

BENEATH THE SURFACE OF THE THERAPEUTIC INTERACTION: THE PSYCHOANALYTIC METHOD IN MODERN DRESS

This study represents a new generation of psychotherapy process research, using multiple perspectives on the data of the analytic situation, including impressions of the treating analyst, ratings of complete sessions by clinical judges, and objective linguistic measures. Computerized measures of language style developed in the framework of multiple code theory were applied to verbatim session recordings from a psychoanalytic case; the measures are illustrated in microanalyses of the process in two sessions. The results show agreement between the linguistic measures and clinical ratings based on a psychoanalytic perspective. The linguistic measures look beneath the surface of the therapeutic interaction by relying largely on lexical items of which clinicians are not likely to be explicitly aware, and enable a new perspective on the therapeutic discourse as seen in the graphic images of the microprocess. While the results of this study were limited to a single case, the automated measures can be readily applied to large samples and in repeated single case designs. Two goals of process research, using measures such as those developed in this study, are discussed: to develop measures of mediating variables that can be used to identify specific treatment effects in comparative outcome studies; and, beyond this pragmatic aim, to assess development of capacities for self-exploration and self-regulation as psychoanalytic treatment goals.

The need to provide evidence for psychoanalytic treatment effects has been recognized from the beginning of the field; controversy concerning the data required for this has been ongoing as well

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(Kernberg 2006; Perron 2006). In addressing this need, the field of empirical psychoanalytic process research occupies an uneasy zone between the more dominant approaches of empirical outcome research and the traditional method of the case report. The value of process research has been questioned from both sides: from the psychotherapy research perspective, as not providing the kind of data concerning treatment effectiveness that is needed to support the professional status of the field; and from the clinical perspective, as not able to represent the complex and deep nature of the analytic experience, and not providing the kind of data that would be useful for clinicians. The entire enterprise of empirical process research, in particular the use of recordings, is seen by some analysts as alien to, and potentially destructive of, the process itself (Green 2003; Perron 2002).

In his summary of the generations of treatment research, Wallerstein (2001) distinguished three generations of outcome research, and identified process research as the fourth generation of empirical studies, emerging in the last several decades with the availability of audio (and in some cases video) recording. He saw the progress of process research as relatively limited, because of its complex and costly nature and a lack of institutional financial support, and did not identify generational transformations as having occurred as yet.

Bucci (2007a), expanding Wallerstein's outline, has identified three generations of process research, beginning in the first generation with the development and validation of a variety of empirical measures; moving on to a second generation that involved collaborative studies among researchers; and now entering a generation that includes an increased recognition of the need to integrate research and clinical perspectives. The claim of this paper is that process research in this third generation has a unique role to play through uniting the values of empirical research with a modern version of the psychoanalytic method, and that such research is not only useful but essential for the progress of the clinical field.

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THE THIRD GENERATION OF TREATMENT PROCESS RESEARCH: THE PSYCHOANALYTIC METHOD IN MODERN DRESS

Freud (1940) saw the psychoanalytic situation as the necessary and sufficient setting for investigation, and the "psychoanalytic method" as the necessary and sufficient means of verification of psychoanalytic concepts and propositions: "We make our observations through the medium of the . . . perceptual apparatus, . . . we fill in what is omitted by making plausible inferences. . . . The relative certainty of our psychical science is based on the binding force of these inferences. Anyone who enters deeply into our work will find that our technique holds its ground against any criticism" (p. 159). Freud belittled the contributions of empirical research, even when they seemed to support his discoveries, as indicated by his dismissive response to experimental data supporting his views (see MacKinnon and Dukes 1964; Grünbaum 1984). Variants of this position are still widely held today by advocates of the case report as the appropriate psychoanalytic database (Tuckett 2000; Green 2003; Brenner 1980).

The epistemological problems associated with data produced by Freud's method, represented in the standard form of the case report, have been discussed by Grünbaum (1984), Bucci (2005, in press), and others. As they have argued, the case report contains data produced by a single observer, who is himself an active participant in the situation, who has a particular perspective based on his personal experience and theoretical approach (Bernardi 2003), and who selects both the case and the aspects of the case material that he chooses to report. Scientific study in any field requires a shared database that may be examined by multiple observers using a variety of measures.

While a database derived from case reports is clearly inadequate for scientific purposes, what is not so obvious is that such data are inadequate even in their own terms. The case report necessarily leaves out of account those aspects of the analyst's experience of the patient, of himself, and of their interaction of which he is unaware, that he does not or cannot acknowledge, and that he is unable to formulate, even for himself. The report also leaves out of account the direct voice of the patient, which is represented only as filtered through the analyst's words. It is striking that a field that is concerned with the study of the unconscious, as Freud and later Green and others have emphasized, can

be satisfied with a report that contains only material of which the analyst is conscious and that he can report. It is also striking that a field that is increasingly concerned with subjectivity and with interpersonal interactions can be satisfied with a report that allows such access, partial as it is, to the subjective experience of only one of the two participants in the analytic interaction.

While criticisms of the psychoanalytic method in its traditional form have validity, the flaws in the method should not lead us to lose sight of its seminal values. As Gedo (2001) has claimed, the development of the observational method of psychoanalysis may be Freud's "most lasting and valuable scientific contribution" (p. 106). The psychoanalytic situation is indeed a unique source of data concerning mental and emotional functions, but the psychoanalytic session as a source of data must be distinguished from the traditional strategy of collecting and reporting these data. What is needed here is a psychoanalytic method in modern dress, one that makes use of the clinical observations in a session, while providing a means of validation of the inferences that are made, through drawing on advances over the past several decades in the fields of empirical process research and cognitive science. The study to be presented here, as a first step in this new approach, has the following major features.

1. We root our investigation in the basic approach of the psychoanalytic method, using the psychoanalytic situation as a unique naturalistic setting for the study of mental and emotional processes.

2. We look at the clinical material using verbatim session recordings, and applying strategies and methods developed in the field of empirical process research.¹ Recordings of sessions enable the shared observations and multiple perspectives that are necessary for scientific research. The issue of whether a valid psychoanalytic process can occur under conditions of recording has been addressed in detail by Bucci (2005, 2007a, in press) as well as by Wallerstein and Sampson (1971), Gill et al. (1968, 1970), Thomä and Kächele (1975), and Szecsody (2000). There is increasing agreement that valid psychoanalytic work can be carried on under conditions of recording—as under conditions of supervision, or of the analyst's intention to publish a case report, or of other events or goals extraneous to the treatment itself—provided

¹This research approach may be applied to process notes as well as verbatim recordings, provided we recognize the limitations of the inferences that can be made (see Bailey et al. in press).

analyst and patient attempt to recognize and address the impact of these circumstances on each of them and on their interactions.

3. We use multiple "observing instruments" (Tuckett 2000), including the treating analyst's impressions, the evaluations of clinical observers, and objective measures (i.e., measures that do not involve judgments), applied to the same recorded materials.

4. We draw on strategies of investigation that have been developed in the field of cognitive science; these may be seen as elaborated versions of Freud's basic method of making inferences from observable events to the inner experience of the participants in the analytic encounter. Beyond Freud's account, however, we recognize the need to make inferences not only from the expressions of the patient to the patient's unconscious experience, but from the expressions of both participants to the conscious and unconscious (or unformulated) experience of both.

5. In the context of cognitive science, we recognize that the validity of the inferences depends on the systematic nature of the theoretical framework within which they are made. In cognitive science, the theoretical framework is explicitly defined and continually revised on the basis of observation. In the psychoanalytic situation, inferences are based largely on each analyst's implicit theory, with its diverse personal, professional, and intellectual sources (Sandler 1983; Bernardi 2003). The conceptual framework of psychoanalytic metapsychology has not been developed in such a way as to provide a systematic basis for inference, in clinical work or in research. Many psychoanalytic and psychodynamic treatment researchers, including Wallerstein (1988, 2001) and his group, Jones, Ablon, and their colleagues (Jones 2000; Ablon and Jones 2005), and others, have addressed this problem through bypassing the concepts of metapsychology and designing their measures on a clinical level. Our approach addresses the issue of construct validity using the strategy of cognitive science: rather than focusing directly on the clinical level, we have developed a general psychological framework within which the concepts of psychoanalytic process can be systematically defined and linked to observable events.

OVERVIEW OF THE RESEARCH DESIGN

In this paper we present a study utilizing this approach. Linguistic measures developed in the theoretical framework of multiple coding and the referential process will be applied to verbatim transcripts of sessions from a single psychoanalytic case, and compared to clinical evaluations of these sessions. The sessions and clinical evaluations are part of a project being carried out by the Program of Research in Psychoanalysis of the Institute for Psychoanalytic Training and Research (IPTAR), led by Norbert Freedman (Freedman, Lasky, and Hurvich 2003). The clinical evaluations represent two different perspectives: the impressions of the treating analyst, and those of clinical raters who listened to the tapes or read the transcripts.

