Research on the process of change

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RESEARCH ON THE PROCESS OF CHANGE*

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This paper explores some of the principles involved in the shift toward the study of change events in psychotherapy. A process-analytic approach to the study of change is suggested aimed at the development of micro-theory to explain the change processes that occur in specific in-therapy contexts. It is suggested that designs which relate these complex change process to outcome will help determine which factors within a treatment model explain the obtained outcomes.

This paper will discuss the paradigm shift occurring in psychotherapy research toward the study of sequentially patterned significant change episodes. During a paradigm shift a field proceeds to engage in questioning its fundamental assumptions, both substantive and methodological. We hope, therefore, that *Psychotherapy Research* institutes and centers around the world are busily developing sign posts similar to the ones shown.

In the field of psychotherapy research there are many unanswered questions, including: How does therapy work or how does change occur, and how can we best study the process of change? There are also some unquestioned answers, which assume that psychotherapy research is aimed at evaluating or comparing treatment efficacy, and that the effects of all therapies are equivalent. This paper will focus on the methodological shifts needed to engage in a new style of process research to investigate unanswered questions and thereby explain how change occurs.

The field of psychotherapy research, for a variety of reasons, initially adopted a defensive position to prove that therapy works, rather than attempting to discover how it works and *what leads to change.* In most sciences the reverse is true, discovery generally preceeds proof. Our goal for the next decade is to establish how change occurs; we no longer wish to justify that therapy works nor to support the assumption that one particular dogma or approach is superior to another. In the more conciliatory and enlightened period we are entering, we will advance by

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improving our understanding of different approaches, rather than by trying to demonstrate the superiority of one approach over another.

Science makes its greatest leaps forward when researchers are able to discover new phenomena and to grow with their data. A science that cannot discover new phenomena by intensive investigation is on its way down. If a research program is sufficiently intensive and discovery-oriented, it will reach a point at which both old conceptions begin to crumble and new techniques become necessary for the investigation of variables that were previously unrecognized. My hope is that the next generation of researchers will be speaking a sufficiently different language, one that past generations would have difficulty understanding. Already on the horizon we have new concepts such as fuzzy sets and prototype measurement (Horowitz, Weckler, & Doren, 1983) to capture the ambiguity inherent in the classifying of behavior. Researchers are beginning to talk about transportability in addition to reliability of measures, and we have new tools such as interpersonal process recall, (Elliott, 1986) intention lists (Hill & O'Grady, 1985), and textbanks (Mergenthaler & Kaechele, 1985).

Now that we have faced Eyesenck's challenge and established that therapy is more effective than no treatment at all ("all have won and all shall have prizes"), we must stop and confront the fact that a field which relies for its scientific respectability on establishing that certain magnitudes of differences in therapeutic outcomes are not due to chance alone is a rather flimsy science. Rather than treating our present findings as answers to questions, we need, instead, to view them as raising questions which beg for answers. Answers which will eventually explain the causal processes or mechanisms that produce those effects which appear to be due to more than chance alone.

THE WORLD OF SCIENTISM

I would now like to wax ancedotal and allegorical for a while. In my final year of high school I decided that "when I grew up" I would like to be a scholar and an investigator who, like Ulysses, would "follow knowledge like a sinking star, to strive to seek, to find, and not to yield." My goal was to explore and discover, to understand and to explain. On entering graduate school in psychology at the end of the sixties from doctoral studies in engineering, I was troubled by finding in psychology a predominance of "scientism" rather than true science. A type of "methodolatory" culture prevailed, one with which I was unfamiliar and which emphasized method over the understanding of phenomena. Psychology was dominated by a logical-empiricist view of hypothesis testing rather than by the spirit of scientific exploration and discovery. This positivist cult of fact translated in psychotherapy research into worshiping group designs, and a set of methodological rules for constructing the individual evaluation study and generalizing from the results. There was little concern with strategies of how to proceed from study to study, or with programmatic research oriented toward *understanding* of phenomena. My youthful vision of the "quest for knowledge" was in danger of evaporating in the alienated, demoralized world of scientism within psychology.

