

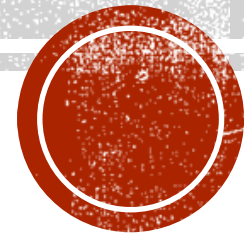
# **STATISTICALLY SIGNIFICANT STRESS: USING EXPRESSIVE WRITING TO REDUCE STRESS**

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# AGENDA FOR TODAY

- What's the problem
- Are there solutions?
- Key Players in the game
- What did we find?
- What did we do?
- Future Directions



# FEELING A BIT STRESSED??

$$Y = a + b_1 X_1 + b_2 X_2 + \dots + b_k X_k + e$$

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

$$s_x = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$



# WHAT'S THE PROBLEM

- Previous research has shown the link among learner anxiety, self-efficacy, cognitive load, and ***performance*** (Huang & Mayer, 2016)
- Learner anxiety can impact ***motivational factors*** such as self-efficacy, i.e., perceived confidence in successfully performing a specific task (Huang & Mayer, 2016)
- There is an increasing recognition that ***affective factors*** play a critical teaching and learning of mathematics (McLeod, 1994)
- Although the causes of math anxiety are undetermined, some ***teaching styles*** are implicated as risk factors. (Ashcraft, 2016)



# WHAT'S THE PROBLEM

- Gender differences occurred only in test anxiety (boys had lower test anxiety than girls). (Erturan & Jansen, 2014)
- Math anxiety, physiological anxiety, social concerns/stress, and test anxiety significantly predicted disadvantageous gambling behavior. (Buelow & Barnhart, 2015)
- When parents are more math anxious, their children learn significantly less math over the school year and have more math anxiety (Maloney, Ramirez, Gunderson, Levine, and Beilock, 2015)



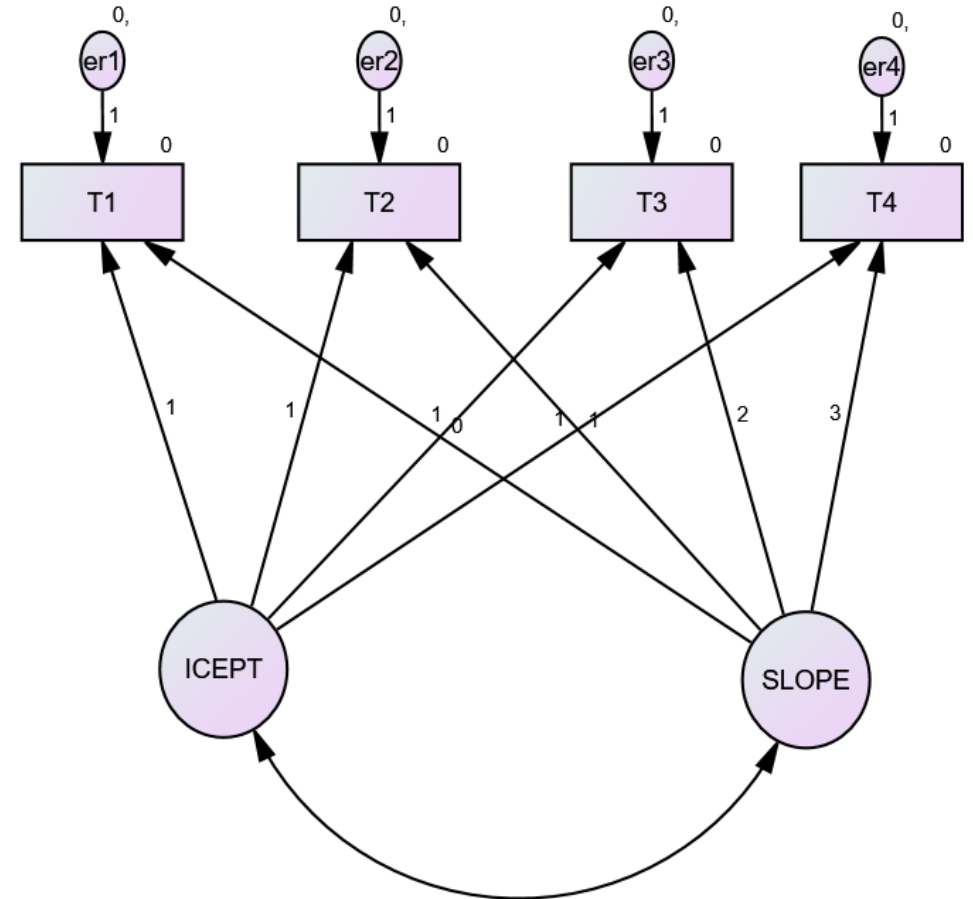
# ARE THERE SOLUTIONS?

