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A computer-based assessment of long-term transference trends¹

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The investigation combines approaches III and IV of the Ulm process research model in an effort to demonstrate that the computer content analysis is able to significantly increase our descriptive power in process research.

Material

The material for this study consists of 130 session (out of 630 sessions) that were transcribed and stored in the ULM TEXTBANK. The distribution of the sample over the course of the psychoanalytic treatment is a stratified time sample; all 25 sessions 5 sessions are included in the study (session 1-5, 26-30, 51-55,, 626-630). The sample thus represents a fifth of the whole treatment process. The decision not to use a random time sample depends on our knowledge that in between sessions there is considerable variation of topic and content. Averaging over a sample of fives sessions gives a fair clear account of the present thematic focal structure.

Study 1: guided clinical judgment of transference and anxiety

In the first study three clinically trained judges (the treating analyst², a second analyst and a clinical psychologist) rated 55 sessions independently for the intensity and degree of following clinically defined concepts:

- = positive transference
- = negative transference
- = castrations anxiety
- = guilt anxiety
- = shame anxiety
- = separation anxiety
- = diffuse anxiety
- = working alliance

¹ This investigation has been part of the author's "Habilitationsschrift" (Kächele, 1976)

² the time between treatment and performance of this study was about three years

= insight

The definition and operational description for the concept for the two transference scales focused on the prevailing affective tone of the relationship of the patient to the analyst. The definitions of the anxiety scales were taken from L. Gottschalk and Gleser's [Gottschalk, 1969 #1884] handbook. The working alliance was captured by four subscales.

The scales for the rating of the clinical concepts extended from 0 - 3: a secondary set of scales for the degree of consciousness were -3 to +3. The value of both scales were integrated by a formal algorithmic procedure which followed the reasoning that the estimation of degree of intensity is of higher hierarchy and the estimation of degree of consciousness functions as a moderator variable on the degree of intensity.

By the following formula a set of integrated values was achieved:

Formula: $10 \times X_{\text{intensity}} + X_{\text{consciousness}} = X_{\text{combined}}$.

With these integrated values interrater coefficients were computed:

Table 1. Inter-Rater Reliability (Rater A, B & C)

	A / B	A / C	B / C	mean r
positive transference	+ .44	+ .59	+ .32	+ .45
negative transference	+ .47	+ .35	+ .42	+ .41
castrations anxiety + .31		+ .38	+ .39	+ .33
guilt anxiety + .37		+ .34	+ .31	+ .34
shame anxiety + .29		+ .04	+ .07	+ .13
separation anxiety + .55		+ .53	+ .30	+ .46
diffuse anxiety + .59		+ .53	+ .49	+ .54
working alliance + .70		+ .65	+ .68	+ .68
insight + .65		+ .60	+ .65	+ .65

N = 55 p = .05 if r = .27 p = .01 if r = .35 Pearson r

Testing for homogeneity of the correlation coefficients of the three pair of raters led in no case to a deviation.

The reliability of judgment among the three raters achieves statistical level of significance in most of the cases - except the concept shame anxiety deviates considerably which could be traced to a different understanding of the three raters - whereas the numerical values are less than satisfying. However, taking into consideration the task of judgment - to read verbatim protocols of many pages - 10 to 20 pages per session - our results are comparable with those of [Bellak, 1956 #72; Strupp, 1966 #2549]; these authors have pointed out that complex clinical concepts are hard to judge any way and are very hard to judge when giving the rater more than 5 min. excerpts to work with.

In face to the numerical low values of rater consensus we decided not to use the arithmetic mean of the three raters for each concept, but performed a factor analysis to extract the common dimensions of all three raters which led to five factors:

Factor 1 : working alliance (assessed by rater B and C)

Factor 2 : positive transference as a defence against separation anxiety

Factor 3 : diffuse anxiety with aggressive transference

Factor 4 : working alliance (assessed by the analyst)

Factor 5 : shame and guilt anxiety

The result of this factorial analysis was used to pursue our interests in empirically identifying focal phases in this analytic treatment. As these results have been presented at the Montreal International Congress in 1987 [Kächele, 1988b #1326] I shall only introduce the material here for the readers convenience.

On the basis of our accurate clinical knowledge and of the understanding of the course of the treatment so far achieved by the research group in the systematic description study , we tentatively formulated four focus-related phases of treatment:

Phase 1 (sessions 1-5; 51-55; 101-105):

Maintenance of defense

Phase 2 (sessions 151-155; 201-205):

Intensification and access to consciousness of the early positive object relation in the transference

Phase 3 (sessions 251-255; 301-305; 351-355)

Alternation of pregenital-positive clinging transference and aggressive distancing in the transference

Phase 4 (sessions 401-405; 451-455; 501-505)

Consolidation of the aggressive transference

Phase 1 is characterized predominantly by a friendly attitude on the part of the patient, who approaches the analytical process with a great deal of interest and seemingly good defenses as judged from the verbal exchange within the sessions. The problem of separation emerges only incipiently in the transference; the

aggressive transference is predominantly unconscious and not very intense. Feelings of guilt and shame alternate in their intensity.

