Fonagy´s & Moran´s
Selecting Single Case
Research Design
Horst Kächele

Types of Research Designs

- A group- based experimental designs
- B Naturalistic designs
- C Individudal case designs

Individual Case Designs

- The focus of interest is the way a particular individual changes as a result of a process unfolding over time.

- The individual case design requires that the causal process studied, as well as its effect, be documented with objective records, and, wherever possible, operationalized and measured.

- The degree of control we decide to exercise over the causal process determines whether an individual case study is experimental or naturalistic.

Replication

- In either case, the feature of the design that allows us the opportunity for scientific study is replication (the repeated occurence) of a homogeneous category of phenomena which can be measured meaningfully.

- The psychotherapeutic -psychoanalytic situation provides us with an ideal laboratory for the study of these kinds:
- Patient-based (mood, reflectiness, or cognitive style)
- Therapist-based (empathy, directiveness)
- Relationship-based (transference-counertransference)

The Single Case Method

- Influential clinical studies in psychology, psychiatry psychotherapy are based on analyses of individual cases:
- Anna O (Breuer 1895), Little Hans (Freud 1909) , Little Albert
- In neuropsychology (Luria 1966)
- In personality theory (Allport 1961)

- The belief that knowledge based upon groups of individuals is somehow more likely to be generalizable than is the case for knowledge based upon individual cases is fatally flawed!
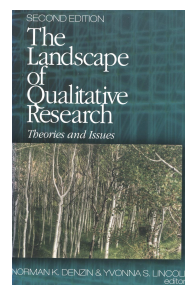
Applicability

- Information to make a decision about the applicability of findings:
- How conditions were specified
- Characteristics of patients
- Characterictics of treatment
- Large numbers of individuals, not groups, are necessary!
- Observation of variability across time within a single case combines clinical interest and research interest!

Types of Individual Case Studies

- The qualitative case study

- The quantitative study of case records

The Field of Qualitative Research

- Current developments in psychotherapy and psychoanalysis tend to invoke the methodological principles derived from techniques of qualitative research.
- Kvale (1986) claims „Psychoanalytic therapy as qualitative research"

Frommer J, Rennie Dl (eds) (2001) Qualitative psychotherapy research. Methods and methodology. Pabst, Lengerich

The Qualitative Case Study

- Case study research aims to make a contribution to knowledge which goes beyond the primarily illustrative purpose of the clinical case report.
- Three principles:
- Use data from multiple sources (triangulation).
- Formulate hypotheses clearly enough to permit counterexamples.
- Clarify the personal connection between the researcher and the possible threats to objectivity.

Edelson´s Six Requirements

- 1) There is a clear statement of the hypothesis
- 2) The phenomena are made intersubjectively accessible
- 3) Negative instances of the generalization are clearly specified
- 4) Evidence that the hypothesis has not contaminated the data
- 5) Formulations alternative to the hypothesis are offered
- 6) The range of individuals and situations to which the hypothesis applies is made explicit

Edelson M (1986) Causal explanation in science and psychoanalysis. Psychoanalytic Study of the Child 41: 89-127

Enhancing the Quality

- Enhanced reporting of the clinical process with dialogues accompanied by commentaries - as opposed to narratives - are recommended format for conveying clinical data:

> Patient (P): Sometimes I have the feeling that I would like to rush at you, grab your neck, and hold you tight. Then I think, "He can't take it and will suddenly fall over dead."
>
> A: That I can't take it.
>
> The patient varied this topic, expressing her overall concern about asking too much of me and of my not being able to tolerate the struggle.
>
> A: It's a kind of a fight to the finish, with a knife. (This interpretation alludes to Amalia's dream about being stabbed, reported at the beginning of the session.)
>
> P: Probably.

Allocation of Clinical Material

- Organzing material according to particular themes or conditions.
- Defining categories that are coherent and exhaustive.

