

The clinimetric approach to clinical psychology

by Elena Tomba, Giovanni Andrea Fava*

Introduction

Assessment in clinical psychology did not initially encompass the quantification of psychopathological phenomena. Acute but irreproducible long descriptions were the way of communicating clinical observations among researchers (Faravelli, 2004). In the late 50s and early 60s the need for a reaction to the current of thought, prevalent at that time, that, inspired by phenomenology and psychoanalysis, maintained subjectivity and irreproducibility as the basic principles of psychopathology, came out (Ibidem). The development of more objective ways of assessment of the severity and the change in psychological facts emerged (Ibidem). Since then, modern clinical psychology has therefore placed all its emphasis on inter-clinician reliability and the assessment of clinical changes started to rely on instruments which have characteristics of validity and reliability (Bech, 1993). In its quest for validity and reliability of assessment, research has rested on the clinically shaky grounds of psychometric theory (Ibidem). The development of psychometrics, however, had taken place outside of the clinical field, mainly for measuring psychological phenomena or educational achievements in the educational and social areas (Rust & Golombok, 1989). Since the phenomena under observation in the development of psychometric principles were not clinical, it is not surprising that they could not be automatically adjusted to clinical psychology (Fava, Ruini, & Rafanelli, 2004).

We will discuss the inadequacies of the psychometric model in the clinical setting and the need of its supplementation with another conceptual framework, clinimetrics.

Inadequacies of psychometric model

The inadequacies of the results produced by psychometric instruments, their improper use, such as to promote and justify artificial findings in clinical setting were first identified by Shapiro (1951), who outlined the methodological difficulties in applying psychometric principles to diagnostic psychological testing in 1951. Kellner (1971, 1972), in the early seventies, described the psychometric problems related to assessment of changes in distress.

Sensitivity to change in distress is a requisite for the clinical validity of an outcome scale. Scales may be valid and reliable, but may lack sensitivity. The ability of a rating or self-rating scale to discriminate between different groups of patients suffering from the same illness (e.g., depressed inpatients and outpatients) has been defined by Kellner as sensitivity (1992). This concept is particularly important when treatment effects are small and in the setting of sub-clinical symptoms (Fava, 1996).

The psychometric model appears also to be largely inadequate in clinical setting because of its search of homogeneity. Homogeneity of components, as measured by statistical tests such as Cronbach's alpha, is often seen as the most important requirement for a traditional rating scale. However, the same properties that give a scale a high score for homogeneity may obscure its ability to detect change (Wright, & Feinstein, 1992). The redundant nature of a scale's items may increase Cronbach's alpha, but decrease its sensitivity. In psychometrics, a high correlation is often regarded as evidence that the two scales measure the same factor. However, a high correlation does not indicate similar sensitivity (Kellner, 1992). When a new

* Department of Psychology, University of Bologna, Bologna, Italy

From the Affective Disorders Program, Department of Psychology, University of Bologna, Bologna, Italy and Department of Psychiatry, State University of New York at Buffalo, Buffalo, New York.

Address correspondence to Dr. Fava, Dipartimento di Psicologia, Università di Bologna, viale Berti Pichat 5, 40127 Bologna, Italy. e-mail: giovanniandrea.fava@unibo.it

scale is developed with “item analysis”, some of the essential variables that are sensitive to change may be either removed or not included (Carroll, Fielding, & Blashki, 1973).

The Hamilton Depression Scale (HAM-D) (Hamilton, 1967) is an example of an instrument based on the classical psychometric model. The key flaw of such an instrument, developed on the basis of factor analysis or principle component analysis (in which correlation coefficients are operating, inter alia, by giving symptoms equal weights), is that the same score at the Hamilton Rating Scale for Depression (Ibidem) may be the product of few very severe core symptoms (e.g. a severely retarded depressed patient) or of several mild accessory symptoms (reflecting perhaps a subject affected by a mild form but with many symptoms and a complaining behavior) (Faravelli, 2004). Correspondingly, when in the research routine the total scores to quantify the clinical response are used, the greatest distance between ‘scientific’ assessment and clinical observation succeeds (Ibidem).

