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The Verbalization of Emotions in the Therapeutic Dialogue - A Correlate of Therapeutic Outcome ?

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Running Head: Verbalization of Emotions

abstract:

An English version of the "Affective Dictionary Ulm" was constructed based on Dahl´s emotion theory for the computerized investigation of affective vocabularies of transcripts stemming from the Penn Psychotherapy Project. Therapist and patient vocabularies from "most successful" and "least successful" psychodynamic therapies were investigated at the beginning and at the end of treatment. Two hypotheses were partially confirmed: 1. therapists verbalize more emotions than their patients, and 2. "most successful" therapists will name more emotion words than their "least successful" collegues. Furthermore, we found that - in comparison with their initial levels - at the end of treatment "most successful" therapists tended to verbalize emotions of the subcategory "anger". These represent emotions where according to Dahl´s emotion theory a subject attributes the "focus of control" of a situation towards the self.

Although Freud´s remark that "nothing takes place in a psycho-analytic treatment but an interchange of words between the patient and the analyst" (1916/17, p. 17) was framed mainly for didactical reasons, a perspective, that focuses on the systematic investigation of these words seems to be justified, given the particular importance of the verbal exchange processes for the majority of psychotherapeutic interventions. The rationale, that verbal interaction is substanially determined by the words that are used to construct it, led to the development of the "ULM TEXTBANK" and the incorporation of computer-supported procedures for analyzing these vocabularies (Kächele, 1976; Mergenthaler & Kächele, 1991; Mergenthaler & Kächele, 1994).

Initial studies on vocabularies of verbatim material from the Penn Psychotherapy Project = PPP (Luborsky et al., 1980; Luborsky et al., 1988) showed, that "most successful" therapists tend to accomodate more to the verbal behavior of their patients in terms of vocabulary measures than "least successful" therapists (Hölzer et al., 1996). Because our impression was that "most successful" therapists in particular responded to words with an emotional connotation that were used by their patients, the development of a systematic method for analyzing these emotional or affective vocabularies seemed to be more promising and more economical from a reseach perspective. The question was whether a computerized measure, applied to the PPP transcripts would empirically support the intuitive impression cited above.

A computer-based measure for investigation of affective vocabularies is based on a quantitative analysis of single words with an emotional connotation, i.e. parts of speech that are particularly characteristic for psychotherapeutic dialogues. Working on and close to the patient´s emotions has been identified as an important therapeutic strategy or as a central "heuristic" as Ambühl (1989) put it by several researchers in the field. In a similar vein, Greenberg and Safran (1987) as well as Kemmler and her group (1991) emphazise the work on emotions as a common denominator of different therapeutic schools. Thus, Kemmler et al. with their studies on the "Use of language in psychotherapy" also focus to a great extent on the verbalization of emotion.

Most of the current psychotherapeutic research methods, which focus on linguistic variables or language parameters reflecting emotions, use human raters for coding (e.g. Gottschalk, Gleser, 1969; Dahl, Hölzer, Berry, 1992). In

contrast to these approaches, we will decribe the development and application of a computerized measure, based on a classification scheme, in which the coding of an emotion word on three independent dimensions leads to a total of eight different emotion categories (Dahl, Stengel, 1978). Whereas the Gottschalk-Gleser methodology is confined to the coding of anxiety and aggression (as well as their respective subcategories) the classification schema of Dahl and Stengel comprises a broad spectrum of positive and negative emotions.

In order to study transcripts of the Penn Project we constructed an English version of the "Affective Dictionary ULM“, named ADU-E. Although in the Penn Project patients with different diagnoses were treated for rather different lengths of time, this material turned out to be by far the best available. Not only did the PPP provide systematic sampling of the numbers of hours of each treatment transcribed, but there was also a thoroughly documented evaluation of treatment outcome (Luborsky et al., 1988). Therefore, the investigation of the connection between size and composition of affective vocabularies realized in psychotherapy and therapeutic outcome, was linked to the using of material from the PPP.

Hypotheses

We investigated the following hypotheses:

Hypothesis 1: Therapists name relatively more emotions, i.e. they show higher scores in "density of affect" (= a higher percentage of emotion words in their verbalizations) in comparison with their patients.

Rationale: Kemmler et al. using a reduced set of 114 emotion words were able to demonstrate, that therapists, independent of their professional affiliation use relatively more emotion words than their patients. This result is easily comprehensible as the naming of emotions, affects and moods by means of emotion words represents one major strategy, among others, to focus on feelings and to verbalize emotions. The verbalization of emotion words as one of the verbal equivalents of a therapeutic heuristic of "working on emotions" (Ambühl, 1989) should be demonstrated to a greater extent by therapists than by patients.