- The Role of Expressive Writing in Math Anxiety (Park, Ramirez, and Beilock, 2014)
  - Students ( $N = 80$ ) varying in math anxiety were asked to sit quietly (control group) prior to completing difficulty-matched math and word problems or to write about their thoughts and feelings regarding the exam they were about to take (expressive writing group).
- Expressive writing can increase working memory capacity (Klein & Boals, 2001)
  - 35 freshmen assigned to write about their thoughts and feelings about coming to college demonstrated larger working memory gains 7 weeks later compared with 36 writers assigned to a trivial topic. Increased use of cause and insight words was associated with greater WM improvements



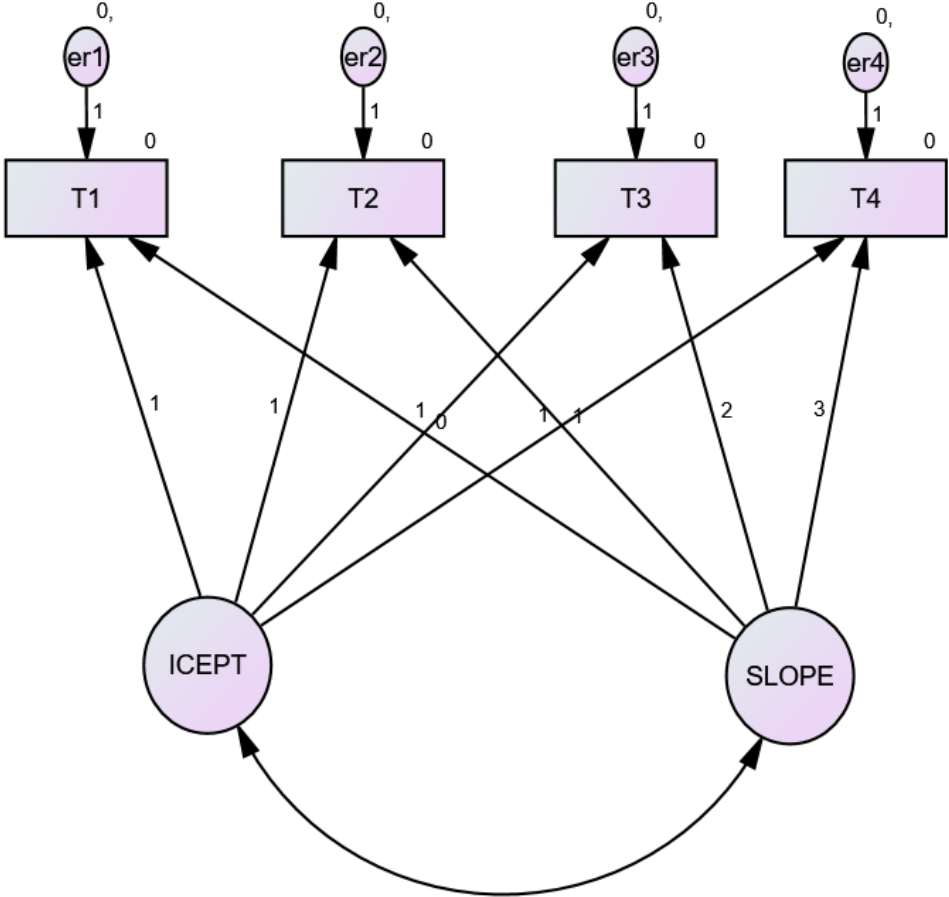
# WHAT DID WE DO?

- Open Recruitment with research hours
- During 5 week stat course
- 4 - 20 min. writing sessions
- 4 – MARS (Math Anxiety Rating Scale, (Plate & Parker, 1982))
- Additional Questions:
  - Anticipated grade
  - Perceived difficulty of course work
  - Read previous week's writing
  - Length of writing
- Used previous grades (X3) for latent clusters