- Examples:

- The Hampstead Child Psychoanalytic Index (Sandler et al. 1980)
  The Menninger Follow-up Study (Wallerstein 1986)

- Sandler J, Kennedy H, Tyson R (1980) The technique of child analysis. Harvard University Press, Cambridge, MA
- Wallerstein Rs (1986) Forty-two Lifes in Treatment. A Study of Psychoanalysis and Psychotherapy. Guilford Press, New York

Examples of Qualitative Case Studies

The Wallerstein (1986) final report:
42 cases studies from the Menninger Treatment Project

The Hampstead Child Psychoanalytic Index :
 the complete analytic treatment records of over 140 cases
(Sandler et al. 1962; Sandler et al. 1980).

Wallerstein RS (1986) Forty-two lifes in treatment. A study of psychoanalysis and
psychotherapy. Guilford, New York

Sandler J (1962) The Hampstead Index as an instrument of psychoanalytic research. Int J
Psychoanal 43: 289-291

1

Quantitative Case Studies

a) Replication by segmentation

b) Time series analysis

1

a) Replication by Segmentation

Mount Zion Group (Weiss & Sampson 1986)
or
Luborsky on the Symptom-Context Method (1996)

are good illustrations of the experimental use of textual
material.

Weiss J, Sampson H, The Mount Zion Psychotherapy Reseach Group (Hrsg) (1986) The
Psychoanalytic Process: Theory, Clinical Observation, and Empirical Research. Guilford
Press, New York

Luborsky L (Ed) (1996) The Symptom-Context Method. Symptoms as Opportunities in
Psychotherapy. American Psychological Association, Washington, DC

1
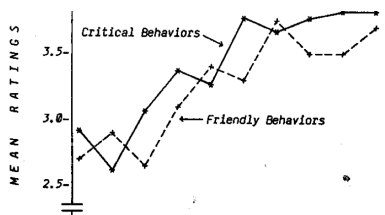
b) Time Series Analysis

phenomena that are contingent of their position during
treatment

f.e. the process features of long-term psychoanalytic
treatments extending over several hundreds of sessions

f.e. change of dream pattern
.

1

Mount Zion Study of Mrs C Behavioral Patterns

Dahl H (1998) The voyage of el Rubiyat and the discovery of FRAMES. in Bornstein RF&Masling JM (Ed) Empirical Studies of the Therapeutic Hour. Washington, DC, American Psychological Association Press S. 179-227

Other Convincing Examples

Moran & Fonagy (1987) in their single case study on "psychoanalysis and brittle diabetes"
and by
Graff & Luborsky (1977) in their four cases study on the relationship of transference and resistance.

Moran G, Fonagy P (1987) Psychoanalysis and diabetetic control: An experiment in single case study. The British Journal of Medical Psychology 60: 357-372
Graff H, Luborsky L (1977) Long-term trends in transference and resistance: A quantitative analytic method applied to four psychoanalyses. J Am Psychoanal Ass 25: 471-490

Quantitative Studies of Case Records

- Qualitative work precedes quantitative assessment!
- Decisions what to measure are qualitative decisions.
- Procedure to turn observation of behavior in a numerical index is necessary.
- Coding scheme for categorizing relevant behaviors.
- Advantage of quantification:
- Numerical representations provide access to statistical technique
- and
- Reduce the complexity of observations to a small number of indicators.

Quantitative Analysis of A Single Case

- Quantitative analysis of an individual case record sets out to demonstrate a lawful relationship between two or more sets of variables which are generally, but not invariably, regarded as causally connected.