In this world the twin gods of "Control" and "Significance" ruled along with other deities such as "Random Sampling" and "Generalizability," and their recently spawned offspring of "Power." This was not the culture to which I had aspired. Rather, what drove me, and a number of my colleagues, was the quest for greater *understanding*. Those seeking understanding, however, were banished to the outer planets of the system to follow their own gods, "Observation" and "Explanation," and the lesser deities "Small N" and "Replication". After two decades of skirmishes in border outposts a direct confrontation is emerging in the form of a showdown between the champions of the two worlds.

"Refute," the champion of the world of logical empiricism, shown above chasing a disrespectful rival hypothesis, carries a sharp axe and uses empirical confrontations to subject everything in his way to the test of empirical jeopardy in order to establish "brute" facts. Only the fittest hypotheses can survive his axe and his sharp cut at the .05 level.

"Refutes" opponent, "Discovery" armed only with a net, champions the renegades from the world of logical empiricism. She casts her net about to catch the contexts, patterns, and meanings of what she encounters. Guided by theory, she too uses empirical observations, but for the creative purpose of understanding the full and deeper meaning of a hypothesis or an observed correlation. We will leave our two combatants poised in struggle with "Refute's" axe slashing away at hypotheses generated by "Discovery" to describe the worlds which they represent.

In the world of logical positivism, one predominant "fiction" is propagated by the ministry of information and universities. The predominant fiction in this world is the *hypothesis testing fiction* (McGuire, 1986). According to this testing fiction a scientist derives, from some theory, a hypothesized relationship between a dependent and an independent variable, and designs a situation in which to objectively measure the variables and test the hypothesis. According to this fiction, if evidence for the predicted relationship is found, confidence is increased in the truth of the hypothesis and in the theory. If evidence for the predicted relationship is not found, these formulations are rejected.

On the other hand, in the world of "Understanding," the doctrine of *exploratory actuality* (McGuire, 1986) is offered as an alternative to the hypothesis testing fiction. In this view the typical scientist (even the adherent of logical empiricism) is seen as being guided by theoretical presuppositions which point to problems worth studying. He or she does not simply receive facts through direct sense data. The scientist proceeds by selecting a phenomenon for study (a crucial act), observing it, carrying out thought experiments about appropriate variables, measures, contexts, and hypotheses, and then cogitating on how validity might be empirically demonstrated. Having explored alternative manipulations, tested the sensitivity of measures, and believing a promising study has been devised, the investigator carries out a final empirical confrontation and inspects the data. In the view of the doctrine of exploratory actuality however, the data often are unfriendly and fail to confirm the hypothesis. But does this outcome lead the experienced investigator to reject the hypothesis in accordance with the logical empiricist rule? No. Rather, this leads to the potential discovery of what has actually occurred and what went wrong in the experiment in actuality. The experiment is rejected, not the hypothesis.

The seasoned scientist may also tinker with the unfriendly data using more powerful tests, or may deal with oddities, control another variable, transform measures, and so on. If this doesn't help, more drastic action is taken, such as analyzing if the relationship holds for some special subgroup. If none of this works, the investigator, based on what has been learned, designs a new, better study, with better measures, different population controls, additional variables, and so forth. In the world of understanding this is all appropriate scientific behavior; such exploratory searchings are proper procedure and should not be suppressed (Kaplan, 1964; McGuire, 1986; Toulmin, 1961; Tukey 1977).

The claim by those in the world of understanding is that it is only in writing up a study, and not in conducting research, that even the adherents of logical empiricism obey the canons of logical empiricism (McGuire, 1986). While doing research all good scientists adopt an exploratory style of discovery-oriented, empirical confrontation. The real work of science occurs in the thought experiments, observations, prestudies, and unsuccessful initial experiments by which the scientist discovers the fuller meaning of the initial insight and the contexts in which the hypothesized relationship does and does not hold. It is just this contextual information (Rosnow & Georgoudi, 1986) that is eliminated when the scientist adopts a logical empiricist stance to write up a study as a confirmation. In fact, all hypotheses are probably true—a dedicated scientist with sufficient resources can always create or find a special context in which the hypothesized relationship holds.

