

Association of education with cognitive and neurodegeneration trajectories in superagers and typical agers

Ellis Spindola Ludtke, Natalia Gomes Gonçalves
Universidade de São Paulo

Introduction

Superagers are older adults with episodic memory comparable to adults aged 20 to 30 years younger. However, most studies on superagers' cognitive performance were cross-sectional. Therefore, the aim of this study was to investigate the association between education and cognitive and neurodegeneration trajectories in superagers and typical agers.

Methods

We used data from *Alzheimer's Disease Neuroimaging Initiative* (ADNI). Superagers were classified as participants of 75+ years old, with memory scores equal to or higher than the mean memory scores of adults aged 50 to 60 years old, and scores of language and executive function no less than -1 standard deviation (SD) from a normative sample of the same age range. Linear mixed-effects models were performed to investigate the association of formal education with cognitive decline and neurodegeneration in superagers and typical agers. The regressions were adjusted for age, sex, and race/ethnicity.

References

1. Harrison TM, Weintraub S, Mesulam MM, Rogalski E. Superior memory and higher cortical volumes in unusually successful cognitive aging. *J Int Neuropsychol Soc.* 2012 Nov;18(6):1081–5. doi:10.1017/S1355617712000847 PubMed PMID: 23158231.
2. Mueller SG, Weiner MW, Thal LJ, Petersen RC, Jack C, Jagust W, et al. The Alzheimer's disease neuroimaging initiative. *Neuroimaging Clin N Am.* 2005 Nov;15(4):869–77. doi:10.1016/J.NIC.2005.09.008 PubMed PMID: 16443497.

Results

Data from 652 participants were analyzed. The average age was 79.4 years (SD = 3.57), 59.4% were men, 96.6% self-identified as non-Hispanic/Latino, an average of 16 years of formal education, and 12.7% were classified as superagers (Table 1). Higher levels of education were associated with slower decline in memory in superagers compared to typical agers ($p = 0.001$) (Figure 1). There was no association of education with language, executive function, and visuospatial function (Figure 1). Education was not associated with neurodegeneration trajectories in typical cognitive agers or superagers (Figure 2).

Table 1. Sample characteristics (n = 652).

Variables	Typical Agers (n=569)	Superagers (n=83)	Total (n=652)	p
Age, mean (SD)	79.6 (3.59)	78.0 (3.11)	79.4 (3.57)	<0.001
Sex, %				0.439
Man	58.7	63.9	59.4	
Woman	41.3	36.1	40.6	
Ethnicity, %				0.251
Hispanic or Latino	3.0	0	2.6	
Not Hispanic or Latino	96.3	98.8	96.6	
Unknown	0.7	1.2	0.8	
Education, mean (SD)	15.9 (2.84)	16.2 (2.71)	16.0 (2.83)	0.381

SD = Standard Deviation.