We will first briefly outline the theoretical framework of multiple coding and the referential process, and its application to the psychoanalytic interaction. We then present the computerized discourse measures that have been developed in this context and illustrate them with microprocess analyses of two sessions, using the interplay between the graphical output of our computer program (The Discourse Attributes Analysis Program; Bucci and Maskit 2005; Maskit and Bucci 2006) and the session transcripts. We then describe briefly the method of data collection and clinical evaluation in the IPTAR project and, finally, present the detailed results of our study comparing our linguistic measures to the clinical evaluations.

THE MULTIPLE CODE THEORY AND ITS CONNECTING PROCESS

The theory of multiple coding and the referential process is a general theory of emotional information processing that is derived from current work in cognitive psychology and affective neuroscience. As described in detail elsewhere, the theory has been applied to a wide range of functions in the domains of communication and creative exploration, as well as to the therapeutic process (Bucci 1997, 2002).

Overview of Multiple Code Theory

Humans, like all species, have multiple forms of information processing in sensory and bodily systems. They differ from other species, however, in possession of the complex and powerful system of verbal

language, which can be mapped only to a limited extent onto the multiple nonverbal processing modalities (Bucci 1997). The major processing systems are characterized as *subsymbolic* and *symbolic*; the symbolic system is further divided into verbal and nonverbal codes. The subsymbolic system has been viewed as predominantly nonverbal, but may also include a subsymbolic verbal mode involving communication through prosody and related devices; this has been studied as yet to only a limited extent.

Symbolic codes: images and words. Symbols are defined here in a basic semiotic, nonpsychoanalytic sense, as discrete entities that refer to other entities and have the capacity of being combined to generate an essentially infinite variety of forms. Words are the quintessential symbolic forms: phonemes are combined to form morphemes, then words, then sentences, ultimately producing the full array of spoken and written discourse. Words are arbitrary and abstract in their reference, carrying the same meaning in written or spoken form or in braille, and not resembling the entities that they represent (with few exceptions as in instances of onomatopoeia). Nonverbal symbols include imagery in any sense modality, although the visual modality may dominate. The generative nature of symbolic systems, combining discrete elements to form larger entities, applies for images as well as for words. Images differ from words in resembling the entities they depict; as we now know (Damasio 1999), sensory images are based on activation of the same neuronal systems underlying perception in each sensory modality.

The subsymbolic system. The subsymbolic system is less familiar conceptually and hard to describe technically, but is quite familiar to us in our daily lives. Subsymbolic (or nonsymbolic) processing is characterized as continuous and/or analogic, in contrast to the discrete representational functions of the symbolic mode, and is modeled in cognitive science by connectionist or parallel distributed processing (PDP) systems (McClelland, Rumelhart, and Hinton 1989), with features of dynamical systems (Bucci 1997).

Such processing, which occurs in motoric, visceral, and sensory forms, and in all sense modalities, is required for a vast array of important life functions: lead and follow in ballroom dancing (especially Argentine tango); distinguishing qualities of wines or perfumes or teas, entering a highway, jazz improvisation, all sports, and creative cooking. Subsymbolic processing is also central in creative scientific and mathematical work. Research mathematicians and physicists understand

this very well; Einstein referred to muscular processes that served as essential elements of his thought (Hadamard 1949, p. 143). We cannot account for the emotions evoked by a Hopper painting by referencing specific images alone; the subsymbolic modality goes beyond the discrete representations of symbolic imagery to add the overtones and coloration that provide the core of emotional meaning in the viewer's response.

Subsymbolic processing may be implicit or within awareness, and may operate with or without intentionality; the crucial information concerning our bodily and feeling states comes to us primarily in subsymbolic form. What we call intuition involves systematic processing of this nature; emotional interactions occur primarily in this mode. Even where this information may occur within awareness, it may be experienced as outside the domain that we can access, direct, and control, and in some cases even as outside the self. The recognition of subsymbolic processes as organized, systematic forms of thought opens a new perspective on the therapeutic process in the "talking cure."

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The Referential Process

The three modes—subsymbolic, nonverbal symbolic, and verbal—are connected by the referential function, but these connections operate to only a limited degree. Subsymbolic, analogic representations can be connected only indirectly and partially to the discrete, abstract symbols of the verbal code.

The referential process usually seems to proceed smoothly and transparently; its limitations become apparent when one attempts to verbalize an experience that has not previously been formulated in symbolic form (e.g., to describe a taste or smell, or teach an athletic or artistic skill) or when one struggles to express an emotion and "can't find the words."

In connecting the analogic processes of the subsymbolic system to the discrete elements of the verbal code, images—symbolic nonverbal representations—play a pivotal role. Images, which may occur in all modalities, connect in their sensory aspects to the sensory contents of the subsymbolic code. As discrete representational elements they are also capable of connecting to the discrete elements of language. The power of metaphor lies precisely in this connecting process: a metaphor represents a discrete image that captures the subsymbolic sensory or emotional aspects of an event, and is capable of evoking corresponding

emotional experience in a listener or reader. The impact of storytelling, from the beginning of recorded history, has built on the capacity for discrete and specific imagery, in a time and place context, to evoke emotional experience in this way.

The Emotion Schemas

The fundamental organizing structures of human emotional life—and probably that of other species—are *emotion schemas*. These are types of memory schemas, as defined by Bartlett (1932), Edelman (1989), and others, formed on the basis of repeated interactions with the caretaker from the beginning of life. They determine what we desire and expect from other people, how we perceive them, and how we act in response, and are themselves able to be affected and changed by new experience. They include components of all of the multiple code systems, including subsymbolic components and imagery; language may be added later in life to some degree. The subsymbolic bodily, sensory, and motoric elements constitute the *affective core* of the schema—the basis on which the schema comes to be organized. The settings of time and place and the individuals who figure in our interactions constitute the specific contexts and contents of the emotion schemas, which continue to be elaborated throughout life.

The emotion schemas provide the multiple code formulation of what are understood in psychoanalysis as psychic structures; change in the emotion schemas are what we mean by structural change.² In treatment, the emotion schemas become manifest in both transference and countertransference; they also underlie all the emotional interactions of life. We see all people—others and ourselves—through the lens of our emotion schemas; there is no other way.

Adaptive functioning depends on adequate integration of processes within the emotion schemas, so that the events of life may be accurately

²The psychological construct of the emotion schema is also related to a range of familiar concepts that are defined in different theoretical contexts, including internalized working models (Bowlby 1969); internalized object relations as formulated within psychoanalysis by Kernberg and others; and Stern's concept of Representations of Interactions that have been Generalized (RIGs; 1985). From the perspective of neuropsychology, the concept of organized multi-process constructs of this type have been characterized as dispositional representations by Damasio (1999) and others. Within psychotherapy research, concepts associated with emotion schemas have been formulated in operational terms as Unconscious Plan (Weiss et al. 1986), Core Conflictual Relational Themes (Luborsky and Crits-Cristoph 1988), and Frame Structures (Dahl 1988).

evaluated in terms of how they make us feel and act. Mental and emotional disorders result from disconnections among the components within the schemas and also between the schemas. Thus, disconnections may occur between the affective core, the bodily and sensory experiences of pleasure and pain, and the representations of their sources, the people who are the causes of the feelings. Dissociation of this nature is characterized here as a general process occurring in different ways in all pathology, not restricted to posttraumatic disorders or consequences of abuse, or other severe situations.

The schemas of pathology emerge not only from the initial defensive dissociation, but also from particular types of spurious repair—the maladaptive means, such as altered states, addictions, phobias, and obsessional rituals, that the individual has devised to regulate painful affects. The use of such processes to regulate affect are now beginning to be understood in a general psychological and also neurological framework (Bucci 2003, 2007b).

Phases of the Referential Process in Psychotherapy

The goals of psychotherapy may be understood in general terms as reconnection and reorganization within and between the dissociated and distorted emotion schemas to enable new emotional information to be taken in and to provide a basis for self-regulation, including the regulation of painful affect. In treatment, change in emotion schemas takes place through the sequential occurrence and iteration of the referential process in the context of the therapeutic relationship. The referential process includes three major phases: *arousal*, *symbolizing*, and *reorganizing*; these phases repeat within sessions and also across treatments. The three phases are defined as follows.

Arousal: activation of the "affective core," the subsymbolic bodily and/or sensory components of a problematic and dissociated emotion schema, in the present context and present relationship of the session. This requires that the patient experience, in vivo, the painful or conflictual affective core of the dissociated schema. The patient will also necessarily experience protective processes developed throughout life as a shield against the painful affect (e.g., avoidance, somatization, or anger directed to the therapist or others).

Symbolizing: connecting the subsymbolic affective experience to images and words. The scenarios of interactions with the therapist

constitute one level of symbolizing of the schemas that have been activated; the schemas will also be represented in verbal form as stories, fantasies, dreams, or other narrative material. The representations of events in the here-and-now relationship will interact with the retrieved fantasies and autobiographical material.

This is the pivotal integrative process of the psychological cure. The connections of self and other, past and present, require representation of specific events in a time and place context—what cognitive scientists and neuroscientists refer to as *event-specific knowledge* or *episodic memories*, in contrast to general or semantic memory. Specific events in narratives or enactments are powerful cognitive-emotional operations whose neuropsychological base is now fairly well understood. They are experienced and processed in multiple systems, including all sensory modalities, motoric actions, and visceral and autonomic systems; they also potentially connect, through hippocampal and other neural routes, to the cortical association areas, activating memories of the past and enabling connections to language (Rubin 2005; Damasio 1999; Moskovitch et al. 2000).

