The Effects of Autobiographical Growth Narratives on Math Performance in Women

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Mindset Interventions

Women suffer from the negative stereotype that they are innately worse than men at math (Spencer, Steele, & Quinn, 1999). This stereotype has a greater impact on women who hold the belief that intelligence is inflexible and innate **(fixed mindset)** compared to women who hold the belief that effort can serve to increase intelligence **(growth mindset)** (Aronson, Fried, & Good, 2002).

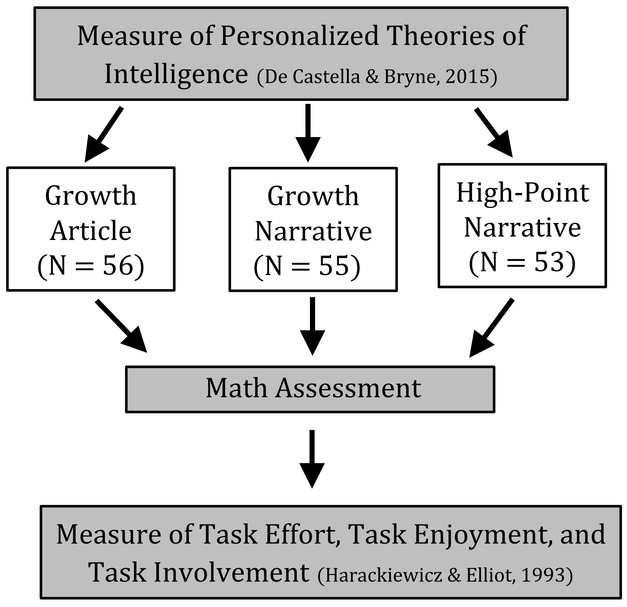
Existing mindset interventions typically require participants to read a *growth article* detailing the malleability of intelligence and the brain, before performing an academic task consistently lead to changes in mindset and task improvements (Dweck, 2000; Dweck & Legget, 1988).

However, self-generated autobiographical narratives that give evidence for a certain trait have been shown to be more persuasive than the presentation of only external information and may be less susceptible to counter-information (Wilson, 2011; Reich & Arkin, 2006; Aronson, 1999).

In the current study, we test whether requiring participants to write about a time in their life where they showed growth in some area (*growth narrative)* will lead to improvements in women's math performance and compare these results to existing interventions.

Study Design

Participants: 164 female Amazon Mechanical Turk users, aged 18-30 (Mean Age = 25.38, SD =3.12)



Hypothesis 1*:* Growth Narrative condition will be associated with the highest math performance, task involvement, enjoyment, and effort compared to the other conditions.

Hypothesis 2: Growth Narrative will be most effective for participants those who began with a fixed mindset.

Results

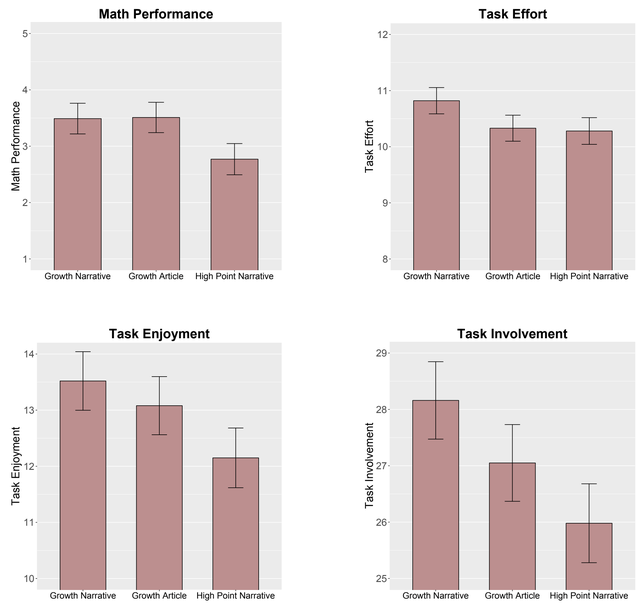
Correlations Between Mindset, Math Performance, Task Involvement, Effort, and Enjoyment

Variables	1	2	3	4
1. Mindset	----			
2. Math Performance	.215**	----		
3. Task Involvement	.357**	.178*	-----	
4. Task Effort	.156*	.055	.502*	----
5. Task Enjoyment	.316**	.170*	.497**	.267**

**. Pearson correlation is significant at the .01 level (2-tailed).

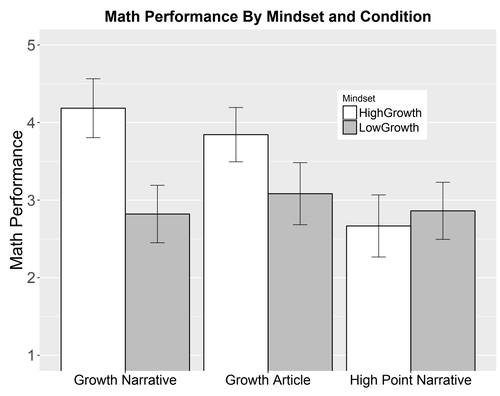
*. Pearson correlation is significant at the .05 level (2-tailed).

Consistent with existing results (Dweck, 2000), initial mindset was positively correlated with scores on the **math assessment** and measures of **task involvement**, **task effort** and **task enjoyment**.



Generating a growth narrative prior to completing a math assessment was associated with higher **math performance**, **task effort**, **task enjoyment**, and **task involvement** compared to generating a high point narrative and led to similar performance as reading a growth article.

Participants were separated into high and low growth mindset groups via median split.

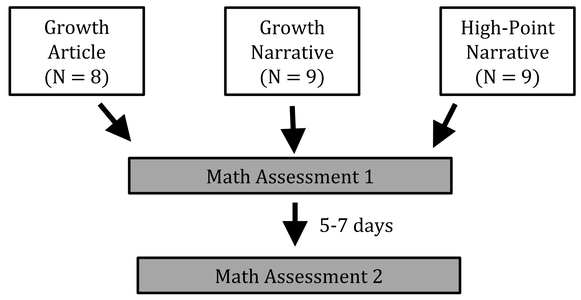


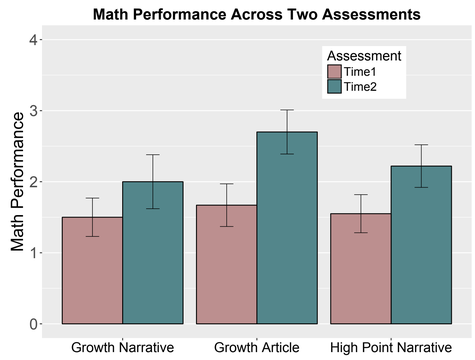
Participants with high initial growth mindset scored significantly higher than those with low initial growth mindset, [$F(1, 158) = 4.238$, $p=0.04$] but this did not differ by condition, [$F(2, 138) = 2.11$, $p = 0.12$].

Pilot Study

Participants: 28 students from Bard College, aged 19 - 22 (Mean Age = 19.72, SD =1.43).

Math performance assessed immediately and 5-7 days following mindset manipulations.





Preliminary analyses suggest that growth article has the longest lasting impact on math performance.

Conclusions

In line with previous research, women with high growth mindset demonstrated higher math performance, task effort, task enjoyment, and task involvement compared to women with low growth mindset .

Self-generated narratives of growth experience led to comparable effects of existing interventions and this was successfully implemented using an online population.

The use of growth narrative appears to be one more tool to combat fixed mindset, particularly with regards to women in mathematics. The simplicity and accessibility of this intervention could make this a useful technique to implement in the classroom.

References

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