PATTERNS OF DISCOURSE IN "GOOD" AND TROUBLED HOURS: A MULTIPLE CODE INTERPRETATION

Multiple code theory is a theory of psychological organization, which is rooted in current research in the areas of cognitive psychology, emotion, and development; it accounts for adaptive functions as well as pathology. The theory incorporates Freud's seminal discovery of modes of thought outside the conscious, rational mode, but recognizes three rather than two forms: subsymbolic nonverbal, symbolic nonverbal, and symbolic verbal. Computer-assisted procedures assessing these three forms are applied to verbatim transcripts of a long-term, fully recorded psychoanalysis. The measures point to the patient's central themes, allow evaluation of the analyst's interventions as facilitating or impeding the patient's explorations, and facilitate more rigorous comparison of differing clinical views. The discourse pattern in an early session was found to anticipate that in the treatment as a whole; the pattern in a later session indicates how this treatment may have become disrupted. The measures point to affiliative themes in the patient material that were not emphasized by previous researchers studying this case.

The challenge for psychoanalytic research is set by the special nature of the treatment and its goals. The patient enters treatment with a set of psychic structures that determine his emotional world views—the

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The work presented in this paper reflects many discussions with colleagues and friends, most recently the faculty and fellows of the 1995 and 1996 IPA Research

analyst with her own emotional meanings and views.[1] The mental and emotional representations of each participant are internal, private, known directly only to their experiencers, and known only partially even to them; the change that is sought is in the patient's inner representational world. Here we see the core epistemological dilemma of the field, which has led some to argue that it is difficult or impossible to do scientific psychoanalytic research in a meaningful way. How do we develop a science whose subject matter consists of mental and emotional representations, which are private and sometimes inaccessible, when the sine qua non of science is that events be jointly observed?

I will not address in detail the philosophical issues involved here. As I have written elsewhere (Bucci 1989, in press b), the epistemological issues that apply in psychoanalysis are basically those facing cognitive science and modern science in general; a single approach needs to be taken in resolving them. In cognitive science, as in all science, nonobservable entities and functions are treated as hypothetical constructs, defined in terms of other concepts, and inferred from observable events. This strategy applies for constructs such as particles and

quarks, the big bang, and life in the Bronze Age; this applies as well for mental representations and processes, whether conscious or unconscious. To employ this scientific heuristic in psychoanalysis, a general theoretical framework is required, as in all science, within which each hypothetical construct and each correspondence rule linking constructs to observable events may be systematically defined.

Freud used precisely this strategy of theory construction as a basis for characterizing the psychological level of mental functions, particularly the unconscious components. Freud's model of the mind, his metapsychology, was an attempt, using the principles of Newtonian mechanics, to account for psychological concepts on the basis of the distribution of mental energy in the psychical apparatus. The problems of the metapsychology and its failure to provide a suitable model for psychological functions have been discussed in detail elsewhere (Bucci

[1]Singular masculine and feminine pronouns are used here and throughout the paper with indefinite reference, as well as in reference to specific individuals.

Programmes. The computer-assisted measures used here are products of collaborative work with Erhard Mergenthaler of the University of Ulm. Kathryn Scrimenti produced the figures. The research presented here has been supported in part by the Fund for Psychoanalytic Research of the American Psychoanalytic Association and by the Glass Institute for Basic Psychoanalytic Research.

in press b; Eagle 1984). While the metapsychology has not yielded the systematic explanatory theory that we require, Freud's basic insight concerning the need for a psychological model remains sound. New concepts and methods now available in the field of cognitive science provide a more systematic basis for developing a psychoanalytic psychology than was available in Freud's time.

The multiple code theory to be presented in this paper is a theory of psychological organization that accounts for psychoanalytic concepts on the basis of current research in cognitive psychology, emotion, and development. The theory is an elaboration of the dual code theory (Bucci 1985), which focused on the distinction between verbal and nonverbal processes; multiple coding incorporates additional distinctions within the nonverbal mode. The theory covers a broad range of mental and emotional functions not accounted for by the metapsychology in any of its versions, and also goes beyond the approach of cognitive science in a manner informed by the psychoanalytic perspective. Within the framework of multiple coding, basic clinical concepts such as repression and the defenses, resistance, and structural change may be defined, operational measures of these concepts developed, and systematic investigation of the treatment process and evaluation of treatment effects carried out. Within this framework, insight acquired in the psychoanalytic situation can contribute to our general theory of psychological organization; at the same time, the concepts developed in the general theory, and their research applications, may be used to inform clinical work.

We will first outline the multiple code theory and some of the research methods that have been developed in this theoretical context. The theory has been discussed in detail elsewhere (Bucci 1995, in press a) and will be reviewed only briefly to provide the framework within which our empirical measures are interpreted. We then illustrate the application of these measures to an analytic case. This research approach enables us to examine treatment effects within and across sessions, and to use the events of the treatment as an empirical basis for a comparison of differing clinical views.

THE MULTIPLE CODE THEORY

From a cognitive perspective, Freud's theory of the psychical apparatus is essentially a bipartite or dual code theory. The identification of modes of thought that differ from conscious verbal forms is a seminal

contribution of psychoanalysis. The functional distinction between the primary and secondary processes is central to Freud's theory of dreams, and to his model of the psychical apparatus in both the topographic and structural forms. From a different perspective, based on modern information processing concepts, similar functional distinctions are incorporated in the multiple code theory, in a more elaborated way. In contrast to Freud's bipartite distinction, the multiple code theory incorporates three major formats or codes, which we have termed the subsymbolic, symbolic nonverbal, and symbolic verbal codes.

The Subsymbolic System

Subsymbolic processing, also known as "connectionist" or Parallel Distributed Processing (PDP), figures in many types of everyday activities, including perceptual, affective and motoric functions, in the human species from the beginning of life, and in other species as well (McClelland, Rumelhart, and Hinton 1989; Rumelhart 1989). This mode of processing involves fine differentiations on continuous gradients and "computation" of analogic relationships among spatial, temporal, or other sensory patterns, within specific perceptual and motoric modalities. This processing is carried out without explicitly identifying the underlying dimensions or metrics, or the processing rules that apply. The infant uses such "computation" in positioning itself at its mother's breast; the toddler uses subsymbolic computation, in visual and motoric systems, to climb down from a table, to determine how far and in what direction to let himself slide before letting go; the dancer and the athlete use this mode of processing to learn new routines, including subtle technical aspects that must be modeled motorically and cannot be described in words or even in diagrams. Similarly, the analyst perceives and responds to his patient on multiple, continuous dimensions, including some that are not explicitly identified. The analyst is able to make fine distinctions among a patient's states, including distinctions on sensory and bodily levels, sometimes using his own feelings as indicators, and without being able to express those feelings in words.

Complex mathematical models have been developed to account for the processing rules by which such functions are carried out. The subsymbolic or PDP models account systematically for the types of intuitive and implicit processing, incorporating sensory and bodily information, which analysts associate with primary process functions, and which have eluded classical information processing models.

Subsymbolic processing constitutes the basic format of what we refer to as emotional information processing, as we will discuss. In operating without explicit intention or direction, subsymbolic processes and representations are often not directly experienced, or may be experienced as in a sense "outside of oneself," outside of the domain of the self over which one seems to have intentional control.