- It is narrowminded to argue that experimenatl manpilaton represents the sole paths to causal accounts.

f.e. Think of sciences like astronomy, evolution theory

Types of Quantitative Case Study

- A Replication by segmentation
- B Time series analysis
- C Patient series or quasi-experimental designs
- D Experimental designs

Replication by Segmentation

- 1. The therapeutic record (f.e. transcript) is sampled and segmented into different episodes or events.
- 2. The segments are selected on the basis of particular kinds of recurring events
- *(as in Luborsky´s classic episodes of momentary forgetting)*
- 3. A particular, measurable, dimension assumed to be causally related to the recurring event is identified and measured.
- 4. The hypothesis is forulated and tested concernin a possbe association between the measures identified n (3) and the events noted in (2)
- Luborsky L (1967) Momentary forgetting during psychotherapy and psychoanalysis:a theory and research method. in: RR Holt (ed) Motives and thought: psychoanalytic essays in honor of David Rapaport. International University Press, New York, pp 177-217

Symptom-Context Method in Ulm

- The patient of the study, Christian Y, has been described in our textbook.
- The leading idea of this step was to investigate the textual correlates of the noun ANXIETY.
- In applying the symptom-context method we followed the instruction to pair text samples with and without the symptom from the same session and look for systematic differences.

Selection of the Material

- For a first study then we selected eight sessions randomly from the time span between session 60 and 120 (sessions 65, 67, 70, 82, 90, 101, 111).
- We applied the following criterium for selecting the symptom sample:
- whenever the noun ANXIETY occureed and the statement of the patient was more then ten lines of text we included the specimen;
- for each symptom sample we choose from the same session a control sample without the noun ANXIETY occuring of approximately the same length.

Results

- The eight symptom samples contained 135 nouns, of which 127 could be classified in a already developed semantic, case specific, category system; thus the coding was quite high (94 %).
- The eight control samples contained 127 nouns of which 116 could be classified (95%). Of ten categories two categories discriminated the the kinds of samples:

category	SYMPTOM %	CONTROL %	p value	
Treatment Conditions	4,74	13,79	0.02	
Bodily Complaints	11,86	3,44	0.02	
Negative Sensations	8,66	7,75	> 0.05 - < 0.10	

Second Attempt

- So in a second attempt we took ten consecutive sessions (session 139 - 148) comparing ten ANXIETY samples with 18 control samples.
- The results looked somewhat more specific:

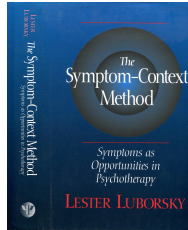| Category	SYMPTOM %	CONTROL %	p value	
People	1, 09	6,56	< 0.01	
Bodily Complaints	13,14	2,31	< 0.01	
Thought Processes	12, 08	26,64	< 0.001	
Treatment Conditions	12,63	6,18	< 0.02	
N Nouns	182	259		
N Nouns coded	92, 85 %	97, 84%		

Discussion

- So for this more narrowly defined textual material the presence of the noun ANXIETY in this patients statements connected again the category BODILY COMPLAINTS with the presence of ANXIETY feeding into the notion that the semantic space of his anxiety were centered around his body;
- talking about TREATMENT CONDITIONS was also high for ANXIETY whereas the absence of other people (like family members) and the low level of THOUGHT PROCESSES was prominent.

Perspective

- What did we learn from this small piece of research using Lester Luborskys ingenious tool ?
- We learned that this is a cute experimental method of investigating functional correlations within a given subject.
- Similar to Julius Laffals (1976) analysis of the contextual correlates of Schrebers use of the words ‚sun ' and 'moon ', we had found a way to empirically describe the meaning space of a core concept of this treatment.

The Summary

- Lester Luborsky started this project in 1946 with the study of the context for an ulcer patient´s recurrent stomach pains in the course of psychotherapy.
- The final summary appeared 1996!

Limitations of the Method

- Discontinous observation: studying a continous process may be complication by independent fluctuations.
- Statistical validity is threatened by low statistical power.
- CAVE sample size

Time Series Analysis 1

- Time series studies of individual case reports are more ambitious in their aims than methods that rely on replication by segmetation.
- In contrast, whch artificially removes processes that change at a slow rate, time series analysis preserves all sequential dependen in the series.
- Time series analysis is a flexibel statisical procedure adapted from econometrics to te behavioral sciences.