Faravelli notes that, as to depression (2004) the decrease in the final score may be ascribed to the improvement/disappearance of the typical depressive signs (e.g. mood, anhedonia, guilt, suicidal ideation, psychic signs and retardation), which is a good purpose on clinical grounds, or to the alleviation of accessory symptoms (e.g. anxiety, appetite, insomnia, sexual interest and somatic symptoms), which is of little worth both for the patient and for the clinician. Besides, adverse effects of treatments (e.g. sleepiness or sedation) may decrease the total score of the rating scale, producing an artificial improvement.

Wright and Feinstein (1992) provide an explanation for the disappointing performance that multi-item scales such as HAM-D may present. It is interesting to note that extremely simple and rough methods for assessing psychopathology, such as the global measures (e.g. the Clinical Global Impression, the Visual Analogue Scales, and the Social and Occupational Functioning Assessment Scale) are generally more sensitive than the fully structured and spelled out multi-item scales. They maintain, however, approximately the same level of reliability. In other words, asking a doctor to score a patient ‘from zero to ten’ (or similar), without any other explicit rule or reference, is as reproducible as using instruments that require long and specific training (Faravelli, 2004).

Psychometrics is the managed care of methods (Nierenberg & Sonino, 2004); all variables have the same weight, just as all physicians have the same value, regardless of experience, expertise, or judgement. An alternative model, clinimetrics is proposed as the conceptual basis to assess clinical phenomena, diagnosis, prognosis, and therapeutics (Bech, 2004; Fava, Ruini, & Rafanelli, 2004; Favarelli, 2004; Nierenberg & Sonino, 2004).

Clinimetrics

The term “clinimetrics” was introduced by Alvan R. Feinstein in 1982 to indicate a domain concerned with indexes, rating scales and other expressions that are used to describe or measure symptoms, physical signs, and other distinctly clinical phenomena in medicine. The purpose of clinimetric science was to provide an intellectual home for a number of clinical phenomena, which do not find room in the customary clinical taxonomy. Such phenomena include the types, severity and sequence of symptoms; rate of progression of illness, severity of comorbidity; problems of functional capacity; reasons for medical decisions; and many other aspects of daily life, such as well-being and distress (Fava, Ruini, & Ravanelli, 2004; Feinstein, 1982). Examples of clinimetric indexes are Jones criteria for rheumatic fever (Feinstein, 1982), the New York Heart Association Functional Classification (The Criteria Committee of the New York Heart Association, 1964) and Apgar’s method of scoring the newborn’s condition (Feinstein, 1999). Clinimetrics has a set of rules which govern the structure of indexes, the choice of component variables, the evaluation of consistency and validity (Feinstein, 1987).

Within the clinical framework, Feinstein (Ibidem) observes that patients use the clinimetric form of assessment when they say they have severe pain, a slight headache or a great improvement in appetite. Clinical psychologists are also very familiar with clinimetric indexes, since, they may weigh factors such as the progression of disease, the overall severity of the disorder, the patients’ social support and their adaptation, resilience and reaction to stressful life events, response to previous treatment (Fava, Kellner, & Staging, 1993).

The clinimetric model introduced by Feinstein (1987) combines theories of measurement with theories of clinical phenomenology. In fact Nierenberg and Sonino (2004) remember how the founder of clinimetric criticized the field of clinical research for always seeking the grail of a statistically significant *p value* without predetermining the size of a difference between groups that would be considered clinically important (Feinstein, 1990).

The differential aspects of clinimetrics and psychometrics have become the focus of a debate (De Wet, Terwee, Bouter, & Current, 2003; Emmelkamp, 2007). De Wet et al. (2003a, b) and Fava and Belaise (2005) argued for the importance of clinimetrics as a methodological discipline which is concerned with measurement issues in clinical medicine and emphasized the substantial overlap between clinimetrics, psychometrics and biometrics together with the need for a better integration of the fields. Streiner (2003a, b) however advocated the abolishment of clinimetrics, as a redundant addition to the set of rules developed within the psychometric field. Emmelkamp (2004) states that although clinimetrics may have a number of advantage over the more classical psychometrically based measures, such as being more sensitive to change, there are still a number of methodological issues that deserve to be studied before we may abandon the psychometrically based methods.