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Reorganizing: reflecting on the narrative material and here-and-now events in the shared context of the session, potentially leading to emotional insight and change in the problematic schema. Eventually through this process new categories and connections are formed, and the schemas of autobiographical memory may eventually be reorganized and reconstructed. Different treatment approaches will place different values on aspects of this process, such as the recovery of memories or verbalization of experiences of the relationship. In all cases, however, some aspects of the changed situation will be made explicit; the individual may become aware of what he feels, or realize that the present situation is different from the past or that his own powers have changed. This explicit realization will necessarily involve verbalization to some degree.

Iteration of the referential process. Each shift or reconstruction of an activated emotion schema potentially enables access to deeper levels of affect and imagery, including experience that has been dissociated. As the connections come alive and the freezing lifts to some degree, an opportunity arises for further connections within the schema to be activated in the treatment context. These include some activation of the painful affect, leading then to the

attempts at repair that the patient has developed. The role of the relationship in breaking through the potential impasse and facilitating the process is discussed in detail elsewhere (Bucci 2003, 2007b).

We should also note that the three *phases* of arousal, symbolizing, and reorganizing may be seen more generally as *aspects* of the process that do not necessarily occur in the specified ordered sequence, though they may. Different aspects of the process may be emphasized for different patients at different times of treatment, and different treatment forms may be characterized in this way, but the general process is shared.

We expect that effective sessions will be characterized by relatively well organized appearances and iteration of the phases of the referential process. In less effective work, the process does not play out, or is truncated, so that the patient does not readily move out of the arousal phase, or attempts to contain the arousal without permitting new material to emerge. In this study we examine occurrences of the referential process using computerized measures of the therapeutic discourse applied to verbatim session transcripts.

LINGUISTIC METHODS: COMPUTERIZED MEASURES OF THE REFERENTIAL PROCESS

Our research program is based on the premise that each of the phases of the referential process—arousal, symbolizing, and reorganizing—will be indicated by particular features of discourse contents and style. Several basic linguistic variables derived from computer dictionaries, to be outlined below, have been developed to represent the features associated with the phases of the referential process. These measures have been applied to a wide range of spoken and written material, as well as to analytic sessions (Maskit, Kingsley, and Welsh 2006; Maskit and Bucci 2006).

The Weighted Referential Activity Dictionary (WRAD)

The measure of Referential Activity constitutes the spine of our empirical study of the referential process. Referential Activity (RA) is a psychological construct that concerns the degree to which speakers (or writers) are able to access nonverbal experience (including emotional experience) in their own minds and to express this verbally in a

form that is likely to evoke corresponding experience in the listener (or reader). People differ in RA as an individual trait with significant stability over time, and also as a matter of state, dependent on interpersonal and intrapsychic fluctuation (Dubé and Bucci 2007). The use of RA measures in therapy process research concerns the state fluctuations. The first measures of RA were scales scored by judges following procedures outlined in a manual (Bucci 1984; Bucci et al. 1992, 2004). The scales, representing dimensions of *concreteness*, *specificity*, *clarity*, and *imagery*, have been used in a wide range of clinical and psychotherapy research studies summarized by Bucci (1997, 2002). The scales are reliable and easy to score, and do not require clinical training or expertise. Like any rating procedure, however, RA scoring by judges necessarily limits sample size.

Computerized measures have been developed to model the scales scored by expert judges; these measures facilitate RA assessment in large-sample and longitudinal studies. The first such computerized procedure for approximating RA was the CRA dictionary of Mergenthaler and Bucci (1999). This has been successfully used in many research studies; some of these have been summarized by Bucci (2002). The WRAD is the second-generation computerized RA measure. The use of a weighted dictionary permits a closer approximation to judges' scores of RA—the correlation of the WRAD with judges' RA scores of a sample set of texts is about .6, while the corresponding correlation for the CRA is about .4 (Bucci and Maskit 2005). The WRAD is a list of 696 very common and frequent items that together account for an average of 85 percent of spoken language in the texts to which the dictionary has been applied.

The WRAD (like the earlier CRA) differs from other computer dictionaries in general use today in being a measure of language style rather than content, derived empirically by modeling the RA scale ratings, rather than developed conceptually based on selection of content words. Like the RA scales, the WRAD specifically captures the points at which language indicates connections to subsymbolic systems, primarily through description of images and episodes. The processes that people use to actualize these connections are built into their linguistic processing systems (Bucci 1997) and cannot be intentionally directed. The items in the WRAD are the kinds of words, including pronouns, prepositions, and other auxiliary and function words, that people use to different degrees, without specific awareness or intent, when they are

carrying out different kinds of linguistic functions in different emotional and cognitive states.³

We will illustrate the dimension of RA and its measurement using the WRAD in examples from the case of Ms. Y, the subject of this study. First we introduce several of the additional dictionaries that have been developed to assess aspects of the referential process, as well as a new text analysis system, the Discourse Attributes Analysis Program, which constructs measures based on these dictionaries.

Other Dictionaries

The word lists or dictionaries to be used in this study include measures of *Affect*, *Reflection*, and *Disfluency* that have been constructed using standard procedures for computerized content analysis. These procedures involve compiling word lists from a large source of texts, and selecting items based on agreement among judges following the conceptual definitions of the dictionary contents. Details of the development of the dictionaries are presented elsewhere (Bucci and Maskit 2005; Maskit and Bucci 2006). As for the WRAD, the word lists and the measures derived from them are understood as operational indicators from which inference to underlying processes may be made.

Affect dictionary. These words concern how people feel and communicate feelings directly; they are the type of direct expressions of feelings that usually figure in emotion content dictionaries that are widely used. The dictionary includes names of emotions, such as *sad*, *angry*, *happy*; words representing functions associated with affective arousal, such as *cried*, *screams*, *giggled*; words associated with motivation or evaluation, such as *best*, *gross*, *awesome*. The items in the Affect dictionary are subclassified as positive, negative, or mixed; this last category includes words such as *need*, *compelled*, *concerned* that have affective elements, but without clear valence, or whose valence is to some extent determined by context. These subclassification scores will not be examined in this study.

Reflection dictionary. These words concern how people think and communicate thoughts. The dictionary includes basic logic words, such as *if* and *but*; words referring to cognitive or logical functions, such as

³The relative usage of these words in relation to different RA levels, as scored by the scales, is reflected in the weights of the WRAD items; see Bucci and Maskit (2005).

think and *believe*, or referring to logical entities, such as *reason* and *cause*; words related to problems or failures of cognitive or logical functions, such as *confuse*; words related to complex communicative functions, such as *obfuscate* and *convince*; and words related to features of mental functioning, such as *creative* and *logical*.

Disfluency dictionary. The Disfluency dictionary used here contains exactly five items; these items are *kind*, *like*, *know*, *mean*, and the filled pause item, often transcribed as *uhm* or *uh*, and transcribed for purposes of our system as *mm*. These are items without particular reference or function that people use when they are having trouble expressing experience in verbal form—in some cases struggling to express experience, in some cases avoiding such expression, as in “mm, I mean, like, it’s kind of . . . mm, you know what I mean.” These lexical items may be seen as gestures in verbal form, midway between vocalization and verbalization.⁴

Nonverbal Vocalized Responses

An additional discourse variable, Nonverbal Vocalized Responses, was also computed. This is a set of items used in our transcribing conventions to represent utterances or vocalizations that indicate the non-speaking participant’s presence or minimal response to the speaker without initiating a turn of speech. The major item in this category is the noninterruption consisting of just the utterance *mm-hmm*. In this study we look at this variable for the analyst only. We should note that both the Disfluency and Nonverbal Vocalized Responses measures are initial attempts to capture aspects of nonverbal communication that can be derived from an audio recording. The use of time markers in our applications to session transcripts adds another component of this dimension, allowing representations of pausing and speech rhythm patterns. In future work, we also will apply vocal analysis to the audiotaped materials, to examine patterns of speech modulation and pitch, and will examine these measures of nonverbal and paralinguistic communication in relation to one another and to our linguistic measures.

All this information is potentially available using audio recordings only. We do not use videotape recordings for several reasons: the

⁴In contrast to the WRAD, which is exceedingly powerful, accounting for about 85 percent of spoken language, the total Affect and Reflection dictionaries each account for approximately 3 to 5 percent of spoken language in most texts studied thus far. The items of the Disfluency dictionary are highly frequent; together these five items account for about 2 to 3 percent of spoken language on average.

scoring methods that have been developed thus far for video are inherently labor-intensive; the interference with the process is experienced as greater by many analysts, as well as by patients; and there are real issues of protecting the patient's privacy when the video is viewed. Given the plentiful information concerning nonverbal behavior in the audio recordings, we would argue that the research benefits of video recording at this point do not seem to override the problems.