Time Series Analysis 2

- A time series is any form of measurement taken at roughly equal intervals ove a large number of occasions,
- The number of observation required for a time series is at least a hundred points.
- Psychoanalytic data thus lend themselves well to study using this technique, whether session or weeks of treatment are adopted as units of analysis.
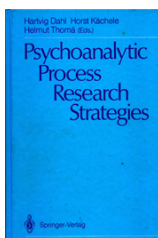
Time Series Analysis 3

- One of the most robust methods is auto-regressive-integrated-movbg-average (ARIMA) modeling.
- The analysi begins by examining the nature of fluctuation and trends with each time series.
- For exploratory studie this alone may provide desciptive data of interest.
- The initial work can give an indication of the regularity of certain types of interpretation; these may be compared across treatment or analysts.

Brittle Diabetes and Psychic Change

- A young girl suffers from brittle diabetes which manifested in recurrent episodes of hypoglycemia and ketoacidosis.
- Psychoanalytic treatment lasted 184 weeks.
- Weekly reports from the analyst:
- A) qualitative stdy to unveil clnical significant dimensions of unconscious conflict.
- B) judged in random order by trained raters for the defined clinical concepts.

- Findungs: significant association betwen quality of diabetic control and clinical themes.
- Time series analysis removed underlying fluctuations and identified that working on analytic themes predicted improved diabetic control.

- Moran G, Fonagy P (1987) Psychoanalysis and diabetes: An experiment in single case methodology. British Journal of Medical Psychology 60: 370-378

Ulm´s Example

Psychoanalytic Process Research Strategies
Hartvig Dahl Horst Kächele Helmut Thomä (Eds.)
Springer-Verlag

- **Time-Series Analysis of Psychoanalytic Treatment Processes: Sampling Problems and First Findings in a Single Case***

- Hans-Joachim Grünzig

- *Supported by the German Research Foundation, Sonderforschungsbereich 129, project B3.

Time Sampling

- For economic reasons long-term psychoanalytic treatments extending over several hundreds of sessions can therefore be investigated only by means of time sampling.

- Different methods of time-series sampling may be considered e.g. random samples in different variations or a typical selection of treatment sessions in which characteristics occur which are specific for a given research question.

- Unfortunately, there is no sampling theory for time-series from which methods for arriving at time-series samples might be derived; the existing attempts to formulate a psychoanalytic process theory (see Thomä und Kächele 1975, 1987; Fürstenau 1977) are not yet precise enough in order to yield sampling criteria.

- For practical research problems we formulated a few sampling criteria which are not strictly founded in a theoretical sense:

Time Sampling

- 1. The sample should cover the entire treatment process in a representative way; sessions from all important treatment phases should be included. However, the notion of representativity is not defined since the parameters of the distribution of the variables are not known for a single case.

- 2. For clinical reasons the sample should consist of blocks of several consecutive therapy sessions. Indeed, it is of special clinical interest to investigate short-term changes of variables across a number of sessions, e.g. variables such as "intervention effects," "mutative interpretation," etc.

- 3. Since the sampling error also is undefined and we therefore had no statistical reason for choosing any particular number of sampled sessions, we arbitrarily chose to include about 20% of the total number of sessions.

Time Sample

Table 1 --Schematic Presentation of the 5-Session-Block, Sample 1a and the 8-Session-Block, Sample 1b

Sample 1a 5-session-block N = 118	Sample 1b 8-session-block N = 112	Sample 1a 5-session-block	Sample 1b 8-session-block
I → 1 – 5	1 – 8 → I	XII → 276 – 280	
II → 26 – 30	25 – 32 → II	XIII → 300 – 304	297 – 304 → X
III → 51 – 55	→	XIV → 326 – 330	
IV → 76 – 80	73 – 80 → III	XV → 351 – 355	348 – 355 → XI
V → 101 – 105	98 – 105 → IV	XVI → 376 – 380	376 – 383 → XII
VI → 126 – 130	109 – 116 → V	XVII → 401 – 405	
VII → 151 – 155	130 – 157 → VI	XVIII → 421 – 425	
VIII → 176 – 180	172 – 179 → VII	XIX → 445 – 449	442 – 449 → XIII
IX → 202 – 206	202 – 209 → VIII	XX → 476 – 480	
X → 221 – 225	→	XXI → 502 – 506	
XI → 251 – 255	249 – 256 → IX	XXII → 513 – 517	510 – 517 → XIV