Symbolic Systems

Symbolic processing, which incorporates both nonverbal and verbal modes, differs from the subsymbolic in content and form. In contrast to the subsymbolic formats of processing on continuous gradients with unspecified metrics and categories, symbols are discrete entities—images or words—and symbolic processing involves organization of such entities, following processing rules that are explicit or can be made so. Symbols have the properties of reference and generativity; they refer to or represent other entities, and they can be combined to generate infinite varieties of composite images and meanings. We think of images particularly in the visual system, but can have imagery in other senses as well. Images are modality-specific, represented in concrete sensory rather than abstract, amodal formats; however, composite images can be generated across sensory modalities. The infant forms a composite image of mother that incorporates all sensory modalities as well as internal somatic experience and motoric feedback.

As we can now see, in comparing this formulation to Freud's theory, the multiple code theory recognizes that within representations of things there are two organized and systematic modalities, one (the subsymbolic) referring to continuous gradations and shifts, the other (the symbolic) to recognition of particular entities. The capacities for both subsymbolic and symbolic processing exist in human beings from the beginning of life, and in other species as well. The infant can distinguish subtle shifts in his mother's demeanor, her smell, her taste, the feel of her body, and responds with subtle variations of his own to these shifts, all within subsymbolic systems. The infant also recognizes his mother as a single entity across a wide range of such variations, in different positions, places, and states, and registers a prototypical image (or images) of mother in this way. We form discrete prototypical images of all objects in the same way. The organization of prototypical imagery occurs within sensory systems themselves, long prior to language acquisition, and continues throughout life, in its own modality-specific

formats. Through the partitioning or "chunking" of continuous gradations of sensory information into the discrete units of symbolic imagery, the means for connecting subsymbolic information to language is developed. This is a process of categorizing that must occur in the nonverbal system before connections to language can be made.

Words, like images, are discrete entities that refer to other entities, and that are generative on many levels. Language, a code that humans invented (or believe they invented), is the code over which we have the most control. It is the code of logic and the code by which much of the stored knowledge of a culture is preserved and communicated to individuals. We can express inner experience with language, at least to some degree; we can also lie with language. We use language to manipulate others and to direct and organize ourselves. Language is the primary medium of psychoanalysis, though it is not the primary medium of thought and certainly not of emotion. Through connections between imagery and words, language may play a role in the reorganization of nonverbal structures; the power of psychoanalytic treatment may be understood in this way, as we shall see.

The Referential Process

To enable an integration of functions, communication with others, and the development of a sense of self, nonverbal representations, in subsymbolic and symbolic formats, must be connected to one another and to language. The basic mechanism of such integration has been termed the *referential process.* The difficulty of this process and its partial and limited nature have not been sufficiently recognized within either cognitive science or psychoanalysis. People can make many sensory distinctions and carry out many functions within subsymbolic systems, operations they cannot capture fully in words. In a similar way, most people have great difficulty expressing emotion verbally; we often characterize intense experience in terms of our inability to express it in words: "My heart is too full for speech; I was struck dumb with horror"; or, in the words of the old song, "I can't begin to tell you how much you mean to me." It is precisely because of the limited capacity of language to capture the full range of human experience that "a picture is worth a thousand words." In our research on Referential Activity (Bucci 1984, 1995; Bucci and Miller 1993), we have examined both trait and state variation in the referential process, and the factors facilitating or blocking its achievement.

The referential process occurs initially within the nonverbal system, through connection of subsymbolic processes to prototypical images; these images are the types of discrete entities that may be connected to words. Images may be connected to one another, both within and across modalities, and expressed verbally in a wide range of metaphorical forms. The wine writer uses metaphor to capture subsymbolic experiences of taste and smell in imagistic and verbal form. The poet uses metaphor to capture emotional experience; the analytic patient learns to use narratives of images, fantasies, dreams, and episodes as metaphors of emotional experience in the same way. It was one of Freud's great contributions to recognize the power of manifestly trivial and irrelevant images and events as metaphorical representations of emotional experience. The concept of the referential process provides a systematic account of the power of free association, which Freud (and Anna O.) intuitively recognized. While language can capture only part of the underlying sensory and bodily contents of an emotional experience, the connections to the verbal system have the power to add new connections and new meanings, not previously seen.

Organization of the Emotion Schemas

Emotions are defined, within multiple code theory, as schemas registered in memory, which include subsymbolic and symbolic elements in all sensory modalities, and which are built up through repetitions of interactions with others, particularly the caretaker, from the beginning of life. These schemas bring together a wide range of experiences in different contexts and forms, joined by a common core of shared sensory and somatic experience, which Emde (1983) has termed the *affective core.* Thus, each individual experiences feelings such as love, rejection, joy, fear, and anger, in many ways, with many different people; the manifestly diverse instances of each affect are linked and organized by the sensory and somatic experiences that they share. Through this shared affective core, the interpersonal objects of the emotion schemas are associated as well. In Kernberg's terms, the emotion schemas would correspond to what in object relations theory would be constituted by representation of self relating to representation of other under the dominance of a certain affect.

The emotion schemas have the basic properties of all memory schemas; they determine how we perceive all new experience and are altered by new input as well (Bartlett 1932; Edelman 1989). They differ

from more cognitive or linguistic types of memory schemas in their relative domination by subsymbolic (sensory, somatic, motoric) information, and in their interpersonal contents. They represent concrete, bodily, sensory knowledge about what we want or need from others, how we expect others to act toward us, and how we feel and act in response. Narratives of prototypical episodes are the primary means by which emotion schemas may be represented in verbal form. The stories, dreams, and fantasies that emerge in free association represent the type of repetitive events through which the emotion schemas were formed, and by which they may be known to oneself and communicated to others.

Pathological Emotion Schemas

Pathological schemas involve sensory and somatic contents that are often experienced as painful and threatening, or compulsive and driven. They are attached to perceptions and expectations that are invalid in the context of one's current life, and to actions that are inappropriate and maladaptive; these schemas are also particularly resistant to change. Like all emotion schemas, pathological schemas are formed through repetitions of interactions from the beginning of life, influenced by the particular interpersonal context of one's life, and also by one's temperamental and cognitive capacities. The formation of pathological schemas may be understood as reflecting both *defensive dissociation* and *dysfunctional attempts at repair* (Bucci in press b).

Defensive dissociation. The individual in the grips of a painful emotion schema cannot directly control the subsymbolic sensory and visceral contents of the affective core—the rapid heartbeat, changes in respiration and temperature, the sickening feeling of dread, the arousal of excitement. Symbols are what we are more able to regulate and control. In pathology, the individual may attempt to avoid a negative schema by turning away from the symbolic contents, the images and words that are linked to it. The individual may avoid such entities in reality, or divert attention from them as they are represented in imagery or memory. The operation of dissociation or desymbolization, in which the connections between the subsymbolic and symbolic components of the schemas are cut, works as the converse of the referential process by which the schemas were organized. The operation of warding off, and the construction of what we think of as the dynamic unconscious, may be accounted for by such dissociation. Defensive dissociation may be seen in various forms, depending on the components of the schema that are accepted or warded

off—as isolation of affect in one form, for example, or as somatization in another.

The dissociation is (1) unsuccessful in achieving its goal and (2) resistant to change. The subsymbolic contents (including the sensory and somatic core of the painful schema and the behavioral responses associated with it) continue to be activated in trace form, at varying degrees of intensity, even if attempts to avoid the symbolic object are made. The activation of these sensory and somatic contents, painful in itself, may lead to maladaptive enactments, regardless of whether the negative expectations incorporated in the schema are fulfilled in reality. Without symbolic organization, however, the individual is unable to direct or regulate his behavior, or to evaluate the reality of his negative expectations in the context of his current life. The power of anxiety, and the vicious circle of the neuroses (Strachey 1934), may be understood on the basis of such repeated internal arousal in trace form, with or without external validation; the negative expectations are self-reinforcing in that sense.

