

Concept Paper Form

Provisional Paper Title: Infinite Reflections: How Mathematics Changed the Way we Understand our Brain (Book at OUP)
Proposing Author: Alain Goriely
Author's Email: goriely@maths.ox.ac.uk
P.I. Sponsor: Avshalom Caspi (if the proposing author is a student or colleague of an original PI)
Today's Date: 10/30/2019

Please describe your proposal in 2-3 pages with sufficient detail for helpful review.

Objective of the study: The goal of the study is to show the relationship between cognitive measures and morphological characteristics.

Data analysis methods: I will use basic regression and correlation methods to find overall trends. Only overall plots relating variables of interest will be published.

Variables needed at which ages: At age 45: cognitive measures (IQ and others if available), brain volume, cortex thickness, white hyperintensities, gender, height and weight.

If available, longitudinal data on the same variables

Significance of the Study (for theory, research methods or clinical practice):

The main goal of the study is to educate the public (through lectures and the publication of a popular science book with Oxford University Press) on the general trend between cognitive functions and morphological characteristics (and the method side, the danger of reaching simple conclusions from correlation). I will use this modern data together with historical work from the 19th century to show how our understanding of the brain has evolved and how proper mathematical treatment can be used to show trends on a population level, while not allowing us to reach conclusion at the individual level.

Data Security Agreement

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<input checked="" type="checkbox"/>	I am current on Human Subjects Training (CITI (www.citiprogram.org) or equivalent)
<input checked="" type="checkbox"/>	My project is covered by the Duke ethics committee OR I have /will obtain ethical approval from my home institution.
<input checked="" type="checkbox"/>	I will treat all data as "restricted" and store in a secure fashion. My computer or laptop is: a) encrypted (recommended programs are FileVault2 for Macs, and Bitlocker for Windows machines) b) password-protected c) configured to lock-out after 15 minutes of inactivity AND d) has an antivirus client installed as well as being patched regularly.
<input checked="" type="checkbox"/>	I will not "sync" the data to a mobile device.
<input checked="" type="checkbox"/>	In the event that my laptop with data on it is lost, stolen or hacked, I will immediately contact Moffitt or Caspi.
<input checked="" type="checkbox"/>	I will not share the data with anyone, including my students or other collaborators not specifically listed on this concept paper.
<input checked="" type="checkbox"/>	I will not post data online or submit the data file to a journal for them to post. <i>Some journals are now requesting the data file as part of the manuscript submission process. Study participants have not given informed consent for unrestricted open access, so we have a managed-access process. Speak to Temi or Avshalom for strategies for achieving compliance with data-sharing policies of journals.</i>
<input checked="" type="checkbox"/>	I will delete all data files from my computer after the project is complete. Collaborators and trainees may not take a data file away from the office. This data remains the property of the Study and cannot be used for further analyses without an approved concept paper for new analyses.

Signature: Alain Goriely

CONCEPT PAPER RESPONSE FORM

A

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Proposing Author	Alain Goriely
Other Contributors	Click or tap here to enter text.
Potential Journals	Click or tap here to enter text.
Today's Date: 10/30/2019	
Intended Submission Date: 1/1/2021	

Please keep one copy for your records and return one to the proposing author

B. To be completed by potential co-authors:

<input type="checkbox"/>	Approved
<input type="checkbox"/>	Not Approved
<input type="checkbox"/>	Let's discuss, I have concerns

Comments: Click here to enter text

Please check your contribution(s) for authorship:

<input type="checkbox"/>	Conceptualizing and designing the longitudinal cohort study
<input type="checkbox"/>	Conceptualizing data collection protocols and creating variables
<input type="checkbox"/>	Data collection
<input type="checkbox"/>	Conceptualizing and designing this specific paper project
<input type="checkbox"/>	Statistical analyses and interpretation (or reproducibility check)
<input type="checkbox"/>	Writing
<input type="checkbox"/>	Reviewing manuscript drafts
<input type="checkbox"/>	Final approval before submission for publication
<input type="checkbox"/>	Agreement to be accountable for the work
<input type="checkbox"/>	Acknowledgment only, I will not be a co-author

Signature: Click here to enter text