An Attempt to Move From "Sadistics" to Statistics

Nyaradzo Mvududu, Ed.D.
Seattle Pacific University

Why look at this?

- Students "fear" of statistics
- Student concerns about being successful in a statistics course
- Student failure to see the relevance of statistics in their lives

My focus in the classroom

- What non-cognitive factors impact student success?
  - Anxiety
  - Attitude
  - Student perception of the classroom environment
  - Hope

Measures used at the beginning and at the end of the quarter

- The Statistics Anxiety Scale (SAS; Pretorius & Norman, 1992)
  - 5 point Likert scale
  - higher scores indicate higher anxiety
  - added items that look specifically at test anxiety

- Attitude Towards Statistics survey (ATS; Wise, 1985)
  - 5 point Likert scale
  - higher score indicate more positive attitude
  - 2 subscales – Field and Course

- The Constructivist Learning Environment Survey (CLES; Taylor, Fraser, & Fisher, 1996)
  - 5 point Likert scale
  - 2 forms – actual and preferred
  - 5 subscales – Personal relevance, Critical voice, Uncertainty, Shared control & Student negotiation

- The Hope Scale (Snyder, Harris et al., 1991)
  - 4 point Likert scale
  - higher score indicate more hope
  - 2 subscales – Agency and Pathways

Findings

Relationships

	Field	Course	Total	Critical voice	Student negotiation
General Statistics anxiety	.64 (.52)	.91 (.84)	.81 (.75)	(-.57)	(-.50)
Test anxiety		.59		(-.55)	(-.50)
# of previous stats classes	.27	.29	.31		
Personal relevance (perception)	.42		.38		

Values in ( ) are for a sample of graduate students only

For graduate students: significant correlation between perceptions of learning environment (uncertainty) and Test Anxiety at the end of the course (r = .48)

Factors related to Hope

	Agency	Pathways
Course		.42 (.47)
Total attitude		.41
Uncertainty (fit)	.47	
Student negotiation (fit)		.33 (.50)

Factors related to Statistics Performance

	Performance
Course (one tail)	.20
Critical voice (perception)	.29
Student negotiation (perception)	.30
# of previous math classes	-.30
Test anxiety (initial)	-.43
Test anxiety (end)	-.32

Change over the quarter (non of the changes statistically significant)

1. Reduction in level of general statistics anxiety – 29.93 v. 29.24- as well as test anxiety – 12.22 v. 12.00
2. Improvement in attitude towards the course (26.95 v. 27.88)
3. Minimal change in attitude towards the field of statistics (75.10 v. 74.76)
4. Improvement in overall attitude towards statistics (102.05 v. 102.63).
5. More hopeful with regards to both agency (13.68 v. 13.71) and pathways (12.90 v. 13.10).

Difference between graduate an undergraduate students

1. Graduate students had a more positive attitude towards the statistics course (30.88 v. 25.75; η^2 = .12) and overall attitude (108.88 v. 98.21; η^2 = .11).
2. Graduate students felt a closer person-environment fit with regards to Personal Relevance (η^2 = .09).
3. Undergraduate students perceived their learning environment as providing opportunities for Critical Voice (21.81 v. 21.11; η^2 = .11) and Shared Control (14.12 v 12.32; η^2 = .09).

Now what?

- Change possible
- To reduce anxiety
  - Create an environment where students are "safe" to question and to explain/justify their ideas. Also make the content relevant to the students' everyday lives
    i. Use data from "real" projects with which they are involved
    ii. More doing of statistics than learning about it
    iii. As far as possible link to other courses
    iv. Frequently check in and ask for feedback
    v. Collaboration even on tests
- May lead to higher hope for success (link between anxiety and pathways)