

# Active Systems Observations and Medical Information: A Single Case Study of Measurement of Personal and Empathic Processes

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**Abstract--**There are two major observer systems from which medical information is derived—the neutral observer based system and the active observer based system. The neutral observer based system forms the basis for formal medical science and relies on the science of the independent observer. In the neutral observer based system, the physician is assumed to be neutral, objective, an unbiased scientific observer of the patient. The subjectivity of the physician observations are deemed to be immeasurable or irrelevant medical information. Medical information, in the active observer based system, often taught at the patient’s bedside has to grapple with the reality of the uniqueness of each patient and physician. They form an interdependent system where each of them is simultaneously an observer and also the observed. Active observations are ubiquitous in medical practice, but it has been difficult to conceptualize a method to measure and communicate. However, active observer systems can be empirically studied. We describe a set of personal and empathic measurements made by a patient and therapist in psychotherapy concerning the patient’s level of functioning according to the Global Assessment of Functioning Scale (GAF) using the active observer system model. The patient’s GAF is rated from 4 points of view: the therapist’s view (TGAF), the patient’s own view (PGAF), the therapist’s empathic view (TEGAF) which seeks to estimate the PGAF, the patient’s empathic view (PEGAF) that seeks to estimate the TGAF. Using these ratings, this presentation will describe a method to measure the degree of accuracy of therapist’s empathy, the degree of patient Over/under-idealization of the therapist’s empathic capacity, and the degree of therapist Over/under-confidence concerning his or her own empathic capacity.

## I. INTRODUCTION

Medical information is framed by the prevailing scientific outlook but science itself continues to be influenced traditions established earlier. Practitioners therefore engage in a constant challenge to incorporate evolving scientific principles into their specific domain. Classical science is based on the assumption of the neutral observer who is assumed to be neutral, objective, an unbiased scientific observer of the patient. Here the subjectivity of the physician observations are deemed to be immeasurable or irrelevant medical information. In current psychiatric practice, after each session, the psychiatrist alone (not the patient), rates the patient’s level of functioning by using the Global assessment of Functioning (GAF) Scale. There is no opportunity for the physician or patient to compare the physician’s (therapist’s) view and the patient’s view concerning the patient’s functioning. The reason for only recording the physician’s observations is based on the assumed physician or therapist objectivity.

## II. PSYCHIATRY AND THE CONTINUATION A CARTESIAN SPLIT IN MEDICAL INFORMATION

Although the notions of “mental” and of “mind/body dualism” have many roots, a prominent source is the writings of Descartes. Descartes confronted a notion of a spiritually extended world that extended over the heavens and inhered in the temporal world. Such an unconstrained spiritual extension impeded the study of natural phenomenon. The notion of the split between mind and matter helped to describe the location and the temporality of any event and subject it to the scientific scrutiny. Descartes maintained that there are two mutually exclusive categories of fundamental substances: extended substances (*res extensa*) and non-extended substances (*res cogitans*). Extended, divisible, spatial substances constitute matter (*res extensa*). Thus, substances that have length, breadth, depth, and motion constitute matter. Cartesian coordinates can be used to describe the shapes and motions of matter. A characteristic of extensible matter is that it is extensible and therefore measurable. The body is matter and it can be empirically studied. Non-extended, indivisible, non-spatial substances such as thoughts, desires and volitions constitute mind (*res cogitans*). Descartes placed great emphasis on the mind (*res cogitans*) and linked thinking and existence. Thus Descartes’ famous Latin statement “Cogito ergo sum” which means, I am thinking, therefore I exist. Despite the importance given to thinking, which is the basis on which existence is concluded, thinking (mind: thoughts, desires, and volitions, etc.) is a non-extended substance. A characteristic of mind is that it is not extensible and therefore it is immeasurable. The mind cannot be empirically studied. Descartes stated, “I have a clear and distinct idea of myself inasmuch as I am only a thinking and unextended thing, and as, on the other, I possess a distinct idea of body, inasmuch as it is only an extended and unthinking thing, it is certain that this I, is entirely and absolutely distinct from my body, and can exist without it [1].”

Classical scientists, assumed that the private life of the observer was not relevant to the procedures, findings and information of the sciences including medicine. From this grew the assumption that subjectivity was easily separable from objectivity. Derived from such ideas, the emotional state of the observer psychiatrist has also come to be seen as not a proper matter for scientific discourse. Grounded in such assumptions, classical scientists, assumed that the private life of the observer (designated as the mind or subjectivity of the observer (physician, or psychiatrist) was not relevant to the procedures, findings and information of

the sciences including medicine. Indeed the assumption was that subjectivity was easily separable from objectivity. Derived from such ideas, the emotional state of the observer psychiatrist has also come to be seen as not a proper matter for scientific discourse. Although it is often believed that the problems raised by the Cartesian dualism has already been solved or that it is insignificant in contemporary science, the problem still needs to be adequately addressed. The currently used Diagnostic and Statistical Manual of Mental Disorders states

Although this volume is titled the *Diagnostic and Statistical Manual of Mental Disorders*, the term *mental disorder* unfortunately implies a distinction between “mental” disorders and “physical” disorders that is a reductionistic anachronism of mind/body dualism. A compelling literature documents that there is much “physical” in “mental” disorders and much “mental” in “physical” disorders. The problem raised by the term “mental” disorders has been much clearer than its solution, and, unfortunately, the term persists in the title of DSM-IV because we have not found an appropriate substitute [3].