For this set of beliefs about the hypothetico-deductive method and empirical research, the adherents of the world of understanding were banished to the outer planets. There they refined their new image of science and developed alternate methods of empirical confrontation to be used in the service of discovery. They began to teach them to their students. These students saw that this use of empirical procedure was vastly superior to the pretense that empirical confrontation was best used as an objective test, and that it was especially useful when the empirical confrontation was specifically organized to exploit its discovery-oriented potential.

PROCESS RESEARCH IN THE NEW IMAGE OF SCIENCE

Returning from this far distant galaxy, with its arcane gods and bloody battles, to the nurturing bosom of the Society for Psychotherapy Research (SPR), I would like to discuss what this new, postcritical image of science suggests to us for conducting a new style of process research.

A PROCESS ANALYTIC APPROACH

In psychological research there have been, to date, two predominant research traditions: correlational and experimental. One attempts to study individual differences (how different people vary in response to similar situations), the other to establish general laws of behavior (how different people respond similarly across situations). I suggest we need a third, *process analytic,* approach to research which transcends these two opposing approaches in a study of in-situation conduct. This third approach involves a study of in-situation performance; a study of how people perform and experience similarly in similar situations. This is often best done by comparing occurrence and nonoccurrence instances of a change performance in similar situations. In this approach, *change performances in specific behavioral contexts which are similar as behavior are studied to isolate common features and processes.* This type of investigation is undertaken to establish specific laws that will help explain the in-situation performances.

In this framework, we at York University have, for example, studied and developed specific models of how people resolve conflict in the context of two-chair dialogue, unfinished business in the context of empty chair work, and problematic reactions in the context of evocative unfolding (Greenberg, 1984; Greenberg, Elliott, & Foerster, 1990; Rice, 1984). Others at other centers have studied interpretation of core conflictual relationship themes (Luborsky, Crits-Cristoph, Mintz, & Auerbach, 1988), interpersonal cycles (Strupp & Binder, 1984), and proplan interpretations (Silberschatz, Curtis, & Fretter, 1985). The fundamental assumption in these endeavors is that in *highly specified in-therapy contexts,* behavior and experience are lawfully explainable, and valid, specific models or micro-theory can be developed to help explain therapeutic change processes.

General Laws or Specific Models? With regard to the value of the development of specific models that apply to specific contexts, as opposed to the development of general laws of behavior, it is interesting to note that so called general laws of physics, such as the, "laws of thermodynamics" or the "laws of motion," are actually context specific laws. No scientist worth his or her salt would drop a billiard ball and ping-pong ball and expect to see them accelerate at the same rate, and neither would disconfirming results in a comparative study on the differential time to impact of ping-pong and billiard balls lead the hypothesis to be refuted. Rather, the investigator would conduct other studies to discover the highly restrictive, and I might add, possibly nonexistent context of a total vacuum, in which the hypothesis does and does not hold. Thus, if we determine context specific laws or microtheories, we will not be falling short of a scientific ideal, but, rather, we will take a major leap forward in developing a true science of psychotherapy.

We need, however, to reevaluate our views on the role of the gods "Generalizability" and "Random Sampling." Is generalizability what we really are aiming for?

Cronbach (1975, 1982) has suggested that generalization has not stood up well in the sciences. Instead of making generalization the ruling consideration in our research, we should instead describe what was controlled and uncontrolled, and move from situation to situation interpreting effects anew in each new situation. The development of context specific models will help greatly in this task.

In addition to problems inherent in the application of the concept of generalizability to psychotherapy research, are problems in our view of the other two gods "control" and "random sampling." One of the methodological difficulties in psychotherapy research is that we do not have control of many of the influencing variables. We inappropriately attempt to cover our ignorance of so called "extraneous" influencing variables with random sampling logic, treating extraneous influences as randomly distributed. Behavior and experience, however, are not random, nor do I believe, are their causes randomly distributed. The assumption that randomization takes care of all the uncontrolled variables, even if it is true in experimental designs, is just not tenable in clinical trials. The possible influencing variables are too numerous and the sample sizes are not large enough.