Hypothesis 2: Therapists conducting most successful therapies name relatively more emotion words in comparison with therapists from less successful therapies.

Rationale: The inhibition of emotional perception and expression as well as avoidance behavior with regard to action *components of emotions* are well documented as etio-pathogenetic factors for the formation of psychic and psychosomatic disturbances (refer to, among others, Billings, Moos, 1982; Hokanson, 1970; Pennebaker, 1982; Traue, 1986, Pennebaker, Traue, 1992). Corresponding to this the therapeutic work on emotional experience -- even taking into account different accentuations among the different schools of psychotherapy (Kemmler et al., 1991) -- is commonly regarded to be one of the basic requirements of successful therapeutic work (Krause, 1983; Krause, Steimer-Krause, Ullrich, 1992; Greenberg, Safran, 1987). The most plausible assumption is that therapists using differentially successful treatments differ quantitatively in terms of their "work on emotions". Therefore, more emotion words in the text of therapeutically successful therapists should be demonstrable.

METHOD: THE SAMPLE OF PATIENTS AND SESSIONS

Measuring therapeutic outcome on the basis of two outcome criteria ("rated benefits" and "residual gain") Luborsky et al. identified 10 "most-succsessful" (here: group MS) as well as 10 "least successful" therapies (here: group LS) in the Penn Project. Since all publications of Luborsky as well as his colleagues from the PPP refer to this sample of 2 x 10 patients, the same sample was used for our investigation.

"The two outcome measures, rated benefits and residual gain, were devised as follows: First, composite measures of pretreatment and posttretament adjustment were compiled using ratings made by a clinical observer and the patient (weighted equally). The measures included the Inventory of Social and Psychological Functioning (A.Auerbach MD, M Johnson, PhD, unpublished data, December 1977); Minnesota Multiphasic Personality Inventory scales for ego strengh, hypochondriasis, and hysteria; the Health Sickness Rating Scale= HSRS (Luborsky, 1962a; Luborsky, 1975a), and the adjustment items of the

Prognostic Index Interview (Auerbach et al., 1972). Second, a measure of raw gain was obtained by subtracting pretreatment scores from posttreatment scores. Third, by partialling out the pretreatment scores from raw gain, a residual gain score was obtained that showed the gain of each patient relative to all the other patients as if each one had begun treatment at the same level. Finally, Rated Benefits scores were obtained by getting direct ratings of change from patients and therapists independently. Residual Gain and Rated Benefits scores were highly correlated (.76). Seven of the most improved and eight of the least improved patients were chosen for study in terms of Residual Gain scores and the additional five of the sample of 20 were chosen in terms of Rated Benefits scores since the two criteria were highly correlated, cases were taken that were extreme on either criterion" (Morgan et al., 1982).

These 20 according to DSM-II criteria non-psychotic patients were treated by a total of 18 psychodynamically oriented therapists in different outpatient units. The age of the patients varied between 18 and 47. The average length of a therapy was 61 weeks for "most successful therapies" and 43 weeks for the "least successful therapies. Luborsky et al. sampled four sessions from each patient for purposes of verbatim transcription: Two sessions from the beginning phase of therapy (T1, mostly sessions 3 and 5), as well as two sessions from a period of time (T2) at which 90% of the respective treatment was completed. Thus, T2 was located before the last phase of treatment started, which was considered being a termination phase dealing partly with termination or separation problems. Using this sampling routine, a total of 80 transcripts were drawn from the 20 patients. Since there were two sessions and therefore two scores for each timepoint (T1 and T2), means of these two sessions were calculated for comparisons between the two groups.

PROCEDURE

The English version of the "Affective Dictonary Ulm", the ADU-E

Using the classification schema of Dahl and Stengel (1978) a variety of German versions of the "Affective Dictionary Ulm" (ADU) were developed and tested with a variety of transcripts from the ULMER TEXTBANK (Mergenthaler and Kächele, 1994). Studies using these German versions yielded a number of rather encouraging results. There were theoretically meaningful correlations between the therapeutic orientation of the therapists and certain classes of emotions (Hölzer, Scheytt, Kächele, 1990), as well as correlations between categories of

the ADU and the intensity of the therapeutic setting (Scheytt, 1990; Hölzer et. al. 1994) and also the activation of certain defense mechanisms (Hölzer et al., 1993). We also found theoretically convincing associations between the composition of the affective vocabulary and its change throughout four psychoanalytic treatments (Kächele and Hölzer, 1996).