It is clear that contemporary psychiatry while recognizing the mind-body problem has been unsuccessful in remedying it. The DSM-IV Work Groups, which designed the framework for the system of classification, strove to articulate methods and procedures for finding, extracting, aggregating, and interpreting data in a comprehensive and objective fashion. Thus the DSM framework is pervaded by assumptions of the objective-subjective and mental-physical splits. This is reflected in the choice of its own title that includes the word “Mental.” The DSM-IV claims to be neutral with regards to theories of etiology and also atheoretical. It is statistically based and used a categorical (yes-no) method to decide on diagnoses. In the DSM system, diagnoses are operationally defined and do not leave room for the patient’s point of view. This reliance on operational criteria therefore given the system an artificial quality that distance it from understanding the patient in an actual clinical setting. In current psychiatric practice the physician’s rating of the patient’s level or functioning is offered in on manner that assumes that physician’s self (however conceptualized) is unrelated to the physician’s (therapist’s) observations.

### III. POSITIVISM AND FALSIFICATION

The neutral observer based system forms the basis for formal medical science and relies on the science of the independent observer. In the neutral observer based system the physician is assumed to be neutral, objective, and an unbiased scientific observer of the patient. The physician (therapist) in such a system is privileged to determine the level of functioning of patient. Patients belong to a class of people whose identity is interchangeable. The observer is like a catalyst and does not interact with the object being measured and the observer remains unchanged by the interaction.

Generalizing from observations on interchangeable pools of patients assumed to belonging to a class reliable by reliable and interchangeable physician experts has been the basis on probability based medical statistics.

In the 1920’s The “Vienna Circle” comprising of a group of prominent philosophers including Schlick, Carnap, Feigl, Frank, Gödel, Neurath, etc., influenced by Bertrand Russell and others, extended the notion of positivism and formulated the notions of logical positivism. Logical positivism arose from their deliberations and lead to the principle of verification. According to the principle of verifiability only sentences or terms which can be observed have meaning.

Popper, in the early twentieth century, devised the criterion of falsifiability to demarcate distinguish scientific from unscientific propositions[4]. Unscientific propositions are framed in such a manner that only positive instances of the proposition can be discovered. He argued that any number of positive verifications are to be overridden by a single falsification. According to Popper, science progresses through progressive falsification and must at least be potentially falsifiable. Therefore, in the absence of falsifiability, he held, the verification principle is meaningless. He stated, “Every genuine test of theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability; some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks. [5]” Popper’s view was that scientific knowledge is objective and logical theories and that subjective or psychological theories should be discarded [6]. Popper subsequently formulated the notion of ‘degrees of verisimilitude’[7]. A greater verisimilitude is possessed by a theory which has a greater degree of truth value.

We concur with regards to the need for falsification and also that there may be degrees of falsification. However differences in measurements by differing active observers must also be included on a continuous basis as scientific information as well as part of the total communicated. In some instances differing observers may initially differ but, after a review of their combined findings, subsequently agree that one of the views was either totally false or partially false. However in some observations, differences in measurements by various observers of the same event may be viewed as complementary. Such variations in measurements, regardless of the degree or agreement or disagreement, may not lend themselves to falsification. We are of the opinion that discarding subjective views diminishes science in addition to being based on a false demarcation between subjective and objective views. Furthermore we believe that in information especially medical or psychiatric information the subjectivity of each observer needs to be part of the observational system. Excluding subjective elements in science only artificially isolates science and makes its findings harder to generalize.

In current psychiatric practice, the psychiatrist alone positively determines the patient’s level of functioning. There is no way for the psychiatrist’s view of to be refuted

or falsified by the patient; nor is there an opportunity for the physician or patient to compare the physician's (therapist's) view and the patient's view concerning the patient's functioning. Disputes between the patient and physician, especially when there is a negative outcome, therefore cannot be addressed or resolved using medical information- such disputes are resolved through legal action.

#### IV. THE EVOLUTION OF THE NOTION OF THE ACTIVE OBSERVER

Although it has penetrated the Western world and most of the contemporary world of science, the split objective public material world and a subjective or mental world is not a universally held view. The Hindu notion of Maya confers on the world a distinctly different status. According to Sankara, the seventh century philosopher and interpreter of Vedanta philosophy, Maya implies that the world exists. It is not a delusion, but only phenomenon. It is an appearance created partly by the superimposition (aropyasya) of the self on the world [8]. Maya's superimposition operates through operations of concealment (Avarna) and misrepresentation (Viksepa). This metaphor of the snake and the rope has been frequently used to communicate the concept of Maya. When a rope is mistaken for a snake, one process of Maya screens or obscures the truth of the rope and another process creates or projects the notion of the snake [9]. So long as the erroneous notion of the snake persists, the image of the projected snake can have causal effects. The observer and the observed cannot be separated. The philosophical notions related to Maya differ from traditional Western science in the insistence that the observed is linked to the observer.

