Plan Overview

A Data Management Plan created using DMPonline

Title: Att inte klara av trycket: hur hänger matteängslan ihop med matematikprestation

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Project abstract:

Matematik är ett av de viktigaste ämnena i skolan, och för många elever är det förknippat med en ängslan som i sin tur påverkar deras matematik prestation. Matematikängslan avser känslor av nervositet och spänning för uppgifter och situationer som innehåller matematisk information. Förekomsten av matematikängslan varierar mellan 25% –33% bland gymnasieelever, med en högre prevalens bland flickor, och initiala tecken redan i grundskolan (Dowker, Sarkar, & Looi, 2016; Ramirez, Shaw, & Maloney, 2018; Vukovic, Kieffer, Bailey, & Harari, 2013). Projektet undersöker kopplingen mellan matematikängslan och prestation longitudinellt från årkurs 3 till årskurs 5. Vi kommer också att experimentellt undersöka relationen mellan elevstrategier, matematiska uppgiftskrav, matematikängslan och arbetsminne när eleverna nåtgår i årkurs 5. Vidare använder vi den longitudinella och experimentella studiedesignerna som bas, för att i årkurs 6 genomföra en intervention som syftar till för att minska matematikängslan genom att implementera en evidensbaserad inlärningsteknik som är känd för att underlätta inlärning och minska ängslan (Agarwal, D'Antonio, Roediger, McDermott, & McDaniel, 2014), betecknad som testbaserat

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lärande.

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Att inte klara av trycket: hur hänger matteängslan ihop med matematikprestation

General Information

Project Title

Choking under pressure: Linking math anxiety with math performance

Project Leader

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diarienummer TUV 5.1-148-19

Registration number at the Swedish Research Council

Diarienummer: 2019-03928

Version

Version 1

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Description of data – reuse of existing data and/or production of new data

How will data be collected, created or reused?

The data collection is both longitudinal and is followed by an experiment and an

intervention, encompassing about 400 students followed from grade 3

Students cognitive abilities will be be collected using a web-based assessment battery at grade 3, 4, and 5. respectively.

An adaptive web-based battery of mathematical tasks cover two critical aspects of mathematical competence: (1) basic arithmetic (single-digit and multi-digit addition and subtraction tasks), and (2) number processing (symbolic and non-symbolic magnitude comparisons, and single- and multidigit number ordering).

Assessing students strategies will be done by asking the students whether they "*calculated the task*" or if they "*remembered the answer*" by clicking on alternatives on the computer

The web-based data collections will be conducted using secure serves in Sweden and Finland. No identifiable data will be on the servers. The data will be structured according to the faculties that they are measuring. In the longitudinal approach, the data will be collected several times and repeatedly controlled for anomalies. However, it should be stressed that the measurements are well established, with high validity and reliability and for which the research group have extensive experience of using.

The data is to be made public and accessible after publication in the form of SPSS or Excel files

What types of data will be created and/or collected, in terms of data format and amount/volume of data?

The data is collected as correct responses on computerized cognitive tests and test of mathematical abilities and stored initially in csv format. It is our experience that csv format is reliable and easy to convert further into, for I instance, Excel or SPSS format. The format of CSV means that the volume in term of megabyte will be quite small

Documentation and data quality

How will the material be documented and described, with associated metadata relating to structure, standards and format for descriptions of the content, collection method, etc.?

The data stored in CSV or Excel format will be accompanied by descriptions of what kind of data, range, max-min values, in what why it has been collected, a sample description. Each variable will be described I detail

How will data quality be safeguarded and documented (for example repeated measurements, validation of data input, etc.)?

The data quality will be consistently monitored by specific staff responsible for the

administration of the servers and double-checked by the research leader Bert Jonsson

Storage and backup

How is storage and backup of data and metadata safeguarded during the research process?

The data is continuously backed up through the secure servers at Umeå University and Åbo Akademi

How is data security and controlled access to data safeguarded, in relation to the handling of sensitive data and personal data, for example?

The data is anonymisied using a code key, hence the data on the servers are not identifiable

Legal and ethical aspects

How is data handling according to legal requirements safeguarded, e.g. in terms of handling of personal data, confidentiality and intellectual property rights?

The data collection is to be preceded by an ethical application, which also will include a description of how to handle confidentiality. Mainly in term of using code keys stored separately as a hard copy (not accessible through the internet)
The ethical application is approved

How is correct data handling according to ethical aspects safeguarded?

An administrator mainly negotiates the data with no insight on which individual "delivering the data" in terms of math performance and cognitive abilities performances. The administrator will not have access to the code-key, so identifying individual participants will not be possible. Moreover. The research leader that will store the code key will not have access to the database and thus will not be able to identify individuals without help from the administrator. However, identifying participants most be possible if some want us to remove their data

Accessibility and long-term storage

How, when and where will research data or information about data (metadata) be made accessible? Are there any conditions, embargoes and limitations on the access to and reuse of data to be considered?

The data will be backed up and stored at Åbo Akademi and Umeå University for at least 10 years after the project is completed. The data will be made available after publication

In what way is long-term storage safeguarded, and by whom? How will the selection of data for long-term storage be made?

All data with no exception will be stored in secured backup servers at Åbo Akademin and Umeå university

Will specific systems, software, source code or other types of services be necessary in order to understand, partake of or use/analyse data in the long term?

The data will be stored in many formats, among other CSV, which is expected to be able to read a long time after the project is completed

How will the use of unique and persistent identifiers, such as a Digital Object Identifier (DOI), be safeguarded?

Each publication and data made accessible will be "marked" with an DOI number

Responsibility and resources

Who is responsible for data management and (possibly) supports the work with this while the research project is in progress? Who is responsible for data management, ongoing management and long-term storage after the research project has ended?

Responsible for the data management during the project is the research leader Bert Jonsson and after the project the department of applied education, Umeå University

What resources (costs, labour input or other) will be required for data

management (including storage, back-up, provision of access and processing for long-term storage)? What resources will be needed to ensure that data fulfil the FAIR principles?

The research project has funding for collecting and handling the data during the project period. After that, the responsibility for long term storage will be on Umeå University

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