Dysfunctional repair. To restore a sense of control and self-direction, the individual, hoping to provide some meaning for the feelings or tendencies to action that have been aroused, will attempt to connect the subsymbolic processes to symbols once again. Continuing to avoid the actual source or meaning of the arousal, he attempts instead to generate new scenarios, with new objects, to account for the aroused affect. These attempts at repair may be understood on one level as displacement and related defensive operations or, on another, as rationalization or secondary gain.

The new objects that give the reconstituted meaning to a schema are likely to be similar to or associated with the dissociated symbolic elements of the schema, but distant and different enough so that the connection is not seen. The child in a state of rage at her mother feels the intense affective and somatic arousal, but may not feel able to bear its emotional meaning and the possible consequences. She seeks instead a different meaning, one that accounts for the arousal while seeking to ward off its real objectives. She may interpret the arousal as a feeling other than anger, may experience it in relation to someone other than the mother, or as directed against herself.

The construction of new schemas, however maladaptive, is an attempt at symbolizing, at spontaneous healing in the representational domain, while maintaining the initial defensive dissociation. The schema,

while remaining maladaptive, persistent, and pervasive, appears now in a specific form, determined by the particular nature of the reconstruction and having its own secondary effects. The general need or wish for symbols and for meaning also has a potentially positive impact, in helping to retain a basis for self-organization and connection to objects.

The concept of the emotion schema, with its multiple and varied components, including visceral, motoric, and sensory representations and processes, provides a basis for understanding how a treatment based on words—a "talking cure"—may have bodily and behavioral as well as cognitive effects. The notion of structural change may now be understood as reconstruction of emotion schemas where dissociation and distortion have occurred. In the deepest sense, this involves changes not only in images and words, but in the subsymbolic bodily and sensory components of the schema.

Operation of the Referential Process: Symbolizing Anew

The domain of psychoanalysis is the private emotional experience of the patient and of the analyst. The goal of treatment is change in the underlying emotion schemas, which determine how an individual experiences her interpersonal world. The patient communicates private experience, intentionally and unintentionally, by words and other means; these communications, reaching the analyst, are processed by him in varying ways and at varying levels. The words of the analyst and the shared verbal formulations that emerge in the analytic discourse must ultimately be translated back into the emotion systems of the patient—including the action programs and the affective core—in order that change in the patient's underlying emotion schemas may occur.

The treatment is specifically designed to permit activation of painful and maladaptive emotion schemas in modulated form and in a new interpersonal context, in which they can be tolerated, examined, and reconstructed. If one can get back to the subsymbolic affective processing—the raw material of dread or rage or desire—one can bring about symbolizing anew, a process of reconnecting and recategorizing. This formulation of change or cure differs from the standard psychoanalytic formulation; I am not talking about replacing one system with another but about connecting and reorganizing systems that remain active and in place. The process of verbalizing the emotion schemas, with their dominant subsymbolic components that are dissociated from language, operates in three basic stages.

1. Subsymbolic activation. The cycle begins with activation of an emotion schema, dominated by subsymbolic processing, with its sensory and somatic components. The patient feels desire or fear or anger, in many cases dissociated from its object, perhaps turned on the self or experienced as a generalized mood state or in somatic form. In treatment, the patient may express this primarily in nonverbal form, by facial expression, gesture, emotive vocalization, and action, or in general verbal terms: "I feel tired"; "I feel tense." If the schema is dissociated, the patient will not connect to its symbolic elements—the images of objects toward whom the schema is directed. The treatment context, however, with its basic rule and the presence of another person, constrains her to go on, to continue verbalizing and symbolizing whatever she can: bodily feelings, vague images, intended actions, whatever comes to mind.

2. Connecting. This phase has two parts. First, a prototypical image comes to mind, retrieved from memory or constructed in the treatment; this is the conversion of the subsymbolic into the symbolic formats, operating within the nonverbal system itself. The discrete images and episodes (including memories of the past or events in the treatment situation itself), are then translated into words and described in narrative form. The power of free association can be seen here. The apparently trivial or irrelevant images and episodes that come to mind are likely to be prototypes of the events from which the emotion schema was constructed. Because their connection to the painful schema may not be seen, they are permitted into awareness, even when the initial objects of the dissociated schema are avoided; the warded-off subsymbolic elements of the schema may eventually be connected to words by this means. The interpersonal power of the treatment context may be seen here as well; the patient is connected to another person in the episode she retrieves and tells, and communicates the emotion schema to the analyst in this new context.

3. Reflection and verbal elaboration. In this third phase the patient, with the analyst, reflects on the images and stories that have been told. The analyst may take the lead at this stage. The narrative of the connecting phase has revealed the patient's emotion schema as it exists now—as it has been retrieved from memory or played out in the context of the current situation. In the telling of the story and the reflecting on it, an opportunity for change in the emotion schema is found. The old story in a new interpersonal context is potentially a new story, not just a retelling. The somatic elements of the activated schema occur in the

session in modulated form; the event is represented in a code that is shared; the tools of logical differentiation and generalization can intentionally be invoked. The connection of the displaced object to the activated memory schema may be recognized, as may differences between the current and past situations. The person of the analyst and the therapeutic context provide prototypical images in the here and now, which may be introduced as new elements into the schemas. If the schemas are altered, we would expect that subsequent narratives would be altered in corresponding ways. Optimally, the process has a spiral rather than cyclical pattern, repeating but continuously deepening and covering new ground.

The good hour. The referential cycle as outlined here may be applied to Kris's formulation of "the good analytic hour" (1956). "Many a time," according to Kris, "'the good hour' does not start propitiously. It may come gradually into its own, say after the first ten or fifteen minutes" (p. 446). As I would suggest, this first ten or fifteen minutes is a phase of subsymbolic activation; much is happening inside the patient, but not much that can be talked about or shared. The patient, who has contracted to continue talking, will bring in whatever elements of the emotion schemas emerge. "Then," Kris notes, "a dream may come, and associations, and all begins to make sense. In particularly fortunate instances a memory from the near or distant past, or, suddenly, one from the dark days may present itself with varying degrees of affective charge" (p. 446). This would constitute the second phase of the cycle, in which the schema is symbolized by a dream or memory. The possibility of intervention, to facilitate a change in the schema, may occur here. But it need not always be a formal interpretation, as Kris also notes: "And when the analyst interprets, sometimes all he needs to say can be put into a question. The patient may well do the summing up by himself, and himself arrive at conclusions" (p. 446). This summing up would be the third phase of the cycle, which may then begin anew at a deeper level.

Measures of the Referential Process

Research measures have been developed, based on multiple coding concepts, that enable an empirical examination of the phases of the referential process. Using these procedures, we can evaluate the degree to which the cycle plays out in a session, and identify factors facilitating or blocking each phase. On a theoretical level, we can also evaluate the

clinical implications of the playing out of the cycle or its interruption, as part of the process of validating multiple code theory itself. Our research methods are described in detail in several publications (Bucci et al. 1992; Bucci and Miller 1993; Bucci 1995). Linguistic measures based on the concept of Referential Activity and new computer-assisted procedures that assess the phases of the cycle will be described briefly.