The idea of the active observer in Western science grew to prominence during the twentieth century in specified areas of atomic physics but their applicability to medical and psychiatric information to this day is limited. The recognition of the active role of the observer in scientific observation, in the observation of sub-atomic events, has been among Heisenberg's fundamental contributions to modern science. Heisenberg in clarifying the role of the subject in an observation stated, "What happens depends upon our way of observing it or on the fact that we observe it. [10]" There he also clarified that "What we observe is not nature itself, but nature exposed to our method of questioning" [11]. Heisenberg notes that, "This indeterminateness of the picture of the process is a direct result of the interdeterminateness of the concept "observation" - it is not possible to decide, other than arbitrarily, what objects are to be considered as part of the observed system and what as part of the observer's apparatus [12]."

Thus according to Heisenberg, the observer is necessarily also a participant in the observation and as much an "actor" as a "spectator" in any scientific inquiry. The subject and object of an observation are in principle inextricable interlinked. The separation of subject from object is only a convenience and a common sense device to facilitate

communication. An objective observation, that removes the subject from the equation of observation, even in theory is impossible.

Thus, there is according to Heisenberg an unavoidable, somewhat uncontrolled, mutual interaction between the observer and observed. The scientist in the act of making measurements, interacts with rather than merely observe the object. The observer, thus causes the object of observation, to be revealed not as it is in itself, but, as a combination of the object's own properties, and also as a function of the observer's measurements. The object that is observed in a scientific experiment, is strictly speaking only the object which is designated as the object of the observation. These two components of any observation, the observer and the object of observation, in principle, according to Heisenberg, cannot be separated. The impact of Heisenberg's concept of the active observer, is most clearly evident in the measurement of subatomic events, where the significance of the contribution of the observer in any observation is substantial.

Colby clarifies that, "Observation in the domain of things, at least large scale things, is characterized by a negligible effect of an observer on the thing... but the effect is so small that we can ignore it for practical purposes... In the domain of persons, observer and observed observe one another observing. A person aware of being observed observes in return. So the first characteristic of participant observation is that observer and observed belong to the same class. Such crisscrossing awareness and simultaneous class membership introduce problems not found when a person observes things. [13]" The applicability of the notion of the active observer is not restricted to sub atomic events; its is also applicable to interactions between active observers. In describing the situation in psychoanalysis, Sripada and Kronmal state, "What makes the analytic situation distinct from that described by Heisenberg is that both the subject and object of the observation are conscious and active... In this regard, constructivism goes beyond Heisenberg's notion of the active observer (which deals with the influence of the active observer on physical objects of observation) and constitutes an understanding of mutually shaping constructive observations of two active observers. This is a contribution to psychoanalysis as well as general science. In such a constructive mutually shaping system, the act of observation not only affects the object of observation, but also the observer, and has the potential for changing the methods of observation. [14]"

Interpretative research in a human context from an interpretive approach assumes that access to reality (given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. The philosophical base of interpretive research is hermeneutics and phenomenology [15]. In interpretative research the importance attached to meanings assigned by individuals to any given phenomena leads the researcher to understanding of the context of the information system the process whereby the information system influences and is

influenced by the context [16]. Dependent and independent variables are not *a priori* decided in interpretive research, but there is a focus on the complexity of human understanding of emergent events [17].

## VI. SYSTEMS, CYBERNETICS AND MEDICAL INFORMATION

Systems theory was proposed in the 1940's by the biologist Ludwig von Bertalanffy, who noted that modern science was characterized by its ever increasing specialization and attendant complexity in each scientific discipline [18]. As a result, each discipline tended to become encapsulated. From the cocoon of each science it became increasingly harder to communicate to members of other sciences. The terms and knowledge of another discipline came to be reduced to the terms of one's own discipline and thus prevented truly meaningful communication between the sciences. Thus the sciences became split and fragmented. To remedy the ill effects of undue specialization, Bertalanffy argued for a unity of science. Systems philosophy seeks to articulate with coherence and internal consistency of unifying assumptions lying at the root of any scientific effort. Bertalanffy emphasized that real systems are open to, and interact with, their environments, and that they can acquire qualitatively new properties through emergence, resulting in continual evolution. A systems orientation seeks to accommodate both the individuality of each science and also the interrelationships and overlaps between the separate disciplines.

Bertalanffy noted that classical science and its disciplines, whether they be chemistry, biology or psychology, isolate elements of the observed universe [19]. He stresses the need to understand the interrelationships among sister disciplines revealed through correspondences or isomorphisms among the disciplines. Instead of the reductionism inherent in such isolated disciplines he recommends a notion of knowledge which is seen as an interaction between the knower and the known. In the systems paradigm, knowledge depends on an interplay of the perspectives of biological, cultural and linguistic considerations which no single discipline (e.g. physics) accorded a monopoly on knowledge. Similar principles underlie different sciences (physics, biology, technology, sociology, etc.), and provide an organizational basis for their unification. Laszlo described the specialized scientist as one immersed in the special language, methods, constructs, or foci of attention and who generates a multiplicity of limited range theories applicable to the domain of highly specific events [20]. Any understanding beyond that specialization is fraught with the dangers of overgeneralization from his or her discipline or oversimplification of other disciplines. Systems theory attempts to unite the isolated disciplines which are only a part of the whole picture making systems theory the science of wholeness.