The Discourse Attributes Analysis Program (DAAP)

The computerized measures are constructed and applied using a new text analysis system, the Discourse Attributes Analysis Program (DAAP; Bucci and Maskit 2005; Maskit, Kingsley, and Welsh 2006; Maskit and Bucci 2006). In addition to the usual linguistic analysis functions, such as computing mean usage of words from specified dictionaries, the program uses a mathematically smooth weighting function to compute, for each second of time, a weighted average of the dictionary matches at nearby times. This second-by-second computation yields a continuous graphical representation of the varying use of words from each dictionary, with breaks at changes of speaker or at long silences; examples are shown in Figures 1 and 2.

The program also produces several derived measures based on these smooth representations. The two types of derived measures to be applied in this study are the *covariations* and the *RA Intensity Index*.

Covariations. For any pair of dictionaries, the program produces a measure, called the covariation, of the extent to which the use of words from the two dictionaries is simultaneously high or low. This can be understood conceptually as indicating the degree to which the processes represented by the two dictionaries move together or in different directions.⁵ Several of these covariations have significant implications in understanding the therapeutic process. For example, the covariation between WRAD and Reflection serves as an index of the extent to which the patient simultaneously is engrossed in telling a story and reflecting on it. We expect that it is psychoanalytically more productive for the patient to engage in these activities separately. This and other covariation measures will be discussed further and illustrated in clinical material below.

⁵Like a correlation coefficient, the covariation is a number between -1 and +1. The covariation is mathematically related to a correlation coefficient, but has different statistical implications arising from the smoothing procedure (see Maskit and Bucci 2006).

Figure 1. Graphic representation of the Referential Process measures for Session 257 of Ms. Y

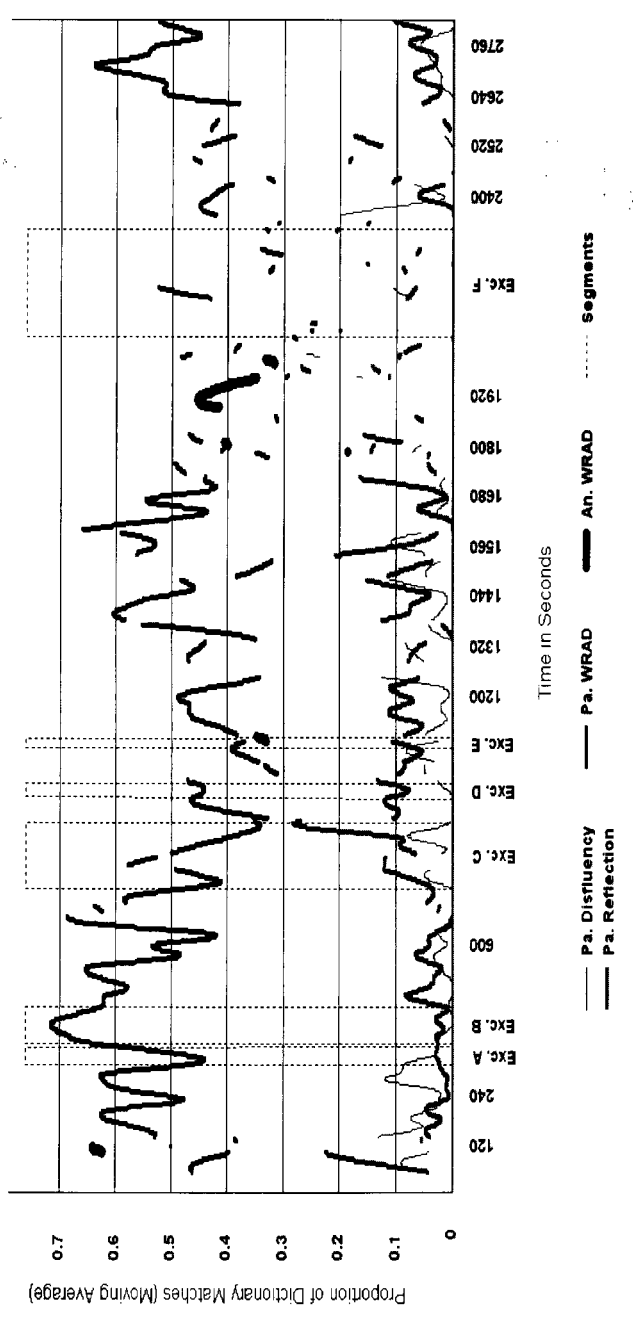
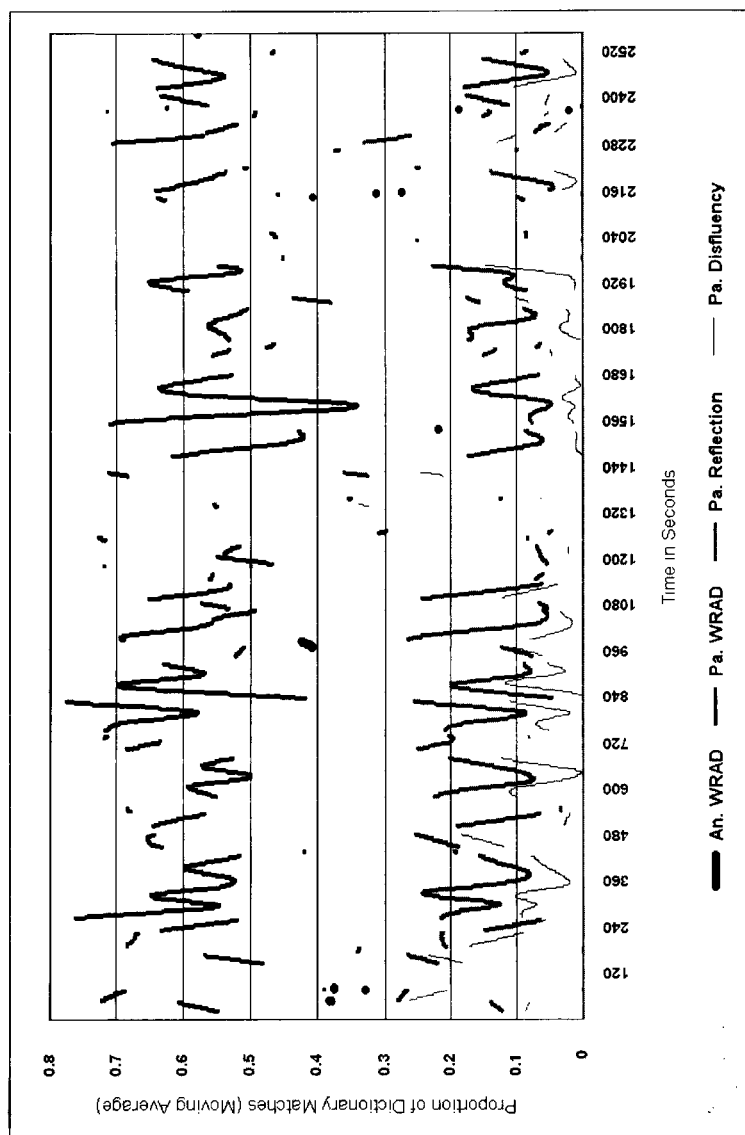


Figure 2. Graphic representation of the Referential Process measures for Session 245 of Ms. Y



The RA Intensity Index. Another important measure that was derived using the smoothing feature of our program and that will be applied in this study is the RA Intensity Index. This provides a measure of a speaker's language production above a certain RA threshold, the midpoint. Conceptually this may be understood as a measure of *how high* the Referential Activity is when it *is high*. The measure tells us how intensely the speaker is performing when he is specifically engaged in processes such as narrating an incident or verbally painting a picture, in contrast to the mean WRAD, which is a measure of average level on the RA dimension. We can compare this concept to computation of the average speed of a competitive runner: the average WRAD for the patient's total speech in a session would be equivalent to the runner's average speed in the course of a day, including all his strolling, walking, and running; the RA Intensity Index, the patient's average above the WRAD midpoint, is equivalent to the runner's average speed in the running mode only. The technical definition of the RA Intensity Index and the mathematical details of this measure can be found in Maskit and Bucci (2006), where it is known by the acronym MHW (Mean High WRAD).

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APPLICATIONS TO SESSION TRANSCRIPTS

The premise of this approach is that the phases of the referential process as they play out in a session may be identified in terms of characteristic clusters of the linguistic measures. Our computer program produces a curve that provides a visual image of the changing extent to which speech matches each dictionary, representing the variation in the feature captured by that dictionary. The program thus allows us to examine directly the moment-by-moment interaction of patient and analyst, and the effects of analytic interventions, spoken or silent, in facilitating or interfering with the treatment process. The graphic representations provide a type of imaging device, like a linguistic version of an fMRI, that enables identification of the interactive discourse patterns in a session. Here we will illustrate briefly how to read these images, and the type of information that may be drawn from them.

In Figure 1, the measures are applied to a single session of the treatment of Ms. Y, the subject of study of the IPTAR group. In this figure we show three variables for the patient: WRAD, Reflection, and Disfluency; and WRAD only for the analyst. The measures are presented

here as a function of time, shown in seconds.⁶ The use of a time line enables a view of speech rhythms and pausing patterns that is not available in commonly used process measures based on word count.