In addition to the problems involved in relying on random sampling in clinical trials, the actuality of an unfolding treatment is far better captured by the images provided by chaos theory, than by those provided by experimental design. In chaos theory small perturbations of initial conditions are seen as having large, complexly determined effects at a distance. Chaos theory's image of patterned complexity offers a far better picture theory (Hansen, 1958) to guide our research efforts than does experimental design's billard ball determinism image of direct and linear causality. An alternative to experimental studies in psychotherapy is a research approach which recognises the complexity of the psychotherapeutic process and attempts to analyze the complex unfolding of moment by moment performance of people in specific states and contexts.

The Specification of Context: Process Diagnosis and Measurement. Adoption of a process analytic view to study the unfolding performances in therapy, in order to build specific models, has certain immediate implications for research activity. The most urgent being the need to specify intermediate level therapeutic contexts such as change episodes (Greenberg, 1986), and to construct classification systems (Greenberg & Pinsof, 1986) to measure the complex in-therapy states and in-therapy performances that occur in these contexts. First generation process research measured in-therapy process but did not identify meaningful in-therapy epidoses and characteristic in-session states, and did not focus on understanding the process of change in these contexts. In terms of measuring in-therapy states, we need to think in terms of process diagnoses (Greenberg, 1986; Rice & Greenberg, 1984). These types of process diagnoses (as opposed to person diagnoses) are essentially definitions of person-situation interaction states in therapy that are problematic and need intervention. They are very concrete in-therapy manifestations of problem determinants (Goldfried, Greenberg, & Marmor, 1990). We need definitions and measures of in therapy states such as experiencing conflict, engaged in transference or in self critical thoughts, or being in interactional patterns such as pursue/withdraw or attack/defend. Defining such in-session phenomena will lead to their investigation. These will become the phenomena to understand.

The Role of the Individual Difference Variable. Implicit in the use of a process analytic approach and the development of context specific microtheory is a different role for the individual difference variable. Rather than focusing on how different

people respond differently to treatments, or what treatment for what population, we would engage in two alternate types of studies. We would be interested first in patients differential responses to different interventions at different in-therapy states, and, second, we would be interested in what type of people produce which in-therapy states. Individual difference variables and diagnostic categories would thus be related to the occurrence of in-session states. We would discover if, for example, depression is characterized by the appearance of many in-session states (markers) of unfinished business or conflict, or particular transference patterns. Ultimately we would establish that particular types of patients produce particular problem markers and respond to specific interventions at these markers in a particular fashion with a specific effect.

A RATIONAL/EMPIRICAL METHODOLOGY

In order to engage in the process analytic alternative to correlational and experimental work, we need to adopt a combined *rational/empirical methodology*, as opposed to a purely rational or purely empirical approach. Investigation of the swamp of process requires that we approach the phenomena with an idea as a light to guide our way, as well as immersing ourselves in the data. We (Greenberg, 1975; Rice & Greenberg, 1984) have spelled out the steps of a rational/empirical discovery oriented approach of task analysis adapted from cognitive developmental psychology and the study of problem solving (Pascual-Leone, 1984; Pascual-Leone & Goodman, 1979; Newell & Simon, 1972). I will describe these steps and the type of research procedures involved in this approach. I will also use some of my own research on resolution of splits and unfinished business to exemplify these steps.

Steps of task analysis. Perhaps the most basic difference in task analysis from either an experimental or correlational paradigm is that a substantial part of the research effort is discovery oriented and is invested in strategies for making extensive *rigourous observations* of single individuals performing tasks. From these observation resolution strategies and components of competence that characterize successful change performances are identified. Note the important shift in this approach is toward observation based research of the process of change, and away from the controlled experiment to establish outcome effect sizes. The steps of this approach shown in Table 1 are described below.

Table 1. Steps of Task Analysis.

Discovery Oriented Steps
1. Explicate implicit map of expert clinician
2. Select and describe the task and task environment
3. Verify the significance of the task
4. Rational analysis of performance—possible performance diagrams
5. Empirical analysis of performance—measurement of actual performance
6. Comparison of actual and possible performances—construct a specific model

Verification oriented steps
7. Validation of model
8. Relating complex process to outcome

1. *Explicate the intuitive map of the expert clinician:*

We begin with an expert clinician/investigator who, in addition to an explicit general model of therapy possesses, based on clinical experience, an implicit, cognitive map of some of the specific important events of therapy. The first step involves the explication of this map to provide a framework to study therapeutic change.