Phase 2 is characterized predominantly by the mobilization of the separation problem in the analytic situation; aggressive aspects of the transference are manifested only in individual sessions.

In Phase 3 the therapeutic aim of reactivating aggressive impulses in the transference which underlie the severe anxieties is achieved for the first time; at the same time, the alternation with the symbiotic- clinging position is impressive.

In Phase 4 we see a perceptible decline of the friendly, conciliatory object relation, which is replaced by an anally tinged, negativistic aggressive transference.

It should be noted that this study was performed when the treatment was not yet completed, so further phases are to be expected when the whole course of analysis lasting for about 1200 sessions will be studied.

The clinically derived focus formulations then were checked by a formal algorithm: using the five factors of the rating investigation, a procedure called discriminant analysis was used to calculate a number of linear functions by which the sessions belonging to the four phases can be checked to determine whether the individual sessions have been assigned to one of the four phases on the basis of the five factor values only randomly or whether the assignment is significant: Without reporting the details of the statistical procedure (see Biomedical Computer Program 1973, p. 221) it is important to understand the logic somewhat: each of the 55 hours is assigned by this method of discriminant analysis to one of the four phases - i.e., the linear combination of the five factors used yields an assignment value for each individual session, thus providing an empirical basis for discussion of the homogeneity of the phases at the level of sessions.

Summarizing the results of this classification procedure by the following classification matrix demonstrates the relative homogeneity of each of the four phases in terms of sessions assigned to it:

Classification Matrix

Discriminant
function _____

Phase	1	2	3	4	N sessions
1	12	0	2	1	15
2	2	6	1	1	10
3	3	4	5	3	15
4	5	1	0	9	15

The four types defined by the discriminant functions 1- 4 which are based on a joint evaluation of the five factors represent correspond clinically to the focal schemes which we have evolved from our joint clinical discussion. With the exception of phase 3 we find a dominating type of session in each phase; the results of phase 3 clearly indicate that all four types of sessions are sparsely over the phase indicating no stable topical preference.

In the five-factor solution none of the castration anxiety variables showed any significant loadings on any of the five factors. We therefore chose out of a nine-factor solution a specific castration factor for further work.

Table 2
factor 2
separation anxiety with positive transference

<i>rater</i>	<i>concept</i>	<i>loading</i>
A	positive transference	+ .67
A	separation anxiety	+ .79
B	positive transference	+ .43
B	separation anxiety	+ .59
C	positive transference	+ .79
C	separation anxiety	+ .66

factor 3
diffuse anxiety with negative transference

A	negative transference	+ .67
A	diffuse anxiety	+ .74
B	negative transference	+ .61
B	diffuse anxiety	+ .64
C	negative transference	+ .35
C	diffuse anxiety	+ .63

single factor
castration anxiety

A	castration anxiety	+ .70
B	castration anxiety	+ .68
C	castration anxiety	+ .72

Ordering the clinical judgments by the factorial structure brings out three dimensions that are meaningfully to interpret: factor 2 describes the close connection between separation anxiety and positive transference, factor 3 describes the close connection

between diffuse, objectless anxiety and negative transference, the specific factor castration anxiety unifies the judgments on the concept into a higher organized scheme. Looking back to the procedure of judging such a vast amount of clinical material as we did in this step of the investigation we are more than ever of the opinion that this approach is too cumbersome to yield fruitful long-term commitment. This led to the development of study 2 of this investigation. (Further details of this part of the study have been described in [Kächele, 1973 #2604; Grünzig, 1978 #2601])

Study 2: Prediction of clinical judgments by computer content analysis

We asked whether it is possible to predict the judgment of clinical concepts by the linear combination of category scores of a computer content dictionary. Our aim was to find a way to implement computer content analysis as a scanning procedure; thus would be able to run through large data bases and find sessions with particular clinical constellations.

Method

As analyzing tool for this investigation we used an adaption of the Harvard III Psychosociological Dictionary [Stone, 1966 #2545]; for technical reasons we restricted the entries in the various categories of the dictionary to the nouns that we identified by a vocabulary analysis of both patient and analyst. The reliability of the dictionary we devised can be described by saying that it coded 70% of all occurring nouns in the verbatim protocols with a minor difference between the degree of text-coverage of the patient and the analyst's productions. The degree of similarity of the categories between patient and analyst over the course of treatments is considerably; the following table 4 shows the correlation of some selected categories over the whole treatment (N = 130 sessions):

As these are the first data of this kind to be reported in the English process research literature, a few comments may be helpful:

For the majority of categories - not only those listed here as examples - we note a statistically significant correlation over the course of treatment. Though statistical significance with an N of 130 is easy to achieve, at least our hypothesis had been that only a few of the categories would reach that level. The results point out that the dyadic relationship organizes the shared "speech world" in such a way that communality is forced onto both speakers.

