ongoing relational experience within the psychoanalytic encounter. This avenue of change implicates the magnitude of the analyst’s participation and the importance of the analyst’s usual and more nuanced explicit and implicit procedural relational knowing.

Rather than change taking place primarily through exploration, the traditional focus, or primarily through implicit relational learning, a more recent proposal, I emphasize the interplay between the implicit and explicit systems for therapeutic change. The foreground and background shifts that comprise the dance between the implicit and explicit systems, in my view, provide an important key to understanding and facilitating psychoanalytic change.

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