# WHAT DID WE FIND?

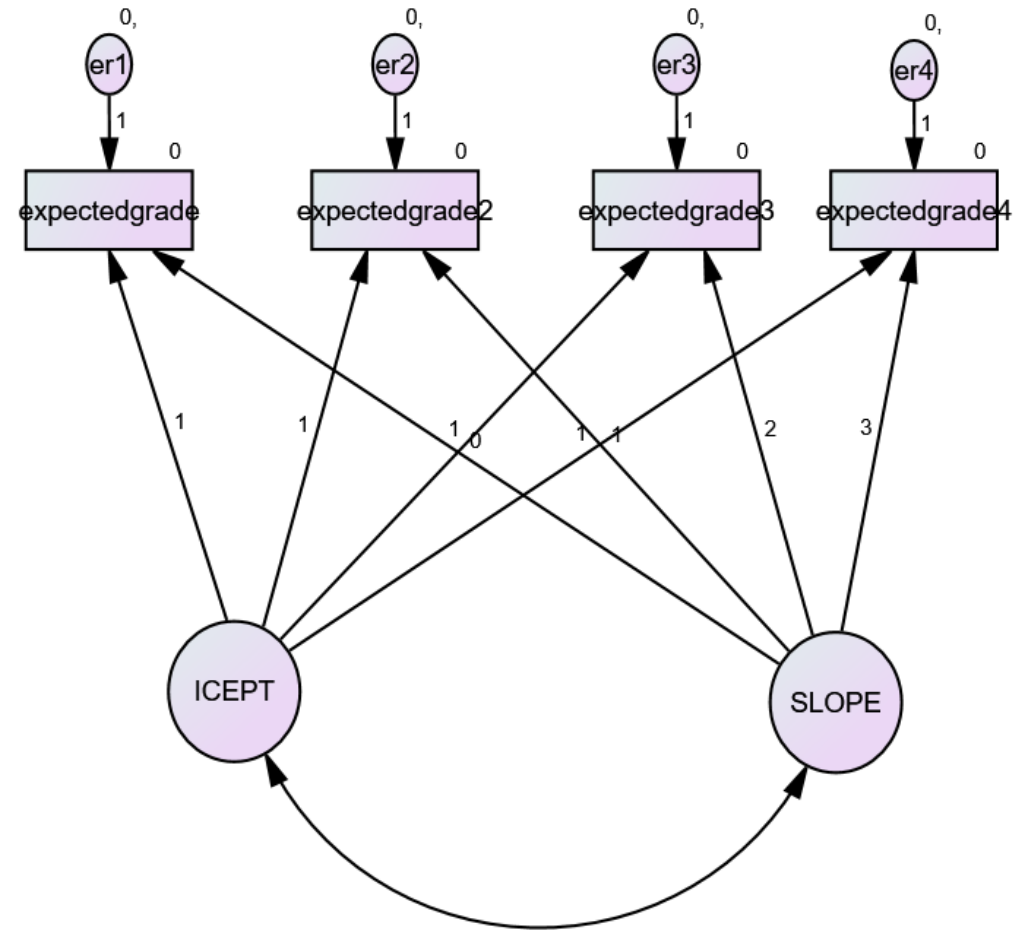
	Estimate	S.E.	C.R.	P
<b>ICEPT</b>	<b>70.471</b>	<b>1.157</b>	<b>60.915</b>	<b>***</b>
<b>SLOPE</b>	<b>-.422</b>	<b>.620</b>	<b>-.681</b>	<b>.496</b>