Clinimetric implications for assessment in clinical psychology

Clinimetrics may offer a conceptual and methodological ground for a substantial revision of clinical assessment providing a number of methodological and clinical advantages over traditional psychometric measures.

Development of Rating Scales

Clinimetrics needs should be considered in the development of rating scales. As an example several versions of a shortened HAMD have been found more sensitive to change than the full HAMD just because they were found to be consistent with Item Response Theory (Gill & Feinstein, 2004; Bech, 2001), defined by Bech (2004) as the combination between clinical coherence with statistical coherence. The item response theory, introduced by Rasch (1980) is thus a modern psychometric theory of measurement that uses a sensible method to assess symptoms based on their prevalence in those with a disorder (clinical coherence) and the importance of those symptoms for clinicians to define severity (weighting of symptoms) (Bech, 2004).

The choice of instruments: incremental validity

The concept of incremental validity refers to the unique contribution or incremental increase in predictive power associated with the inclusion of a particular assessment procedure in the clinical decision process (Wimmer, 2003). The concept is mainly applied to the selection of instruments in a psychometric battery. In clinical research, however, several highly redundant scales are often used under the misguided assumption that nothing will be missed (Ibidem). On the contrary, violation of the concept of incremental validity only leads to conflicting results. The concept, however, should also be extended to inclusion of items in the construction of a scale, with particular reference to sensitivity to change. The customary psychometric goal is to achieve homogeneity (Derogatis, 1987). In this process, components that seem to be different and may be likely to detect change may be discarded.

Diagnostic Categorization

Engel (1960) warned about the inhibiting influence of nosology on the formulation of a general concept of disease. 'Diagnostic labels are ways of indicating categories of information about

our patient. A diagnostic label rarely, if ever, fully defines the illness. Rather, it has statistical and predictive value' (Ibidem).

Take for example DSM-IV diagnosis of major depressive disorder, which requires at least 5 of a set of 9 symptoms to be present. All items are weighed the same, unlike in clinical medicine, where major and minor symptoms are often differentiated (e.g., the Jones criteria for rheumatic fever). As a result, a patient with severe and pervasive anhedonia, incapacitating fatigue and difficulties in concentrating, which make him/her unable to work, would not be diagnosed as suffering from a major depressive disorder, despite the clinical intuition of potential benefit from pharmacotherapy. The diagnosis in fact could be performed in a patient who barely meets the criteria for five symptoms.

The hidden conceptual model is psychometric: severity is determined by the number of symptoms, not by their intensity or quality, to the same extent that a score on the depression rating scale depends on the number of symptoms that are scored as positive. As Faravelli (2004) remarks, the effect of psychometric theory on psychological assessment is to consider an illness as the sum of its symptoms, which, in turn, are represented by the numbers associated with specific behavior.

Despite current diagnostic entities are particularly helpful in setting a threshold for conditions worthy of clinical attention, their use is still influenced by psychometric model, a clinimetric, instead of psychometric, model should guide the diagnosis in clinical psychology

Macro and Micro-Analysis

Clinimetrics suggests that a satisfactory assessment requires multiple points of observation during the course of illnesses by calling in fact for a substantial modification of the flat, cross-sectional approach based on DSM-IV criteria only. A longitudinal consideration of the development of disorders, may prove to be more fruitful for clinical decision making and treatment planning than a cross-sectional diagnosis (Fava, Ruini & Rafanelli, 2004, Feinstein, 1990, Fava & Belaise, 2005). This approach is also in accordance with the sequential model of treatment, which was found to be effective in clinical medicine and psychiatry (Fava, Ruini & Ravanelli, 2005).