Critical researchers, often influenced by Habermas, assume that social reality is historically and currently constituted and favors domination by some groups that

produce alienation in the dominated group. Oppositions, conflicts and contradictions among such groups constrain society and also attempts to study it. People are constrained in their ability to find relief from such domination. Accordingly undertaking a social critique and seeking emancipation are goals of critical research [21] [22]. The physician patient relationship has the potential to unduly privilege the physician at the expense of the patient. Hence a perspectival approach adopted by us seeks to give equal weight to both the participants in physiotherapy and the medical information that emerges reflects this tendency.

In current psychiatric practice the patient's level of functioning is determined by the psychiatrist alone and it is not seen as an emergent conclusion on the basis of systemically links between the physician (therapist), patient, insurance companies and other stake holders. This is true although all concerned in actual practice acknowledge the close connection between all participants in the system.

## VII. MEDICAL INFORMATION AND EMPATHY MEASUREMENT

Empathy "Empathy" is derived from the German word *empathie* which the Oxford English Dictionary characterized as "the capacity of the spectator to project his personality into the object of contemplation." Carl Rogers defined empathy as the ability "to sense the client's world as if it were your own, without ever losing the 'as if' quality. [23]" In defining empathy as a mode of observation, Kohut (1966) called empathy "the mode by which one gathers psychological data about other people... even though it is not open to direct observation [24]." From clinical observations, Kohut clarified that accurate empathy and correction of empathic failures by the therapist are related to successful therapeutic change.

### A. Patient Idealization and Therapist's Confidence

Idealization is the process by one person looks up to another person and in psychotherapy the patient's idealization of the therapist has been recognized [25] [26]. Devaluation by the patient of the diagnostician (or therapist) in the clinical setting between the patient and the diagnostician has also been recognized [27].

Although there is substantial literature concerning the processes of idealization and devaluation, there is an insufficient appreciation of the difference between manifest idealization and over/under-idealization. A few brief examples will clarify this concept. When a patient assumes 100 % empathic accuracy from his or her therapist and the therapist delivers 100% accuracy, there is 100 % idealization but 0% over/under idealization. When a patient assumes 50 % empathic accuracy from his or her therapist and the therapist delivers 50% accuracy, there is 50% idealization but 0% over/under idealization. When a patient assumes 100 % empathic accuracy from his or her therapist and the therapist delivers 50% accuracy, there is a high degree of idealization and also a high degree of over

idealization. However, when a patient assumes 50 % empathic accuracy from his or her therapist and the therapist delivers 100% accuracy, there is underidealization. This underidealization may also be termed devaluation.

therapist’s accuracy of understanding of the patient [30].

*B. The Measurement Of Empathic Processes In Active Observer Systems*

The Global Assessment of Functioning (GAF) Scale has been adopted by the American Psychiatric Association as the standard psychiatric measure used to assess patient

Similarly, a therapist may be more or less confident in his or her accuracy of empathic understanding. Mental health professionals have been shown to be overconfident [28]. Overconfidence may result in hasty assessments and rigid intervention plans, reducing the quality of therapy [29]. There is a need for continuous verification of the functioning (see Figure 1, next page). It measures the dimension of patient functioning and is a 100-point continuous scale. Zero represents the extreme of total

**Figure 1: Global Assessment of Functioning (GAF) Scale**

|        |  |
|--------|--|
| 100-91 | Superior functioning in a wide range of activities, life’s problems never seem to get out of hand, patient is sought out by others because of his or her many positive qualities. No symptoms.   |
| 90-81  | Absent or minimal symptoms (e.g., mild anxiety before an exam), good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, no more than everyday problems or concerns (e.g., an occasional argument with family members).  |
| 80-71  | If symptoms are present, they are short-lived and expectable reactions to life’s stresses (e.g., difficulty concentrating after family arguments); no more than slight impairment in social, work, or school functioning (e.g. temporarily falling behind in school work).   |
| 70-61  | Some mild symptoms (e.g., depressed mood and mild sleep disturbances) OR some difficulty in social, work, or school functioning (e.g., occasional truancy, or theft within the household), but generally functioning pretty well; has some meaningful relationships with people.   |
| 60-51  | Moderate symptoms (e.g., occasional panic attacks or other symptoms) OR moderate difficulty in social, work, or school functioning (e.g., few friends, conflicts with peers or co-workers).  |
| 50-41  | Serious symptoms (e.g., thoughts of suicide or severe obsessional rituals) OR any serious problem in social, work, or school functioning (e.g., no friends, unable to keep a job).   |
| 40-31  | Some impairment in reality testing or communication (e.g., speech is at times illogical, obscure, or irrelevant) OR major problems in several areas, such as work or school, family relations, judgment, thinking, or mood (e.g., depressed man avoids friends, neglects family, and is unable to work; child is defiant at home, and is failing at school). |
| 30-21  | Behavior is considerably influenced by delusions or hallucinations OR serious impairment in communication or judgment (e.g., sometimes acts grossly inappropriately, suicidal preoccupation) OR inability to function in almost all areas (e.g., stays in bed all day; no job, home, or friends).  |
| 20-11  | Some danger of hurting self or others (e.g., suicide attempts without clear expectations of death; frequently violent; extremely excitable) OR occasionally fails to maintain minimal personal cleanliness OR gross impairment in communications (e.g., largely incoherent or mute).   |
| 10-0   | Persistent danger of severely hurting self or others (e.g., recurrent violence) OR persistently unable to maintain minimal personal cleanliness OR serious suicidal act with clear expectation of death.   |

non-functioning and 100 represents ideal or perfect functioning. This study expanded the use of GAF ratings to include the views of the patient and therapist. Four views (ratings) of the patient functioning are obtained 1) the patient’s rating of patient’s functioning, 2) the therapist’s rating of patient’s functioning, 3) the patient’s empathic view of how the patient guesses the therapists rating of the patient’s functioning and 4) the therapist’s empathic guess of how the patient rating of the patient’s own functioning.

