

Meaning, Measurement & Personality Disorder

Pragmatic Psychometric Profiling
VS
Measurement based upon causal theory

Paul Barrett

email: p.barrett@liv.ac.uk

<http://www.liv.ac.uk/~pbarrett/paulhome.htm>

Affiliations: The State Hospital, Carstairs
Dept. of Clinical Psychology, Univ. Of Liverpool
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Pragmatic Measurement

- ▣➔ has utility
- ▣➔ may not be indexing any causal variables
- ▣➔ is not concerned with axiomatic properties of measurement
- ▣➔ is not necessarily designed from *a-priori* theory and meaning instantiation.

Quantitative Scientific Measurement

- ▣➔ generally has utility
- ▣➔ designed from *a-priori* theory and meaning instantiation
- ▣➔ is directly concerned with the axiomatic properties of measurement
- ▣➔ takes care to establish the quantitative structure of any variables for which measurement is to be constructed.

Let's be Pragmatists .1

Task: we need to determine those individuals who might be said to possess a “personality disorder”- PD - so that we can make decisions concerning their removal from society (for society's safety), perhaps offer some kind of treatment, and perhaps to no more than be able to distinguish them from other mentally disordered patients (on the basis of excluding them from certain treatments).

Let's be Pragmatists .2

Computational Essence of our problem: we need to determine the optimal set of criterion variables and their weights that will predict a single-scale function of PD.

Measurement Problems: not all prediction variables will necessarily be quantitative.

Criterion Variable Problem: how are we to define PD since it is not an objective outcome variable (i.e. success or failure) but a psychological construction?

Solutions? Select variables according to some utility value for each, with maybe an eye on a model for PD i.e. an “exclusion based **model**” rather than an “inclusive” symptom **model**. Perhaps, tie the meaning of PD operationally to societal-based useful outcome variables (legal?).

Let's look at how an enhanced pragmatic approach might work in occupational selection - using **smart profiling** ..

The next few slides are taken from:

Barrett, P.T. (1999) Beyond Psychometrics: The strategic implications for occupational psychology. *BPS DOP Millennium Conference, March 1999.*

Available for download (ppt and pdf) from:
<http://www.liv.ac.uk/~pbarrett/present.htm>

A bank would like to select 20 high-flyer candidates to train as business development managers, one for each of 20 targeted branches. The training is full-time, and intensive, lasts for 10 months and involves study of both academic and practical matters concerned with company law, corporate accounting, advanced banking practice, financial planning, insurance protocols, and basic business computing skills. The bank wishes to appoint from both within its own staff complement, and externally.

After the 10 month training, the candidates are expected to move into place, and undertake their new role.

Phase 1: Step 1

Create a precise job specification, both for the training **AND** for the final job.

Phase 1: Step 2

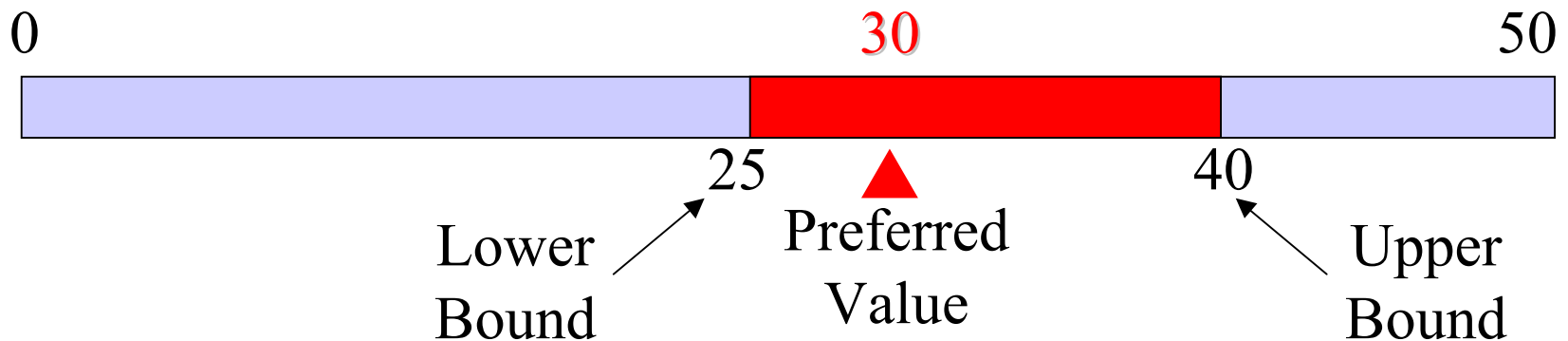
Create the person specification. In fact, you are now going to create the **Preferred Employee Model (PEM)**. Whereas a person specification is generally a series of verbal requirements, or perhaps a “target” profile from say an OPQ or 16PF5, the PEM is a computational schema, complete with variables to be measured, their preferred values and permissible ranges, and their weighting coefficients for the profile function. The PEM forms the basis for the computational fit of candidates.