A very high positive correlation occurs with a few categories like PLEASURE and ANGER. From the word lists that make up these categories we can infer that the dialogue around angry and pleasurable topics was very tight and mutually stipulating. The category DISTRESS referring to all the topics of complaints the level of synchronization did not surpass the average level of all categories. Clinically this could mean that the analyst did not invariably tune in when the patient would complain about nausea, pain and other physical distress symptoms; he would only pick it up as much as necessary to keep in touch.

As we should be eager to learn more about other treatment with regard to vocabulary or category synchronization, we took up this issue in a study of vocabulary similarity with successful and unsuccessful patients [Hölzer, 1987 #894]

Table 4 Correlation of selected dictionary categories between patient and analyst over the course of treatment

variable	category name	correlation coefficient
1	MALE ROLE	+ .64
2	FEMALE ROLE	+ .59
3	NEUTER ROLE	+ .39
4	JOB ROLE	+ .39
6	BODY PART	+ .48
9	TOOL	+ .20
10	NATURAL OBJECT	+ .45
11	NON SPECIFIC OBJECT	+ .06
12	TIME REFERENCE	+ .34
15	SOCIAL PLACE	+ .28
16	NATURAL WORLD	+ .23
17	IDEAL WORLD	+ .38
18	DEVIATION	+ .44
19	ACTION FORM	+ .15
20	MESSAGE FORM	+ .35
21	THOUGH FORM	+ .30
22	AROUSAL	+ .28
23	URGE	+ .31
24	AFFECTION	+ .25
25	PLEASURE	+ .75
26	DISTRESS	+ .33
27	ANGER	+ .66
28	SENSE	+ .12
29	THINK	+ .24
35	COMMUNICATE	+ .25
36	APPROACH	+ .42
37	GUIDE	+ .26
38	FOLLOW	+ .28
40	AVOID	+ .35

$p = 0.01$ if $r = 0.22$; $p = 0.001$ if $r = 0.28$ for $N = 130$

From this set of data - 61 categories from the adopted Harvard III dictionary for patient and analyst one each - we selected those 55 sessions that had been judged by the clinical raters as described in study 1. The category frequencies were dichotomized at the mean of each category individually and entered as independent variables X_1 X_n in a stepwise proceeding multiple regression analysis (BMD O2R, Dixon, 1973). The dependent variable Y_1 , Y_2 and Y_3 were the factor-scores of the factorised clinical judgments as described above.

The model of the multiple linear regression states that the dependent variable Y results from the following linear combination of the independent variables X_1 in the following way:

$$Y = a_1 x_1 + a_2 x_2 + \dots + a_n X_n + C$$

The values a_1 represent weight factors with which the x_1 values are multiplied in order to achieve the maximum of prediction. C represent an additive constant. If Y and x_1 are given, then the coefficient a_1 have to be selected in such a way that the Non-explanability from Y out of X_1 becomes a minimum. This is a problem of differential equations

The results of such a stepwise procedure can be described as a pure statistic for the relationship of the content categories and the clinical concepts. If one claims that the sample of 55 sessions is a representative sample for all sessions then the achieved multiple correlation coefficient has to be tested for chance effects.

By performing various pre-tests we singled out of the 2 x 61 variables those variables that persumably would have a high predictive relevance and entered the final analysis with 24 patients-categories and 23 analyst-categories.

Table 5

List of content categories for the final multiple regression analysis

patient variables	analyst variables	
FEMALE ROLE	.36	MALE ROLE	.27
NATURAL WORLD	.33	JOB ROLE	.15
DEVIATION	.38	BODY PART	.38
MESSAGE FORM	.35	TOOL	.33
THOUGHT FORM	.38	TIME	.38

AROUSAL	.44	SOCIAL PLAC	.31
URGE	.31	NAT. WORLD	.33
PLEASURE	.33	DEVIATION	.11
DISTRESS	.51	THOUGHT FORM	.45
ANGER	.31	AROUSAL	.42
SENSEK	.35	AFFECTION	.23
NOT	.33	URGE	.38
GOOD	.11	DISTRESS	.43
COMMUNICATE	.31	ANGER	.27
GUIDE	.25	THINK	.42
ATTACK	.38	IF	.13
EXPELL	.13	NOT	.13
HIGH STATUS	.33	DEFENSE	.13
PEER STATUS	.33	APPROACH	.25
LOW STATUS	.31	ATTACK	.31
OVERSTATE	.22	MOVE	.29
SIGN STRONG	.29	PEER STATUS	.20
SIGN AFFECT	.31	UNDERSTAT	.24
SEX SENSE	.31		

For each category we also have put down the mean value. As these are dichotomized frequencies, the mean value shows percentage of session, in which the category occurs: 1 = category occurs in all session; 0 = category occurs in zero sessions.