Measures of Referential Activity. The construct of Referential Activity (RA) refers to activity of the referential connections between the nonverbal systems and the communicative verbal code. The theory of Referential Activity recognizes two basic kinds of linguistic function, one that is connected to nonverbal, particularly emotional, experience and one that is not. The language measures we have developed enable us to rate the patient's language according to the degree to which it represents one or the other of these functions. High Referential Activity, indicated by concrete and specific language referring to imagery, is dominated by narratives of episodes. This reflects the central mechanism of the referential function, the construction or retrieval of specific prototypical imagery and its connection to words. Low Referential Activity is indicated by language that is more general and abstract.

Measures of Referential Activity include scales that assess the Concreteness, Specificity, Clarity, and Imagery levels of language, as well as other measures based on features of language style, and new computer-assisted procedures (Bucci 1984, 1995; Bucci and Miller 1993). The RA measures have been validated as indicators of cognitive-linguistic-affective integration, and as associated with adaptive interpersonal functioning, in a metaanalysis of Referential Activity by Samstag (1996). They have also been validated as locating the points in the session at which central themes, including transference themes, are likely to be found (Bucci 1993, in press a). Relationship Episodes (REs), defined as narratives about oneself in relation to others, which serve as the basis for scoring the Core Conflictual Relationship Theme (CCRT) (Luborsky and Crits-Cristoph, 1988), show significantly higher levels of RA than do non-RE passages (Bucci 1988, 1993, in press a).

Computer-assisted measures of the symbolizing cycle. The analysis of case material to be presented here will focus on the application of new computer-assisted procedures. In our current work we use three basic word lists to model the phases of the referential or symbolizing cycle, and additional content dictionaries to map thematic contents. The three basic word lists are Emotional Tone (ET) and Abstraction (AB),

developed by Mergenthaler (1992, 1996), and Computer-measured Referential Activity (CRA), developed by Mergenthaler and Bucci (1993). We have also constructed specific content dictionaries, including measures of maternal and aggressive preoccupations. In applying the dictionaries to case material, the word lists are matched to session transcripts, and the number of matched words and their proportion of total word count are computed. Our procedures for dictionary development, matching, and computing proportions of matched words are based on the Text Analysis System (TAS) developed by Mergenthaler (1985). The use of computer-assisted procedures is based on the premise that meanings are redundantly expressed in language and are carried to a large extent by individual lexical items, independent of syntactic form. We do not simply assume this interpretation, however, but test its validity in our empirical research (Mergenthaler and Bucci, 1993; Bucci and Miller, 1993; Bucci 1995; Bucci in press a,b). The framework of multiple code theory directs the choice of words and provides a framework for their construct validation in relation to other clinical and linguistic measures.

The Emotional Tone word list is used to model the first phase of the cycle, Subsymbolic Activation, in which the speaker is opening up an emotion schema dominated by subsymbolic components that can be expressed only partially in words. The ET list consists of items that demonstrate an emotional or affective state of the speaker and are likely to cause emotion in the listener (Mergenthaler 1996). We are developing additional linguistic measures of this phase, including a dictionary of somatic concerns. We should also note that the meanings expressed in this phase may be represented most directly by nonverbal or paralinguistic features, such as pausing, and measures of facial expression and gesture, rather than by linguistic measures. In future research, the validity of the linguistic measures will be further developed in terms of their relationship to these more directly expressive forms.

The second phase of the cycle, the Connecting phase, is marked by high Referential Activity. The Computer-measured Referential Activity (CRA) measure was developed empirically by modeling the Referential Activity (RA) scales as scored by expert judges (Mergenthaler and Bucci 1993). CRA is computed on the basis of two separate word lists: a High CRA word list consisting of the type of words people are likely to use in describing concrete and specific imagery and events, and a Low CRA list consisting of words associated with more abstract and general

language use. In computing CRA, we match each word list to the words in a text; compute High and Low CRA scores separately; then derive the CRA measure as the difference between the two scores. Details of the construction, validation, and application of the CRA measure are given in Bucci (1995), and Mergenthaler and Bucci (1993).

In the third phase, Reflection and Verbal Elaboration, the individual moves from the concrete and specific instantiation of the emotion schema in an image or episode to a more generalized and abstract understanding of the meanings and implications of the event. Using computer-assisted procedures, we attempt to capture this phase with concomitant high levels of emotional expression, using the ET word list, and the more formal language of abstract thought, measured by the Abstraction (AB) list. The latter consists of complex, abstract words that are understood as signs of logical reflection and evaluation (Mergenthaler in press). High AB alone indicates intellectualization; high AB along with a concomitant increase in ET indicates emotional insight—the power of the shared verbal system, including logical processing, being brought to bear on the contents of emotional experience.

AN EMPIRICAL APPLICATION: THE CASE OF MRS. C.

In our empirical research, we apply these computer-assisted content analysis procedures to sessions as a whole and trace changes across a treatment; we also divide sessions into segments and trace the process within a session. The computer-assisted procedures enable us to investigate long-term treatments and potentially permit replicated or multiple treatment designs, in a way that is not possible with procedures requiring judges' ratings. The computer measures may be used both as indicators of clinical process in themselves and as scanning devices to locate significant points in a treatment, where more intensive clinical ratings might then be most effectively applied.

The application of computer-assisted procedures will be illustrated here with examples from the case of Mrs. C., a fully recorded psychoanalysis of a young woman that lasted six years, conducted five days a week, with a total of 1,114 sessions.[2] The case has been studied by several

[2]The field of process research owes its existence to the scientific spirit and courage of analysts, such as the analyst of Mrs. C., who are willing to record their treatments. I would also like to acknowledge the collegiality and care with which Hartvig Dahl, who holds the archives of Mrs. C., has made them available to researchers, while safeguarding their confidentiality.

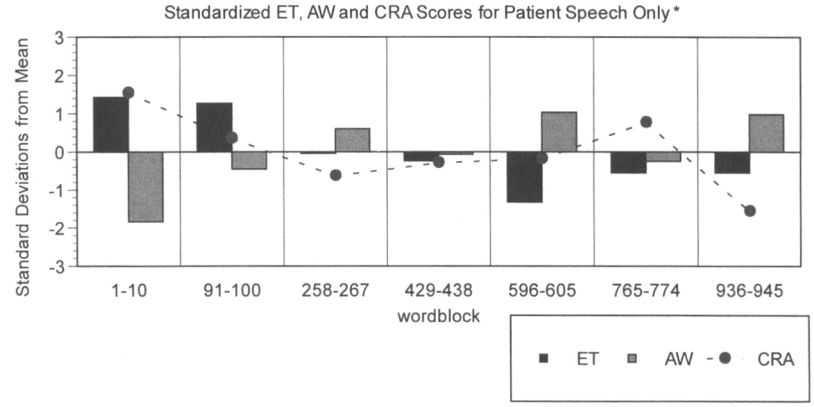
researchers, with a variety of clinical perspectives and research techniques. The first hundred sessions of this case were transcribed for the study of Mrs. C. reported in Weiss and Sampson (1986). Seventy sessions, selected in groups of ten each from throughout the treatment, were used by Jones and Windholz (1990) in their study of this case. The examples to be presented here are drawn from a more extensive discussion of this case (Bucci in press b).