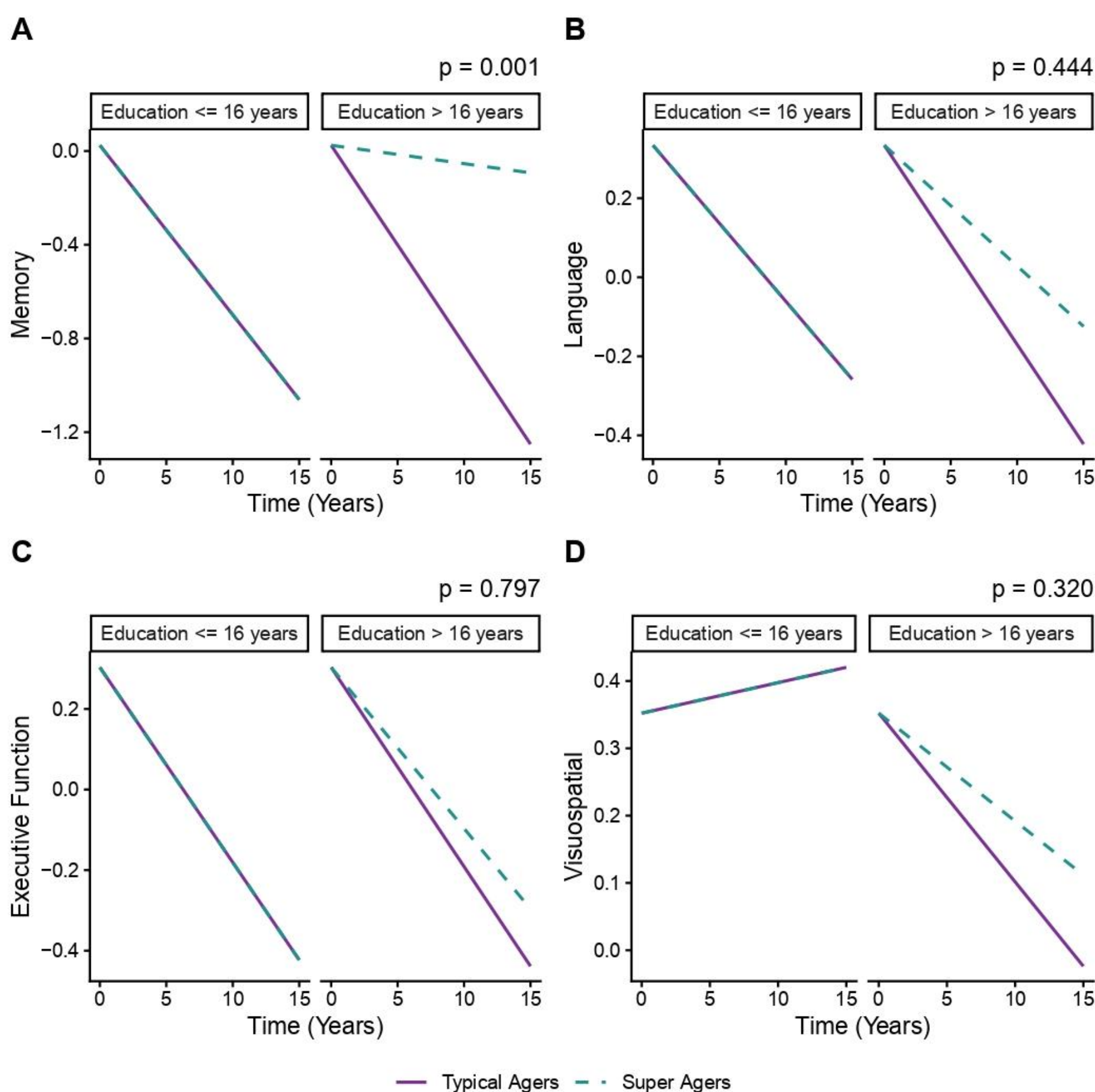


Figure 1. Association between education and (A) memory, (B) language, (C) executive function, and (D) visuospatial function in typical agers and superagers.

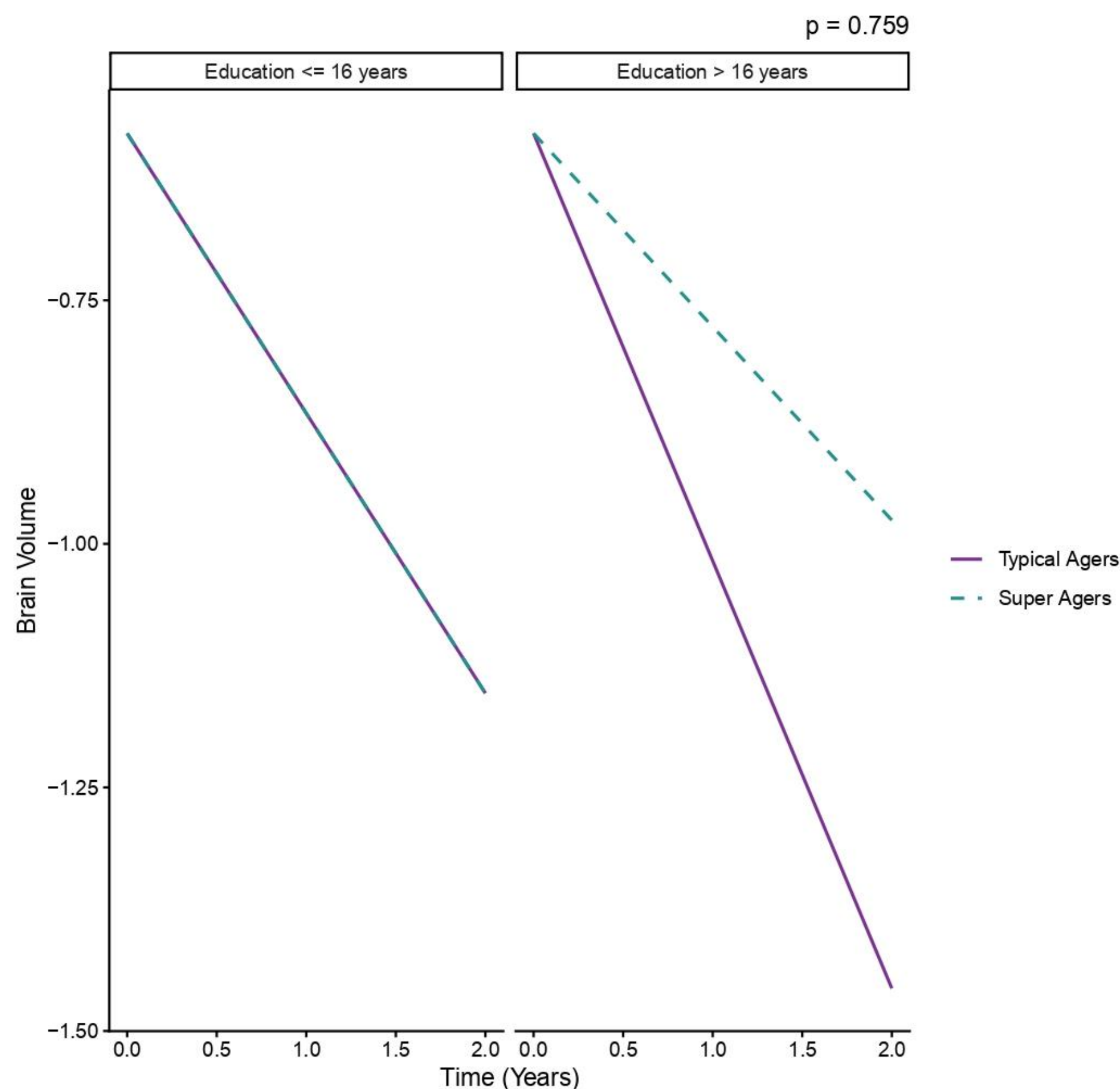


Figure 2. Association between education and neurodegeneration trajectories in typical agers and superagers.

Conclusion

Our results show that public policies aimed at increasing education levels can be effective in reducing memory decline in advanced age.

Acknowledgements



Contact

ellisludtke@gmail.com
natalia.g@fm.usp.br