The patient, Ms. Y, is a married woman in her thirties, with two small children, seen on the couch four times a week by an experienced female analyst. In the session from which this example was drawn, Ms. Y is talking about having been incapacitated with a severe migraine headache over the weekend. Her husband Jack was left with the responsibility of baby-sitting for a relative's children, while also taking care of their two small children, Frank, a toddler, and Lizzy, a baby.

We will illustrate the microprocess analysis with several excerpts representing different phases of the referential process. The excerpts have numbers in square brackets inserted every twenty seconds to enable precise correspondence between the transcript of the spoken language and the graphic representation, which has time in seconds on the x-axis. A slash is placed in the text every two seconds; slashes without intervening text indicate periods of pausing. Each of the excerpts is labeled and marked off by dotted lines in the graphic image.

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The session begins with an initial period of some pausing and interchange concerning scheduling lasting for approximately two minutes (to about second 120). This opening interchange is characteristic of this treatment. Ms. Y then begins a series of associations with relatively high pausing and Disfluency and considerable fluctuation in WRAD. The disfluency and fluctuating engagement in a narrative are indicators of an arousal phase.

Excerpt A

/ but I couldn't, / I c- I can't lift / Lizzy and I couldn't, / I just couldn't
do much of anything so, / so that um [320] / / / added to, pressure
/ I guess or or not pressure just / made me feel, guilty / / and / / / Friday
it it seemed a little, [340] / funny? with Jack I can't remember exactly
/ but it was, uh, / just didn't, / things weren't clicking / / and, / I could
feel tension . . .

The patient then enters a period of symbolizing that is fluent and that lasts for approximately ten minutes, until just past second 660. This is characterized by a peak in WRAD, generally low Reflection,

⁶The number of variables included in the visual presentation is limited here for visual clarity in the black and white medium; the program is capable of including any number of variables that may be chosen to examine the discourse patterns.

no marked pauses, and little Disfluency. Here she relates an incident from the same weekend. Jack and the children return home late at night:

Excerpt B

... he, woke / me up by calling / me and telling me that there was a coyote out in / the back yard, so, / this is just a little sidebar (laughs). / so and it was fascinating because, / he, we have a bird feeder / that's like six feet from the kitchen window. / and, and / the coyote, had, you [380] / know, just flipped it on its side / and was lying in the grass, / eating the birdseed out of the bird feeder. / big, / coyote. and / Jack had, / been bringing the kids / in one by one and he had Frank, / and when he [400] / went out on the patio, by / the back door, he muttered / to himself "what was that thing in the back / yard?" and then he flipped on the light / once he got inside the / door and he, Frank / and Jack watched the coyote and came in / sat and ate and so / I came down, and was watching it / too. and it was th- and we [420] / couldn't get Lizzy from the car, / because the coyote, was there. and, / so luckily she was / asleep the whole time but he was there for an hour! / and finally he left. / and then Jack went out and got / Lizzy. so, I / went to bed at one-thirty and then for the next two hours / I had these nightmares about being / in the woods and coyote and my kids; [440] / I dreamt that I was in this cabin / and there was a threat of a coyote outside / both Frank and Lizzy were on infant seats / and I had to get them before this coyote got them ...

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This is a typical instance of a symbolizing phase, with a manifestly irrelevant story (the patient herself says "this is just a little sidebar" and laughs), that leads her into a dream with distressing contents. WRAD then declines, while pausing and Disfluency increase, along with a steep increase in Reflection, indicating a period of reorganizing that lasts until around second 900.

Excerpt C

I, / lay there / knowing that, I've been / saying in here lately that, I'm not, / I'm treating Jack like a [740] / second-class citizen I'm not, / I'm not, / making him / a priority, I had felt that for / a while. and / so I, I / didn't deny any of it. I // like he asked me, / you know "what what are your priorities" [760] / or "how are, how are you acting, / what are the priorities that you live" / you know. and I said /um, I said I felt that // managing myself, / and, Frank, / are my priorities ...

... // it was very sad. / uh / [860] // I / I lay there, Saturday night,
/ starting to / think that MM (uh) // maybe I would cancel, / coming
here! today. / because I became very confused, / feeling [880] / like,
/ this is wrong, / what I was doing / somehow. / or it's not worth! / it
if it's going to, / drive / my husband away ...

As these excerpts illustrate, and as indicated by the fluctuations in the graph, the session has opened with a sequence of arousal, symbolizing, and reorganizing that constitutes a full and readily recognized manifestation of the referential process.⁷

The patient then stays below the WRAD midpoint (.5) for over five minutes, until about second 1350, with considerable pausing and some Disfluency and Reflection. The content shows her moving from her guilt and confusion concerning her husband to her sexual fantasies concerning the analyst. She becomes very graphic, as she often does in her erotic fantasies; but there is also some indication of change in her usual representations of the relationship, including dissatisfaction with her fantasies concerning their lovemaking, emerging here for the first time.

Excerpt D

// it's odd I started to have this, / fantasy of us, / making love, and / our
groin areas [960] / were pressed against each other, // but what struck!
me, / and what was different / from other fantasies is that it didn't / feel
satisfying / to me ... [980] it, / felt lacking, / somehow / ...

The analyst intervenes briefly, questioning to some extent the patient's understanding of her fantasies, shown as a thick line beginning at about second 1080.

Excerpt E

Patient: and I thought maybe that's why, / in the past I've gotten
/ so angry that you haven't / given back [1080] / in my fantasy / maybe
in part it's why I criticize you, although / I don't know.

Analyst: that might be / that's one reason, but there could
be more than one / reason that feeds that / but that could certainly
be one.

⁷We have not as yet developed an overall measure of the complete playing out of the referential process as such. The covariation measures, which will be discussed below, capture the separation and alternation of the phases.

The patient then brings in some additional material about her problems with her husband, then some fantasies about the doctor who was caring for her during the weekend. She works primarily on her own during this phase of the session, showing several additional instances of the referential process pattern.

Around second 1760, she talks again about playing out something in the session and wanting to cancel; the analyst then intervenes, again questioning the patient's fantasies concerning the relationship. These are the only two points of substantive intervention by the analyst in the session, both responsive to similar material.

Following the second intervention, represented by the thick line from about second 1880 to second 1960, the patient enters an intense arousal phase, with considerable pausing, high Disfluency, low WRAD indicating little symbolizing, and low Reflection indicating little self-organization. The transcript shows her confused and in considerable distress (pauses of six seconds or greater are represented on the graph by breaks in the curves).

Excerpt F

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I'm / getting a headache / [2060] /// (shuffling sounds) /// (crying)
 I / kind of have glimpses but / (sniffs) / [2080] /// but I / don't, quite
 get it /// [2100] /// (exhales) / [2120] /// (sniff) ///
 [2140] /// I'm I'm / just thinking how, / looking all over my pattern,
 / with men, [2160] / particularly in college where, / it looks like I was
 fishing, / like I just wanted to / like, / reel someone in, / just to see if I
 could get them, you know, / that's all. and then I didn't really / want to
 have a relationship with the guy and really didn't know / what to do, at
 that point / [2180] /// [2200] /// I'm not thinking very
 / well right now / [2220] // It's just / because I'm /// (crying) (sniff) /
 it's / not very clear / [2240] /// I, / just thought of my parents I
 thought [2260] / maybe / I'm, / playing something out / with Jack in
 response to my anger, / towards them /// [2280] /// (sniff) /
 [2300] / (exhales) (clears throat) /// I wish I / could think of something
 else to say, / and I wish, this session were over / [2320] . . .

The analyst doesn't intervene any further. The patient struggles on her own, finally moves into a symbolizing mode, a story about her doctor who has been so helpful, and with whom she is also involved in fantasy. He had asked her to call him Sunday afternoon, to check in, but when she called he wasn't there. We may speculate concerning the emotional meaning, with respect to the analysis, of this last story—about

a caretaker who is not there. The session ends before this might be addressed.

Comparison with Another Session

The pattern of this session may be compared with Session 245, shown in Figure 2. Here we see no extended period of patient WRAD above the .5 midpoint, and no instances of the referential process phase sequence can be identified. The session is characterized by considerable pausing and Disfluency, and relatively high Reflection throughout.

The capability of moving back and forth between the graphic images that represent the structure of the discourse, and the clinical contents, provide far richer and more complex insights into the process of both these sessions than can be explored in this paper. Our purpose here has simply been to provide an illustration of the playing out of the linguistic measures in the microprocess of a session. This microanalysis provides a basis for our hypotheses concerning the overall relationship of the linguistic measures to clinical evaluations.

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Predictions for Linguistic Measures in Relation to Clinical Ratings

Based on the theory of the referential process, we expect that in sessions seen clinically as more effective, involving active exploration and some reorganization in internal representations, the patient will go through at least one full occurrence of the referential process, the phases will be fairly clearly delineated, and the patient will spend relatively more time in the narrative and reorganizing phases than in the arousal phase. This process is less likely to be seen in less effective or more troubled sessions. The contrast is illustrated in the graphs in Figures 1 and 2 above. These predictions will be examined by comparing the computerized linguistic measures with independent clinical evaluations carried out within the IPTAR research program.