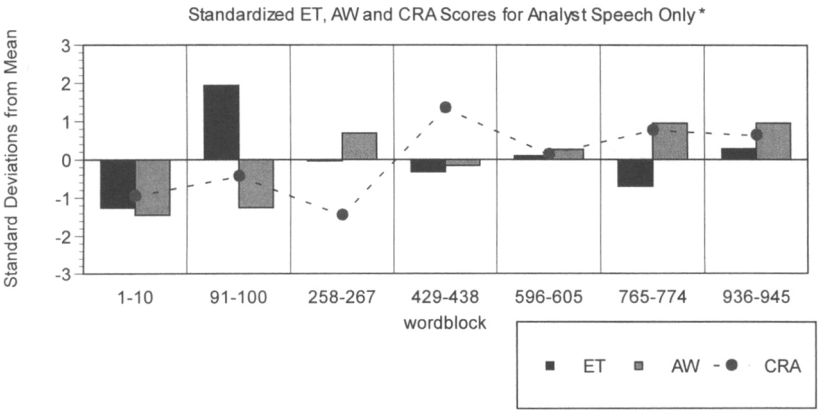
Figure 1 shows the application of our computer-assisted procedures to the same seventy sessions that were used in the Jones and Windholz study (1990). The graph shows the application of our measures to patient and analyst speech separately, for each of the seven groups of ten sessions, spaced throughout the treatment. Scores are computed as standardized scores, fluctuating around their mean, with units of their standard deviation from the mean, across the entire set of sessions. The black bars show the scores for proportion of ET words; the grey bars represent the proportion of AB words; CRA is shown as a continuous line. The patient's ET is highest for the beginning of the treatment, in the sample of sessions from the first one hundred hours, during the first year
170 of treatment. CRA is also generally high at this time; AB is low. The language measures indicate that the patient, in this early phase of the treatment, is relatively able to connect to emotional experience, to tell the stories and describe the images that constitute metaphors for underlying emotional states; she also uses less abstract language at this time.

The pattern changes dramatically as the treatment continues. By the second year (sessions 258–267), the patient's use of emotional speech declines and never recovers consistently, and CRA declines, while AB increases. As we have discussed, high RA language is significantly associated with adaptive cognitive and affective processing. We also know, from previous research, that high AB language, without accompanying ET, is associated with increased intellectualization and related defenses (Mergenthaler in press; Fertuck 1996).

The patient never again reaches the CRA level that she shows in the first ten sessions. She shows some increase, but still to a lower level, in the ten sessions from the fifth year of treatment (sessions 765–774), in which Jones and Windholz see her as struggling with feelings of aggression and guilt. Since we have as yet analyzed only a few sessions from this period of the treatment, beyond the ten summarized here, we do not know whether this CRA increase constitutes a valid representation of the treatment course in this phase. We are continuing to explore

Figure 1.
Application of Computerized Procedures
to Seven Groups of Ten Sessions Studied by Jones and Windholz (1990)





* Scores are averages of 10 consecutive sessions selected from 7 distinct phases of the treatment.

this question in our more comprehensive studies of additional sessions of this treatment.

In contrast to the patient's pattern, the analyst shows an overall increase in CRA across the treatment, with a local peak in the third year (sessions 429–438). We may note that this is a special, not a representative, time in this treatment; these are the patient's immediate predelivery and postparturition sessions. It is interesting that the analyst's CRA indicates his increased involvement in this material, while the patient's CRA remains low. Without going into details, we can see that these results raise interesting questions concerning the effect of the patient's pregnancy on the transference and countertransference in this phase (Friedman et al. 1994).

In the Jones and Windholz study, the seventy sessions were rated in random order by clinical judges using the Psychotherapy Process Q-set (PQS) technique. The PQS was designed to provide a basic language for the description and classification of patient and analyst actions and attitudes, and their interaction. On the basis of their ratings, Jones and Windholz (1995) concluded that "over the years the patient's discourse was less intellectualized and dominated by rationalization, and increasingly reflected greater access to her emotional life and a developing capacity for free association" (p. 100). In contrast, our linguistic overview indicates that Mrs. C. shows a general decline in expression of emotional experience across the six years of her treatment, as reflected in level of both CRA and ET, and that her language style in treatment becomes more intellectualized and abstract, as reflected in the increase in AB. In effect, we reach essentially opposite conclusions from those of Jones and Windholz, using the same set of seventy sessions. We will return to these findings in our analysis of several individual sessions from this case, to be reported below.

Weiss and Sampson (1986), using a set of process research methods based on assessment of the patient's unconscious pathogenic beliefs, goals, and plans, studied the first and last hundred hours of this case. According to Weiss (1995), the patient's plan, as inferred from the first hundred sessions, was still guiding her behavior during the final hundred: "Throughout her analysis, Mrs. C. was unconsciously worried about the analyst, for whom she felt omnipotently responsible. During the first 100 sessions she tested her belief in her responsibility for the analyst by attempting to demonstrate to herself that she could not push him around. During the last 100 sessions she tested this same belief by attempting

to demonstrate to herself that she would not hurt the analyst if she made clear to him her wish to terminate" (p. 25).

Weiss discusses this consistency of Mrs. C.'s unconscious plans and goals as a demonstration of the psychometric stability and reliability of the plan formulation measure. The question may be raised, however, as to whether one would expect pathogenic belief systems to remain unchanged across a successful analysis, and what it means if they do. From one perspective, the stability that is observed in this case raises questions about the interpretation of the Weiss and Sampson plan construct; from another perspective, one that is central to our discussion here, this must lead us also to question the effectiveness of Mrs. C.'s treatment in addressing her pathogenic beliefs. Presumably, if an analyst repeatedly passes the patient's "tests," in the terms of the Weiss and Sampson approach, one would expect the patient's pathogenic belief system to change rather than remain stable.

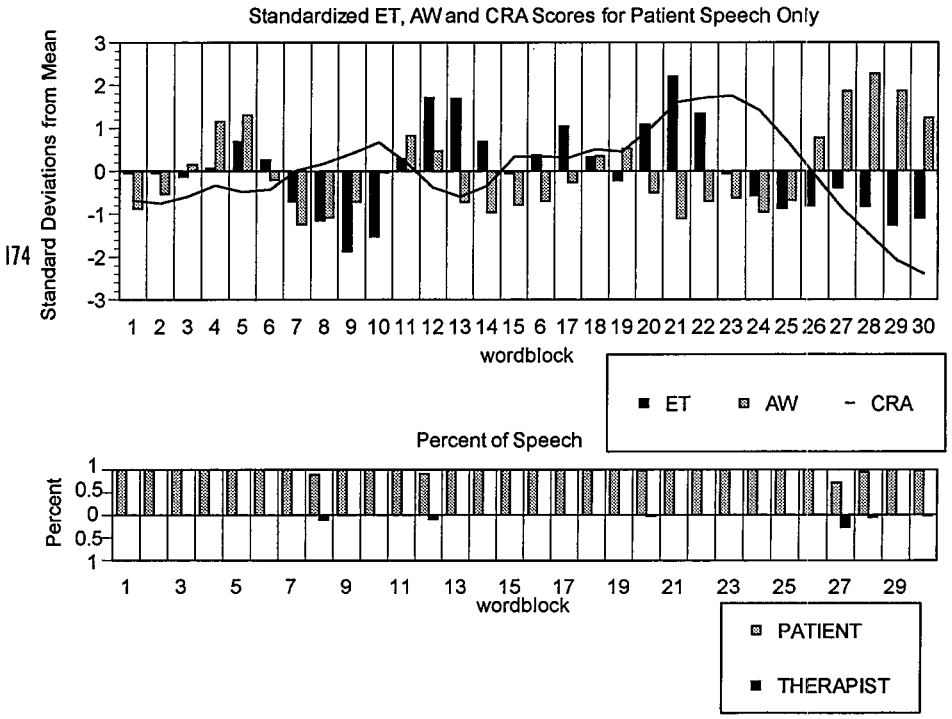
Changing Patterns of Interaction: A Study of Two Sessions

We can begin to explore the questions raised by comparison of these formulations by looking now at the process within sessions. We will examine two sessions, from the first and fourth years of treatment, using our computer-assisted procedures combined with examination of some of the clinical material identified as salient by these measures.