For example, in studying splits and unfinished business within a Gestalt framework, explication of implicit theory suggested that (1) resolving splits between shoulds and wants was therapeutic and was facilitated by creating a dialogue between those aspects of the personality which embodied them, and (2) lingering bad feelings toward significant others interferred with functioning, and therapeutic dialogues with imagined significant others helped to resolve unfinished business.

2. *Select and describe the task and the task environment.* The most basic assumption underlying this research approach is that psychotherapy can be broken down into a series of events or episodes, the resolution of which advance the course of therapy and lead to change (Rice & Greenberg, 1984). Working in this framework and guided by my implicit understanding of the process of change in this therapy, I selected for study two change tasks; the resolution of splits and of unfinished business. Each task begins with an in-therapy statement or marker of the problem. For example, a marker of unfinished business is constituted by the presence of four measurable features: (1) a lingering unresolved feeling (2) toward a significant other, (3) in which the emotion is experienced in the present, (4) but the emotional expression is interrupted or constricted. Similarly, split markers were defined and measured. Splits contain four identifiable features, the two opposing aspects of self, a juxtaposition indicator pitting the two parts against each other, and an indicator of a current struggle between the parts (Greenberg 1979, 1984). These markers constitute *process diagnoses* of states in need of, and currently amenable to, specific types of intervention.

In studying change it is important to recognize that the client is the site of change, and therefore we must put our investigatory emphasis on the client rather than on the therapist. We initially treat the intervention as a controlled background variable defining the therapeutic environment as a constant task environment in which the client task performance will be studied. Our emphasis is then focused on the client change performance. The task environment eventually becomes more and more specified, and can result in an intervention manual.

3. *Verify significance of the task to be studied.* The investigator may wish to, or need to, demonstrate the presence of active ingredients of change in the episode or task to be studied before proceeding on an intensive analytic research program. This was done by demonstrating the efficacy of two-chair dialogue for resolving splits (Greenberg, 1984), and empty chair dialogue for resolving unfinished business (King, 1989; Maslove, 1990).

4. *The Rational analysis—constructing performance diagrams of possible performances.* Having selected and defined a task and the task environment, and having shown its significance, the investigator now begins the intensive analysis of the client's task performance. The investigator first draws on his or her implicit map and on some intensive scrutiny of a few tape recorded interviews to generate possible resolution performance paths, and to *diagram* these. The investigator thus conducts a kind of "thought experiment" (Husserl, 1973) in which possible resolution performances are varied freely in imagination to extract the

essential nature of the performances and the fundamental strategy underlying the performance.

The investigator lays out a diagram of the steps of how he or she thinks change might occur in the specific context of this task. This diagram provides a framework for understanding the actual performance of the client.

Having constructed an initial rational model, the investigator then needs to consider how the different performance components can be measured. This step of constructing a rational model is essentially a disciplined form of creative clinical thinking stated in some kind of precise process language.

5. *Empirical analysis—description of actual performance.* Having developed a diagram of a possible performance, the investigator now makes a detailed sequential description of the actual performance of one or more single individuals engaged in the therapeutic process under study. These sequential descriptions should use performance categories which are minimally inferential, and yet serve to reduce the complexities involved to manageable proportions. The more thoroughly the task is understood, the more fine-grained the analysis can profitably become. It is crucially important that the descriptions of possible task performances in Step 4 above, and the description of actual performance here in Step 5, be stated in the *same* process language, or at least that the language of Step 5 can be unequivocally translated into the language of Step 4.

In this step the investigator analyzes the performance intensively and attempts to draw pictures of the data. This was most helpful in our study of split resolution in which the graph of depth of experiencing (Klein, Mathieu, Kiesler, & Gendlin, 1969) in each chair, shown in Figure 1, led us to a key discovery. In this picture we see that each chair operates at different experiencing levels, until some critical point, when the levels converge and then both increase. This point, which we initially called the merging point, came to signal the beginning of a key change process in the resolution of conflict, that of the softening of the previously harsh critic. Tukey (1977) has noted that the great value of "a picture" is that it forces us to notice what we never expected to see.