METHODS OF THE IPTAR STUDY

The procedures of the IPTAR study have been described by Freedman, Lasky, and Hurvich (2003) and will be outlined briefly here. The analyst, a recent graduate of an analytic institute, expressed an interest in participating in the research project. She selected the case from her ongoing private practice, explained the project to the patient, and received her consent. There were no concrete incentives offered to

the patient; the analyst communicated her professional interest in the project, and the patient agreed to participate.⁸

The procedures included collection of the analyst's impressions of each session, clinical ratings based on the analyst's impressions by one set of judges, and ratings of a selected set of sessions by different judges based on listening to the tape recording of the entire session. The data used in this study included ratings based on the analyst's impressions for fifty-four sessions, and ratings based on recordings of the entire session for a selected set of sixteen sessions.

The Analyst's Impressions

A set of analyst's impressions for sixty sessions was collected covering the second year of Ms. Y's psychoanalysis; this was the third year of her treatment, which began as psychotherapy. The sessions constituting the sample were continuous from fall to spring, not interrupted by major vacations. Six of the recordings were not usable or were lost, yielding a sample of fifty-four sessions for this study.

Immediately after each session, with the tape recorder still on, the analyst dictated her impressions of the session just ended. She described her experience of the session freely and spontaneously, without following any preimposed structure or outline; her report represents the kinds of thoughts and feelings that may permeate an analyst's consciousness just after the patient has left the room, such comments as: "The patient was extremely anxious at first, she saw her dilemma, and I sensed what she wanted from me, I felt I knew her . . ."; or "The session didn't seem to go anywhere; the material was chaotic, I felt attacked and irrelevant" (Freedman, Lasky, and Hurvich 2003, p. 209). Each report lasted about three to five minutes. Aside from her role in recording the sessions and providing her recorded impressions, the analyst had no interaction with the research team.

Clinical ratings: the A and Z dimensions. The clinical ratings were based on process qualities that were given the designations A and Z. According to the IPTAR group, these abstract terms were selected so as to avoid an evaluative designation; A or Z do not simply mean "good" or "bad," but refer to different qualities of treatment

⁸According to the analyst and the IPTAR research group, the patient expressed spontaneous willingness to participate. We may note that since the treatment was ongoing at the time recording began, the establishment of the relationship may be seen as a factor in the patient's consent.

(Freedman, Lasky, and Hurvich 2003). A qualities generally represent processes of integration, developmental progression, and relatively stable exploration and may reflect a range of functions such as explicit transference, affect communication, reflective function, and interpretations received. Z qualities are associated with nonintegration, regression, and destabilization, and may be associated with an experience of impasse. According to the IPTAR group, analytic process involves a rhythmic alternation of A and Z qualities, operating both between and within sessions.

The A and Z dimensions were each rated by the judges on a scale of 0 to 10; a single overall score was given for each dimension. The rating procedure as developed by the IPTAR group was based on the judges' global response to the material; no anchor points or ratings of individual components of the A and Z dimensions were used. The intent of the methodology was for experienced analysts functioning as raters to apply the same type of judgment procedure they might use in their own clinical work, informed in a general way by the qualities associated with the A and Z dimensions. The judges first applied this procedure to sessions from another treatment, discussed their scoring, and clarified their understanding of the scales. Each judge then independently rated the A and Z dimensions for the analyst's impressions for the case of Ms. Y.

Reliability of ratings based on analyst impressions. For the 54 analyst's impressions, for the A dimension, the single-measure Intraclass Correlation Coefficient (ICC) was .64; the standardized item Alpha was .78. For the Z ratings the ICC was .69; Alpha was .84.⁹ The ratings of the two judges were then averaged for each dimension. For purposes of this study, the difference between the A and Z scores was computed to represent the clinical ratings. The difference score is interpreted as representing the overall dominance of A vs. Z qualities for each session.

Ratings of Full-Session Recordings

From the initial set of 54 analyst's impressions, the IPTAR group selected sixteen sessions, representing the extreme high and low A vs. Z difference scores, for more intensive study. These sixteen sessions were transcribed verbatim, and additional clinical ratings as well as the

⁹Absolute agreement definition of ICC used unless otherwise indicated.

linguistic measures were applied to them. A different set of two raters, also experienced analysts, listened to or read the verbatim transcripts of these sixteen sessions, and scored them on the A and Z dimensions.

Reliability of ratings based on full sessions. These sixteen sessions were selected using a criterion of 1 standard deviation or more above or below the mean; these included 9 predominantly A (A minus Z difference score ranging from 6 to 9) and 7 predominantly Z (A minus Z difference ranging from -5 to -8). Two new clinical judges, different from those who rated the analyst's impressions, listened to five of these sessions, and provided A and Z ratings for them. Interjudge reliability for these five sessions was computed as to categorical rating (dominantly A, with positive A minus Z difference scores; vs. dominantly Z, with negative A minus Z difference scores), and complete agreement was found. One of the two judges then rated the remaining sessions. These sixteen sessions were transcribed for linguistic analysis, and also examined by the IPTAR clinical group for close-process analysis of the clinical material of the session, as presented elsewhere (Freedman, Lasky, and Hurvich 2003).

The judges' A-Z difference scores based on the analyst's impressions could then be directly compared with the scores based on listening to the audiotapes and reading the transcripts for the entire session. The computerized linguistic measures were then compared with these two sets of A-Z difference scores for the same sixteen sessions.

Predictions for Comparisons of Linguistic Measures to Clinical Evaluations

Patient speech. We expect that the pattern of the referential process outlined above is more likely to play out in sessions evaluated clinically by the IPTAR group as showing greater dominance of the features associated with the A dimension, in particular exploration and progression, and less of the Z qualities associated with destabilization and impasse. To examine this general hypothesis, the linguistic measures will be compared to the A-Z difference scores reported by the IPTAR group. In particular, we expect the following relationships for the patient speech for the ratings of the sixteen entire sessions:

1. The mean WRAD score and the RA Intensity Index will show a positive correlation with the A-Z difference score.
2. Mean Disfluency for the patient for the session as a whole will correlate negatively with the A-Z difference score.

3. The covariation between WRAD and Reflection will be negatively correlated with the A-Z difference score. (The higher the A-Z difference score, the more likely it is that these linguistic measures will be moving in opposite directions, representing greater separation in time between narration and reflection.)

4. Similarly, the covariation between WRAD and Disfluency will be negatively correlated with the A-Z difference score. (Again, the higher the A-Z difference score, the more likely it is that these measures will be moving in opposite directions, representing greater fluency [less Disfluency] in the symbolizing phase and more Disfluency in the other two phases.)

5. The covariation between Reflection and Disfluency will be positively correlated with the A-Z score. (The higher the A-Z difference score, the more likely it is that the patient will be disfluent while reflecting, indicating that the reflection is occurring with new formulations or new thoughts, rather than as restatements of previously formulated material.)

Predictions for analyst speech. While the study focuses on patient speech, features of analyst speech will also be examined. We expect that analysts are likely to be relatively silent and listening during the patient's symbolizing phase, when the patient is immersed in her material, and to be more active during the period of reflection on this material. Overall, we expect that patient RA will be higher than the analyst's; the privilege of storytelling is the patient's. Other aspects of the analyst's speech associated with qualities of analytic work as evaluated by clinical raters will also be explored. The covariation measures were not computed for analyst speech because the generally low analyst word count limits the validity of the interpretations of these measures.

RESULTS

Comparison of Ratings Based on Analyst Impressions and Entire Sessions

The A-Z difference scores based on judgments of the analyst's impressions were compared to scores based on the direct examination of the session material for the sixteen selected sessions. The two sets of ratings were in agreement regarding categorical rating—characterization of the session as being dominantly A or dominantly Z—for twelve of the sixteen criterion sessions, and in disagreement for four. We may note that the procedures of rating and computing reliability differed for the two sets of judgments: two judges independently rated all sessions based on the ana-

lyst's impressions, and reliability was computed using continuous measures; whereas the session judges carried out the far more labor-intensive procedure of listening to the entire session for a subset of the sessions only, and reliability was computed for category assignment only (predominantly A vs. predominantly Z). Nevertheless, it is striking that disagreement between the two sets of ratings occurred for 25 percent of the sixteen sessions that had been selected as representing the *extremes* of the A vs. Z dimensions in the ratings based on the analyst's impressions. This finding points to the need for recorded data to which multiple perspectives may be applied, rather than reliance on a single "observing instrument." The nature of this divergence and its implications will be explored briefly below.

Comparison of Patient and Analyst Linguistic Measures

The comparisons of the patient and analyst language measures are shown in Table 1. As expected, patient WRAD is significantly higher than the analyst's; this difference holds for both dominant A sessions (with positive A-Z difference scores) and dominant Z sessions (with negative A-Z difference scores). In contrast, the RA Intensity Index is higher for the analyst than for the patient; while not significant, this difference appears stronger for the dominant A sessions. It is interesting that preliminary results for four additional psychoanalytic treatments show similar results for this measure, as reported and discussed by Bucci (2006). We may suggest that while the privilege of storytelling is generally the patient's, as indicated by higher mean WRAD, when analysts do

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Table 1. Comparison of patient and analyst language measures for Ms. Y in dominant A vs. dominant Z sessions (according to judges' ratings of entire sessions).