The early phase; a partial cycle. Session 38, from the first year of the treatment, was a session with a high overall score on the three language measures, ET, AB, and CRA. The high levels of our measures could in principle be productive or not, depending on the patterning of these events, but this was a good bet, using our measures as a screening device, to find a session in which all aspects of the cycle are likely to be found.

Figure 2 shows the three dictionaries (ET in black bars, AB in grey bars, CRA as a continuous line) applied to session 38. The transcript of the session is divided into 150-word blocks; the scores, proportions of words matched, are computed for each measure for each block and then converted to standard scores. The measures yield a kind of linguistic profile or "CAT scan" of therapeutic transactions in the session, revealing the underlying structure of the process in a way that reading or listening cannot. The upper graph shows the computer-assisted content analysis for patient speech only; the lower graph shows proportion of each 150-word block accounted for by patient speech (height of bar

Figure 2.
Application of Computer Assisted Procedures to Session 38 of Mrs. C.'s Analysis



above the midline) and analyst speech (below the midline). As we can see, the analyst speaks very little in this session, in word blocks 8 and 12 and again in 27 and 28. This is fairly typical of his interventions throughout the treatment.

The hour selected turns out to look in some respects like an example of the "good hour" as described by Kris. In accordance with both Kris's description and our outline of the referential cycle, the hour does not start propitiously; little happens in the first third of the session. The patient tells of her feelings of rejection by her mother; she says she is afraid she will not be able to control her anger at her mother. Finally, in word block 12, the analyst asks her what she would like to do, to which she responds with a vivid answer, reflected in high ET: "Shout something awful at her, or throw something, break something, generally create a disturbance. . . . I want to attack her, hurt her back in some way."

Following this expression of feelings and actions, Mrs. C. moves to a series of narratives. This is the second phase of the cycle, connecting to imagery and telling this in narrative form. This phase is represented in the RA peak extending from word blocks 15 to about 24. She reports an incident concerning a man whom, she says, she had been petrified about dancing with, but then she danced with him and enjoyed it—"he was wild enough and strong enough as a leader so it made me do things that I might not have dared to do otherwise." It is not a big inferential leap to see a reference to the analytic relationship in this. This inference is validated by the subsequent associations. She thinks of a dream, consistent still with Kris's model of the "good hour," and also following the pattern of the referential cycle. She was at a gathering of people connected with the dance; the analyst was there and told her that he knew what she was doing and that she had better stop. This leads to a description of a movie she recently saw, about a girl who wanted to be a free spirit, and then to other associations and narratives, ending with her telling about her fears of being left alone and rejected. Dreams are, of course, characteristic contents of the RA peaks. For this patient it is also quite characteristic to use movies or books as vehicles for her narrative constructions. Following the RA peak, the analyst intervenes, in block 27, with a clarifying question. He asks her what it was, in her dream, that he had told her to stop doing, to which she responds, "I think I was actually sort of, um, gradually hunching up more and more and putting my face in my hands and just kind of hiding my face." The patient then goes on to considerable summing up on her own, for the

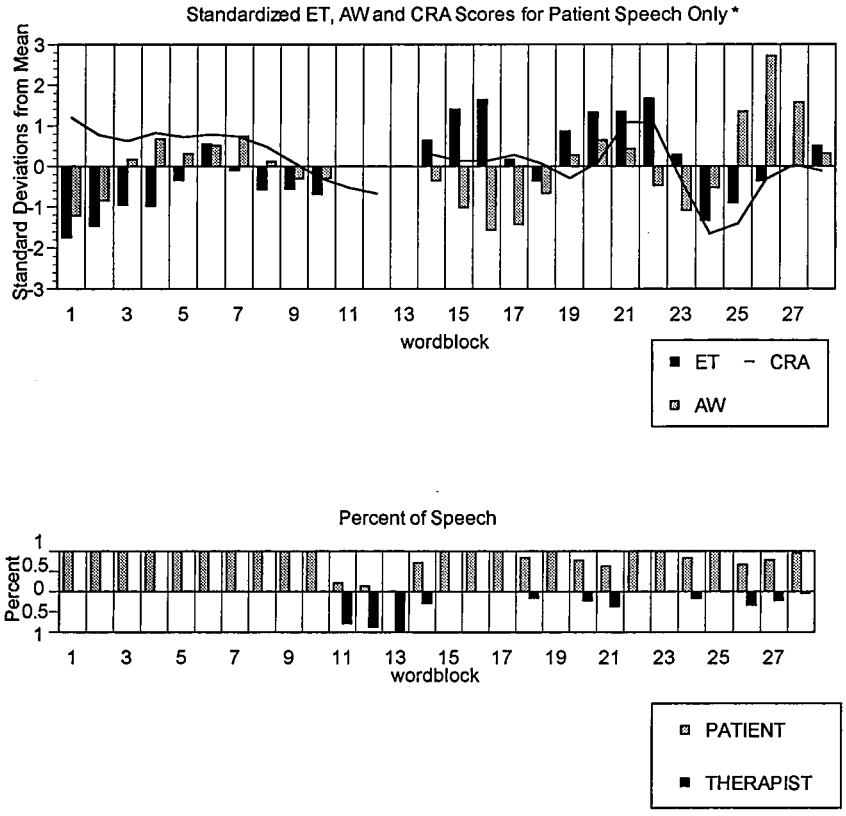
remainder of the session. She says that she feels understood, cared for, comforted. However, her language becomes increasingly abstract. She attempts to probe the meaning of the analyst's being in her dream, and her feelings about it; she is uncomfortable about his being in the dream, about having him "take an importance with me that was just fantasy." At the same time, she has a feeling of freedom that she can say what she thinks here, but has this feeling more when she thinks about being in the session than when she is actually there. She talks about fooling herself; she distrusts everything she says.

In this session we see the opening of a cycle, with emotional arousal indicated by high ET, leading to narratives of an incident, a dream, and a movie, constituting a CRA peak. The analyst's brief question in block 12 may have contributed to the unfolding of these narratives. Optimally, according to our model, the sequence of narratives in the CRA peak would have been followed by concomitant increases in ET and AB, indicating emotional insight. Here it is followed by high AB alone, while ET is low, indicating reflection without emotional connection. She becomes locked into ruminative doubting of the feelings that have been opened up, rather than moving forward with them. She is moving away from her connection to emotional experience and withdrawing from the analyst; she recognizes this withdrawal herself, at least to some degree.