The construction of the English version of the "Affective Dictionary ULM" (ADU-E) was based on the same procedures as its German version (Hölzer, Scheytt, Kächele, 1992). By applying these procedures it was assured that all words in the transcripts which were judged to have emotional connotation, were incorporated into the dictionary. The construction of the ADU-E using the Penn transcripts was based on the identification of a total of 1629 single emotion words. The coding of these words on the three independent intersecting dimensions as first defined by Dahl and Stengel (1978) and later revised by Dahl, Hölzer and Berry (1992) resulted in eight lists of emotion words representing the eight categories of the original classification schema.

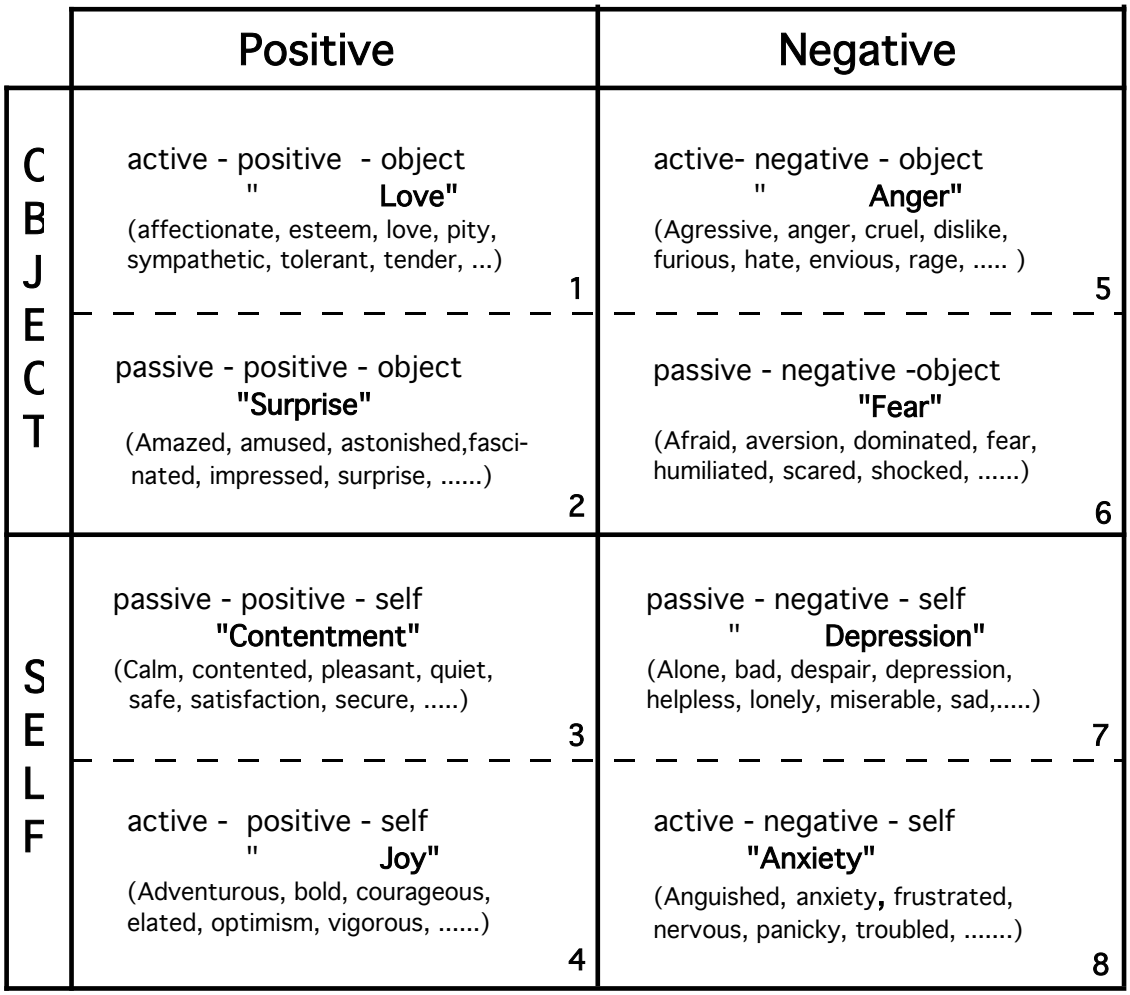

Figure 1. The eight categories of the "Affective Dictionary Ulm" (= ADU). Prototypic examples - used as category names - are printed bold; e.g. "anger for the category "active - negative - object" (adapted from: Dahl et al., 1992).