Results

1. Prediction of the clinical concept "castration-anxiety"

The stepwise regression resulted in a combination of 15 categories 8 patient and 7 analyst categories that showed a multiple r of + 0.92 with the concept "castration anxiety". The weight of these 15 categories is variable and their direction too (Table 6.): The content of the predictive categories of the patient refers especially to the female roles and hints at affective states, as they are coded by words as "desire", "mistrust" and "praise". The positive weight of the category DEVIATION, coding the verbal references to his cardiac symptomatology, fits well in the clinical understanding of the patient. The category SEX SENSE fits well in the picture as it refers to sexual topics especially to

masturbation and the anxieties of the patient to have damaged himself by this. In the analyst's list of predictive categories we find DISTRESS,

Predicting categories for castration anxiety and their coefficient of regression

patient variables	coefficient	analyst variables	coefficient
FEMALE ROLE	+ 1.44	DISTRESS	+ 0.92
SIGNT AFFECT	+ 1.35	UNDERSTAT	+ 0.80
DEVIATION	+ 0.80	MOVE	- 0.43
COMMUNICATE + 0.75		THOUGHT FORM	- 0.55
SEX THEME	+ 0.66	THINK	- 0.78
ANGER	- 0.16	DEFENSE	- 0.96
MESSAGE FORM	- 0.94	AFFECTION	- 1.70
GUIDE	- 1.12		

Table 6

which contains the most frequent noun of this analysis "anxiety". We should note it is not the patient's verbalized anxiety, but the analyst's translation of bodily distress symptoms into anxiety which is predictive in a positive direction.

2. Prediction of the clinical concept "separation-anxiety" with positive transference

The stepwise multiple regression led to a combination of 16 categories (9 patient and 7 analyst) that predicted the clinical concept with a multiple $r = + .94$.

patient variables		analyst variables	
FEMALE ROLE	+ 0.71	JOB ROLE	+ 0.83
AROUSAL	+ 0.62	THOUGHT FORM	+ 0.60
GUIDE	+ 0.46	APPROACH	+0.53
NOT	+ 0.26	UNDERSTATE	+0.47
		TOOL	+0.32
ATTACK	-0.29		

SIGN STRONG	- 0.57	ATTACK	- 0.41
PLEASURE	- 0.66	SOCIAL PLACE	- 0.51
PEER STATUS	- 0.67		
GOOD	-1.31		

A high positive prediction is achieved by the patient's use of the category FEMALE ROLE ; however we suspect that it is more the use of the word "mother" than the use of the word "girl"; this can be shown empirically:

	girl	mother
castration anxiety	+ 0.13	- 0.12
pre-oedipal attachment	- 0.04	+ 0.31

Positively connected to the clinical concept "separation plus positive transference" shorthand pre-oedipal attachment, are words like arousal, feeling, atmosphere. Words like shelter and help contribute positively. The category NOTR consists of the entries "opposite" and "lack" and fits well in. The analyst words touch upon the physician and the nurse and underscoring the caring theme of this factor.

3. Prediction of the clinical concept "diffuse anxiety with negative transference"

The stepwise regression led to a combination of 7 categories (3 patient and 4 analyst) that predicted the clinical concept with a $r = + 0.77$.

patient variables		analyst variables	
DISTRESS	+ 0.71	JOB ROLE	+ 1.08
ANGER	+ 0.57	THINK	- 0.55
AROUSAL	- 0.44	DEFENSE	- 0.56
		MOVE	- 0.58

The patient's part consists mainly of anxiety and anger, the job-roles of physician and nurse carry in this function clearly negative connotations. Opposite to the negative transference are the categories AROUSAL with words as excitation, atmosphere, curiosity that do not conform to the hostile relationship.

Clinical discussion of the results

The validity of the impressive predictive power of those combination of content categories is dependent on the validity of the clinical judgments. The basis assumption of the study is that clinicians when making clinical judgments on the basis of reading verbatim protocols base their judgments mainly on verbal elements of the text. In another, more experimental study we could show that short samples of text material that were coded in terms of four anxiety themes by many clinicians could be differentiated reliably by discriminant analysis of computer content categories [Grünzig, 1976 #2600]. If those clinicians change the verbal referents in the process of their judgment procedure unwittingly then the method is bound to procedure artifacts that will not stand any replication. Another problem of the method so far is that the combination of categories might be idiosyncratic for this patient only and clinicians intuitively find their specific referents in every case history.