Retreat from linking; schemas in stalemate. The next example, session 726, occurred several years later in the treatment, several months prior to the phase characterized by Jones and Windholz (1990) as the period of transference neurosis and resistance. In the intervening years, during the period represented by sessions 316–438, she had become pregnant and delivered a healthy baby girl. Session 726 is the first of a series of three, occurring in the week prior to the analyst's vacation, that were characterized by low CRA and ET and high AB. The measures mark these sessions as a generally unproductive period in which emotional connections were not made and intellectualization was dominant. The graphic representation of session 726, constructed as described above for session 38, is shown in Figure 3.

The session begins with a relatively long silence of approximately three minutes, typical for Mrs. C. at the opening of a session. (Silences are not indicated on this graph, which is based on word count rather than time.) Her first utterance is a CRA peak. When she came into the room, she noticed an odor that made her think of cat urine. She has the fantasy that somehow cats have gotten in and urinated on the couch—although

Figure 3.
Application of Computer Assisted Procedures to Session 726 of Mrs. C.'s Analysis



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* Scores not calculated for ET, AW and CRA for wordblocks where patient speech is less than 25 percent of spoken words.

she knows that must be impossible—and then she has to lie in it. The other thing she was thinking, which seems to her more likely, is that the material on the couch has somehow gotten damp; it has that kind of smell. She says that perhaps she started thinking about cats having urinated to avoid thinking about someone having been on the couch just before her and what they might have done. She had the idea of that person sweating profusely and making the material damp.

An idea comes into her mind, one she was not aware of when she first talked about this smell; sometimes her husband will sweat a lot when they are making love. She doesn't want to get to that kind of thinking; she feels stuck. She talks about a general feeling of panic that overtook her yesterday and today, a feeling related to the analyst's impending vacation at the end of this week. She feels that her understanding of what they have talked about is vague and out of reach; she needs to come to treatment in order not to lose it. She needs something to happen before the end of the week; otherwise it will be too late.

She falls silent for two minutes, around block 5, and then begins to reflect and ruminate in a general and abstract way. She knows she is getting tangled up, and this perception is validated in continuing declines in all three language measures, through block 10.

The analyst intervenes for the first time during blocks 11–14, while the patient is in this tangled, ruminative phase. His intervention here is far longer than his usual utterances, taking up almost the entire word count for these segments, as shown in the bottom portion of Figure 3. Referring first to her fantasy about the cats, he suggests that she was saying that his place stinks. He then refers to her fantasies about provoking a male to attack her, which he has previously noted with respect to her husband and himself: "So you keep, in one way or another, by your behavior, inviting me to, as you say, break through, to rape you, to attack you; then you'll have an occasion to fight back and kick me in the groin and destroy me. And it's this kind of a fantasy behind all the things that you're doing, I think. And now you're saying, you haven't got much more time. I, if I'm going to do it, I've got to do it this week. Ah, in a way this is very similar to the way you've behaved toward [your husband] for years."

In response to this intervention, Mrs. C. speaks with increased emotion, as reflected in a brief, relatively high CRA utterance, followed by high levels of ET. She disagrees, in part, with what the analyst has said. What she actually wants is to be overcome, not to fight back.

Perhaps she wants to fight some with her husband, but she wants him to be stronger.

The analyst responds, in block 18, that he is struck with how nonspecific the things she is thinking are. She responds directly to this, asking herself, "What am I not thinking by not being specific?" She seems to comply with the analyst's interpretation; she goes on to describe a situation in which she passively resists her husband's wishes and gets him to become angry at her. She sits around on a Sunday, reading the newspaper, doing nothing, not getting dressed; she doesn't feel good, but does it anyway. Her husband doesn't like her doing that; she waits for him to nag her. Then she would get dressed "and it would be, the end result would be something that, even though we'd fought to get there, was one I really kind of wanted." This is part of the CRA peak of blocks 21 and 22. She thinks that maybe what she does could be interpreted two ways—as setting up the fighting to get the end result she wants, or as related to her wish to destroy her husband and attempting to control this wish. This brings her back to her wish, discussed in previous sessions, to have tape recordings of the session to listen to during the vacation: "Well, the thing I'm thinking now, I, um, I can see it could be interpreted two ways. And I'm not sure, um, (sighs) but something led me to, um, think back to what you had said that got, got us started on thinking about these things, or me started, um, in the way that I am right now. And, I don't know, it's as if I'm, what I'm trying to do is replay exactly what you said and then everything that's been said since then, um, as if it's a recording in my mind so that when I leave here I'll have it. And if I can't do that then I won't have it when I leave here."

The analyst interprets her wish for the recording, as he has done previously, as further evidence of her wish to have what he has and, by implication, to destroy him: "Well, the recording for you is equivalent to—it's my penis. I have it and you don't and you want it. And that's what the fight is about. That's what you want to get revenge for. That's why you're trying to defeat me, frustrate me. That's what you want to do to the guy in the movie, it's what you'd like to do to [your husband]. That's why you're thinking this." Mrs. C. resists this interpretation, as she has done in several previous sessions, and returns to what she sees as her own reasons for wanting the recordings—her feelings about the forthcoming separation. The analyst does not acknowledge the possibility of alternate interpretations, and the issue remains unresolved.

Comparison of patient and analyst themes. As discussed above, we view the narratives of the RA or CRA peaks as derivative expressions of the patient's dominant emotion themes. The difficulties that occur in the session may be examined by comparing the patient's themes in her CRA peaks with the analyst's interpretations. Her theme in the first peak may be characterized as follows: *I think about what happens here when I am not here. I have not taken in enough to keep me going while you are away. I need you to do something to me, to give me something to take away with me.*

The analyst does not respond at first; silent for several minutes, the patient then becomes vague and tangled in her speech, as indicated by declines in all three language measures. The analyst's long intervention, following this period of rumination and withdrawal, does not reflect Mrs. C.'s theme but continues a theme of his own, which he has been pursuing in previous sessions: *You try to provoke me (or him); you want me to force you to do something, or to be angry with you, so that you are then free to fight back and destroy me.*

The contents of the patient's second CRA peak, in blocks 21 and 22, a narrative about her husband, in some respects appears in agreement with the analyst's interpretation, but with a different perspective. She acknowledges that she tries to provoke her husband, but suggests that her motivation may be understood in two ways. Perhaps she does have destructive wishes toward him; however, she also provokes her husband (or her analyst) as a way to control herself or to activate him to restrain and overcome her. She continues to resist the connection of wanting a tape recording to wanting his penis, and as representing envy and destructiveness. Her second theme may be stated as follows: *I am angry and powerful. I provoke you to control myself. You restrain and overcome me. I am relieved.* The analyst's interpretation following the second CRA peak reiterates the theme of his earlier intervention, in essentially unmodified form.

In our approach, one way to evaluate the validity of the analyst's view of the case is to use our language measures to examine the patient's responses to interventions. We look not for direct agreement or disagreement, the meaning of which is intrinsically ambiguous, but for indirect indicators in the patient's language style that the analyst's interventions are facilitating or blocking access to emotional experience.

The lengthy series of interventions in blocks 11–14, pursuing the theme of envy and destructiveness, is followed by an increase in ET

and a decline in CRA and AB. As the measures indicate, the patient has been emotionally aroused by the interventions, but she continues to speak in a vague and disconnected way, responding to what the analyst says and struggling to get her opposing view across.

The analyst's intervention in block 18, which refers to the nonspecific nature of her thoughts, may be seen as having its intended effect. She experiences this as his exhorting her to be more specific. His comments appear to empower her to accept her hostile wishes, reducing her censorship of them. This leads to a series of narratives that are indeed more specific than the material that has gone before, and that constitute the second CRA peak of the session.