Dahl et al. (1992) defined the first dimension, *Orientation*, as the subject's *focus of attention*, that is, whether the subject's attention is focused on an object (person, place or a thing) or on the subject's own internal state. This dimension *Orientation* provides a profoundly important classification into two major categories of emotions with markedly different functions: **IT** emotions (e.g. love and hate), which function as "*appetitive wishes about objects* " and **ME** emotions, which function as "*beliefs about the status of fulfillment of wishes*." (p. 6).

The second dimension, *Valence*, refers to a positive-negative decision, which for IT emotions results either in *attraction to* an object (e.g. "love") or in

repulsion to an object (e.g. "hate"). For ME emotions *Valence* refers to a *positive* or *negative* expectation about the fulfillment of appetitive and other wishes.

The third dimension, *Activity*, is defined for IT emotions as the subject's *focus of control*, which is *active* if the subject attributes control to the subject her- or himself (as in case of "hate") or *passive* if control is attributed to the object (as in case of "fear"). For ME emotions the belief in a *certain* satisfaction or dissatisfaction of a particular wish is classified as *passive* (e.g. "satisfaction" and "depression") and belief in the *probable* satisfaction or dissatisfaction is *active* (e.g. "anxiety" and "joy").

The eight major categories resulting from the intersection of these three independent categories are shown with their arbitrary category number (1-8) in figure 1.

Since "measurement", i.e. the identification of emotion words listed in the dictionary categories in verbatim transcripts, is accomplished absolutly reliably, problems with reliability primarily concern the construction of the dictionary. Here the question which words should be considered to be emotion words at all and to which of the single categories should they be assigned becomes important (Speidel, 1979; Scheytt, 1990). Even if the loading of an emotion word on one of the dimensions might vary depending on the context the word occurs in, Dahl and Stengel report a substantial reliability for the rating of single emotion words on their three dimensions: With respect to the dimension *Valence*, 58 raters agreed significantly on 95% of the 400 words given. They agreed on 86% of the words with respect to *Orientation* and agreed on 75% with respect to *Activity*. The assignment of the english emotion words to the eight categories of the ADU-E was based on these empirical findings of Dahl and Stengel.

The results of the study presented here, were produced with a dictionary version that contained merely 1582 of the original 1629 words originally classified as being "emotional", as only those entries that were solely or mainly used with their emotional meanings in the transcripts were incorporated into the ADU-E. Words that were jugded to be used in too many different, ie. non-emotional meanings as well as emotional meanings, were identified with the

"keyword-in-context" procedure of the ULMER TEXTBANK and excluded from the dictionary (Hölzer, Scheytt, Kächele, 1992).

STATISTICAL PROCEDURES

To statistically compare both groups of treatments (most successful vs. least successful) we applied the model of a unifactorial analysis of variance with two repeated measures. For the question whether treatment success and the relative size of the Affective Vocabulary and its subcategories covary as well, the grouping factor "outcome" represents the independent variable, the relative frequency of emotion words as well as of the different categories of the ADU-E represent the dependent variables. The factor "speaker", i.e. the difference between therapist and patient, corresponds to a repeated measure, as the relative frequencies of the Affective Vocabulary are obtained from the same dialogue. The therapists and patients do not act independently of each other. Another repeated measure is "time" (beginning vs. ending of therapy). Thus, the ANOVA tests the three sources of variance ("outcome", "speaker" and "time" of measurement) as well as interactions between these variables with regard to their influence on the dependent variable "Affective Vocabulary"[1] .

RESULTS

The results confirm hypothesis 1. The analysis of variance confirms the predicted significant difference in the usage of emotion words between therapists and patients.

[1] A (nearly) normally distributed dependent variable as well as comparability of the variance of the samples investigated is a necessary prerequisite of an ANOVA as described above. For when wanting to analyze relative frequencies an "arc-sine-transformation" is often recommended, to stabilize the variance and to render a distribution more symmetric (Sachs, 1984, p. 211f.). For the sake of comprehensability we adopt the following strategy: In tables and figures means and standard deviations of the original relative frequencies will be displayed. However, the statistical results reported (statistics, p-values) are based on variables transformed by the arc-sine-transformation.

