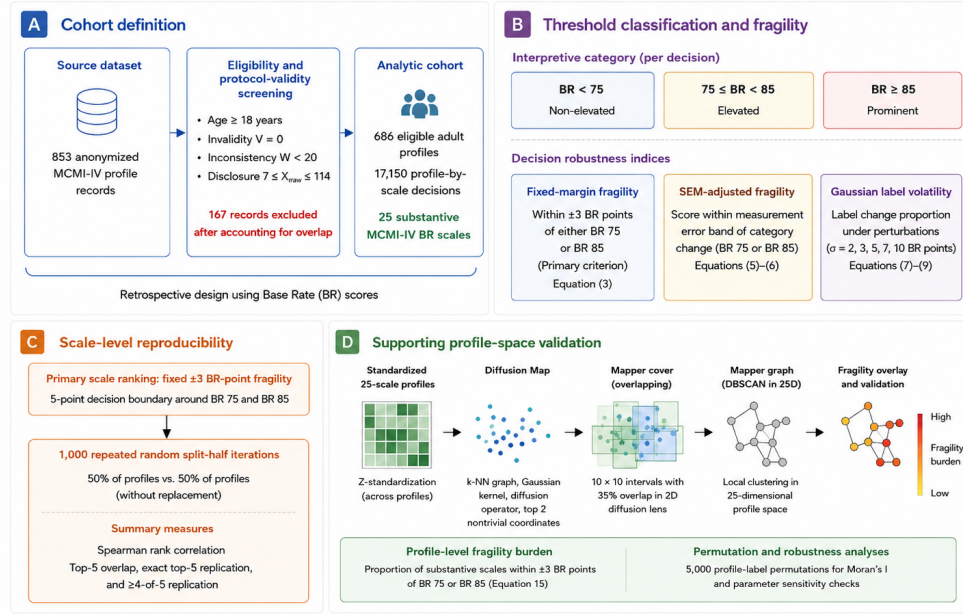


Supplementary Material

Threshold Fragility in MCMI-IV Base Rate Interpretations: a Retrospective Psychometric Analysis

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Supplementary Figures



Abbreviations: MCMI-IV, Millon Clinical Multiaxial Inventory-IV; BR, Base Rate; SEM, standard error of measurement; DBSCAN, density-based spatial clustering of applications with noise; k-NN, k-nearest neighbors.

Fig. S1 Conceptual and method overview. The study proceeds from cohort screening and BR-threshold classification to the fixed-margin fragility atlas, threshold-specific and SEM-adjusted characterization, Gaussian perturbation and split-half robustness checks, and supporting whole-profile Diffusion Map/Mapper validation. BR = Base Rate; SEM = standard error of measurement.

Supplementary Tables

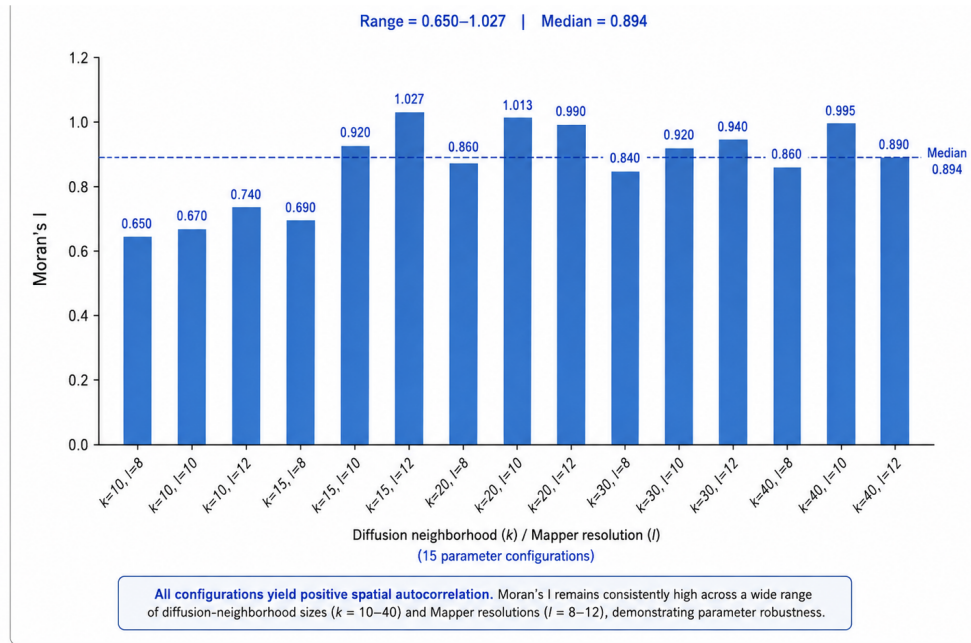


Fig. S2 Diffusion/Mapper parameter robustness. The unadjusted graph-level Moran's I remained positive across 15 configurations formed by diffusion-neighborhood size $k = 10, 15, 20, 30, 40$ and Mapper resolution 8, 10, or 12 intervals per diffusion dimension (range .650–1.027; median .894). This sensitivity analysis supports the stability of the unadjusted topology result but does not supersede the elevation-adjusted analysis reported in the main text.