**Patient questions (1-4)**

- 1) Please rate your own GAF as it is now.
- 2) Estimate your therapist’s rating of your GAF today.
- 3) How accurately do you think your therapist can estimate your own rating of your GAF today.

**Therapist questions (4-6):**

- 4) What is your rating of this patient’s GAF today.
- 5) Estimate the GAF score that this patient gave himself or herself today.

- 6) How accurate do you think your estimate is of your patient’s own self-rating of his or her GAF today.

Ratings were made at the end of a session and openly discussed at the beginning of the next session. Thus, the therapist made an empathic guess of how the patient would rate his or her own GAF rating. The patient, too, makes an empathic guess of how the therapist would rate the patient’s own GAF rating. Gathering data from therapist and patient’s point of view and also from their empathic views of the other’s estimate of the patient’s level of global functioning forms the basis of this study. The patient (question 3) also guesses on a 100 point scale the degree to which the patient anticipates that the therapist empathic

rating will correspond to the patient’s own self rating. This forms the rating related to the Patient’s conscious idealization rating of the therapist’s empathic accuracy. The therapist, on a 100 point scale, rates his degree of confidence

that he can accurately predict the patient's self-rating. This forms the basis for determining the therapist's conscious confidence.

*C. Case Example*

The patient (Ms. A.) was a fifty year old woman who had been married when she was twenty years old. Her husband began to have a string of affairs and she divorced him after reconciliation failed. She became depressed and research project, Ms. A. readily agreed to participate. She completed the 20 sessions duration of the research project. The following is a summary of the key findings of the ratings. As the ratings of the entire 20 sessions clearly indicate, there is a general convergence between the ratings of the patient and that of the therapist. The following is a detailed summary for sessions 1-5. As the GAF rating of

experienced much economic strife. For several years, her daughter, who used street drugs, was sporadically employed. Her daughter had a son out of wedlock. Her grandson was a young a teenager and was not doing well at school. She worried that he may be "going bad" as he hung out with "bad" company. She began treatment, with a female psychiatrist (Dr.D.) Ms. A. felt that Dr. A. helped to make her feel less depressed. When approached about this the first session indicate, Ms. A. rated herself (PGAF) as functioning at a level of .75. Although Dr. D. rated the patient as functioning at a level of .75, Dr. S's empathic rating was .79. Thus there was interpersonal congruence of a 100% and the empathic rating was accurate in comparison to the rating of the patient (PGAF) by a factor of .94.

**Figure 2: Definition of Showing the Ratings and Formulae**

**Ratings:** PGAF, PEGAF, TGAF, TEGAF, Patient Conscious Idealization, Therapist's Conscious Confidence.  
**Formulae:** Accuracy (Degree of Therapist's empathic accuracy), Patient's Over-idealization or under-idealization of the therapist empathic accuracy (capacity), and Therapist's Over-confidence or Under-confidence of his or her empathic accuracy (capacity)

| Session | PGAF | PEGAF | TGAF | TEGAF | P+atient Conscious Idealization | Therapist Conscious Confidence | Therapist Accuracy | Patient Unconscious Over-idealization or Under-idealization | Therapist Unconscious Over-confidence or Under-confidence |
|---------|------|-------|------|-------|---------------------------------|--------------------------------|--------------------|---|---|
| 1       | 0.75 | 0.85  | 0.75 | 0.79  | 0.88                            | 0.9                            | 0.9467             | -0.0667   | -0.0467   |
| 2       | 0.8  | 0.9   | 0.89 | 0.85  | 0.9                             | 0.9                            | 0.9375             | -0.0375   | -0.0375   |
| 3       | 0.75 | 0.85  | 0.5  | 0.5   | 0.9                             | 0.95                           | 0.6667             | 0.2333  | 0.2833  |
| 4       | 0.8  | 0.85  | 0.85 | 0.85  | 0.9                             | 0.85                           | 0.9375             | -0.0375   | -0.0875   |
| 5       | 0.9  | 0.9   | 0.85 | 0.8   | 0.95                            | 0.9                            | 0.8889             | 0.0611  | 0.0111  |
| 6       | 0.85 | 0.85  | 0.88 | 0.95  | 0.9                             | 0.9                            | 0.8824             | 0.0176  | 0.0176  |
| 7       | 0.9  | 0.9   | 0.8  | 0.8   | 0.95                            | 0.9                            | 0.8889             | 0.0611  | 0.0111  |
| 8       | 0.9  | 0.9   | 0.85 | 0.88  | 0.9                             | 0.9                            | 0.9778             | -0.0778   | -0.0778   |
| 9       | 0.9  | 0.85  | 0.9  | 0.9   | 0.95                            | 0.9                            | 1                  | -0.05   | -0.1  |
| 10      | 0.75 | 0.8   | 0.7  | 0.75  | 0.9                             | 0.9                            | 1                  | -0.1  | -0.1  |
| 11      | 0.9  | 0.9   | 0.9  | 0.85  | 0.95                            | 0.9                            | 0.9444             | 0.0056  | -0.0444   |
| 12      | 0.8  | 0.85  | 0.75 | 0.75  | 0.9                             | 0.95                           | 0.9375             | -0.0375   | 0.0125  |
| 13      | 0.85 | 0.85  | 0.89 | 0.85  | 0.95                            | 0.9                            | 1                  | -0.05   | -0.1  |
| 14      | 0.9  | 0.9   | 0.9  | 0.9   | 0.95                            | 0.95                           | 1                  | -0.05   | -0.05   |
| 15      | 0.9  | 0.9   | 0.9  | 0.9   | 0.98                            | 0.95                           | 1                  | -0.02   | -0.05   |
| 16      | 0.9  | 0.9   | 0.95 | 0.95  | 0.98                            | 0.95                           | 0.9444             | 0.0356  | 0.0056  |
| 17      | 0.9  | 0.9   | 0.88 | 0.85  | 0.95                            | 0.9                            | 0.9444             | 0.0056  | 0.0056  |
| 18      | 0.85 | 0.9   | 0.9  | 0.9   | 0.95                            | 0.95                           | 0.9411             | 0.0089  | 0.0089  |
| 19      | 0.9  | 0.9   | 0.9  | 0.9   | 0.95                            | 0.95                           | 1                  | -0.05   | -0.05   |
| 20      | 0.9  | 0.9   | 0.85 | 0.9   | 0.98                            | 0.9                            | 1                  | -0.02   | -0.1  |