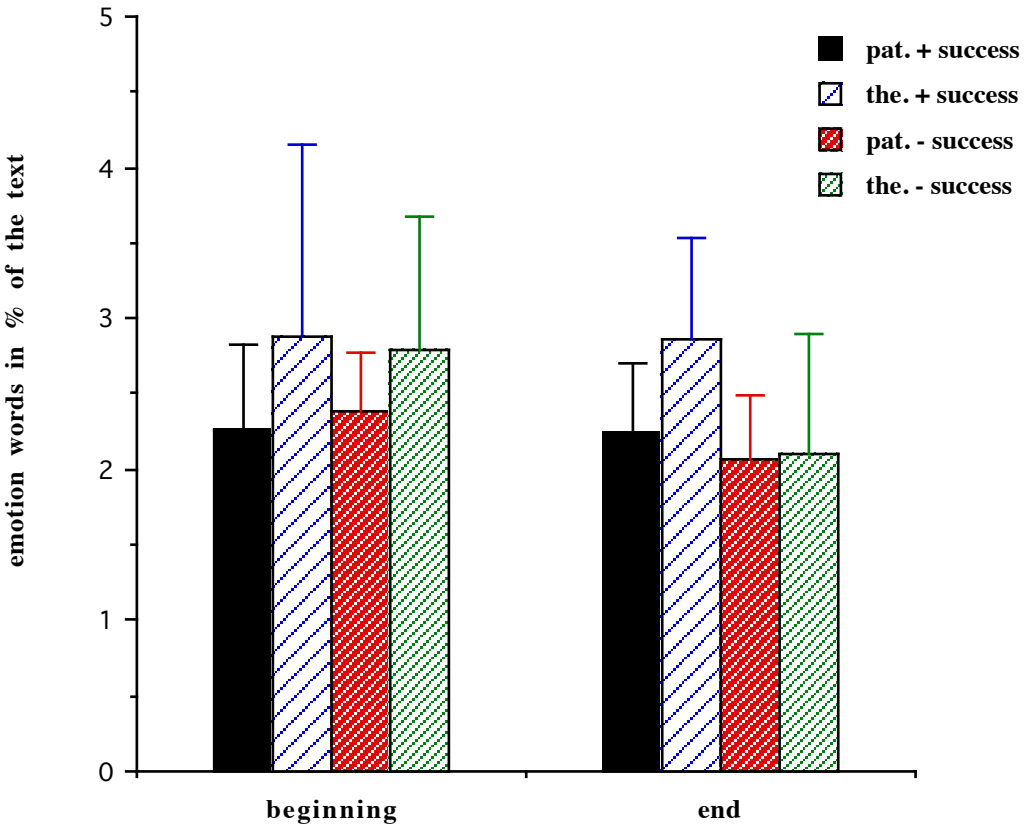

Figure 2. Differences within and between the two outcome groups in "density of affect" (the composite measure containing all subcategories of the ADU-E) at the beginning and at the end of treatment.

Figure 2 and Table 1 about here.

At the beginning of treatment (T1) therapists of both groups display an impressively higher density of affect than their patients: The therapists of the least successful group (density of affect: 2.79%) are hardly distinguishable from their more successful collegues (density of affect: 2.87%). With regard to this parameter the least successful patients (2.38%) show higher scores than the most successful patients (2.27%) at the same point of time T1. It seems to be of particular interest that this difference between the "speakers" is due to the more frequent use of IT emotions by therapists ($F = 6.14$; $df = 18,1$; $p = .023$).

In contrast, at the end of treatment (T2) only the most successful therapists still display a higher density of affect in comparison with their patients: the least successful therapists have dropped to a level where the density of affect is even below the one shown by their patients at the beginning of treatment. This finding is confirmed by a statistically significant interaction between "outcome" and "time".

Hypothesis 2 that successful therapists verbalize more emotion words than less successful therapists was only partially confirmed. A direct comparison of therapists of both groups (by means of an independent t-test) shows that there are no differences as to the various categories of the ADU-E at the beginning. However, at the end of treatment there is a statistically significant difference: the most successful therapists outnumber their less successful colleagues not only with regard to density of affect but also show significantly higher values for IT emotions (1.58% **:** 1.11%, t-test for independent groups, $t = 2.36$; $df = 18$; $p = .03$)[2].

Since IT emotions both contribute to the differences between patients and therapists as well as between most successful and least successful therapists, it seemed fruitful to specify the composite category of IT emotions with regard to its components. We found that the established differences were mainly determined by the subcategory "anger".

[2] This difference found for therapists can be demonstrated for patients in a similar vein: At the end of treatment (T2) patients of the group MS show significantly higher scores in the composite category of positive emotions (i.e. the composite category that contains positive it-emotions as well as positive me-emotions, 1.13% : 0.85%, t-test for independent groups, $t = 2.32$; $df = 18$; $p = .03$). Again, this difference was due to verbalizing more it-emotions on the side of MS patients.

