

EDITORIAL

The challenge of measurement in psychiatry: the lifetime accomplishments of Per Bech (1942-2018)

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In spring 2018, the scientific community lost a great psychiatrist, researcher, and human being: Professor Per Bech passed away suddenly after a typical working day.

Per Bech was Professor of Clinical Psychiatry and Head of the Psychiatric Research Unit, Mental Health Centre North Zealand, University of Copenhagen, Denmark. Working initially in psychometrics, and subsequently in clinimetrics, for more than four decades he was undoubtedly one of the most influential scientists in the field.

He was born in Svendborg, Denmark, on January 12, 1942, and obtained his medical degree in 1969 from the University of Copenhagen. At the same University, he specialized in psychiatry and in 1981 defended his doctoral thesis on rating scales for affective disorders. This work (p. 5)¹ already contained a central concept that would inspire his future studies with rating scales: "Among psychiatrists it is widely held that rating scales have been overgrown with statistical symbols, terms, and tables. Statistical inference has had an important position. In my opinion, however, the statistical analyses used have been epistemological tools rather than ornamental plants, and they have never been conceived as alternatives to ordinary clinical thinking." In 1983, he was awarded the Anna-Monika-Stiftung Prize for his innovative clinical approach to the assessment of depression.

His original and outstanding contributions, particularly to the field of clinical psychiatry, include more than 490 papers published in international peer-reviewed journals and a number of books, five of which were published in English.²⁻⁶ Two books in particular, *Clinical Psychometrics*² and *Measurement-Based Care in Mental Disorders*,³ represent his impressive effort to synthesize decades of work dedicated to the study of rating scales.^{7,8} These books contain principles that all psychiatrists should learn about how rating scales can improve not only their research but also their daily clinical practice with patients. In his Preface to *Measurement-Based Care in Mental Disorders*, Bech stated (p. x)³: "All these scales have been used in randomized controlled clinical trials but, as an essential factor in measurement-based care,

the scales should also be valid when making a practical outcome evaluation plan in daily clinical routine."

Bech long questioned the adequacy of traditional psychometric theory in clinical psychiatry and psychology.^{7,9} In a 2004 monograph (p. 136),⁹ he stated: "The basic problem with the classical psychometric concept of statistical coherence (as evaluated by Cronbach's coefficient alpha or factor analysis) is what Feinstein has referred to as the psychosocial investigator problem. Such investigators lack the solid clinical experience when they develop their scales and they are therefore fascinated by the coefficients emerging from correlation analyses, often of statistical but not of clinical significance." Professor Bech was one of the first researchers in psychiatry to understand the importance of supplementing the traditional psychometric model with clinimetrics,¹⁰ the innovative clinically based evaluation method introduced by Alvan R. Feinstein^{11,12} and further refined as the science of clinical measurements.¹³ With his groundbreaking studies on clinimetrics,¹⁴⁻¹⁹ Bech provided a major contribution to the development of this discipline. Combining the clinical judgment of experienced psychiatrists with item response theory (IRT) models, he outlined an innovative method which he used to evaluate the validity of rating scales from a clinimetric perspective.^{2,4,9,10} In his *Clinical Psychometrics* (p. 48),² Bech stated: "When analyzing the measurement validity of an assessment scale such as, for example, a depression scale, it is important first to evaluate its clinical validity; this can only be done by a highly experienced psychiatrist." Thus, modern IRT models are required to statistically test whether a scale measures the severity of the clinical condition under assessment.² Following such clinimetric principles,²⁰ Bech developed a number of fundamental and well-known rating scales, such as the Bech-Rafaelsen Melancholia Scale (MES),²¹⁻²³ the Bech-Rafaelsen Mania Scale (MAS),²⁴⁻²⁷ the World Health Organization-Five Well-Being Index (WHO-5),²⁸⁻³⁰ and the Major Depression Inventory (MDI).^{31,32} He also modified existing scales and proposed short, clinically incisive

versions of many classical scales, such as the 6-item version of the Hamilton Rating Scale for Depression (HAM-D6),^{33,34} the 6-item version of the Hamilton Rating Scale for Anxiety,^{3,35} and the 6-item version of the Brief Psychiatric Rating Scale (BPRS).^{3,14,36}

Professor Bech also introduced Rasch analysis to clinical psychiatry. He first used the IRT model in a demonstration of the scalability of personality items in 1978.³⁷ Three years later, he employed Rasch analysis to demonstrate the clinical validity of the HAM-D6, probably one of the most synthetic rating scales for the assessment of the core symptoms of depression severity.^{33,38-40} In a 2004 paper (p. 135),⁹ he clearly illustrated the clinical utility of Rasch analysis: "In the Rasch analysis, homogeneity is closely linked to transferability. Cattell considered transferability as the key issue in mental testing, and he defined transferability as the extent to which a rating scale measures the same clinical phenomenon in various populations within the range of its intended application (e.g., males versus females, younger versus elderly patients, or primary versus secondary depression)."