Table S1: MCMI-IV Base Rate scales included in the primary analyses

Code	Scale	Dataset variable
1	Schizoid	BR_1
2A	Avoidant	BR_2A
2B	Melancholic	BR_2B
3	Dependent	BR_3
4A	Histrionic	BR_4A
4B	Turbulent	BR_4B
5	Narcissistic	BR_5
6A	Antisocial	BR_6A
6B	Sadistic	BR_6B
7	Compulsive	BR_7
8A	Negativistic	BR_8A
8B	Masochistic	BR_8B
S	Schizotypal	BR_S

Code	Scale	Dataset variable
C	Borderline	BR_C
P	Paranoid	BR_P
A	Generalized Anxiety	BR_A
H	Somatic Symptom	BR_H
N	Bipolar Spectrum	BR_N
D	Persistent Depression	BR_D
B	Alcohol Use	BR_B
T	Drug Use	BR_T
R	Post-Traumatic Stress	BR_R
SS	Schizophrenic Spectrum	BR_SS
CC	Major Depression	BR_CC
PP	Delusional Disorder	BR_PP

Note. Disclosure (X), Desirability (Y), Debasement (Z), Validity (V), and Inconsistency (W) were not included as substantive variables.

Table S2: Scale-specific reliability coefficients, observed Base Rate score standard deviations, and standard errors of measurement

Code	Scale	α_j	Observed BR SD (s_j)	SEM_j
1	Schizoid	0.73	14.38	7.47
2A	Avoidant	0.84	20.77	8.31
2B	Melancholic	0.88	17.62	6.10
3	Dependent	0.77	24.19	11.60
4A	Histrionic	0.72	20.79	11.00
4B	Turbulent	0.82	20.19	8.57
5	Narcissistic	0.71	18.22	9.81
6A	Antisocial	0.66	19.84	11.57
6B	Sadistic	0.73	11.87	6.17
7	Compulsive	0.60	15.76	9.96
8A	Negativistic	0.80	15.21	6.80
8B	Masochistic	0.83	18.00	7.42
S	Schizotypal	0.73	13.64	7.09
C	Borderline	0.86	19.15	7.16
P	Paranoid	0.77	14.03	6.73
A	Generalized Anxiety	0.74	18.91	9.64
H	Somatic Symptom	0.78	22.26	10.44
N	Bipolar Spectrum	0.70	18.39	10.07
D	Persistent Depression	0.89	21.99	7.29
B	Alcohol Use	0.48	31.37	22.62
T	Drug Use	0.76	25.98	12.73
R	Post-Traumatic Stress	0.84	23.54	9.42
SS	Schizophrenic Spectrum	0.83	15.41	6.35

Code	Scale	α_j	Observed BR SD (s_j)	SEM_j
CC	Major Depression	0.90	23.46	7.42
PP	Delusional Disorder	0.80	17.85	7.98

Note. Observed BR-score standard deviations were calculated from the final analytic sample of 686 profiles. Cronbach's alpha coefficients were obtained from the Persian MCMI-IV validation study. $SEM_j = s_j\sqrt{1 - \alpha_j}$.

Table S3: Scale-level measurement-error-adjusted fragility

Scale	Mean estimated category-change probability (%)
Somatic Symptom	38.2
Negativistic	35.3
Dependent	30.1
Borderline	30.0
Schizoid	29.5
Melancholic	29.2
Generalized Anxiety	29.2
Paranoid	29.1
Sadistic	28.8
Narcissistic	28.6
Avoidant	27.0
Delusional Disorder	27.0
Bipolar Spectrum	25.3
Alcohol Use	24.9
Antisocial	24.8
Post-Traumatic Stress	24.7
Schizotypal	23.6
Schizophrenic Spectrum	23.4
Persistent Depression	23.2
Major Depression	17.9
Masochistic	16.4
Drug Use	16.4
Histrionic	14.6
Compulsive	13.6
Turbulent	10.7

Note. Values are averages across 686 profiles and describe sensitivity of test-based threshold decisions under the scale-specific SEM model; they are not probabilities of clinical diagnosis.

Table S4: Scale-level label volatility under the primary Gaussian perturbation model

Scale	Mean label-change probability at $\sigma = 5$ (%)
Negativistic	26.6
Melancholic	25.7
Sadistic	24.4
Borderline	23.3
Somatic Symptom	23.2
Paranoid	22.8
Schizoid	21.5
Avoidant	19.3
Schizophrenic Spectrum	19.1
Schizotypal	18.0
Generalized Anxiety	17.8
Delusional Disorder	17.8
Persistent Depression	17.2
Narcissistic	16.6
Dependent	16.5
Post-Traumatic Stress	14.9
Bipolar Spectrum	14.0
Major Depression	12.8
Antisocial	11.4
Masochistic	11.2
Histrionic	6.8
Compulsive	6.6
Alcohol Use	6.2
Turbulent	5.9
Drug Use	4.0

Note. Values are analytic probabilities under a common $\sigma = 5$ BR-point perturbation and should not be interpreted as temporal clinical instability.