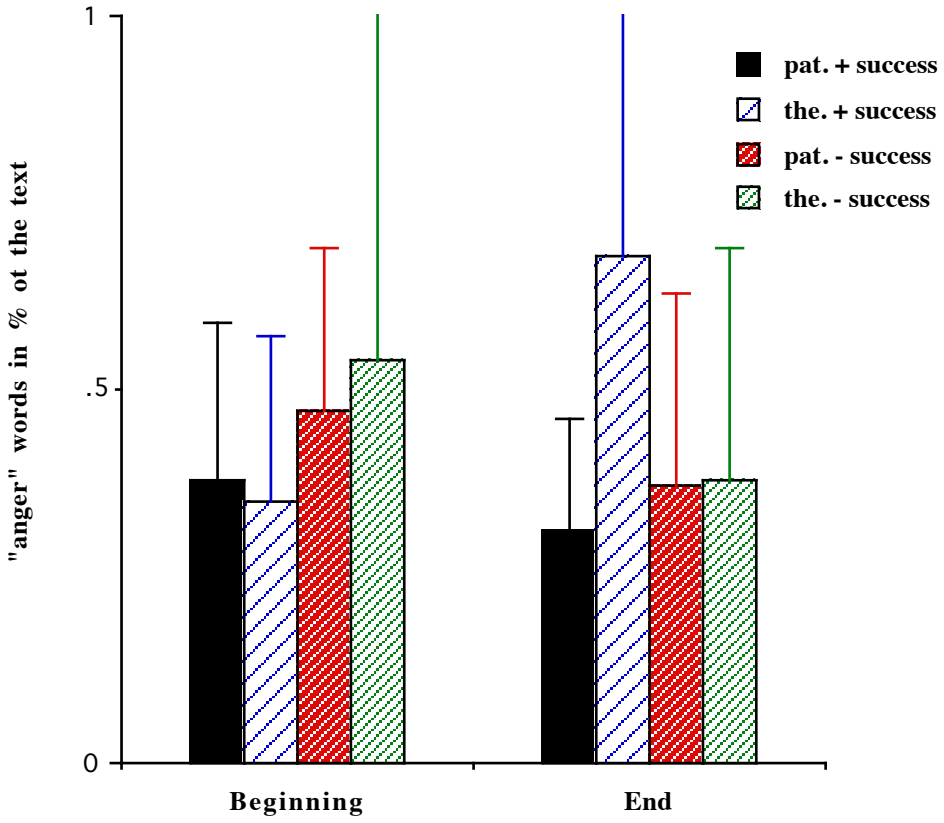

Figure 3. Differences within and between the two outcome groups in category "anger" at the beginning and at the end of treatment.

For "anger" the difference between T1 and T2 for the more succcessful therapists is most impressive. The significant interactions between "outcome" and "time", and between "speaker" and "time" are mostly due to this increase in "anger" as well as the decrease in "anger" for the least successful therapists.

-**Table 3.** Spearman rank correlation coefficients between the ADUE categories (means across T1 and T2) and "residual gain", N in each group = 10, * indicates significantly different correlations between the two outcome groups ($p < .05$; "test for comparison of correlations"; Sachs, 1984).

Categories of the ADUE	Therapists + success	Therapists - success	Patients + success	Patients - success
Density of Affect	.24	.20	.09	-.49

IT Emotions	.42	.23	.21	-.43
ME Emotions	-.02	.39	-.03	-.61
Positive Emotions	.15	.16	.02	-.79
Negative Emotions	.52	.61	.22	-.11
Pos. IT Emotions	.80	.01*	.45	-.68*
Pos. ME Emotions	-.77	.04	-.31	-.85
Neg. IT Emotions	.19	.22	.18	.01
Neg. Me Emotions	.72	.61	.37	-.49
Love	.57	.37	.18	-.68
Surprise	.20	.51	.41	-.57
Contentment	-.83	.07	.33	-.51
Joy	-.69	.26	-.42	-.64
Anger	.44	.28	.17	-.06
Fear	-.09	.23	.28	-.23
Depression	.77	.39	.30	-.04
Anxiety	.46	.36	.07	-.24

Table 3 summarizes the correlations between the various sub-categories and the composite categories of the ADU-E and treatment outcome. For more successful therapists treatment outcome is positively associated with the naming of positive IT emotions and negatively associated with naming of positive ME emotions. The same is true for the most successful patients. Furthermore the correlations for patient vocabularies exhibit an obvious pattern: Whereas for most successful patients only positive correlations between verbalization of emotion words and therapy outcome are identified (except for the category "Joy"), for least successful patients only negative correlations were found.