	Total sessions (<i>n</i> = 16)		Dominant A (<i>n</i> = 9)		Dominant Z (<i>n</i> = 7)	
	Patient	Analyst	Patient	Analyst	Patient	Analyst
Mean WRAD	.458	.404***	.469	.405***	.444	.403**
RA Intensity Index (Mean High WRAD)	.056	.067	.061	.085	.049	.044
Mean Affect	.040	.040	.042	.040	.037	.040
Mean Disfluency	.026	.021(*)	.024	.023	.030	.019*
Mean Reflection	.047	.062**	.046	.062*	.049	.062(*)

Note: Analyst and patient pairs marked in bold are significantly different from one another: *** $p < .001$; ** $p < .01$; * $p < .05$; (*) $p < .10$.

speak they are likely to use more evocative language, and this is associated with more effective clinical work. Patient Disfluency is higher than the analyst's; this difference is carried by the Z sessions only. For the A sessions, the Disfluency measures for the two participants are essentially equivalent, possibly indicating more collaborative work. The analyst's Reflection level is higher than the patient's; this holds for both A and Z sessions. The difference appears only at the level of a trend in the Z dominant group, possibly reflecting the somewhat lower number of sessions. No difference was found between analyst and patient in the use of Affect words.

Comparison of Linguistic and Clinical Measures

The relationship of patient and analyst language measures to the A-Z difference scores for the sixteen sessions, as rated based on both the analyst's impressions and the whole sessions, are shown in Tables 2 and 3, using Pearson correlation coefficients. Since correlation can be biased when there is potential non-independence, as in the analysis of sessions within a single case, we will focus our discussion on the effect sizes of the correlations.¹⁰

Results for Patient Variables

Full-session ratings. For the full-session ratings, the predicted relationships were generally found for the linguistic variables in relation to the full-session ratings produced by direct examination of the session material. Mean WRAD showed a positive correlation with large effect size ($r = .538, p < .05$) with the clinical ratings; the RA Intensity Index showed a positive correlation with medium effect size; and the Disfluency variable showed a negative correlation with medium effect size. No predictions were made for the Affect measures; we may note that the Affect measure showed a positive correlation with medium effect size ($r = .457, p < .10$). The use of Affect words will be explored further in subsequent work, including division into subcategories and their role in covariations.

For the covariation variables, as predicted, the WRAD/Reflection covariation showed a negative correlation with large effect sizes ($r = -.698, p < .01$) with the session evaluations, and the Disflu-

¹⁰Significance levels as given in the table are based on the confidence intervals determined by a "bootstrap" analysis (Efron and Tibshirani 1993); this is used to enable a more accurate statement of the significance of the correlation coefficient in analysis of data where there is potential non-independence.

ency/Reflection covariation showed a positive correlation, also with large effect size ($r = .523, p < .05$). We view the negative WRAD/Reflection covariation as the single best indicator that a referential process is occurring in a session, indicating that the two measures are generally moving in opposite directions. This suggests that the patient is able to be immersed in her material when telling a narrative, without distancing herself from it; when the narrative is finished, as indicated by falling WRAD, the increase in Reflection suggests that the patient is then able to contain and reorganize the material that has been introduced. This pattern was in fact seen in the microprocess of the dominantly A sessions, as illustrated below. The only variable that did not support our predictions was the WRAD/Disfluency covariation; the raters apparently did not respond to the feature of fluency when telling a narrative in developing their clinical evaluations.

Rating based on the analyst impressions. For the patient linguistic variables, the results were generally in the same direction for ratings based on the analyst impressions as for those based on the sessions as a whole, but in most cases with lower effect size. The mean patient WRAD did not show the expected relationship to the clinical ratings;

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Table 2. Relation of patient language measures to A-Z difference scores for Ms. Y sessions based on analyst's impressions and full-session recordings ($N = 16$).

Patient Language Variables	Correlation to Clinical Ratings Based on Analyst's Impressions (Pearson Correlation)	Correlation to Clinical Ratings Based on Full-Session Recordings (Pearson Correlation)
WRAD	.267	.538*
RA Intensity Index (Mean High WRAD)	.385	.358
Affect	.153	.457(*)
Reflection	-.136	-.254
Disfluency	-.341	-.421(*)
WRAD/Reflection Covariation	-.418	-.698**
Disfluency/Reflection Covariation	.449*	.523*
WRAD/Disfluency Covariation	-.353	-.249

Probability, 2-tailed: (*) $p < .10$, * $p < .05$, ** $p < .01$

Medium effect sizes (.30-.50) marked in italics; large effect sizes ($> .50$) marked in boldface.

the RA Intensity Index, however, did show a positive correlation with medium effect size; Disfluency showed the expected negative relationship, with medium effect size. The WRAD/Reflection covariation showed the expected negative correlation, and the Disfluency/Reflection covariation showed the expected positive correlation, both with medium effect sizes. The WRAD/Disfluency covariation showed the expected negative correlation to the A-Z difference score with a medium effect size, suggesting that the analyst may have been more responsive to this feature of the patient's spoken discourse than the clinical judges who listened to the session.

To summarize: the results are generally as predicted for both rating procedures; the differences between the two sets of results represent the difference in perspective between the analyst, who is immersed in the ongoing process and in the relationship, and the judges, who respond clinically but are not involved in the clinical interactions.¹¹ We may also note that the session illustrated in Figure 1 received the highest positive A-Z difference score, and the session in Figure 2 the most negative A-Z difference rating, based on both the analyst's impressions and

Table 3. Relation of analyst language measures to A-Z difference scores for Ms. Y sessions based on analyst's impressions and full-session recordings (N = 16).

Analyst Language Variables	Correlation to Clinical Ratings Based on Analyst's Impressions (Pearson Correlation)	Correlation to Clinical Ratings Based on Full-Session Recordings (Pearson Correlation)
WRAD	-.150	.036
RA Intensity Index (Mean High WRAD)	.245	.481*
Affect	-.002	.025
Reflection	-.100	-.010
Disfluency	.322	.227
Nonverbal Vocalized Responses	.457*	.619**

Probability, 2-tailed: (*) $p < .10$, * $p < .05$, ** $p < .01$
Medium effect sizes (.30-.50) marked in italics; large effect sizes (> .50) marked in boldface.

¹¹ It is possible that the difference in the results may have been affected by the differences in rating procedures and the less stringent reliability of the full-session ratings; This seems less likely, however, given the systematic nature of the results: less strict reliability assessment might be expected to produce more randomness in the results.

the ratings of the session as a whole. Thus, the overall data support the inferences concerning the incidence of the referential process derived from the analysis of the microprocess as seen in the graphs.

Results for Analyst Language

No predictions were made for the linguistic measures of the analyst's speech. Her low rate of speech production makes the covariation measures less discriminatory, so these were not computed for her speech. The analyst's use of Nonverbal Vocalized Responses (mostly *mm-hmms*) showed a correlation with medium effect size for the ratings based on the analyst's impressions ($r = .457, p < .05$) and high effect size for the ratings based on listening to the full sessions ($r = .619, p < .01$), as shown in Table 3. Instances of Nonverbal Vocalized Responses indicate attention and presence without initiating a speaker shift; the floor remains the patient's. The analyst's RA Intensity Index showed a positive correlation with moderate effect size ($r = .481, p < .05$) for the ratings based on whole sessions only. As noted earlier in comparing analyst and patient language, while the analyst does not have generally higher WRAD in the A sessions, she appears to be more free to use vivid speech, with metaphor and imagery, when she does speak. This positively affects the view of the raters of full sessions but was not found to be related to the analyst's impressions.

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DISCUSSION AND IMPLICATIONS

It is striking that linguistic measures derived from a general psychological model showed a strong correlation to the impressions of psychoanalytic clinicians using dimensions of evaluation developed in the framework of the implicit and explicit theories that guide their clinical understanding. The clinicians were looking for clinical features such as exploration, progression, and stability, on the one hand, and regression, destabilization, and lack of integration on the other; they were certainly not looking for the types of linguistic variables and linguistic dimensions that we applied, which are likely to have little or no conscious clinical relevance for them. In focusing on discourse style rather than content, the linguistic measures have a particular capability of reaching beneath the surface of the therapeutic interaction and representing patterns of discourse and aspects of emotional expression that speakers

may not consciously intend and to which listeners may not explicitly attend. We have identified some variables that had stronger influence on the clinical raters who looked at whole-session material from the outside, and a few that affected the treating analyst more strongly; the implications of these differences remain to be explored.

In a discussion of the aims of psychoanalysis, Anna Freud remarked that “analysts should distinguish between aim and method in psychoanalytic treatment. The analyst’s aim is stated in terms of the patient’s needs. The analyst’s method is not to concentrate on these needs during the course of treatment but rather to direct attention to the analytic process itself. The analyst reaches his aim only if he concentrates on the process. It is very much like driving somewhere. Your aim is to arrive, and if instead of looking at the road, you think how nice it will be when you arrive, you will probably have an accident” (Anna Freud, cited in Sandler, Kennedy, and Tyson 1980, p. 251).