*D: Definition of Terms and Formulae*

*Ratings:*

PGAF Rating : patient's self-rating of their own Global Assessment of Function level made at end of each session  
 PEGAF Rating: patient's empathic estimate of how the therapist will rate their (the patient's) Global

Assessment of Function level made at end each session  
 TGAF Rating: therapist's Global Assessment of Function rating of patient made at end of each session.  
 TEGAF Rating: therapist's empathic estimate of patient's self-rating of patient's own Global Assessment of Function level at end of session.  
 Patient Conscious Idealization Rating: patient's percentile manifest conscious estimate of the therapist's empathic accuracy

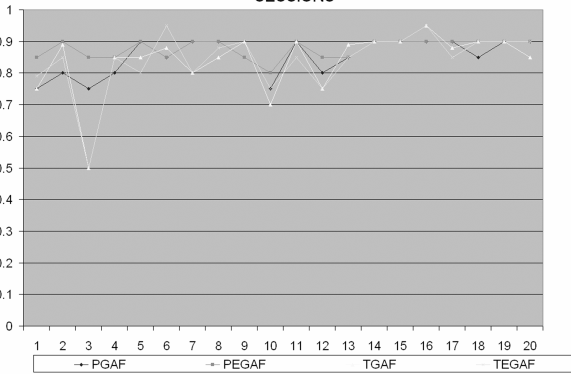
Therapist's Conscious Confidence Rating:  
 therapist's percentile manifest conscious estimate  
 of the therapist's empathic accuracy  
 Formula for Therapist's <sup>s</sup>-Accuracy (Therapist's  
 empathic accuracy, also a measure of the prevailing  
 therapist's empathic capacity):  $PGAF - [PGAF -$   
 $TGAF] / PGAF$  equals PGAF minus the absolute  
 values of  $PGAF - TGAF$  divided by PGAF

*Formulae:*

Formula for Patient <sup>s</sup> Over-idealization or Under-  
 idealization: Patient Conscious Idealization rating –  
 Therapist empathic Accuracy equals Patient's  
 rating of Conscious Idealization minus Therapist's

In the third session Ms. A. reported that she was upset. In  
 the intervening two weeks, her grandson had been arrested

FIGURE 3: SHOWING PGAF, PEGAF, TGAF and TEGAF RATINGS ACROSS 20 SESSIONS



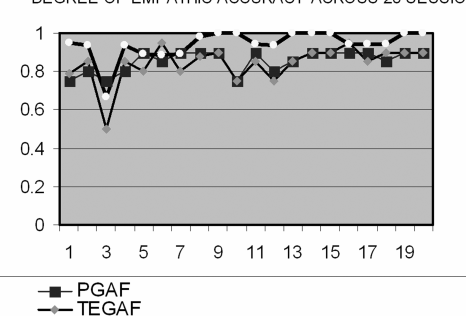
for theft. His mother, Ms.A.'s daughter, asked Ms.A. for  
 bail money to get him released. Ms.A. did not have any  
 money. However she reluctantly decided to help her  
 daughter get the money by borrowing some money from a  
 male friend, Mr.I. Ms.A. did so under the firm  
 understanding that her daughter would return the money in a  
 week. With the money her grandson obtained bail. Ms. A's  
 daughter promised to return the money and asked Mr. I to  
 come and get the money from her apartment. Mr. I came to  
 the door, at the agreed-to time, and rang the door bell. He  
 could hear the television playing in the living room and  
 some voices inside the house. But no one answered the  
 door. He called by telephone but no one picked up to  
 answer. Mr.I. was somewhat apprehensive being in a  
 strange neighborhood. He left without collecting his money  
 and subsequently called and complained to Ms.A. Ms.A.  
 became very angry at her daughter. More than money was  
 involved. Ms.A. felt that her daughter had besmirched her  
 honor. In that session, Ms.A. told Dr. D. that her mood were  
 down. With the loss of honor she felt fleeting thoughts that  
 life was not worth living.