As a response to the current flat diagnostic evaluation, Emmelkamp et al. (1992) and Fava et al. (2004) distinguish, in the initial psychological assessment, two levels of functional analysis: macro-analysis (a relationship between cooccurring syndromes is established in order to enable the therapist to determine which problem should be targeted first) and micro-analysis (a detailed analysis of symptoms). Problems may be caused by different factors and may be maintained by different factors (Fava & Kellner, 1993).

Emmelkamp (2004) provides an example of the surplus value of a macro-analysis. A substantial number of depressed patients presenting for treatment also experiences marital distress, whereas in approximately half of the couples that have marital problems at least one of the spouse is depressed. These data suggest that depression and marital distress are closely linked. Furthermore, marital distress is an important precursor of depressive symptoms. In addition, persons who, after being treated for depression, return to distressed marriages are more likely to experience relapse (Emmelkamp, Bouman & Scholing, 1992).

Although in depressed patients either antidepressant drugs or cognitive behavior therapy are the treatment of choice, clinimetric assessment including macro-analysis might reveal that behavioral marital therapy should be preferred in depressed maritally distressed couples. Taken the results of the studies in this area together, in maritally distressed depressed couples behavioral marital therapy seems to have an exclusive effect on the marital relationship, which is not found in individual cognitive-behavior therapy, while it is as effective as cognitive therapy in reducing depressed mood (Emmelkamp & Vedel, 2002). Not surprisingly, behavioral marital therapy was hardly effective in depressed patients who did not experience marital problems (Emmelkamp, 2003).

A patient may present with a major depressive disorder, obsessive-compulsive disorder and hypochondriasis. In terms of macroanalysis, the clinician may give priority to the pharmacological treatment of depression, leaving to post-therapy assessment the

determination of the relationship of depression to obsessive-compulsive disorder and hypochondriasis. Will they wane as depressive epiphenomena or will they persist, despite some degree of improvement? Should, in this latter case, further treatment be necessary? What type of relationship obsessive-compulsive symptoms and hypochondriasis entertain? On the basis of the type and longitudinal development of hypochondriacal fears and beliefs (Emanuel-Zuurveen & Emmelkamp, 1997) the clinician may decide to tackle obsessive compulsive disorder, regarding hypochondriasis as an ensuing phenomenon. Or he/she may consider them as independent syndromes. If the clinical decision of tackling one syndrome may be taken during the initial assessment, the subsequent steps of macro-analysis require a re-assessment after the first line of treatment has terminated.

Recovery

Clinimetrics provides also relevant clinical implications in the definition of recovery. Commonly, the concept of recovery reflects that of "improvement" which refers to the clinical distance along which the current state of the patient is compared to the pre-treatment position (Savron et al., 1996). In this sense, recovery can be expressed either as a categorical variable (present/absent) or as a comparative category (nonrecovered, slightly recovered, moderately recovered, greatly recovered). Both expressions require arbitrary cut-off points related to the amount of improvement.

A depressed patient who is asked how he or she feels after 3 weeks of treatment replies "just fine" (instead of "better") uses a self-monadic component. The amount of change induced by treatment, however, may make him/her overlook the distance from an intended goal, such as the pre-episode state. The physician may collude with the patient in this illusion of wellness, since he/she may be gratified more by the amount of improvement induced in the patient, than by the current distance from an intended goal (Fava, 1996). Clinicians may choose recovery as a target that is negotiated between the doctor and the patient. The doctor can insist that the target be reasonable (e.g., not asking to be better than before the illness). Nevertheless, the idea of successful recovery may differ from one patient to the next and should not be constrained too much by the doctor's ideas. We should accept the possibility that a treatment may determine abatement of symptoms in some patients, leave a substantial residual symptomatology in others, yield an unsatisfactory response in others, and provide no benefit or even cause harm in a few.