In this paper we have tried to provide a systematic way to focus on the method, to look at the road. We can see the overall goal of this research from two different perspectives: (1) to develop measures of mediating variables that can be used, along with measures of symptoms and behaviors, as components of treatment outcome studies; and (2) to focus on the processes of psychoanalytic treatment, including self-exploration, emotional regulation, and interpersonal interaction, as these are manifest in the session and develop in the course of treatment, indicated by changes in linguistic variables, as ends in themselves.

The Perspective of Treatment Effectiveness; Identification of Mediating Variables

To understand the results of comparative outcome studies, it is necessary to identify the specific mediating mechanisms, the actual treatment components that determine the treatment effects; to identify factors that are specific to particular treatment modalities; and to distinguish these from factors that are common across approaches (Blatt and Zuroff 2005; Fonagy, Roth, and Higgitt 2005).

Several programs of research on the relation of process to outcome have been developed to identify such mechanisms. In general, these studies have relied on systematic means of coding and quantifying clinical variables that might be expected to distinguish psychoanalytic or psychodynamic from other treatment forms. Thus, for example, the Psychotherapy Process Q-set methodology developed by Jones and his

colleagues (Jones 2000; Ablon and Jones 2005) includes process elements such as transference manifestations and resistance, aspects of the therapist's activity, and the patient's expressions. In the Comparative Psychotherapy Process Scale developed by Hilsenroth and his colleagues, the Psychodynamic-Interpersonal subscale includes items such as exploration of feelings and percepts linked to past experience, and focus on the patient-therapist relationship; items in the Cognitive-Behavioral subscale include giving explicit advice or direct suggestions, and specific outside-of-session activities (Hilsenroth et al. 2003). In both these research programs, assessment of the process variables is carried out through ratings by judges, applied at the macroprocess level, with the treatment hour as the unit of observation.

Our approach to empirical assessment of mediating variables differs from these studies in several major ways.

1. In contrast to measures applied at the level of clinical process itself, such as types of patient expressions or therapeutic interventions, we use measures of specific expressive and interactive features that underlie and contribute to these functions. A benefit of this approach is the potential of identifying factors of which neither the treating clinician nor the raters may be aware, but which affect their responses and judgments.

2. The computerized measures are by their nature objective, in contrast to the procedures of the standard clinical studies, which depend on judgments by trained raters. From a psychometric perspective, this eliminates problems of interrater reliability, as well as possible judgment bias, and permits direct comparison of results of research carried out by different groups at different places and times. The interpretation of the measures depends on their psychological construct and clinical criterion validation; our research program is directed toward building such validation.

3. The automatized measures permit designs with sufficient numbers of sessions and treatments to allow longitudinal assessment and provide adequate power for statistical analysis. Given advances in the technology of voice recognition, we can foresee (or fantasize) transformation of the recording of a session to the graphic image with minimal processing by transcribers in the not too distant future, thus greatly increasing the potential for developing a database large enough to support statistical analysis.

4. The automatized measures allow fine-grained word-by-word or second-by-second application within a session, as well as overall

quantitative session evaluation. Here we come closest to being able to identify specific features of the treatment process that may distinguish treatment modalities. Thus, in the graphic images of sessions we can identify factors leading to particular interventions, and their effects; and we can explore these effects in different modalities of treatment, with different types of patients, and at different points in treatment. For example, we might expect that a successful psychoanalysis would be distinguished by particular patterns of arousal, enactment, exploration, and reflection developing in the course of treatment. In contrast, work with some borderline or conduct-disordered adolescent patients might be expected to involve less exploration and more directive intervention focused on self-regulation; this might also be expected to change as the treatment proceeds.

An optimal process-outcome design. From the perspective of treatment effectiveness, to meet the goals of identifying mechanisms that contribute to successful outcome in psychoanalysis, the automatized discourse measures might be used alongside a variety of clinical measures. An ideal process-outcome methodology might be based on a repeated single case design involving a relatively large sample of treatments studied longitudinally, with appropriate measures of outcome, including new measures of changes in inner experience, such as are being developed by Wallerstein and his group (Wallerstein 2001, 2006), as well as clinical process measures and standard measures of symptoms and behaviors. The automatized linguistic procedures could be used both to provide the basic indicators of the referential process as outlined here, and also as a scan to enable selection of sessions or parts of sessions, to which additional process measures, including more labor-intensive clinical ratings, might be applied.

A Second Perspective: Studying the Path

There is another perspective concerning process research in which the treatment process is itself the appropriate focus of study. Cooper (1993) has made a strong case for this approach: "It may be unfortunate that the greatest spur for empirical research in psychoanalysis is the need for efficacy (outcome) studies, not only to support our confidence in our treatment, but also to participate as a beneficiary of mental health funding. . . . Intellectually, the most interesting aspect of psychoanalysis is not its outcome but its process ideas. It may well be that from a public health vantage, psychoanalysis is most valuable as the clinical

and research field that has spawned the ideas and techniques of dozens of other therapies that, while less ambitious, are more easily studied and administered” (p. 381).

Beyond the contribution of psychoanalysis to other fields, we would make the additional claim that for psychoanalysis the process should be seen not as a means to an end, but as a goal in itself. Improvement in the symptoms and behaviors that bring a patient to treatment may occur early in the course of any therapy, including psychoanalysis, as a result of nonspecific factors. Changes in inner experience or psychic structure, identified using new measures including the Scales of Psychological Capacities (SPC) developed by Wallerstein and his group (Wallerstein 2001, 2006), Sandell’s “Changes after Therapy” (CHAP) instrument (Sandell et al. 2000), and the psychodynamic scales of Hoglend et al. (2006) may have greater promise in showing the specific effectiveness of psychoanalysis than standard outcome measures. Even beyond these, however, it is possible that the particular impact of psychoanalytic treatment may best be shown in the process itself, in the development of capacities for self-exploration and self-regulation that will allow ongoing change to take place throughout life. We suggest that fine-grained studies of the treatment process, including studies of the referential process such as those presented here, are well suited to assess the development of such capacities.

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The Patient’s Voice

In the rigorous self-examination of the professional clinician, in a field that above all honors the operation of unconscious processes and unconscious motivation, it seems essential to acknowledge that a report of the treatment process based on formulation of the conscious and accessible experience of only one participant will necessarily leave a large gap to be filled concerning the factors that are playing out in the therapeutic interaction. Clinicians, in reading case reports in the literature, may fill this gap in implicit as well as explicit ways, making inferences from what is reported to experiences of which the treating/writing analyst may be unaware. The infinite interpretive regress that is mounted here—the need to understand the factors contributing to the individual reader’s inferences—raises new questions rather than providing solutions. We suggest that objective measures, such as those described in this study, are needed to fill this epistemological gap.

For example, in this paper, using data on the overall session level, we have shown that the linguistic measures of the referential process showed somewhat different and generally stronger relationships for the ratings of judges listening to full sessions, compared with ratings based on the analyst's impressions. This provides some validation of ratings based on whole sessions, including direct representation of the patient's speech; it is also possible that the analyst who is a participant in the interaction has access to aspects of the process that are missed by both of these external perspectives. These and other differences need to be explored in future work. We may note that fine-grained microanalyses of the four sessions in which the ratings showed most disagreement have pointed to specific material introduced by the patient that was not included in the analyst's impressions (Bucci 2006; Freedman, Lasky, and Webster 2007).

The Goals of Treatment, the Goals of Research

1392 To carry forward Cooper's claim, psychoanalytic process research can potentially play a central role on both clinical and scientific levels. The new techniques that have been illustrated in this paper enable psychoanalytic researchers to do what we do best: to look directly at the therapeutic interaction while meeting appropriate scientific standards. Ultimately the identification of mediating variables may have major public health significance, by contributing to the development of more effective treatment techniques for particular patients at particular times. Beyond the clinical domain, the study of the psychoanalytic process has broad scientific potential as a unique source of the kind of data concerning mental and emotional functioning in an interpersonal context that has been called for by neuroscientists (LeDoux 1999; Panksepp 1999).

Finally, we may note that there is a complex interaction of societal, professional, and deeply personal issues that are involved in emphasizing the value of studying the psychoanalytic process in its own right, and in claiming therapeutic goals such as enduring and ongoing capacity for self-exploration and self-regulation. We do not expect to strengthen the case for managed care payments for long-term psychoanalytic treatment, or NIMH funding for psychoanalytic research, on the basis of fine-grained studies of the treatment process aimed at measuring development of such processes. Nevertheless, it may be important to acknowledge that the primary value of self-

exploration, and the recognition of the psychoanalytic situation as a unique source of data concerning inner life, are what brought many of us into this field and what continue to motivate us, clinicians and psychoanalytic researchers alike.¹²

Certainly the goal of treatment is to address the patient's needs, relieve the symptoms, and enable more adaptive behaviors, but it is also true that these objectives show evolution in the course of treatment; and part of the aim of treatment is to uncover and reinterpret these objectives. It follows that psychoanalysis is always a work in process, measures of process are also mini-outcomes, and measures of outcome are always incomplete. In this sense, the direction of the psychoanalytic "road" is not mapped out at the start, but continually determined anew.

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¹²We might hope that the value of such studies might be recognized by the NSF, under appropriate circumstances, in the long term.

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