

Mental Construal Level and Women's Interest in STEM Fields

Meghan Bauer and Lora E. Park, PhD
University at Buffalo

Women in STEM

- Women hold less than 25% of all jobs in STEM careers and earn fewer college degrees in these subjects than men (National Science Board, 2010).
- Women in STEM fields may experience feelings of threat to belonging in these fields, which are typically male-dominated (e.g., (Cheryan, Plaut, Davies, & Steele, 2009).
- **Construal Level Theory** (Trope & Liberman, 2010) may provide one way for women in STEM to be protected against feeling as though they do not belong.
- Past research has shown that self-affirmation, a technique that makes construal levels more abstract, also boosts feelings of belonging (Sherman et al., 2013; Wakslak & Trope, 2009).

Construal Level Theory

- Focuses on the difference between concrete thinking (low-level mental construal) vs. abstract thinking (high-level mental construal) (Trope & Liberman, 2010)
- Adopting a concrete, low-level construal leads people to focus on the "here and now" and on what they're currently feeling, which may make it difficult to see past the immediate situation.
- In contrast, adopting an abstract, high-level construal involves focusing on more general, superordinate features of stimuli, which may help individuals to distance themselves from the immediate situation (e.g., conditions of threat).

Present Study

- Examine whether shifting women's mental construal (from low-level to high-level) can "undo" feelings of threat in STEM.
- 2 (Threat: threat to belonging in STEM vs. no threat) X 2 (Mental Construal: abstract vs. concrete construal) between-subjects design.
- **Hypothesis:** Women who feel a lack of belonging in STEM may show boosted STEM outcomes (greater sense of belonging, identification, and interest in STEM) if they are assigned to adopt a high-level (vs. low-level) mental construal.

Participants and Procedure

- 124 female undergraduate students from the Introductory Psychology Subject Pool at the University at Buffalo.
- Data were excluded for those who failed to follow directions for the threat manipulation (n=9) or construal manipulation (n=6).
- Final N= 110 ($M_{age}=19.40$, $SD=1.46$)
56% Asian, 33% White, 5% Black, 5% Hispanic, 1% Other

- **Task Order and Instructions:**
Threat to Belonging in STEM (adapted from Pickett, Gardner, & Knowles, 2004)

STEM Threat Condition:
Write about a time in which you felt rejected in some way *in a math or science course that you have taken*, a time that you felt as if you did not belong in that class. This rejection can be interpersonal in nature (e.g., a time when a professor, TA, or classmate in your math/science course made you feel unwelcome or stupid in some way) or can be a rejection from a group (e.g., a time in which you felt excluded from a project or felt left out in some way in your math/science course).

No Threat Condition:
In this task, we would like you to write about a time you walked/drove to campus or work. In the space provided, please describe in detail your past commuting method.

Category vs. Exemplar Mental Construal Task (Fujita, Trope, Liberman, & Levin-Sagi, 2006)

Abstract Construal Condition: "[Given word] is an example of _____"
(Participants need to come up with a superordinate category)

Concrete Construal Condition: "An example of a [Given word] is _____"
(Participants need to come up with an exemplar)

- Participants saw the same list of stimuli words (e.g., soda, actor; 40 words) in completing their respective construal task.

Dependent Variables :

- **Feelings of belonging in STEM** (8 items, $\alpha=.90$; Ahlqvist et al., 2013)
e.g. "How do you feel about your current or most recent math class?" on a scale from 1 (*Miserable to be in my math class*) to 9 (*Thrilled to be in my math class*).
- **Identification with STEM** (5 items, $\alpha=.93$; Nosek et al., 2002)
e.g. "How much do you consider yourself to be a "Math and Science" person?" on a scale from 1 (*Not At All*) to 7 (*Very Much*)
- **Interest in STEM** (8 items, $\alpha=.93$; Diekmann et al., 2010)
e.g. "How interested are you in a career in ____?" on a scale from 1 (*Not At All*) to 7 (*Extremely*); 25 career choices were listed, 8 categorized as STEM careers

Results

- A series of 2 x 2 ANOVA analyses were conducted to examine main effects and interactions of Threat Condition and Construal Condition.
- No significant effects were found for any of the dependent measures (all $ps > .20$).

Discussion

- Contrary to predictions, inducing a high-level construal did not lead to better STEM outcomes when asked to recall a time when participants felt low belonging in STEM.

Possible reasons for lack of significant results:

1. Category vs. exemplar task may not have had the intended effect.
 - The construal manipulation used in this study may not have been as effective (as self-affirmation, for example) because it was not directly tied to the self.
2. Abstract Construal Condition may have been more mentally taxing than the Concrete Construal Condition, which may have dampened subsequent effects on the dependent measures.

Future Directions

- Design a study using a different construal manipulation that is more directly relevant to the self:
e.g. Why (abstract) vs. How (Concrete) do you do something? (Freitas et. al, 2004)
- Examine "threat in STEM" in other ways
e.g., examine individual differences in feelings of belonging in STEM; make the threat in STEM more immediate and uniform across participants.

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