Since temporal patterns are, however, notoriously easy to impose on sequential data, we need simple rules for verifying that certain performances patterns are in fact
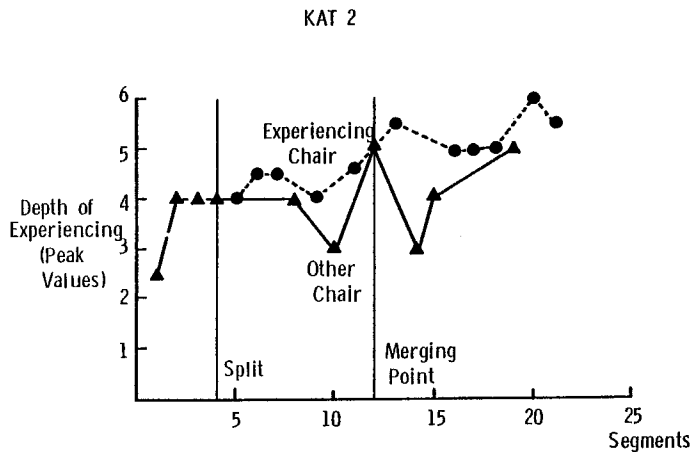

Figure 1

appearing across subjects. For example, in split resolution performances we found statistically significant differences both on Depth of Experiencing and Client Vocal Quality for stages of the dialogue before and after merging, as well as different frequencies of occurrence of specific performance configurations of experiencing, voice, and structural analysis of social behavior (Greenberg, 1984).

6. *Comparison of actual and possible performances—construct a specific model*

The investigator compares the actual performance with the possible performances (Steps 5 and 4), and from this comparison begins to construct a specific model, consistent with the general model, of the kind of performances that could have generated the observed performance. In building a specific model, the investigator is able to progressively correct, expand, and make more explicit his or her understanding of the processes involved in generating resolution performances. It is at this stage that the clinician-scientist attempts to conceptualize the mechanisms that enable the process of therapeutic change. The construction of a detailed, specific model of the components of resolution involving successive repetitions of Steps 4 to 6 is the long range goal of the model building effort.

A refined model of the resolution of Unfinished Business obtained by this procedure is shown in Figure 2. In this diagram we see the resolution process involves the client expressing blame, complaint, or hurt to a negative other in the empty chair. The client then differentiates these feelings, often recalling and reliving a related episodic memory. Resolution involves the intense expression of a specific emotion (generally anger or sadness), and the mobilization and expression of an associated previously unmet need. In the enactment, in the empty chair, of the significant other, resolution performances move through the expression of specific negative aspects by the other to a shift to the expression of more positive to personal aspects by the other. Finally, resolution occurs in the self chair either by the expression of self-affirmation and self-assertion in which the other is held accountable for his or her damaging actions, or by the development by the client of a new view of the other, in which the client understands and/or forgives the other. These components were measured using Depth of Experiencing (Klein, et al., 1969), Structural Analysis of Social Behavior (Benjamin, 1981), an Emotional Arousal Scale (Daldrup, Beutler, Engle, & Greenberg, 1988), and a measure of needs as shown on the diagram.

This step provides a model of change that can now be subjected to testing and ends the discovery oriented phase of the task analysis.

VERIFICATION PHASE

7. *Validation.* Making use of the newly constructed specific model, hypotheses concerning client performance on the task are advanced. Resolution and nonresolution performances are now rigorously compared to validate that specified components discriminate between resolvers and nonresolvers. This validates the model. In a recent study of unfinished business, 11 resolved and 11 unresolved events were compared, and the resolution components described above were validated (Foerster, 1990). A similar type of study of conflict resolution demonstrated differences between components of resolved and unresolved conflict resolution performances (Greenberg, 1984).