- Once such criteria have led to selecting a particular sample of therapy sessions then the central question to be answered is:
- to what extent is there a correspondence between the view of the treatment process resulting from the investigation of the sample sessions and that which would result from an examination of the entire case?
- Or, to put it another way, would a different sample of different sessions arrived at by using the same criteria lead to the same process description?

Method: CACA

•Computer Assisted Content Analysis (CACA) using both the variables in the **Ulm Anxiety Topic Dictionary (ATD)**
•and
•a count of the number of words spoken by the patient.

•The ATD consists of Gottschalk and Gleser's (1969) four anxiety scales, i.e., *guilt, shame, mutilation anxiety,* and *separation anxiety,* operationalized as lists of individual words meant to represent each category.
•A computer program, EVA performs the CACA by
•(1) comparing the transcribed text of each therapy session word by word with the ATD entries,
•(2) keeping track of the occurrences of text words that match the words in each of the four ATD categories,
•(3) summing the counts for each category,
•(4) computing percentages of total text words matched in each category,
•and
•(5) counting the number of patient words spoken.

ARIMA

- The aim of this methodology is to investigate regularities, i.e., serial dependencies within a given series of time ordered data values.
- A consistent increase or decrease of the time-series values over time is called a *trend* and is denoted by the letter I in the ARIMA abbreviation; I stands for *integrated* process and can adopt the values 0 (no trend; stationary time-series), 1 (for a linear trend), 2 (for a quadratic trend), etc.
- The value of I denotes the order of the integrated process.

Autoregressive (AR) Model

•For a further description of serial dependencies, two different mathematical models are suggested:

•the *autoregressive* (AR) model and the *moving average* (MA) model.

•The *AR* model implies that the value of a variable at a given time point is dependent on the value(s) of the variable at the preceding time point(s); the number of the preceding time points determining the value of the given data point denotes the order of the AR model.

•For example, a 1st order AR model (AR(1) model) means that only the immediately preceding data point is determining the value at the given time point.

•An AR process may be thought of as a time-series having a kind of memory of the preceding data value(s).

Moving Average (MA) Model

•The *MA* model implies that the value at a given time point is composed of a certain data level (which is assumed to be constant for the entire time-series) with a deviation caused by so called random shocks that occurred at the preceding time point(s);

•the number of the preceding time points at which those random shocks with an influence on the given data point occurred denotes the order of the MA model.

•For example, a 1st order MA model (MA(1) model) means that such a random shock occurred only at the immediately preceding time point. An MA process may be thought of as a homeostatic process over time, the time-series continuously trying to restore its values at the assumed constant level. Of course, all three models may be present in a given time-series.

Discussion

• Thus the results of our time-series analyses using 5 computer generated content measures have provided a reasonably clear (if nonetheless limited) answer to the important question:

• will different methods of sampling the sessions of an entire long-term psychoanalytic case yield similar or different results?

• And the answer is, *both*, depending on the kind of sample.

Patient Series or Quasi-Experimental Designs

• Clinical, qualitative patient series (Freud & Breuer 1895)

• Systematic, primarily quantitative, patient series follow the **principle of local observation** (Cronbach 1975):

• 1 Maintaining a clear focus on the individual, rather than the average group member

• 2 carefully examine how uncontrolled factors may cause specific departres from common trend

• 3 integrating personal characteristics, uncontroled conditions, and events that occur during therapy

• 4 delaying generalization and emphazising the exceptions as well as the rules.