In a survey on factors identified by depressed outpatients as important in determining remission, the most frequently judged as such were the presence of features of positive mental health, such as optimism and self-confidence, a return to one's usual, normal self; and a return to the usual level of functioning (Bech, 1990). In 1958 Marie Jahoda outlined some tentative criteria for positive mental health, encompassing attitudes toward the self, growth, integration, autonomy, perception of reality and environmental mastery. Such criteria were refined and expanded in Carol Ryff's multidimensional model (1989), which was then applied in a variety of clinical settings (Zimmerman et al., 2006). Ryff's psychological dimensions may be instrumental in assessing both the process and the definition of recovery [see Table 1]. Table 2 provides a clinimetric definition of recovery applied to major depression.

The Roll-Back Phenomena and the state-trait distinction

Detre and Jarecki (Fava & Ruini, 2003) provided a model for relating prodromal and residual symptomatology, defined as the rollback phenomenon: as the illness remits, it progressively recapitulates (though in a reverse order) many of the stages and symptoms that were seen during the time it developed. According with the rollback model, there is also a temporal relationship between the time of development of a disorder and the duration of the phase of recovery.

The psychometric distinction between state and trait may also reflect the rollback phenomenon and it may hinder detection of change. There is evidence – reviewed in detail elsewhere

(Wright & Feinstein, 1992) – that personality assessment is considerably influenced by state variables, i.e. the relationship of antidepressant treatment to personality measurements (Fava, 1996; Ryff, 1989a). Psychological constructs traditionally conceived as trait dimensions may surprisingly display sensitivity to change in a specific clinical situation, whereas constructs viewed as state dimensions may display unexpected stability throughout the longitudinal development of the disorder (Detre & Jarecki, 1971).

Conclusion

If clinical research uses the wrong measures to assess efficacy, if diagnostic tests are not thought through so that clinicians can apply them properly then the results become merely academic, without improving the lives of our patients (Nierenberg & Sonino, 2004; Petersen et al., 2002).

Clinimetric theory offers the conceptual and methodological ground for a substantial revision of assessment parameters and for linking co-occurring syndromes. By a clinical viewpoint, it may allow more flexibility and be more in tune with the clinician's reasoning, both in terms of diagnostic assessment and evaluation of comorbidity, once variables are no longer considered as equal. By a research viewpoint, it may pave the way for inclusion criteria and assessment tools which are more suitable for the purposes of clinical research. Rigid adherence to the psychometric model may only prevent such progress in clinical psychology.

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TABLE 1. Modification of the six dimensions of Psychological Well-being according to Ryff's model (1989). At least A or B or C should be present for satisfying criteria for each dimension.

Dimensions	Optimal level
Environmental mastery	A. The subject has a sense of mastery and competence in managing the environment; B. Makes effective use of surrounding opportunities; C. Is able to create or choose contexts suitable to personal needs and values.
Personal growth	A. The subject has a feeling of continued development; B. Has sense of realizing own potential; C. Sees improvement in self and behavior over time.
Purpose in life	A. The subject has goals in life and a sense of directedness; B. Feels there is meaning to present and past life; C. Holds beliefs that give life purpose.
Autonomy	A. The subject is self-determining and independent; B. Is able to resist to social pressures; C. Evaluates self by personal standards.
Self-acceptance	A. The subject has a positive attitude toward the self; B. Accepts his/her good and bad qualities; C. Feels positive about past life.
Positive relations with others	A. The subject has warm and trusting relationships with others; B. Capable of strong empathy affection, and intimacy; C. Understands give and take of human relationships.

TABLE 2. Definition of Recovery from a Major Depressive Episode

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| <ul style="list-style-type: none"> a) the patient remains in full remission despite discontinuation of treatment (whether pharmacological or psychotherapeutic); b) if subclinical or subsyndromal symptoms are present, these are judged to be likely to improve spontaneously over time or not to affect the course of the illness. Residual symptoms which occurred also in the prodromal phase of illness are unlikely to be devoid of clinical implications; c) the patient reports psychological well-being in at least one of the six areas outlined in Table 1; d) normalization of altered biological markers in the acute phase of illness (if available) should have occurred. |
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