

Lifestyle and behavioural influences on cognitive ageing across cultures

PhD candidate: Anamaria Brailean
Supervisors: Prof. Martin Prince, Dr. Matthew Prina
King's College London

Project objectives

A first rationale for carrying out this research project is the need for a better understanding of the ageing-related changes in different cognitive domains. Secondly, this project aims to advance our understanding of the nature, direction and robustness of the association between cognitive function domains and late-life depression dimensions. This includes a particular focus on the cross-cultural validity of the assessment instruments, as a prerequisite for cross-cultural comparisons. There is also an interest to examine whether later born cohorts differ from earlier born cohorts in their level of cognitive performance, in their rate of decline in specific cognitive abilities, and in the complex relation between cognitive abilities and late-life depression dimensions. Last but not least, this project aims to investigate the potential protective role of a lifestyle factor, namely physical activity, on cognitive and depression functioning in old age.

The study sample comprises 10,405 community-dwelling older adults from six Latin American countries (10/66 database), as well as baseline and follow up data from 3 Dutch cohorts: 1992, 2002, 2012 (Longitudinal Ageing Study in Amsterdam).

Research question 1

- Is the Euro-D factor model invariant across Latin American countries?
- Is there a differential association of late-life depression domains with age, gender, verbal fluency and memory performance? Is this association weakened or exaggerated by measurement bias?

Analysis Method

Multiple Indicators Multiple Causes Modelling

Main findings

- The Euro-D factor structure was invariant across Latin American countries;
- Measurement bias was minor and did not alter substantive conclusions;
- Gender differences were larger for affective suffering than for motivation disturbance, whereas differences in verbal fluency impairment were more strongly related to motivation disturbance;
- Both depression domains were unrelated to age;
- Cognitive function levels confounded the effect of age on depression domains.

