

Investigating the associations of trajectories of depressive symptoms and self-perceived health and incident dementia – an unsupervised machine learning approach.

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BACKGROUND

- Risk factors show inter-individually varying trajectories over the lifespan with differential effects on the risk of dementia¹
- depressive symptom trajectories characterized by late-onset are associated with adverse cognitive outcomes²

RESEARCH QUESTIONS

- Which trajectories of depressive symptoms and self-perceived health can be observed?
- How are the distinct risk factor trajectories associated with dementia?

METHODS

- Risk factors were measured with the Euro-Depression scale (EURO-D) and a single item measure for Self-Perceived Health (SPH)
- Clustering reveals 5 distinct trajectories for SPH & EURO-D (see figure 1)
- Dementia status was assessed through self-reports

Table 1. Demographic variables.

Variable	N
Mean age (SD)	73.88 (7.88)
Self-report female sex (%)	3,050 (57.3)
Education	
Lower secondary (%)	2,388 (44.8)
Upper secondary (%)	1,469 (27.6)
Tertiary (%)	1,432 (26.9)

Note. 5,326 respondents to the Survey of Health, Ageing and Retirement in Europe (SHARE)³ have been included.

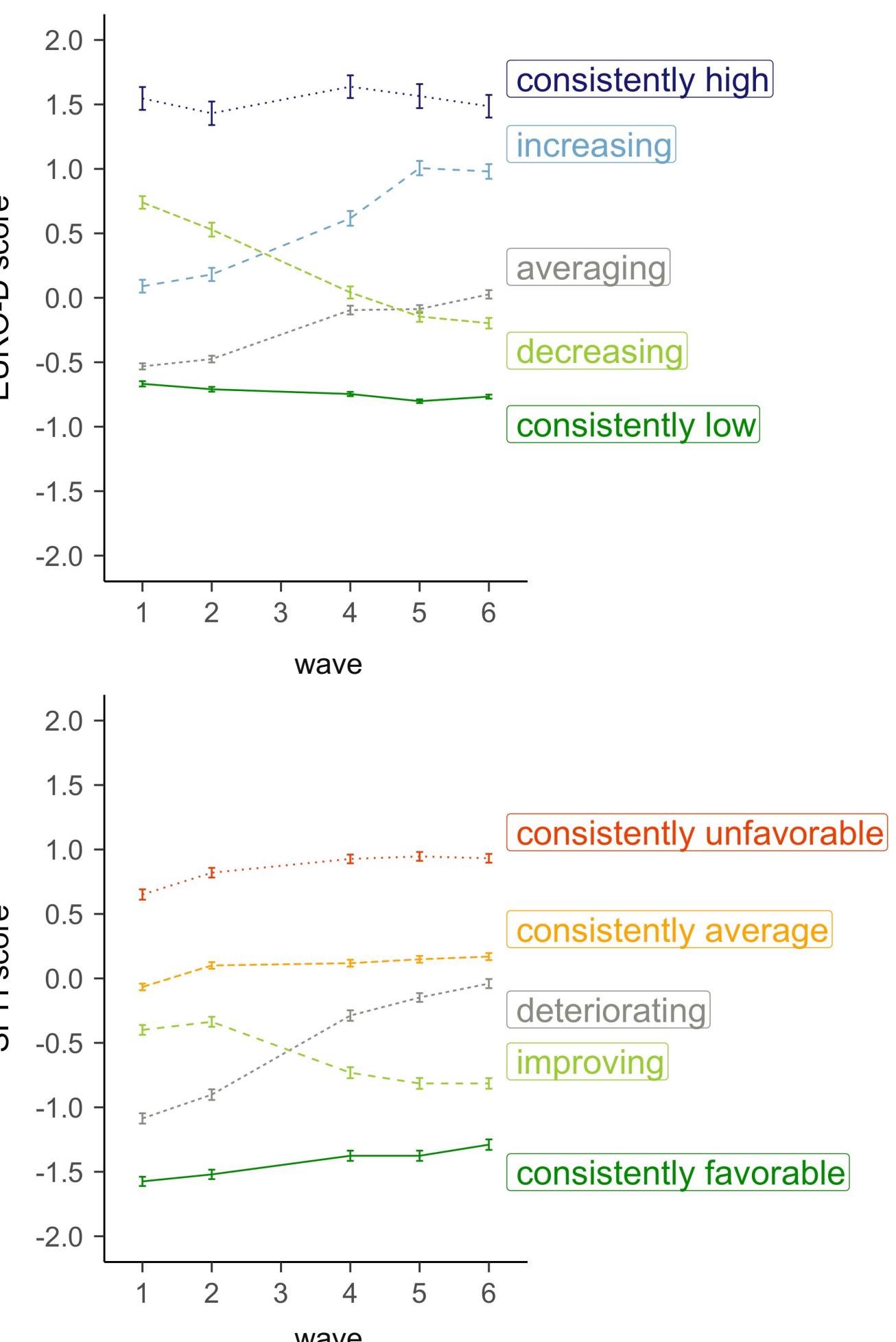


Figure 1. Values of EURO-D and SPH per trajectory cluster. Scores were z-standardized. Wave 3 did not cover the variables of interest.

RESULTS

- Visual inspection suggests 5 distinct clinically relevant trajectories for EURO-D and SPH
- Trajectories of **consistently high** and **increasing EURO-D** as well as **consistently unfavorable SPH** alter the risk for dementia (see table 2)

