

Research background: Research suggests that a problem processing mathematics can affect achievement in the subject (Halberda 2008, Libertus 2011, Starr 2013). This can affect the experience of the individual within the mathematics classroom. The aims of this research were

- 1) To examine the perspectives of adolescents with dyscalculia type processing
- 2) To compare these perspectives with other students (high and low achievers in mathematics)

Psychological Effects on Secondary School Students with Problems Processing Numerical Information

Eleanor Willard
Leeds Beckett University
e.Willard@leedsbeckett.ac.uk

Method: Students (n=375) presenting with dyscalculia were identified by screening Key stage 3. The Q sorts were conducted on 36 students. Q sort items included items covering mathematics anxiety, engagement, locus of control, sense of coherence, academic and social competence measures. The analysis produced 7 factor arrays. Two were generated by students presenting with dyscalculia, 2 from non-presenting low mathematics achievers and 3 from competent mathematicians

Items for mathematics attitude

• Maths is my worst lesson

- If I do badly in maths it makes me feel like I'm no good at anything
- Being asked a maths question by a teachers stresses me
 - I often lose track of what is being taught in maths
- I get stressed when I have to add up a pile of money in a shop
- I find the way maths is taught makes it hard to understand

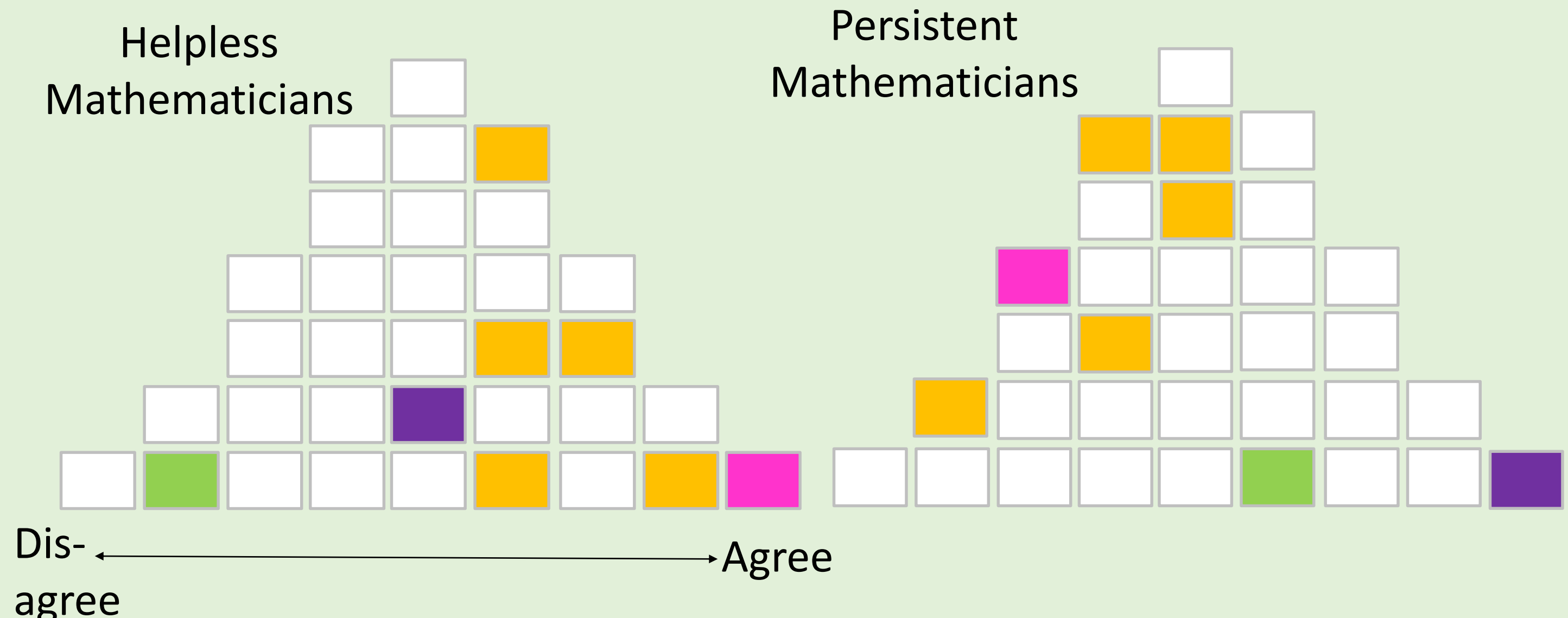
Item indicating mind set

There is always something I can do to improve my maths

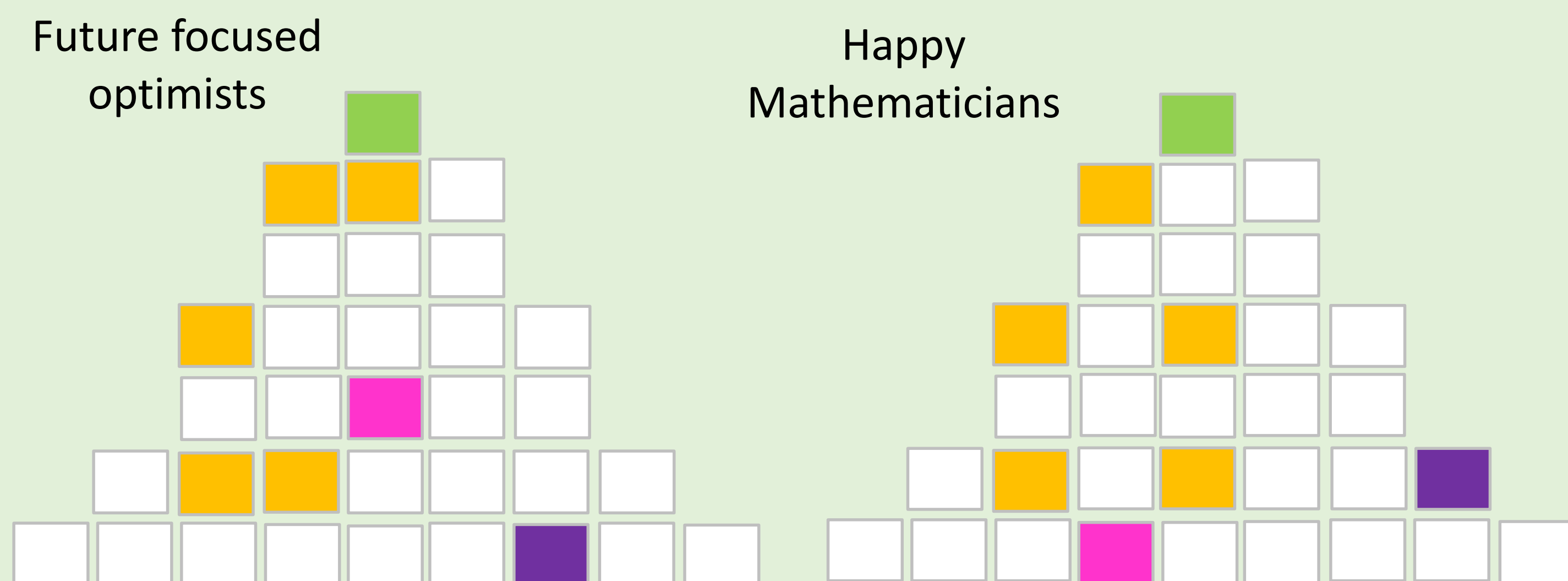
Item indicating perceived ability within the class

I am one of the better students in my class

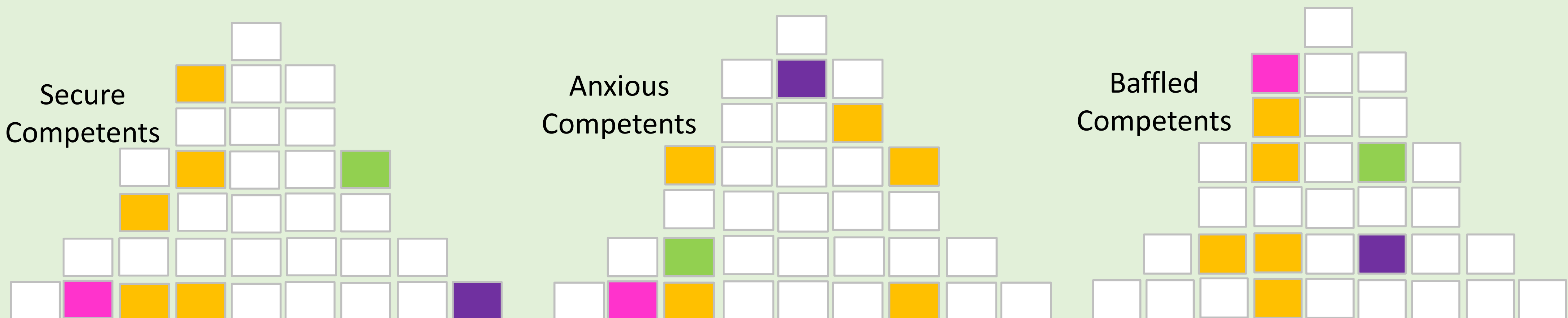
Dyscalculia presenting factor arrays



Non-Dyscalculia presenting/ low achievers factor arrays



Mathematics competent factor arrays



Conclusions

- A growth mind set and perceived ability level within the class seem to be mediating factors in attitude to mathematics in all sets of students.
- There are both students with a positive and negative outlook in all 3 groups
- Dyscalculia presenting students were more likely to express a very negative attitude towards mathematics

References: Halberda, J., M. M. Mazocco, et al. (2008). "Individual differences in non-verbal number acuity correlate with maths achievement." Nature 455(7213): 665-668. Ingesson, S. G. (2007). "Growing Up with Dyslexia Interviews with Teenagers and Young Adults." School Psychology International 28(5): 574-591. Libertus, M. E., L. Feigenson, et al. (2011). "Preschool acuity of the approximate number system correlates with school math ability." Dev Sci 14(6): 1292-1300. Starr, A., M. E. Libertus, et al. (2013). "Number sense in infancy predicts mathematical abilities in childhood." Proc Natl Acad Sci U S A 110(45): 18116-18120