Nottingham Trent University

The value of longitudinal analysis in capturing ongoing motivation: The Statistics Anxiety Project.

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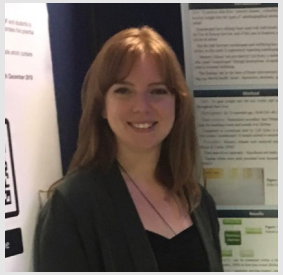

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Plan for the talk

1. Statistics Anxiety
2. The statistics anxiety project
3. Findings from time 1.
4. Future talks and plans
5. Your questions and discussion

Statistics and Statistics anxiety.

Statistics.

- In our modern world, where data is a prevalent feature of our lives, the understanding and applying statistical knowledge is of great importance (Gal, 2004; Galesic & Garcia-Retamero, 2010; Giovannini, 2008).
- The understanding of statistics is an important element within any Psychology degree, as students need to be able to master statistical methods in order to undertake quantitative research, a requirement of British Psychological Society accreditation.
- Previous research has suggested that the statistics module within any psychology degree causes the most problems (Murtonen et al., 2008), through significant negative attitudes (Connors et al., 1998; Ruggieri et al, 2008) and a lack of interest and motivation (Rajecki et al., 2005).
- Emmioglu & Capa-Aydin, (2012) undertook a meta-analysis of undergraduate students undertaking introductory statistics modules, looking at the impact of affect, cognitive competence, value and difficulty, with affect and cognitive competence having the higher effect sizes.
- In conclusion, it is important that students demonstrate positive attitudes (Ramirez et al., 2012), which in turn leads to higher performance in statistics (Chiesi & Primi, 2009; Dempster & McCorry, 2009).

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Statistics Anxiety.

- One factor that might be impeding performance in (Baloglu & Zelhart, 2003; Onwuegbuzie & Wilson, 2003) and enjoyment and engagement of statistics modules (Murtonen, 2005; Paxton, 2006) is that of statistics anxiety.
- Statistics anxiety is defined as anxiety that is experienced by a student when they encounter statistics in education and every-day life (Onwuegbuzie et al., 1997).
- It is thought to be distinct from mathematical anxiety, anxiety experienced by individuals when they encounter mathematics in education and everyday life (Baloglu, 2002; Dowker, 2019).

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Statistics anxiety.

- Nature of statistics anxiety- developmentally.

The statistics anxiety project

The Problem and research questions

- About 1000 students study year one statistics in Psychology
- We know they worry about statistics, a lot.
- But how does the experience of studying statistics at NTU Psychology change through a year-long module?
- Do students reduce or increase their anxiety?
- Are there differences in types of students in terms of their changes in anxiety?
- Are the changes in anxiety related to module grades?

The statistics anxiety project: Design

Time 1 Questionnaire (October, 2021) → Time 2 Questionnaire (December, 2021) → Time 3 Questionnaire May, 2022)

Time 1 variables - Demographics

- Gender
- Age
- Ethnicity
- Postcode - Please write down the postcode of your address away from university i.e., your home address. If you are in any way worried this postcode will identify you specifically, please note that a typical 7-digit postcode e.g., MK13 0LA covers about 100 households or about 300-400 people. If you are uncomfortable giving your 6 or 7 digit postcode, we can work with just the first part of your postcode e.g., MK13.

Time 1 and 2 variables - Motivational

- Self-Efficacy (3 items) - *e.g., Compared with other students in this class I expect to do well.* 1= not at all true for me to 7=very true of me
- Class Anxiety (7 items) – *e.g., Doing the coursework for a statistics course* 1 = No anxiety and 5=strong anxiety
- Fear of asking for help (4 items) – On a scale of 1 to 5 where 1 = No anxiety and 5=strong anxiety, rate your level of anxiety in the following situations: *e.g., Going to ask my statistics teacher for individual help with material I am having difficulty understanding*
- Statistics worthiness for study (16 items) – *e.g., I lived this long without knowing statistics, why should I learn it now?* 1 = Strongly Disagree and 5=Strongly Agree.
- Maths Self-concept (7 items) - *e.g., I have not done maths for a long time. I know I will have problems getting through statistics* 1 = Strongly Disagree and 5=Strongly Agree.

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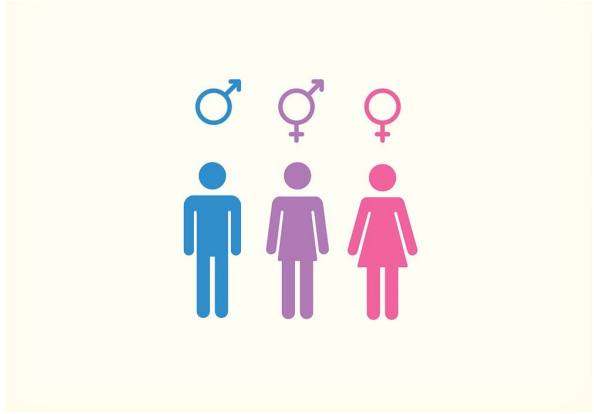
Findings from time 1.

Summary of Results – The sample

- N=170 completed phase I (> 20% response rate)
- M=22 F=143, Non-binary=3
- Mean age=19.2 (s.d.=3.2)
- Ethnicity=112 white, non-white=58.

Student confidence

Negative relationship between all variables and self-efficacy, such that students who have higher self-efficacy have lower class anxiety, lower fear to ask for help, see statistics as more worthwhile and have better stats self-concept.



Gender: Females had higher class anxiety, higher fear asking support, lower attitude towards worth of stats, lower perception of ability to calculate and understand stats.

Ethnicity: White students had lower stats self-efficacy (i.e., confidence) than non-white students.

Social class: No differences for all the many ways we assessed social class e.g., deprivation indices, social class categories AB, C1, C2, D1.

Findings from time 2.

Future talks and plans

What we have planned

- Talk in September to present findings in detail from phase III – How did all these changes relate to final course grades?
- NTU funded studentship https://www.ntu.ac.uk/research/find-a-phd-opportunity/studentship-projects/next-slide-please-motivating-our-next-generation-of-data-analysts - Anyone you know who may be interested?

Any questions?

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