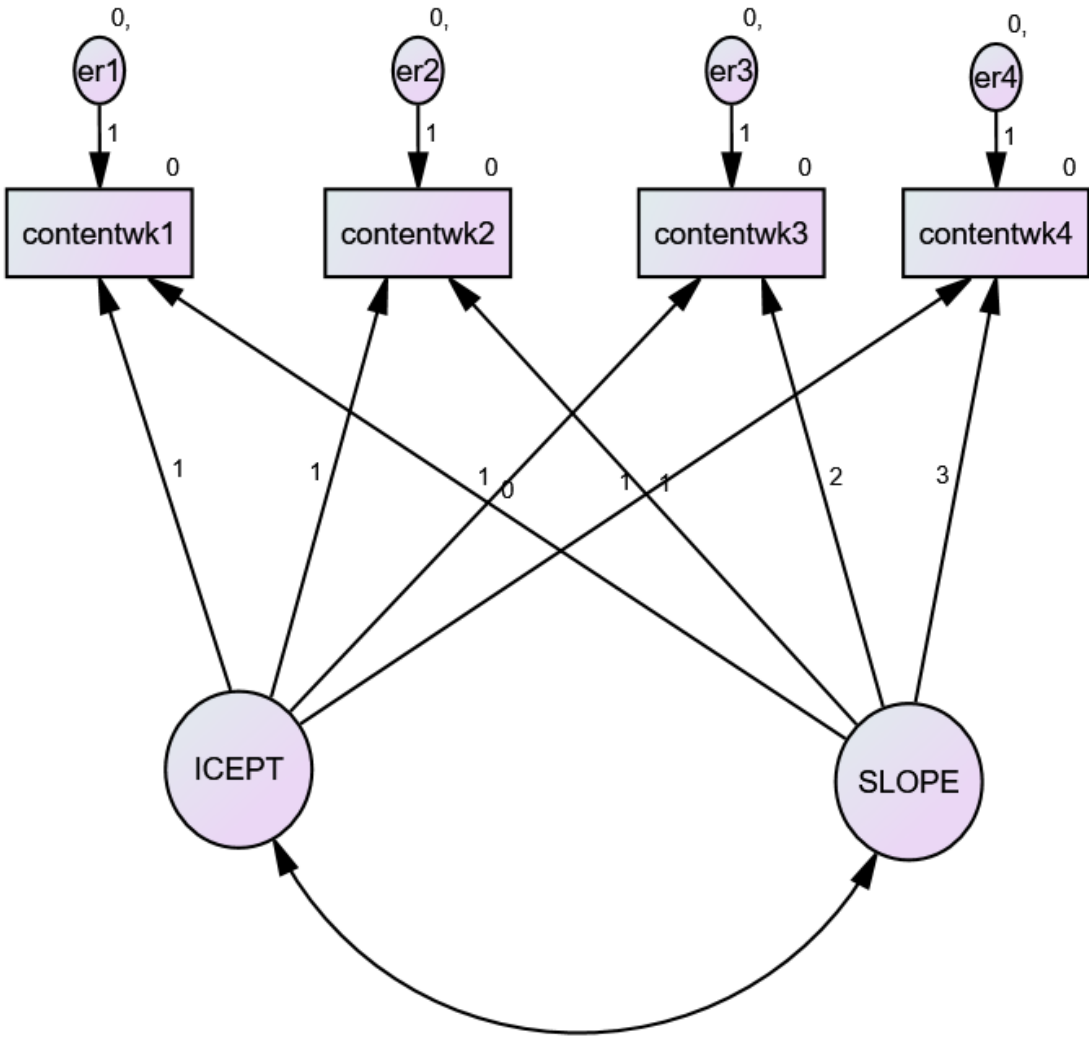
# WHAT DID WE FIND?

	<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>
<b>ICEPT</b>	<b>6.073</b>	<b>.064</b>	<b>94.528</b>	<b>***</b>
<b>SLOPE</b>	<b>-.090</b>	<b>.036</b>	<b>-2.518</b>	<b>.012</b>



# WHAT DID WE FIND?

	<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>
<b>ICEPT</b>	<b>2.213</b>	<b>.087</b>	<b>25.497</b>	<b>***</b>
<b>SLOPE</b>	<b>.549</b>	<b>.038</b>	<b>14.400</b>	<b>***</b>