Visual Display Analysis

- Graff & Luborsky (1977) plotted four analysts´ weekly rating of transference and resistance across the entire span of both successful and unsuccessful analyses.
- The plots clearly revealed that in a successful analysis the average ratings of both transference and resistance increased in the early phase of the analysis.
- The intensity of transference rating continued to increase while the resistance ratings leveled off. In the endphase of the successful analyses, resistance declined while transference remained intense.
- By contrast. In the unsuccessful analysis resistamce was more intense than transference from the start; transference was not firmly established by the middle phase; and resistance failed to decline in the terminal phase.

- Graff H, Luborsky L (1977) Long-term trends in transference and resistance: A quantitative analytic method applied to four psychoanalyses. J Am Psychoanal Ass 25: 471-490

Therapie Session Checksheet
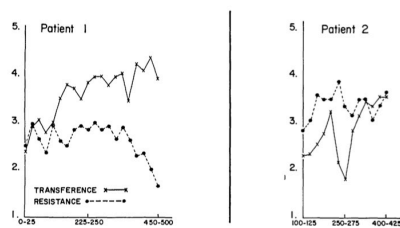

Transference & Resistance Pat 1-2

FIGURE 1
Transference and Resistance Curves: Patients One and Two

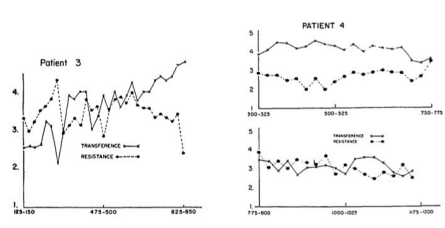## Transference & Resistance Patients 3+4

FIGURE 2
Transference and Resistance Curves: Patients Three and Four

Experimental Designs

This methodology is not a strong domain in dynamic therapies

There are many good reasons for this: the assumption of independent variables is questionable-

Exemption: Studies on Free Association

•Heckmann H, Hölzer M, Kächele H, Robben H (1987) Resistance and transference as two main constituents in an "experimental analogue" of free association. in: W Huber (ed) Progress in Psychotherapy Research. Presses Universitaire de Louvain, Louvain-la -Neuve, pp 582-593

Monitoring AAP via fMRT

frontiers
IN HUMAN NEUROSCIENCE

A clinical case study of a psychoanalytic psychotherapy monitored with functional neuroimaging

Anna Buchheim, Karin Labek, Steffen Walter and Roberto Viviani

---

Monitoring APP via fMRT

- This case study describes one year of the psychoanalytic psychotherapy using clinical data, a standardized assessment instrument of the psychotherapeutic process (Psychotherapy process Q-Set, PQS), and functional neuroimaging (fMRI).
- A female dysthymic patient with narcissistic traits was assessed at monthly intervals (12 sessions).
- In the fMRI scans, which took place immediately after therapy hours, the patient looked at pictures of attachment - relevant scenes (from the Adult Attachment Projective Picture System, AAP) divided into two groups: those accompanied by a neutral description, and those accompanied by a description tailored to core conflicts of the patient as assessed in the AAP interview.

Monitoring AAP via fMRT

- Clinically, this patient presented a defense structure that influenced the relationship with the therapist and that was characterized by fluctuations of mood that lasted whole days, following a pattern that remained stable during the year of the study.
- The two modes of functioning associated with the mood shifts strongly affected the interaction with the therapist, whose quality varied accordingly ('easy' and 'difficult' hours).
- The PQS analysis showed the association of 'easy' hours with involvement with relationship issues, and of 'difficult hours' with self-distancing, a defensive manoeuvre common in narcissistic personality structures.

Monitoring AAP via fMRT

- In the fMRI data, the modes of functioning visible in the therapy hours were significantly associated with modulation of the signal elicited by personalized attachment-related scenes in the posterior cingulate (p=0.017 cluster-level, whole-volume corrected).
- This region has been associated in previous studies to self-distancing from negatively valenced pictures presented during the scan.
- The present study may provide evidence of the possible involvement of this brain area in spontaneously enacted self-distancing defensive strategies, which may be of relevance in resistant patient reactions in the course of a psychoanalytic psychotherapy.