Table 2. Odds Ratios for risk factor trajectories.

Variable	N	Odds ratio	p
EURO-D consistently low	1965	Reference	
averaging	1270	1.02 (0.53, 1.95)	0.94
decreasing	846	1.21 (0.58, 2.46)	0.60
increasing	681	1.91 (0.99, 3.71)	0.05
consistently high	368	2.54 (1.21, 5.31)	0.01
SPH consistently favorable	849	Reference	
deteriorating	936	1.78 (0.60, 6.54)	0.33
consistently average	1548	2.32 (0.87, 8.04)	0.13
improving	871	2.15 (0.72, 7.84)	0.20
consistently unfavorable	926	3.68 (1.34, 13.04)	0.02

Note. Logistic regressions controlled for age group (50-59, 60-69, 70+), sex, country and ISCED level (lower/upper secondary, tertiary).

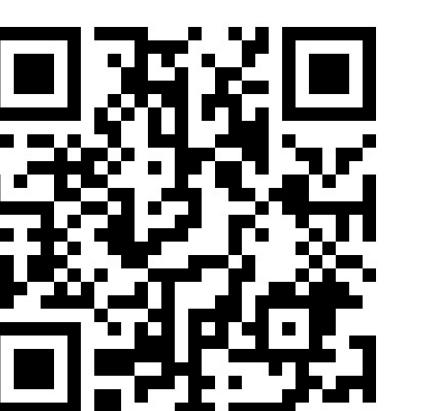
TAKE-HOME MESSAGE

- Distinct shapes of risk factor trajectories are associated with dementia in old age
- Long-term consistent trajectories associated with dementia risk suggest depressive symptoms and self-perceived health as risk factors rather than indicators of a prodromal stage

REFERENCES

- Singh-Manoux A, Dugavat A, Shipley M, et al. Obesity trajectories and risk of dementia: 28 years of follow-up in the Whitehall II Study. *Alzheimers Dement J Alzheimers Assoc.* 2018;14(2):178-186. doi:10.1016/j.jalz.2017.06.2637
- Demitz N, Anatürk M, Allan CL, et al. Association of trajectories of depressive symptoms with vascular risk, cognitive function and adverse brain outcomes: The Whitehall II MRI sub-study. *medRxiv*. Published online May 26, 2020:2020.05.20.20106963. doi:10.1101/2020.05.20.20106963
- Börsch-Supan A, Brandt M, Hunkler C, et al. Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *Int J Epidemiol.* 2013;42(4):992-1001. doi:10.1093/ije/dyt088

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