CONCLUSION AND DISCUSSION

Summarizing the results we draw the following conclusions:

- In their verbal behavior therapists relate more to emotional contents than their patients. Thus, our findings with the ADU-E based on 1582 English words confirm the results of Kemmler et al. which were based on 114 German emotion words.

- Within more successful therapies more emotions words are used than in less successful therapies; however this difference is only reflected towards the end of treatment.

- Assumming that the parameter "density of affect" is a valid quantitative indicator for the therapeutic work on emotions, our results support the notion that in successful therapies this work is more extensively realized.

- Furthermore, the mainly negative correlations between treatment outcome and the individual subcategories of the ADU-E for the least successful patients makes it plausible that differential aspects of the verbalizing of emotions have to be discussed; for least successful patients verbalizing emotions might reflect a tendency to be angry about their lack of progress rather than a real working with emotions.

- The class of IT emotions seems to be responsible for the differences found both between patients and therapists and between most successful and least successful therapists. These emotions which serve primarily the monitoring and the regulation of object relations supporto the hypothesis that in psychodynamic therapies intensive focusing on object relations and relationship conflicts acts as a "therapeutic agent". Furthermore, our findings demonstrate that for successful therapists an increase of the category "anger" support the clinical impression that the transformation of patients´ "complaints" into "accusations" represents a core psychodynamic strategy of treatment. However, it is clear that further detailed studies expanding the context of this work on emotions would be highly desirable.

Regarding the application of computer based methods for text analysis in psychotherapy research, which have been in use for more than 30 years (Spence 1969; Kächele, 1976) our results allow for a reserved optimistic outlook. The correlation of emotional vocabulary and outcome is in contrast with the often heard critique that such measures are too remote from the actual therapeutic process to be of clinical significance. However, the investigation of affective vocabularies and the development of an ADU and the ADU-E serves as an indicator for relevant clinical processes and represents a productive step that should be pursued further (see also Mergenthaler & Kächele, 1996). The fact that a computer-based procedure is able to replicate successfully a painstaking content analysis of human subjects on a much larger data base (Kemmler et al., 1991) allows for an optimistic perspective to a further specialized instrumentation on measures of verbalization for psychotherapy research.

REFERENCES

Ambühl, H. (1989). The therapeutic process in the two PEP-therapies from the perspective of the realization of therapeutic heuristics. Unveröffentlichtes Vortragsmanuskript. 3rd European Conference of the Society for Psychotherapy Research, Bern.

Auerbach, A. H., Luborsky, L., Johnson, M. (1972). Clinicians predictions of outcome of psychotherapy. A trial of a prognostic index. American Journal of Psychiatry, 128, 830-835.

Billings, A., Moos, R. (1982). Stressful life events and symptoms: A longitudinal model. Journal of Health Psychology, 1, 99-117.

Dahl, H. (1978). A new psychoanalytic model of motivation. Emotion as appetites and messages. Psychoanalysis and Contemporary Thought, 1, 373-408.

Dahl, H., Hölzer, M., Berry, J.W. (1992). How to classify emotions for psychotherapy research. Ulm: Ulmer Textbank.

Dahl, H. Stengel, B. (1978). A classification of emotion words: a modification and partial test of de Rivera's decision theory of emotions. Psychoanalysis and Contemporary Thought, 1, 269-312

Freud (1916/17) Introductory lectures on Psycho-Analysis. Collected Papers, Vol. 15. London: Hogarth press.

Gottschalk, L. A., Gleser, G. C. (1969). The measurement of psychological states through the content analysis of verbal behaviour. Berkley: California Universities Press.

Greenberg, L.S., Safran, J.D. (1987). Emotion in Psychotherapy. New York: Guilford Press.

Guillard, P. (1987). Emotionen als Begierden und Botschaften - ein Konzept und eine Replikationsstudie. Ulm: PSZ-Verlag

Hölzer, M., Scheytt, N., Pokorny, D., Kächele, H. (1990). Das "Affektive Diktionär". Ein Vergleich des emotionalen Vokabulars von Student und Stürmer. Psychotherapie, Psychosomatik, Medizinische Psychologie Disk-Journal, 1.

Hölzer, M., Scheytt, N., Kächele, H. (1992). Das "Affektive Diktionär Ulm" als eine Methode der quantitativen Vokabularbestimmung. In C. Züll & P. Mohler (Hrsg.), Textanalyse. Anwendungen der computerunterstützten Inhaltsanalyse. Beiträge zur 1. TEXTPACK-Anwenderkonferenz. (S.131-154). Opladen: Westdeutscher Verlag GmbH.