8. *Relating process to outcome.* As a final step in this program, complex client process patterns, viewed as a causal chain of change processes, are related to short-
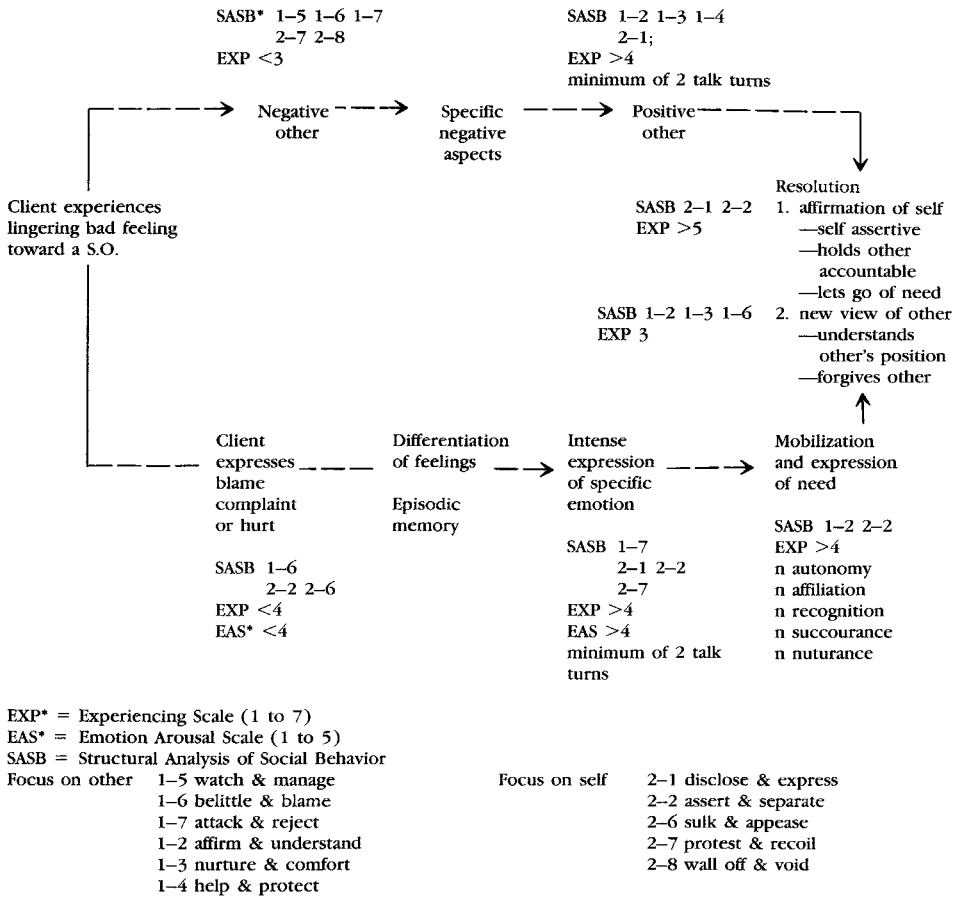
SASB* 1–5 1–6 1–7   SASB 1–2 1–3 1–4
        2–7 2–8   2–1;
EXP <3   EXP >4
                                     minimum of 2 talk turns

Negative - - → Specific - - - → Positive
   other   negative   other
                  aspects

                                                        Resolution
Client experiences   SASB 2–1 2–2   1. affirmation of self
lingering bad feeling   EXP >5   —self assertive
toward a S.O.   —holds other
                                                        accountable
                                                      —lets go of need
                                     SASB 1–2 1–3 1–6 2. new view of other
                                     EXP 3   —understands
                                                          other's position
                                                        —forgives other

                                                        ↑

Client   Differentiation   Intense   Mobilization
expresses   of feelings   expression - - → and expression
blame   of specific   of need
complaint   Episodic   emotion
or hurt   memory   SASB 1–2 2–2
                                     SASB 1–7   EXP >4
SASB 1–6   2–1 2–2   n autonomy
      2–2 2–6   2–7   n affiliation
EXP <4   EXP >4   n recognition
EAS* <4   EAS >4   n succourance
                                     minimum of 2 talk n nuturance
                                     turns

EXP* = Experiencing Scale (1 to 7)
EAS* = Emotion Arousal Scale (1 to 5)
SASB = Structural Analysis of Social Behavior
Focus on other   1–5 watch & manage   Focus on self   2–1 disclose & express
                  1–6 belittle & blame   2–2 assert & separate
                  1–7 attack & reject   2–6 sulk & appease
                  1–2 affirm & understand   2–7 protest & recoil
                  1–3 nurture & comfort   2–8 wall off & void
                  1–4 help & protect

Figure 2. Revised Model of Resolution of Unfinished Business.

and longer-term outcomes. The advantage of this type of study, coming at this stage of the research program, is that hypothesized causal links between highly specified client process steps and outcome provide increased control over client performance variance.