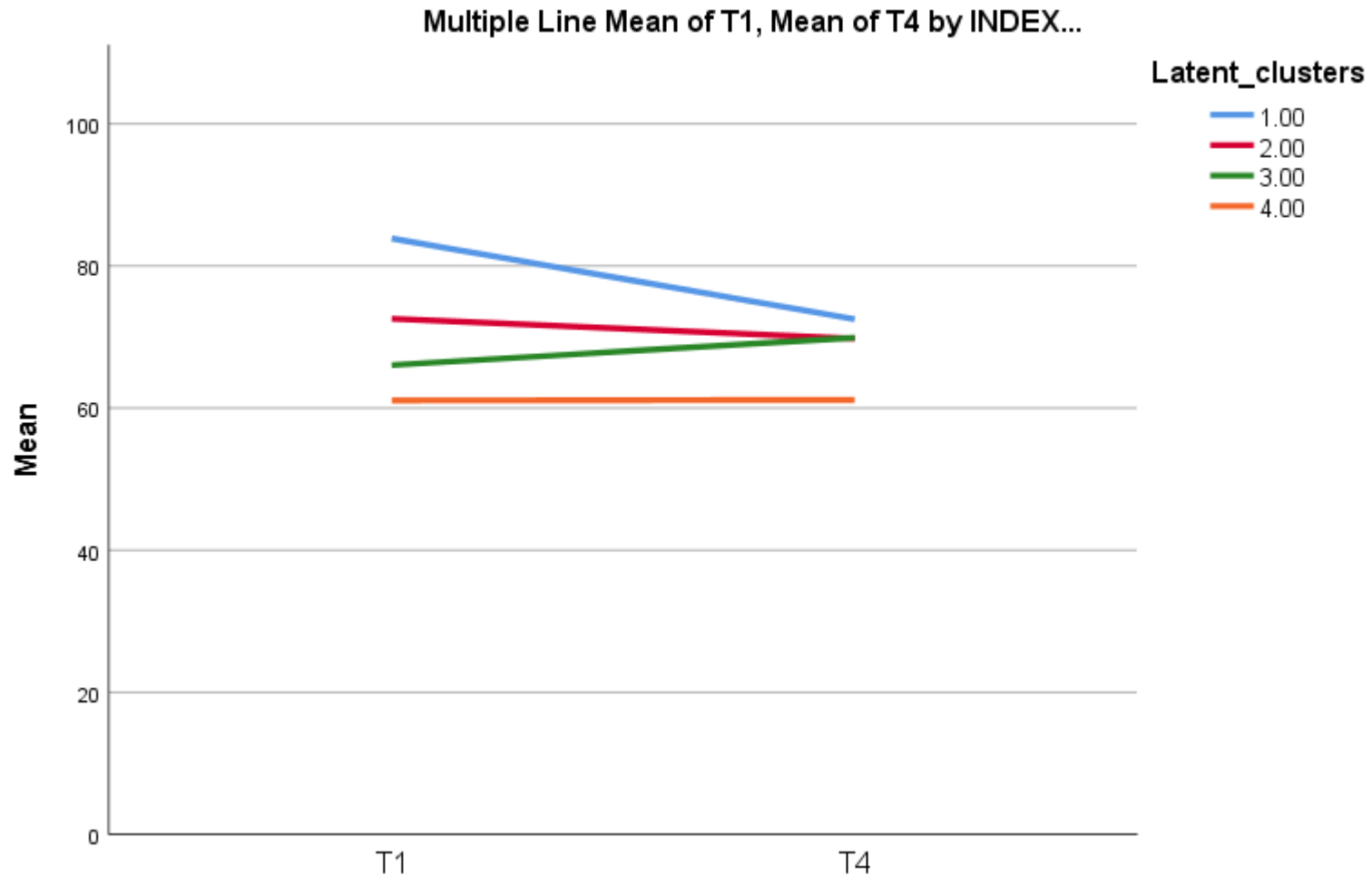


# WHAT DID WE FIND? (LATENT CLUSTERS)

Latent_clusters	N	Resultaat_2	M
1.00	14		5.76
2.00	80		6.89
3.00	44		8.14
4.00	14		9.47



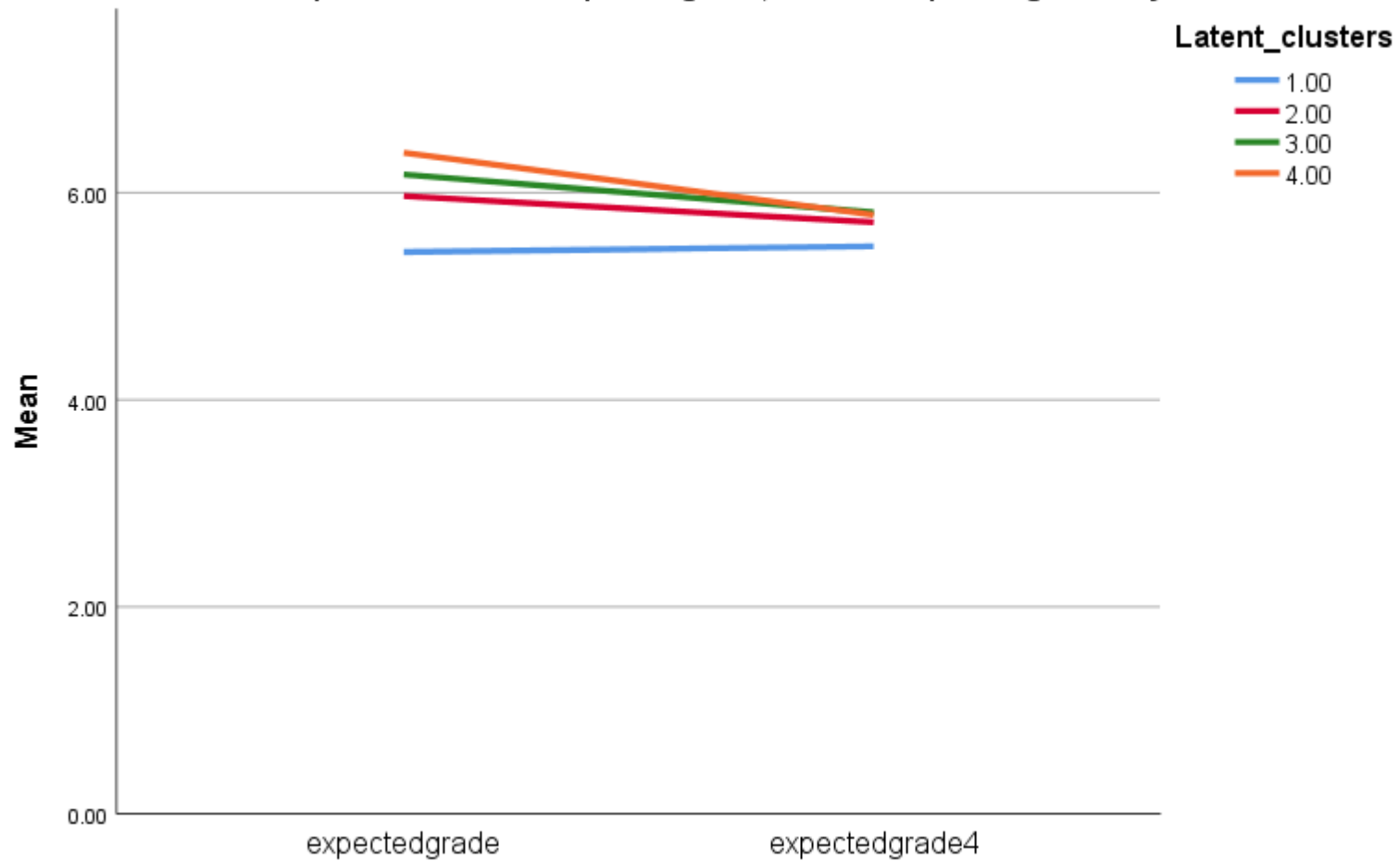
# WHAT DID WE FIND? (LATENT CLUSTERS)