Brazilian Journal of Psychiatry readers had the honor of having two contributions by Professor Bech published in the journal. In the 2011 editorial "The ABC profile of the HAM-D17,"⁴¹ Bech showed how the 17 items in the HAM-D could be reallocated to follow the vertices of a triangle so that "A" covers the core symptom items of the depressive state (HAM-D6), while "B" (HAM-D9) covers the unspecific stress (arousal) items with reference to Selye's original definition of stress as the non-specific response of the body to any demand made upon it. Finally, "C" (HAM-D2) covers the items of suicidal thoughts and lack of insight. He emphasized that the ABC profile can also be used as a guide to evaluate patients with depressive symptoms, starting from the B vertex, going to the A vertex, and concluding through C.⁴¹ In 2013, Bech was the first author of another study published in the *Brazilian Journal of Psychiatry*: "The time has come to stop rotations for the identification of structures in the Hamilton Depression Scale (HAM-D17)."⁴² By changing the pattern of loadings already found clinically meaningful within the principal component analysis approach, Bech and co-authors showed that the rotated factors can be seen as an artifact of factor analysis.⁴² As he previously noted in his *Clinical Psychometrics* (p. 37)²: "It was after many attempts to perform factor analysis, especially with the many suggested ways of rotation, that Rasch realized that this approach was unscientific, because the guidelines for these rotations procedures were based on trial and error, not on evidence."

In all his innovative initiatives, the patient was the focus of his efforts, and the clinician, besides, benefited from the development of new tools for clinical measurement. In his last book (p. 86),³ Bech stressed this concept: "The value of measurement-based care evaluation plans in the daily routine is in taking into account such issues as why do patients so often drop out of the treatment plan? Or why do they stop taking their medicine? We have considered the essential element in measurement-based care as that of ensuring a collaborative relationship between the doctor and his or her patient. The self-reported

Symptom Checklist-90 (SCL-90) subscales, the self-reported side-effect scale (PRISE-CAR), and the WHO-5 well-being questionnaire are measurements that require the doctor to listen to the patient. This makes it possible for the doctor and the patient to collaborate every second week to evaluate the extent of improvement during the course of treatment."

Professor Bech proposed the pharmacopsychometric triangle for measurement-based care.^{2,3,43} In this model, the first vertex of the triangle represents clinically desired effects; the second represents the adverse or side effects of medications; and the third, patient-reported quality of life or psychological well-being. Bech focused on a clinimetric approach and performed the Rasch and Mokken analyses to identify short and valid rating scales to be used for each vertex.^{2,3,43} Using brief, unidimensional, and clinically valid instruments which also display clinimetric sensitivity is an excellent strategy to optimize the time spent during an interview with a patient.^{3,44} Using instruments that are shorter and more user-friendly would allow clinicians to both spend more time in empathic human contact and also measure the care provided.

Recently, Fava et al.⁴⁵ noted that standard psychometric evaluation methods are inadequate to capture the complexity of treatment outcomes in psychopharmacology. Therefore, they proposed a comprehensive assessment strategy and defined as "clinical pharmacopsychology" the area concerned with the application of clinimetric methods to the evaluation of psychological effects of medications, including the clinical benefits of psychotropic drugs, the characteristics that predict responsiveness to treatment, the vulnerabilities induced by specific therapies (i.e., side effects, behavioral toxicity, iatrogenic comorbidity), and the interaction of drugs with specific and nonspecific treatment ingredients.⁴⁵ As they state in their position paper (p. 134),⁴⁵ "Clinical pharmacopsychology offers a unifying framework for the understanding of clinical phenomena in medical and psychiatric settings."

Another area that particularly attracted Bech's attention in recent years was the clinical assessment of positive mental health.^{3,46-49} To evaluate such a clinical dimension, he recommended using rating scales with positively worded items.^{3,17,44} He and his research group^{28,29} validated one of the most widely used rating scales containing only positively phrased items: the WHO-5, a self-report questionnaire for the assessment of psychological well-being. Recently, Fava et al.⁵⁰ provided a comprehensive definition of positive mental health when they introduced the concept of euthymia. They expanded the traditional meaning of euthymia used in the psychiatric literature and described a condition characterized not only by the absence of affective disorders but also by the presence of psychological flexibility and well-being, resistance to stress, and a unifying outlook on life, which guides actions and feelings for shaping future accordingly.⁵⁰ They also developed a self-rating scale for the assessment of euthymia,⁵⁰ which has been found to display excellent clinimetric properties.⁵¹ In his *Measurement-Based Care in Mental Disorders* (p. 46),³ Bech described this scale as follows: "The euthymia scale can be considered a

combination of the fighting spirit personality and the WHO-5 items.”

Professor Bech’s work is a legacy of how science and humanism can interact and improve the quality of care. With his mind looking ahead, he anticipated the future challenges for clinician scientists⁵²: applying scientific methods to the care of patients and the assessment of their mental health.^{53,54} Thank you, Professor Bech, for your extraordinary contribution and example.

Disclosure

The authors report no conflicts of interest.

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