Hölzer, M., Aeschelmann, D., Schwilk, C., Kächele, H. (1993). Defense mechanisms and linguistic styles. New Trends in Experimental and Clinical Psychiatry, 9, 15-22.

Hölzer, M., Mergenthaler, E., Pokorny, D., Kächele, H., Luborsky, L., (1996). Vocabulary measures for the evaluation of therapy outcome: studying transcripts from the Penn Psychotherapy Project. Psychotherapy Research: 6 (2), 93-105.

Hokanson, J.E. (1970). Psychophysiological evaluation of the catharsis hypothesis. In: Megargee, E.J. & Hokanson, J.E. (Hrsg.) The dynamics of aggression, 74-86. Harper & Row: New York.

Kächele, H. (1976, 4th. ed: 1986)). Maschinelle Inhaltsanalyse in der psychoanalytischen Prozessforschung. Ulm: PSZ-Verlag.

Kemmler, L., Schelp, T., Mecheril, P. (1991). Sprachgebrauch in der Psychotherapie. Emotionales Geschehen in vier Therapieschulen. Huber: Bern.

Krause, R. (1990). Psychodynamik der Emotionsstörungen. In: Scherer, K.R. (Hrsg.) Psychologie der Emotion, Bd.3, 630-705. Hogrefe: Göttingen.

Krause, R., Steimer-Krause, E., Ullrich, B. (1992). Anwendung der Affektforschung auf die psychoanalytisch-psychotherapeutische Praxis. Forum der Psychoanalyse, 8, 238-253.

Luborsky, L. (1962). Clinician's judgments of mental health: a proposed scale. Archives of General Psychiatry, 7, 407-417.

Luborsky, L. (1975). Clinician's judgments of mental health: Specimen case descriptions and forms for the Health-Sickness Rating Scale. Bulletin of the Menninger Clinic, 35, 448-480.

Luborsky, L., Mintz, J., Auerbach, A., Christoph, P., Bachrach, H., Todd, T., Johnson, M., Cohen, M., O´Brien, C.P. (1980). Predicting the outcomes of psychotherapy. Findings of the Pennpsychotherapy project. Archives of General Psychiatry, 37, 471-481.

Luborsky, L., Crits-Christoph, P., Mintz, J., Auerbach, A., (1988). Who will benefit from psychotherapy? Predicting therapeutic outcomes. New York. Basic Books.

Mergenthaler, E., Kächele, H. (1991) The University of Ulm: The Ulm Textbank Research Program. In: Beutler, LE., Crago, M. (eds.) Psychotherapy Research. An international review of programmatic studies. American Psychological Association: Washington, p 219-225.

Mergenthaler, E, Kächele, H. (1994). Die Ulmer Textbank. Psychotherapie, Psychosomatik, Medizinische Psychologie, 44, 29-35.

Mergenthaler, E., Kächele, H. (in press) Applying multiple computerized text analytic measures to single psychotherapy cases. Journal of Psychotherapy Practice Research.

Morgan, R., Luborsky, L., Crits-Christoph, P., Curtis, H., Solomon, J. (1982). Predicting the outcomes of psychotherapy by the Penn Helping Alliance method. Archives of General Psychiatry, 39, 397-402.

Pennebaker, J.W. (1982). Psychology of physical symptoms. Springer: New York.

Pennebaker, JW., Traue, HC. (1992) Inhibition and Psychosomatic Processes. In: Traue, HC., Pennebaker JW., (eds.) Emotion, Inhibition and Health, Hogrefe und Huber: Seattle, Toronto, Göttingen.

Sachs, L. (1984). Angewandte Statistik. Springer Verlag:Berlin, Heidelberg, New York, Tokyo.

Scheytt, N. (1990). Das affektive Vokabular eines Therapeuten in Abhängigkeit von therapeutischen Rahmenbedingungen. Diplomarbeit, Univ. Tübingen.

Speidel, H. (1979). Entwicklung und Validierung eines Wörterbuches zur maschinell-inhaltsanalytischen Erfassung psychoanalytischer Angstthemen. Unveröffentlichte Dissertation, Universität Ulm.

Spence D (1969) Computer measurement of process and content in psychoanalysis. Transactions of the New York Academy of Science 31: 828-841.

Tischer, B. (1988). Kein Spaß im Wortfeld der Gefühlsbegriffe? Zehn Methoden zur Kennzeichnung der Wortfeldzugehörigkeit. Archiv für Psychologie, 140, 15-31.

Traue, HC.(1986). Über die Inhibition von Ausdruck als Komponente psychosomatischer Störungen. Zeitschrift für Psychosomatische Medizin und Psychoanalyse, 32, 349-360.