A “target” variable possesses

- ▶ a *mandatory* or *optional* classification
- ▶ a “preferred value”
- ▶ a lower bound
- ▶ an upper bound

For say Critical Verbal Reasoning, as a target variable, we could specify these variables as:



The computational profile function consists of:

- ▶ a distance weighting function for normalised within-profile distance
- ▶ a variable weight (importance) coefficient within the overall profile

For a single quantitative variable we have:

$$D = [(PV - AV) \cdot f] \cdot w$$

Where: PV = Preferred Value for the target variable

AV = Actual observed Value

f = the distance weighting function

w = the profile weight for that variable

The model in total also consists of:

- ▶ *cumulative-count* variables (e.g. the number of ‘A’ levels, or the number of years of service etc.)
- ▶ *categorical variables* (e.g. evidence of excellence [yes, no], favourable appraisal last year [yes, no], qualification in area [banking, accountancy, finance, business computing])

These forms of variables have a profile weight applied to a threshold function, cumulative count, or each category.

Finally, production rules may also be invoked, in order to account for target *combinations* of certain variables

The complete computational schema sequence:

Though not necessarily in this order:

$$D = \sum_k \sum_i \left[(PV_{k_i} - AV_{k_i}) \cdot f_{k_i} \right] \cdot w_{k_i}$$

numerical variables
i across k categories

$$D = \sum_i (CD_i \cdot cw_i)$$

i categorical variables
CD = category distance
PRO = production rule outcome

$$D = \sum_i \left[PRO_i \cdot \{ \text{productionrule weight function} \}_i \right]$$

i rules

The kinds of variable categories to be considered:

- ▶ Age, gender
- ▶ Psychological Attributes
- ▶ Education Qualifications
- ▶ Professional Qualifications
- ▶ Supervisor Ratings
- ▶ Previous Skill Ratings/Performance Indices
- ▶ Job History
- ▶ Other Relevant Information

Benefits of this approach

- ▣▣▣▣➔ We are forced to make absolutely explicit the criterion variables, their weights, and their importance to our outcome variable PD.
- ▣▣▣▣➔ There is no clinical diagnostic judgement involved AFTER the profiling model is created.
- ▣▣▣▣➔ You have a clear means of making an “ordinally scaleable” diagnosis on any patient who enters the system
- ▣▣▣▣➔ You can easily evaluate the consequence of changing one or more variable features (or deletion, augmentation) by re-running the model on your patient groups (i.e. how many might now be “selected” as PD - and what are they like as a group).

Drawbacks of this purely pragmatic approach

- ▣▣▣▣➤ The causal status of the variables used in the measurement is unclear i.e. how do these individuals become PD. Why do they show such symptoms?
- ▣▣▣▣➤ You are possibly making a whole range of assumptions concerning the quantitative operations made within the measurement.
- ▣▣▣▣➤ If you change some criteria, you can possibly completely change the membership of any PD group.
- ▣▣▣▣➤ Knowing group membership may not help you to offer appropriate treatment.