empathic accuracy. If a positive value, it represents  
 degree of Patient's Unconscious Over-idealization;  
 and if a negative value it represents the degree of  
 Patient's Unconscious Under-idealization  
 Formula for Therapist <sup>s</sup> Over-confidence or Under-  
 confidence (Degree of therapist's Over-confidence  
 or Under-Confidence in therapist's empathic  
 estimate): Therapist's Conscious Confidence rating  
 – T- Accuracy. If a positive value, it represents  
 degree of therapist's unconscious over-confidence;  
 and if a negative value it represents degree of  
 therapist's unconscious Under-confidence

Superscript S "s" indicates number of session

At the end of that session the following ratings were  
 made: by Ms. A. (PGAF .75 and PEGAF .85) and Dr. D.  
 (TGAF .50 and TEGAF .50). Ms. A. felt that the therapist  
 would be accurate to a degree of .9 and Dr. D. was confident  
 that she would accurately predict the patient's PGAF rating  
 to the degree of .95. When Ms. A. and Dr. D. exchanged  
 their mutual ratings (as they did at the beginning of each  
 session), both noted the discrepancy between the patient's  
 ratings and the therapist's ratings. Ms.A. patient asked the  
 therapist to explain why the therapist gave her a rating of .50  
 for the TGAF and TEGAF. Dr. A. drew attention to the  
 previous session and the comment by Ms. A. that she felt  
 that life was worth living without honor. Dr. A. pointed to  
 the rating scale that indicated serious symptoms (e.g.,  
 thoughts of suicide) were to be rated between .40-.49. Ms.  
 A. felt that Dr. A. over read her depression. Ms. A. too  
 pointed to the scale and noted that some mild symptoms  
 (e.g., depressed mood) are to be rated as between .60 -.69.  
 On the basis of this mild depression, Ms. A. justified her  
 rating of .75. She insisted that she needed to make an  
 adjustment to the scale and go slightly beyond the range of  
 .60-.69. Both Ms.A. and Dr. D. felt that the reason for the  
 variation were to be attributed to variations of understanding  
 and use of the scale.

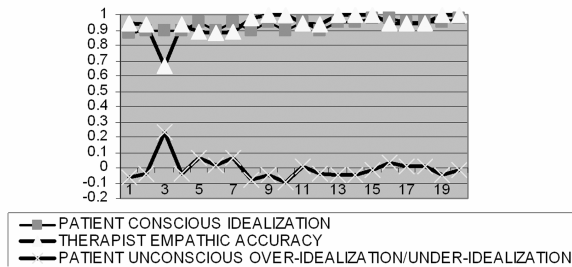
FIGURE 4: SHOWING PGAF, TEGAF RATINGS AND THERAPIST'S  
 DEGREE OF EMPATHIC ACCURACY ACROSS 20 SESSIONS



Explanation of Figure 3: (PGAF, PEGAF, TGAF, and  
 TEGAF) of the patient's level of functioning have been

converted to dimension ranging from 0 to 1. This fuzzy representation clarifies that bivalent reduction has been

FIGURE 5: SHOWING DEGREE OF THE THERAPIST'S EMPATHIC ACCURACY, PATIENT'S RATED MANIFEST CONSCIOUS IDEALIZATION AND DERIVED DEGREE OF LATENT UNCONSCIOUS OVER-IDEALIZATION OR UNDER-IDEALIZATION



eliminated. The patient's GAF is represented from four points of view indicating plural views of the patient's level of functioning. The therapist's expert view (PGAF) is represented. Because the therapist's view is represented among other views and the therapist's view is not considered the only valid view, privileged reductionism has been reduced. The histories of each of the views are continuously represented, thereby eliminating a-historic reductionism. Each person's ratings across the sessions are monist and are considered an indivisible. These four ratings reflect the manifest and conscious impressions of the patient and therapist.

Because of the effects of empathic processes and progress in the treatment, there appears to be tendency of the convergence of the four views starting the 13'th session as well as an increase in the functioning patient.

Explanation of Figure 4: Note the drop in therapist's empathic accuracy (see Formula) in session 3. The therapist's empathic accuracy is a measure of the variance between the patient's PGAF rating and the Therapist's TEGAF rating.

Explanation of Figure 5: Note that there is a high degree of manifest Conscious Patient Idealization of the therapist by the patient (rating of Patient Conscious Idealization). In session 3 this high conscious idealization occurs in the presence of a decrease in therapist's empathic accuracy. This indicates the patient's unconscious over-idealization (see formula).

Explanation of Figure 6: Note that the drop in the therapist's empathic accuracy in session 3 followed by a slight drop in the manifest Conscious Confidence in the therapist (top of the chart). The therapist empathic accuracy is generally very high. After session 7 and in light of this high therapist's empathic accuracy, there is a slight degree of latent therapist unconscious under-confidence.