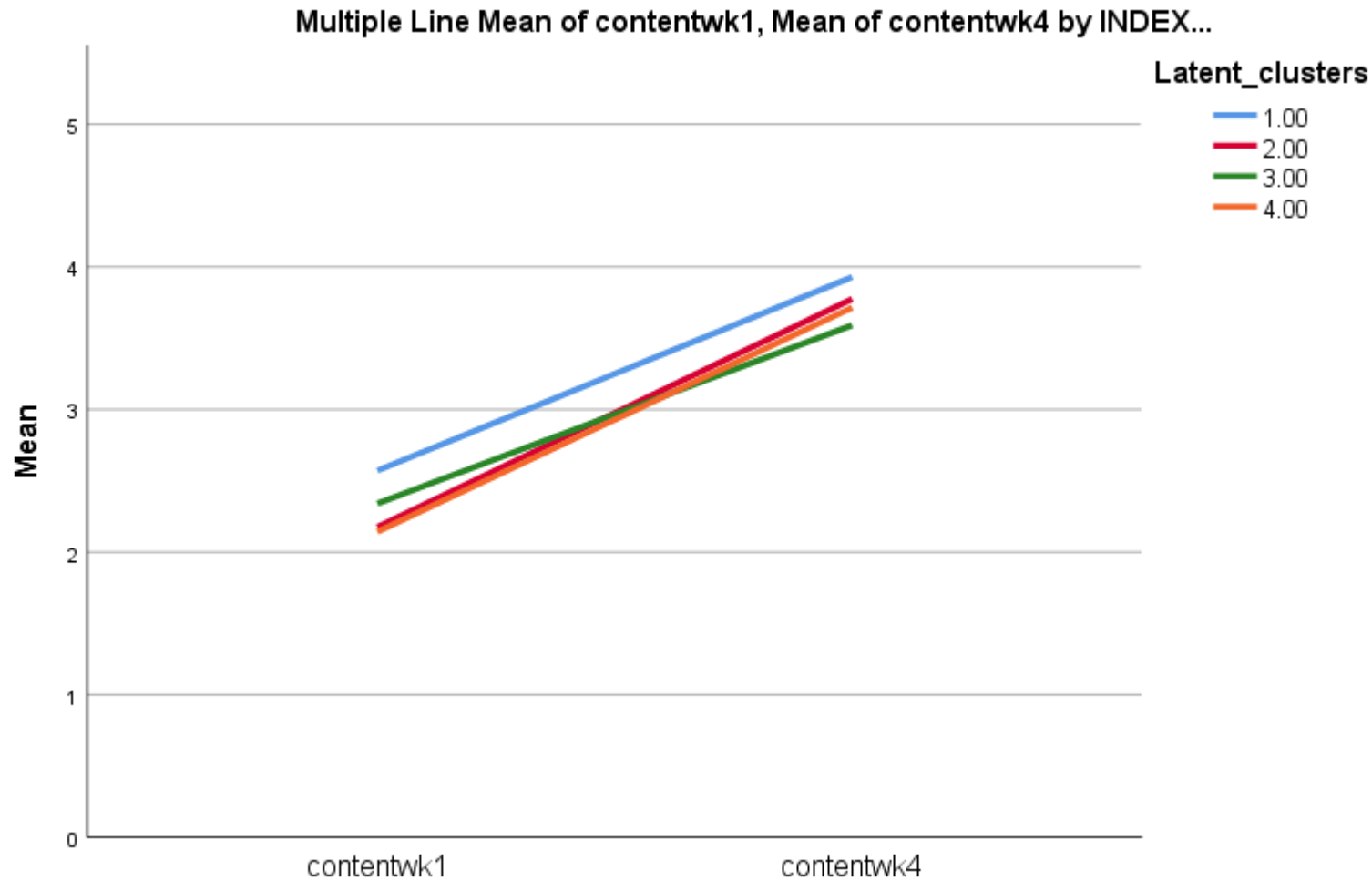
# WHAT DID WE FIND? (LATENT CLUSTERS)