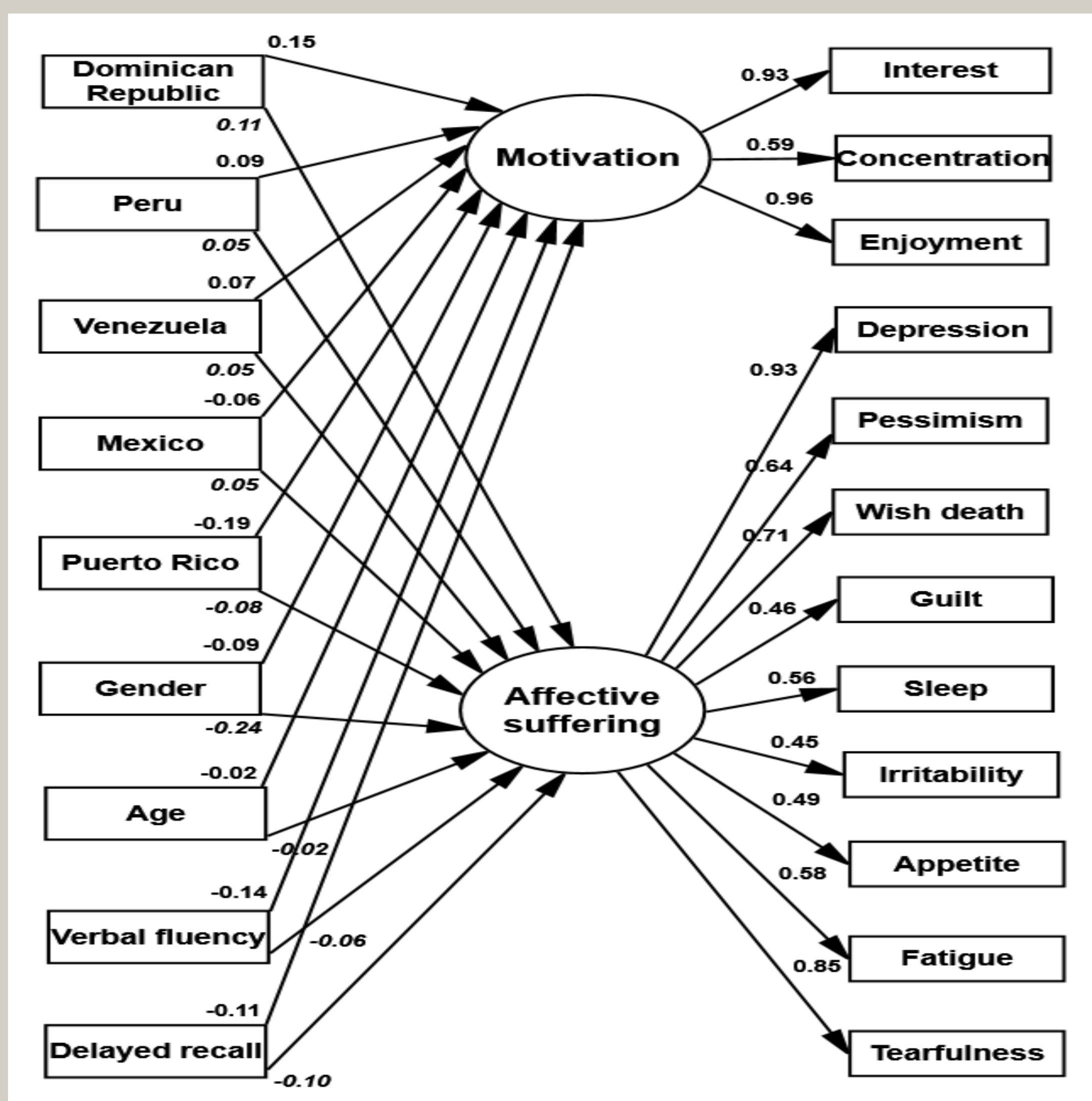


Figure 1. Multiple Indicator Multiple Causes (MIMIC) model showing the impact of background variables on the two depression factors, before adjusting for direct effects. Residual covariances are not shown in the model. For gender the reference group is female; for country the reference group is Cuba.

Research question 3

How many factors (or cognitive dimensions) could account for the performance of older individuals across a range of cognitive tests?

Analysis Method

Exploratory factor analysis (EFA)
Confirmatory factor analysis (CFA)

Main findings

The measurement model consisted of the following factors: memory, orientation, language, praxis and executive function.

Research question 4

What is the cross-sectional and longitudinal relation between physical activity levels, depressive symptoms and cognitive abilities in old age?

Analysis Method

General linear models

Main findings

- Higher levels of physical activity at baseline predicted lower levels of depression at both baseline and follow-up.
- Higher levels of physical activity at baseline predicted: (1) better cognitive performance at baseline in the areas of language, orientation and executive function; (2) better cognitive performance at follow up in the areas of memory and orientation.

Research question 2

- How do different domains of cognitive functioning change overtime?
- How do depressive symptoms change overtime?
- What is the longitudinal relationship between domains of cognitive functioning and depressive symptoms? What is the direction of causation?

Analysis Method

Cross-lagged path analysis

Main findings

- For all cognitive abilities, higher performance at baseline predicted higher performance at follow-up;
- Higher levels of depressive symptoms at baseline predicted higher levels of depressive symptoms at follow-up;
- Significant bidirectional effects were found between depressive symptoms and memory, orientation and executive function impairment, but not for language impairment. The magnitude of the cross-lagged effects was comparably small for both directions of causation;
- Older age was related to poorer performance in all cognitive domains;
- Higher education predicted better cognitive performance and lower levels of depressive symptoms;
- Females had higher levels of depressive symptoms than males.