The analyst's interventions in blocks 20 and 21 continue his earlier theme. The *content* of the patient's material here appears to provide partial confirmation, as we have seen. Her subsequent language *style*, however, tells a different story, as steep declines in CRA and ET indicate that the patient turns away from her emotional experience and from the analyst as well. The patient's language indicates that the analyst's view, as expressed in his interpretation, did not succeed in opening connections to the patient's emotion schemas; she remains disconnected and defended. We may also note that the failure to connect to the emotion schemas continues in the two sessions following this one, 727 and 728, as indicated by continued low levels of CRA and ET. Based on our measures, the analyst's view, as reflected in his interpretations at this phase of the treatment, is not validated in the patient's response.

On the basis of these results, it appears likely that Mrs. C.'s anger, as expressed in the second CRA peak of the session and in the accompanying high ET language, is determined at least in part by the interaction in the session; rather than being primary only, as the analyst assumes, the anger is multiply determined. Our analysis of this session suggests alternate explanations (as does the patient herself). Her anger may be a response to the analyst's initial rejection, to his preceding interpretation, or to his unwillingness to consider alternative interpretations. It may also, ironically, be an indirect compliance with his formulation (which is characteristic of this patient)—she becomes angry, as he claims she has been.

As Friedman et al. (1994) have discussed, it seems apparent that for Mrs. C. as a woman (and now a mother of a small child) having the analyst's tape recording can have important meanings other than taking away his treasures and destroying him, just as her pregnancy can have

an emotional meaning other than that assumed in classical theory. The theme of having the analyst's baby emerged during the pregnancy, but was interpreted there on the basis of the classical assumption of the infant as attempted reparation for the female's lack of a penis. In session 726, examined here, this interpretation appeared remote from the contents of the patient's associations and failed to open new connections to the emotion schemas. While many factors may be operating, the difficulty here appears to reflect a disregard of the patient's affiliative wishes and other aspects of maternal strivings as primary, perhaps operating alongside of and in interaction with sexual and aggressive motivations, but not secondary to them. Along these lines, we can see that the patient's wish to have something of the analyst to take with her does not necessarily mean that she is envious or has destructive wishes toward him. A property of objects such as tape recordings (and babies), in contrast to bodily parts, is that they can be propagated, can be jointly held, and can even increase in value, substance, and meaning, in various senses, when they are shared. In the instance of the pregnancy, the infant is something she has created with a man; the analyst figured centrally in her fantasies concerning the pregnancy. In the instance of the tape recording, this is also something they have made together. If such images and motivations were present for Mrs. C., and were not understood, they would account quite directly for her anger and hurt.

Stability of the discourse pattern. In the first session discussed here, Session 38, which occurred early in the treatment and was selected on the basis of relatively high scores on all our language measures, the patient begins to make connections to her own emotional experience and to the analyst. She experiences feelings of freedom and sees the analyst as supporting these, but she is threatened by the new possibilities and withdraws from her open position, as indicated by the decline in emotion-related speech and the increase in abstraction at the end of the session.

A similar pattern of opening up and expressing feelings more freely, and then defending against them, is seen in the treatment as a whole, with high levels of ET and CRA in sessions selected from the beginning of the treatment, and their subsequent decline, along with an increase in abstract speech, reflected in high AB. The emotion schemas and discourse pattern with which the patient began appear to characterize this patient and this dyad in the analysis as a whole. As we have argued with respect to Weiss and Sampson's concept of the unconscious plan, this stability may be seen as a demonstration of the reliability of our

language measures and our portrayal of her emotion schemas. On the other hand, one might argue that in a successful treatment, this pattern might be expected to change.

We may also suggest that the difficulties that are seen in the second session described here, session 726, may be seen as related to the difficulties in the treatment as a whole. In that session, the patient begins by desiring closeness and has fantasies of what happens in the office when she is not there; she wants to have something of the analyst's, or of theirs together, to take with her. She is rejected, not understood; she offers some compliance, or at least a compromise; he retains his position; she feels anxious and angry. In our studies of the pregnancy phase of this treatment, we have seen her relationship with a cold and rejecting mother as salient, and have identified emotion schemas of desire for closeness with expectation of rejection and consequent feelings of anger, withdrawal, and defense (Friedman et al. 1994; Udoff 1995; Bucci in press b). The events of session 726 appear to reflect a reenactment of this pattern. The change brought about by the treatment is not in the overall schema, but in her empowerment to express anger; she also defends against this.

We should also note that Mrs. C.'s view of her second theme is very close to the statement of her unconscious plan, as formulated by Weiss and Sampson: She feels responsible for the other (the analyst, her husband); she tests her pathogenic belief (and presumably attempts to disconfirm it) by trying to demonstrate that she cannot push him around or hurt him. The analyst's rejection of her request for the tape recording may be seen, in that respect, as passing her test (although the analyst would have been unlikely to have formulated the patient's unconscious plan in such terms). On the other hand, his focus on her wish to destroy him (and other males) implicitly supports her belief in her power and her responsibility in this regard; *she is dangerous, as she fears, and can feel safe from doing damage only if the male is stronger and is able to restrain her.* In Weiss and Sampson's terms, her belief in her responsibility for the analyst's feelings and her own is repeatedly confirmed.

CAVEATS AND CONCLUSIONS

Each of the researchers and clinicians who have studied this case has seen it through a different lens. The analyst focused on Mrs. C.'s structures of envy and aggression, stemming from the birth of a younger brother. Weiss and Sampson emphasized feelings of unconscious guilt,

based on unconscious feelings of superiority, and saw her envy and her belittling of herself as secondary. Friedman and Bucci have emphasized themes of affiliation and anticipated rejection, with anger and anxiety consequent on this. The language analysis presented here provides some support for that position, and also some indication that the analyst's interventions may not be connecting to Mrs. C.'s emotion schemas as the treatment proceeds.

At this point the formulation of the process in these sessions is only partially supported by empirical research. What I have presented here may be seen as an outline for a process research project, rather than a completed study. The flow of the patient's associations, the location of the dominant themes, and the interaction with the analyst have been captured in a systematic and reliable way in our language measures. I have, however, provided only descriptive accounts of the contents of her themes and the effects of interventions. To develop the empirical study of this material more fully, and to allow statistical evaluation of the effects of interventions, a large number of sessions need to be analyzed, and additional content measures, developed by other researchers and by ourselves, need to be applied. These include reliable measures of the patient's central themes, such as the Core Conflictual Relationship Theme (CCRT) measure developed by Luborsky and Crits-Cristoph (1988), or the new version of the FRAMES measure currently under development by Dahl, based on his emotion theory (Dahl 1978), as well as measures of defensive operations (Perry 1993). Content dictionaries, including measures of maternalism and affiliation (Udoff 1995) and measures of aggression and hostility, have also been developed for evaluation of clinical themes. These researchers and others are currently carrying out studies applying multiple measures of these types to the case of Mrs. C. and other recorded psychoanalytic treatments. Through application and comparison of multiple measures, their construct validity may be developed, and differing clinical views may be reliably compared.

The theoretical framework of multiple code theory makes it possible to define the concepts of pathology and its change in treatment in terms of a general model of psychological organization, independent of any specific clinical theory. In this framework, empirical studies of psychoanalytic sessions may be used as the basis for developing a psychoanalytic psychology, and can also inform clinical work. We have taken a first step here, to illustrate the potential power of this approach.

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