“Psychometric Monitoring in the Military: Importance and Difficulty”

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Presentation focus

- **Importance of monitoring**: raison d'être, difference from recruitment, difficulty

- **The standard resilience concept**: limits of mathematical measurement, important macro components, its relation to monitoring

- **Road to resilience monitoring**: set of ground requirements

  ... And to **Antifragility**: “don’t resist shocks, but benefit from them”
“The systematic evaluation, at given time intervals, of qualitative variations of psychometric traits”
Monitoring, state-of-the-art assumptions

- **Objective**: strength as a collective, implying resilience of the entire human capability development in the military
- Recruitment instruments evaluate resilience traits & facets, but are not followed up at regular intervals in a systematic and objective way

What are the assumptions of this thinking?
- Resilience is a static trait of individuals
- Monitoring is considered better when performed by humans
- Psychometric science of dynamic traits is (for now) too complex
Let’s not add yet another definition of resilience, but let us define an important categorization:

“Complete resilience is the ability to adapt to enduring circumstances and acute instances of adversity”
... enduring circumstances and acute instances ...

**Cumulative Traits**
- Yields predictable behavioural responses
- Can be approximated with Gaussian models

**Non-linear traits**
- Unpredictable behavioural responses, only visible during the instant itself (concept studied in military human factor studies)
- Cannot be expressed with linear models/Gaussian models
- Lack of labelling data for predictive validity modelling (asymmetric dataset)
... enduring circumstances and **acute** instances ...

**Cumulative** Traits
- Yields predictable behavioural responses
- Can be approximated with Gaussian models

Example pathology: **Burnout** as direct effect of cumulative stress (Potter et al., 2010)

**Non-linear** traits
- Unpredictable behavioural responses, only visible during the instant itself (concept studied in military human factor studies)
- Cannot be expressed with linear models/Gaussian models
- Lack of labelling data for predictive validity modelling (asymmetric dataset)
Monitoring of cumulative traits is intrinsically different from recruitment in both process and psychometric terms.

**Dynamic trait premise:** characteristics of the individual change over time
- Currently performed by in-house psychologists and not via instruments, which reduces standardization and objectivity
- Ad-hoc monitoring instruments cannot be validated with standard measures as test-retest reliability

**Different Expected Utility model**
- Recruitment utility of instruments is clear: getting recruited
- Monitoring utility is non-existent if not related to benefits of promotion/paid leave
Monitoring use case: Italian armed forces

Sample size
N=16 soldiers, 3 samplings (48 data points)

Deployed on public safety tasks at a regional level

Military contact
Single-point-of-contact, with decision making power, who administered the tests

ADMONITOR-18
Paper administrations every 3 weeks
Monitoring use case: Normality testing

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In essence: the number of items passing normality testing reduced at each sampling
Monitoring use case: Response distribution
Lesson learnt: Main research question

How to devise a military psychometric self-reporting instrument for monitoring, which:

• Measures **qualitative variations** of **cumulative** variables
• Has **expected utility** for the candidate
• Has **predictive validity with known burnout scales / stress measures**
• Which **assists CBT** treatment status evaluation
• Exhibits reliability over time in terms of lack of variability degradation

...
Main research question

... And above all, acts as criteria for the creation of next generation training measures to enable **antifragility**, intended as the ability to benefit from adverse, variable and unforeseen circumstances (Taleb, 2012), rather than be harmed by it, or simply be resilient to it.

*Monitoring is necessary to bring resilience analysis to antifragility analysis.*

Currently looking for international collaborations on this line of research.

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