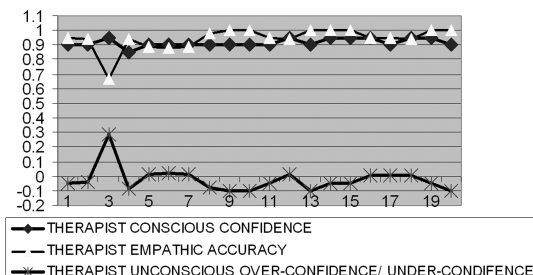
## VIII. DISCUSSION

Sullivan coined the term 'consensual validation' and indicated that it was the basis of communicable knowledge [31]. The essence of consensual validation is that a notion that "appears in the mind" is subjected to comparison with past experiences and also with the testimony of others. The notion has continued to be useful in understanding the therapeutic situation and in decreasing the degree of interpersonal distortions. Trad reiterated Sullivan's notion of consensual validation. He contrasts the patient's subjective reality with objective reality [32]. The patient's subjective reality is viewed as distorted because of the failure of validation from others during development. Here, therapy is credited with producing change by enabling the patient to become more aware of such distortions.

The notion of consensual validation is a crucial step in the formal recognition that there are two participants in therapy and that consensus is the basis of communicable knowledge. We are in agreement with this premise. However, the notion of consensual validation also subscribes to the essential split between subjective and objective. It assigns subjectivity to the patient and objectivity to the therapist. The patient's subjectivity is paired with the tendency for distortions in the patient's views. In contrast, the analyst or therapist's view is privileged as the objective view and considered the representative of objective reality. We do not subscribe to these latter views and believe they need to be tested empirically. Gill states that an analyst needs to recognize that all his responses, including silence or inaction can be a stimulus to a patient [33].

In this study concerning the measurement of the patient's GAF the raters may agree, their ratings demonstrate a high degree of consensual validity, and their ratings may be highly reliable, but a high degree of error is still possible. This is so if the therapist's is highly inaccurate but over-confident and the patient is over-idealizing of the therapist's empathic capacity. This may also occur when the patient is underidealizing or devaluing the therapist's empathic

FIGURE 6: SHOWING DEGREE OF THE THERAPIST'S EMPATHIC ACCURACY, THERAPIST'S RATED MANIFEST CONSCIOUS CONFIDENCE AND DERIVED DEGREE OF LATENT OR UNCONSCIOUS OVER-CONFIDENCE OR UNDER-CONFIDENCE



capacity and when the therapist is under-confident. Empathic validation is the measure of understanding each observer has of the other's observation regardless of the degree of consensus between their observations. Empathic validation thus is a measure of understanding while



consensual validation is a measure of agreement. Thus, adding empathic validation to consensual validation add an additional measure of stability to the system of observations when two active observers are observing each other.

Earlier we noted that systems theory subscribes to the notion of the unity of science and this is justified on the grounds of commonalty or isomorphism among different sciences. However, this view of a unified science has been challenged. Noting that the claims for a unity of science are based on irremediable forms of reductionism and are not supported by theory and practice, Suppes [34] coined the term "The plurality of Science." Cartwright [35] also argued against the unity of science on the grounds that the science provides theories and descriptions of artificially isolated systems. Dupre [36] argued against the unity of science because it was unprincipled as it involved privileging one kind of membership over another kind of membership.

Plurimorphism, a systemic method for measurement active observations was described by us and our collaborator [37] An active observer system is in effect when two or more active observers (agents) are linked by their observations of the same event. Plurimorphism seeks to describe the conscious and unconscious perspectives of all observers of any given event while preserving the historical uniqueness, and indivisible identity of each such observer. In accordance with Plurimorphism, this paper has described an example of active systems observations. The inevitable mutually shaping individual personal and empathic views of each self referential observer (patient and therapist) have been measured and expressed. The empathic processes (degrees of therapist's empathic accuracy, patient's over or under idealization of the therapist's empathic capacity and therapist's confidence in his or her empathic capacity) has been described as has the degree to which the empathic accuracy, patient over/under idealization and therapist's over/under confidence has been falsified has been determined.

## IX. CONCLUSION

This paper has presented personal and empathic processes in measurements between a physician and a patient using the patients Global Assessment of Functioning. This has been done in a manner that the patient intuitively understand the method. A simple method to measure the prevailing degree of therapist's empathic accuracy has been presented. The distinction between the patient's manifest or conscious idealization of the therapist's empathic capacity and the degree of unconscious over or under idealization of that capacity has been described. So too, the therapist's manifest confidence and unconscious confidence in his or her empathic capacity has been clarified.

This presentation described an innovative and plurimorphical method for measuring and communicating medical information when two or more active observers are linked by observing the same event. It has been shown that the unique personal and empathic views of all such observers must be included to comprise a rational system of observations. The observations presented in this study were all falsifiable to a degree (0-100) making possible a simultaneous measured

degree of falsification and verification. Each observer is shown to be a integrated (non split) unit with a combined and indivisible subjective and objective elements. The importance measuring the degree of consensus (agreement) leading to the assessment of the degree of consensual validation as well as understanding leading to assessment of the degree of empathic validation has been described.

In the light of current advances in science, medical information, ideally, should be falsifiable, include the personal and empathic views of all observers who have participated in observing the same event.

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