

# Modelling the Effects of Lifestyle and Demographics on Cognition: A Factor Analysis Approach

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## BACKGROUND

- Models of cognition suggest several core components: cognitive control, working memory and attention, and visuomotor functioning
- Lifestyle and demographic attributes are known to be related to cognitive performance
- Modelling latent factors and lifestyle and demographics variables simultaneously is possible through Regularized SEM (RegSEM)

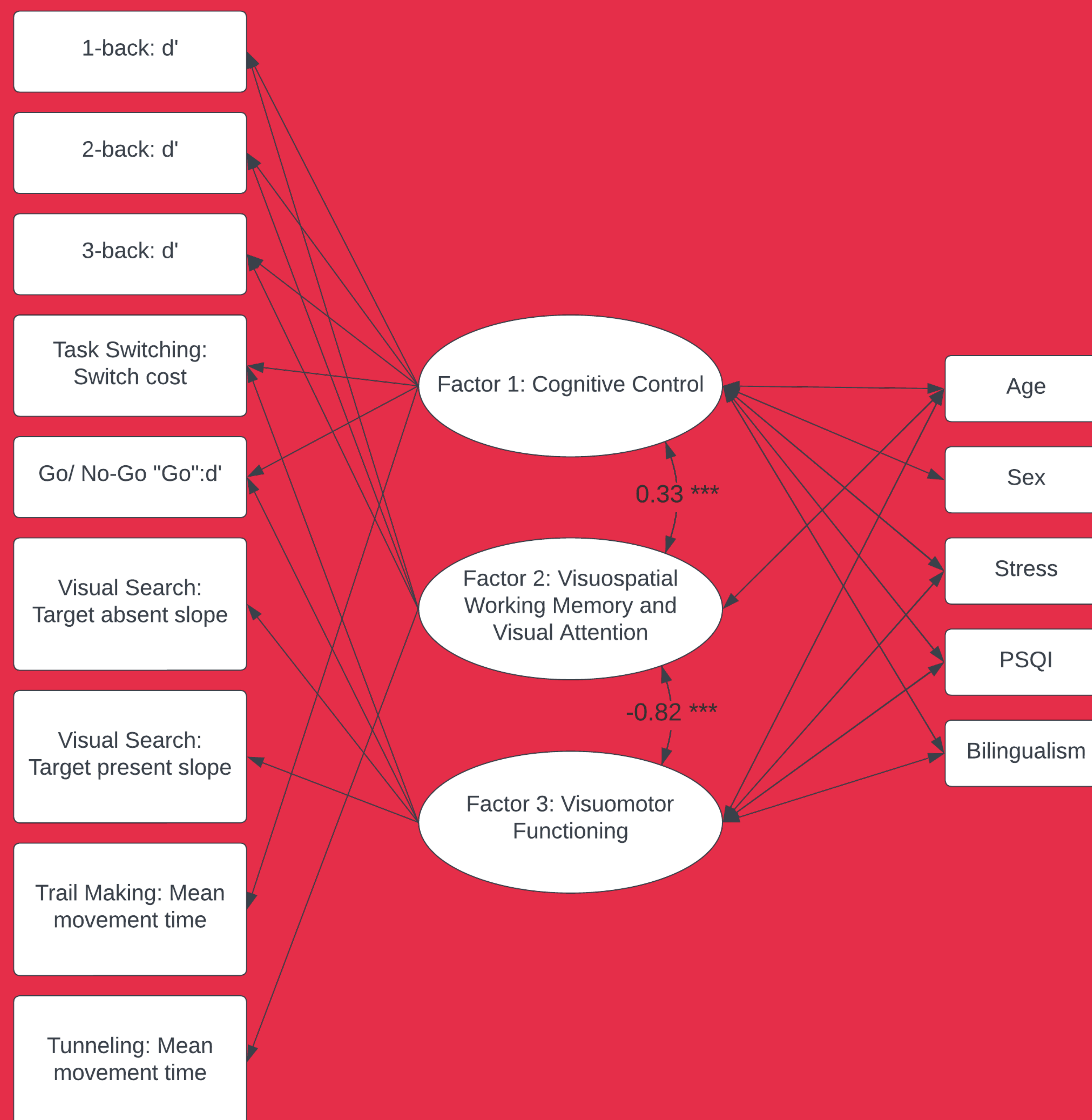
## METHODS

- 1141 participants (781 female,  $M_{age} = 23.13$  years)
- Completed demographic and lifestyle questionnaires, and a battery of cognitive tasks online
- {Demographic} age, sex, birth method
- [Lifestyle] fitness, stress, affect (PANAS), sleep quality (PSQI), cannabis frequency of use, bilingualism
- [Cognitive tasks] N-back, task-switching, go/no-go, visual search, trail-making, tunneling task
- RegSEM penalizes large models with many low loadings

## RESULTS

- Birth method, fitness, affect, and cannabis frequency were not loaded onto any cognitive latent variables
- Task switching nor visual search loaded onto visuospatial working memory and visual attention
- Cognitive control and visuomotor function were not significantly covaried

# Demographics & lifestyle predict cognition & behaviour – Toward a causal model



## All Model Loadings

Latent Variable	Measured variable	Loading
Cognitive Control	1-back: d'	0.62 ***
	2-back: d'	1.55 ***
	3-back: d'	0.97 ***
	switch cost	-0.35 ***
	gng "go": d'	0.17 ***
	trail. MT	-0.63 ***
WM and Attn	age	-0.46 ***
	sex	-0.10 *
	stress	0.18 ***
	PSQI	-0.27 ***
Visuomotor	bilingualism	-0.13 **
	1-back: d'	0.52 ***
	2-back: d'	1.54 ***
	3-back: d'	0.95 ***
	tun. MT	0.54 ***
	age	0.51 ***
Visuomotor	stress	-0.24 ***
	PSQI	0.21 ***
	bilingualism	0.11 *
	switch cost	0.23 ***
Visuomotor	gng "go": d'	0.15 ***
	vis. absent	0.79 ***
	vis. present	0.88 ***
Visuomotor	age	0.25 ***

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## Final model fit indices

- $\chi^2(108) = 739.192$
- RMSEA = 0.72, 90% CI [0.067, 0.076]
- SRMR = 0.089
- GFI = 0.910, CFI = 0.723, TLI = .607
- BIC = 42039.980

## CONCLUSIONS AND FUTURE DIRECTIONS

- Not all demographic and lifestyle variables were related to the cognitive latent variables
- Future directions: Infer causal relationships between demographic and lifestyle variance and the latent cognitive variables

## Next Steps

- Analyze the nature of missing data
- Compare to a PCA approach for dimensionality reduction of the cognitive task data
- Run directional analyses