Multiple Line Mean of expectedgrade, Mean of expectedgrade4 by INDEX...

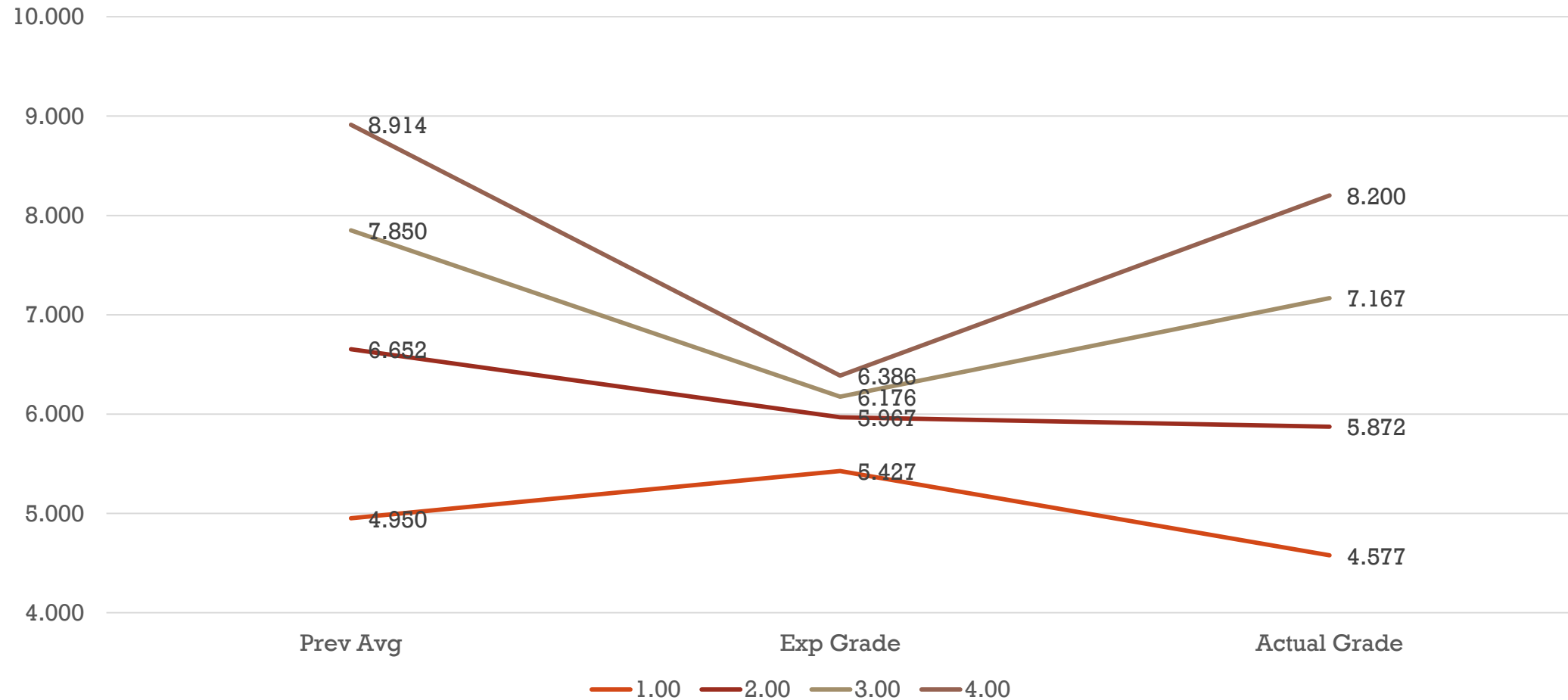
(Group 4,  $p = .042$ )