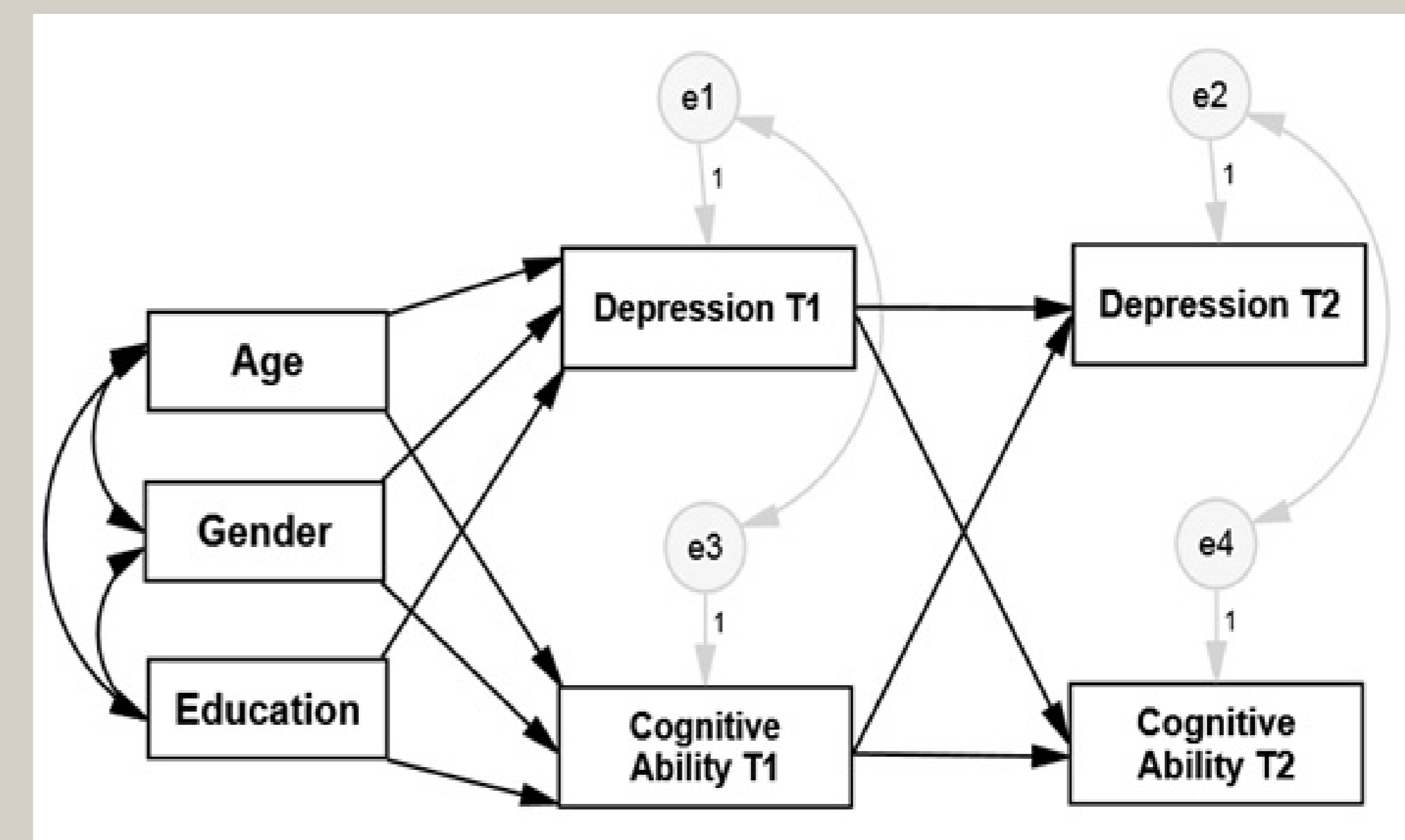


Figure 2. Example of a two-occasion cross-lagged model that captures the direction of effect between a specific cognitive ability and depressive symptoms. The model assumes that each variable predicts itself and the other variable overtime. Education, age and gender are included as covariates in the model.

Future Directions

Research question 5

What is the longitudinal relation between specific depression dimensions (affective suffering and motivation disturbance) and specific cognitive abilities?

Analysis Methods

Cross-lagged structural equation modelling (using 10/66 data)

Research question 6 (secondment at VuMC Amsterdam)

Are there cohort differences in the initial levels of performance and in the rate of decline in different cognitive domains?

Analysis Method

Univariate general linear models & general linear models with repeated measurements

Research question 7 (secondment at VuMC Amsterdam)

Is there a differential relation between specific depression dimensions and specific cognitive function dimensions? Does this relation differ between Dutch cohorts?

Analysis Method

Multi-group structural equation modelling

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