Let's be Quantitative Scientists .1

The Same Task: we need to determine those individuals who might be said to possess a “personality disorder”- PD - so that we can make decisions concerning their removal from society (for society's safety), perhaps offer some kind of treatment, and perhaps to no more than be able to distinguish them from other mentally disordered patients (on the basis of excluding them from certain treatments)

Let's be Quantitative Scientists .2

The PD construct

- ▣➡ designed from *a-priori* theory and meaning instantiation
- ▣➡ directly concerned with the axiomatic properties of measurement
- ▣➡ takes care to establish the quantitative structure of any variables for which measurement is to be constructed.

Basically, we have to figure out what we mean by a construct called “Personality Disorder”. **Until we specify its meaning and rules for instantiation (which implies a proposed causal model for any explanatory variables), we cannot make measurement that accords to a quantitative scientific definition.**

Let's be Quantitative Scientists .3

A Problem

▣▣▣▣ if we speak of “Personality Disorder”, this implies we have a clear definition for what constitutes Personality. The “Disorder” tag can then be specified as some departure from a “Normal” categorisation.

Let's be Quantitative Scientists .3 ... **what is Personality?**

Eysenck (1970) provided a definition of personality as:

‘A more or less stable and enduring organisation of a person’s character, temperament, intellect, and physique, which determines his unique adjustment to the environment. **Character** denotes a person’s more or less stable and enduring system of conative behaviour (“will”); **temperament**, his more or less stable and enduring system of affective behaviour (“emotion”); **intellect**, his more or less stable and enduring system of cognitive behaviour (“intelligence”); **physique**, his more or less stable and enduring system of bodily configuration and neuroendocrine endowment.’

(H.J. Eysenck, 1970, p. 2 ...The structure of human personality (3rd ed.), London: Methuen)

Let's be Quantitative Scientists .4

Do any of these “variables” possess quantitative structure?

Michell, Science, and Measurement

▶ The Scientific Hypothesis

- ↳ a variable of interest possesses quantitative structure
 - ↳ ordinality
 - ↳ additivity (concatenation)
 - ↳ a unit “object” of measurement and a standard series

▶ The Instrumental Hypothesis

- ↳ developing more accurate measures of magnitudes for the quantitative variable

Michell, J. (1997) Quantitative Science and the definition of measurement in psychology. *British Journal of Psychology*, 88, 355-383

My conclusions .1

- ★ I don't think there can be any substantive progress in understanding PD until a clearly specified criterion-set of variables (and the magnitudes and/or outcomes on each) is defined for PD, in such a way that they can form a computational profile for PD categorisation.
- ★ Therefore, using psychometric tests for **the purpose of identifying patients with a personality disorder** is not possible, for the criterion is still relatively ambiguous.

My conclusions .2

★ In the meantime, I would encourage the idiographic approach of Sean Hammond for **treatment** issues - as this enables a clinician to deal directly with the problems of the patient at hand. Psychometric tests may, or may not, be used by the clinician - but now their use is patient-focussed and specific, rather than normative-criterion diagnosis focussed.

★ Ultimately, **outcome evaluation** will be the final arbiter of treatment success or failure.

★ Look at Adrian Raine's work - and think again about the definition and "psychology" of PD, and its "psychological treatment".

Adrian Raine, DPhil; Todd Lencz, PhD; Susan Bihrlle, PhD; Lori LaCasse, BA; Patrick Colletti, MD. (2000) Reduced Prefrontal Gray Matter Volume and Reduced Autonomic Activity in Antisocial Personality Disorder. *Arch. Gen. Psychiatry*. 2000;57:119-127,128-129

Valid Questions

- What test/s can I use to help me decide whether this patient has a personality disorder?
- What test/s can I use to show change in my patient with PD?
- Why don't I just use the DSM and stay with the medical model?

Solutions

- Structure PD - and cumulative symptom/behaviour/cognition scaling ... the Hammond approach
- Smart Profiling using computational profile generation ... the Barrett approach