One of the problems with treatment efficacy studies is that in comparing or evaluating the assumed direct effects on outcome of different treatment interventions, there is a hidden, intervening variable, which is not accounted for. This variable can be thought of as *absorption of the treatment* by the client. I may deliver the treatment, but does it take? Its all very well that I invite a client to experiment with expressing feelings to a Significant Other, but if a treatment group contains some clients who become involved in the process, some who do so only intellectually, and others who refuse, we are not getting a true test of the active ingredient of the treatment. Probably what is being tapped in most outcome studies is an overall measure of the effectiveness of therapists in building alliances, getting people to agree on the goal, and to engage in the therapeutic tasks, rather than a measure of the effectiveness of the *resolution* of therapeutic tasks themselves.

Current outcome studies predominantly capture the effects of therapists' ability in creating an alliance, and dealing with any interpersonal difficulties that arise in maintaining the alliance. If, however, in a specified treatment we studied those clients who went through the process steps in the required manner to see if they changed more than those who didn't, we would then truly be testing for causal change processes. The controlled experiment and the control group are not the most preferred way of gathering evidence on causal processes in therapeutic change. Rather, I suggest we compare the outcomes of those clients who engage in treatment in the hypothesized change process with those who don't. We need to study the client change process/outcome link and demonstrate that particular processes lead to particular types of change.

For example, in a study of the resolution of decisional conflict in 31 clients, we demonstrated that a differential, complex chain of process predicted outcome. Those clients who engaged in the predicted process steps had superior outcomes at termination and follow-up on anxiety, target complaints, degree of indecision, and on a behavioral index of decision making to those who did not engage in the steps. We are currently planning a study to see if those patients who resolve unfinished business in the course of treatment according to our model show better outcomes than those who do not.

RESEARCH PROGRAMS

The steps of task analysis described above represent a strategy for a research program which at different times emphasises discovery and hypothesis generation, and at other times hypothesis testing. What is important in this strategy is the emphasis on empirically based hypothesis generation via respect for the clinicians map, and the crucial circular process of looping from thought experiment or rational model through rigorous empirical observation, back to model construction, back to observation, and so on. The refined specific model represents an empirically derived microtheory which generates hypotheses for the crucial test of refutation. When one moves into verification studies one has a highly detailed understanding of complex change processes, a complex model of change, and ultimately some understanding of individual difference variables that effect the model.

A research program of this sort probably involves 5–10 years of study on one phenomenon in which a large scale group study is a final product. The field needs to recognize the steps along the way as good science. Hypothesis testing should be the final step in a rigorous program of discovery and understanding. We shouldn't try to prove something until we are confident of success, otherwise much effort is wasted.

CONCLUSION

A true science aims at understanding and specifying causal processes. To this end I have suggested the need for a rational/empirical, process analytic methodology which focuses on change processes in a context sensitive, discovery-oriented fashion, and aims at building explanatory models which will ultimately allow us to relate complex sequences of change process to outcome.

Returning now for a moment to that galaxy, far, far away, in which the war between the worlds of hypothesis testing and understanding still rages, we find our two combatants as we left them, poised in struggle; Refute is still striking out with his axe and Discovery is still casting her pattern catching net. We can only hope that in the conflict between our two combatants Discovery will cast her net around Refute and reduce his domination by placing him in a new context. This confrontation will, I hope, increase their mutual respect, such that the two will cease the struggle. Each needs to learn from the other. Refute needs to recognize the importance of exploration and understanding, and to lend his axe to Discovery to help her test her discoveries so that she can establish which are the most valuable and worthy of her creations and findings. She, on the other hand, needs to ally with Refute's rigour and precision to aid her in a search for true understanding. This increased mutual appreciation of what each has to offer the other is most important for the advancement of knowledge; for unbeknownst to Discovery, Refute has been born under the prophecy that he shall only be defeated by one who joins him. This hoped for union will then result in many offspring and create a pluralistic universe of methodologies which will allow the quest for knowledge to continue.

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