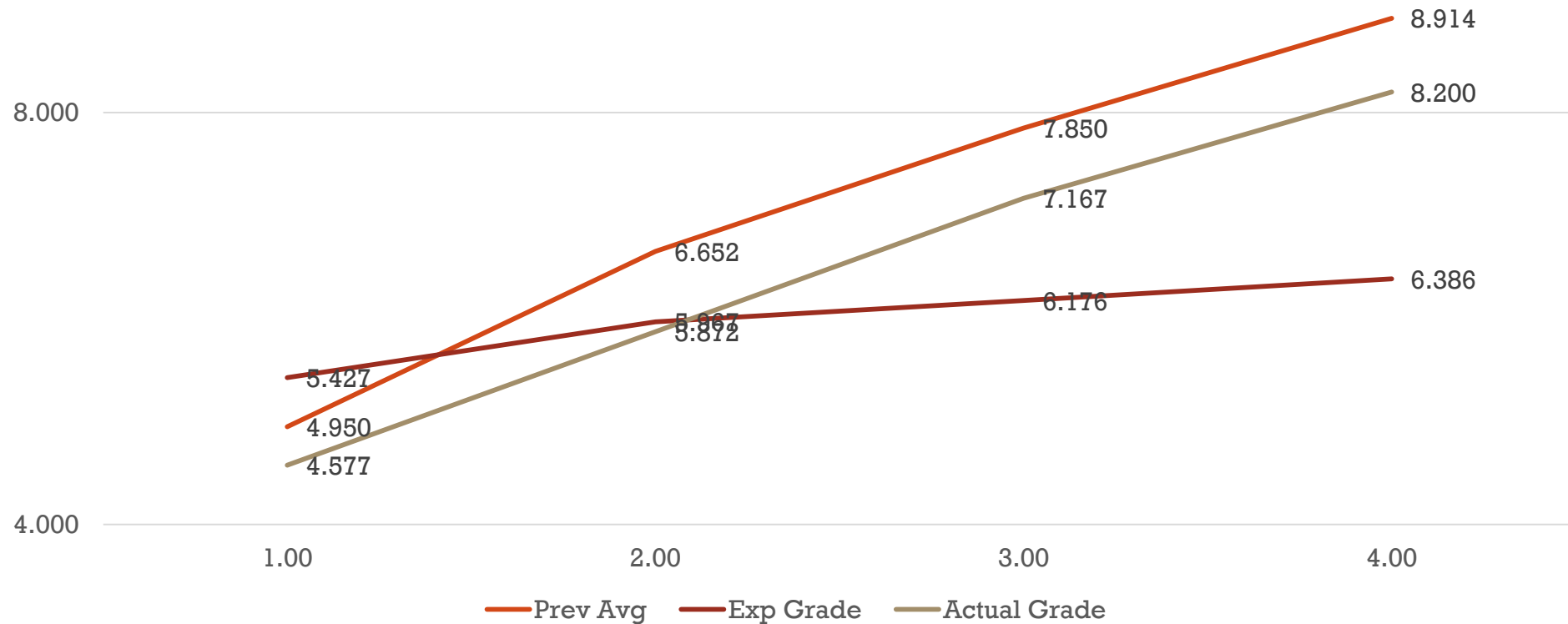
# WHAT DID WE FIND? (LATENT CLUSTERS)



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# KEY PLAYERS IN THE GAME

- Teachers
  - Turner et al. (2002) documented the patterns of student avoidance (e.g., not being involved or seeking help) that result from teachers who convey a high demand for correctness but provide little cognitive or motivational support during lessons.
- Study Advisors
  - Stress and anxiety workshops, testing practice



# FUTURE DIRECTIONS

- Development of Anxiety Workshops
- Development of New Anxiety Scale
  - Student developed from last year's cohort
  - Pseudo Delta data gathering technique
- Addition of RASI\_18 to check relationship anxiety and learning approaches.

