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A Holistic Approach to Combating Stereotype Threat in STEM Among Elementary Children

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Abstract:

- **Stereotype threat** research has revealed that marginalized group members' concerns about being negatively stereotyped can impact their **academic performance and interests.**
- Past efforts have mostly focused on **independently** identifying both **internal and external factors** that may moderate stereotype threat effects, especially among **adult populations**.
- Here, we take a more **integrative, holistic approach** to studying these internal (i.e., **identity, resiliency**) and external (i.e., **role models, social support**) moderators **among children.**
- Our **proposed toolkit** can be utilized by elementary teachers to help students, particularly young girls, achieve **academic success** while also developing **grit and enduring STEM interests.**

Past Literature:

- Women are globally less likely to participate in STEM activities, receive STEM degrees, or be represented in STEM disciplines (Alam & Tapia, 2020).
- A lack of representation in STEM has been found to inhibit women's motivation and endurance in their academic pursuits (Logel et al., 2009; Clark et al., 2019).
- Children possess gender stereotypical STEM beliefs as young as six years old, with boys and girls showing similar implicit and explicit biases (Cvencek et al., 2011).
- Self-affirmation exercises can lead to growth mindsets and to women's ability to overcome stereotype threats in male-dominated fields (Forbes & Schmader, 2010).
- One's identity complexity (i.e., connections with school, family, friends, and hobbies) can increase a sense of belonging among STEM women (Gresky et al., 2005).
- The presence of trusted role models and social support networks, especially for women, positively influences their STEM-related outcomes (Carrell et al., 2009).

Current Aim:

- Our theory-driven approach focuses on examining the interdependent relationship of past moderators to *proactively* build grit and STEM interest over time, rather than *reactively* mitigating stereotype threat effects after years in the classroom.

Scan here for our Toolkit:

Starburst Identity Chart – Self-Concept Map

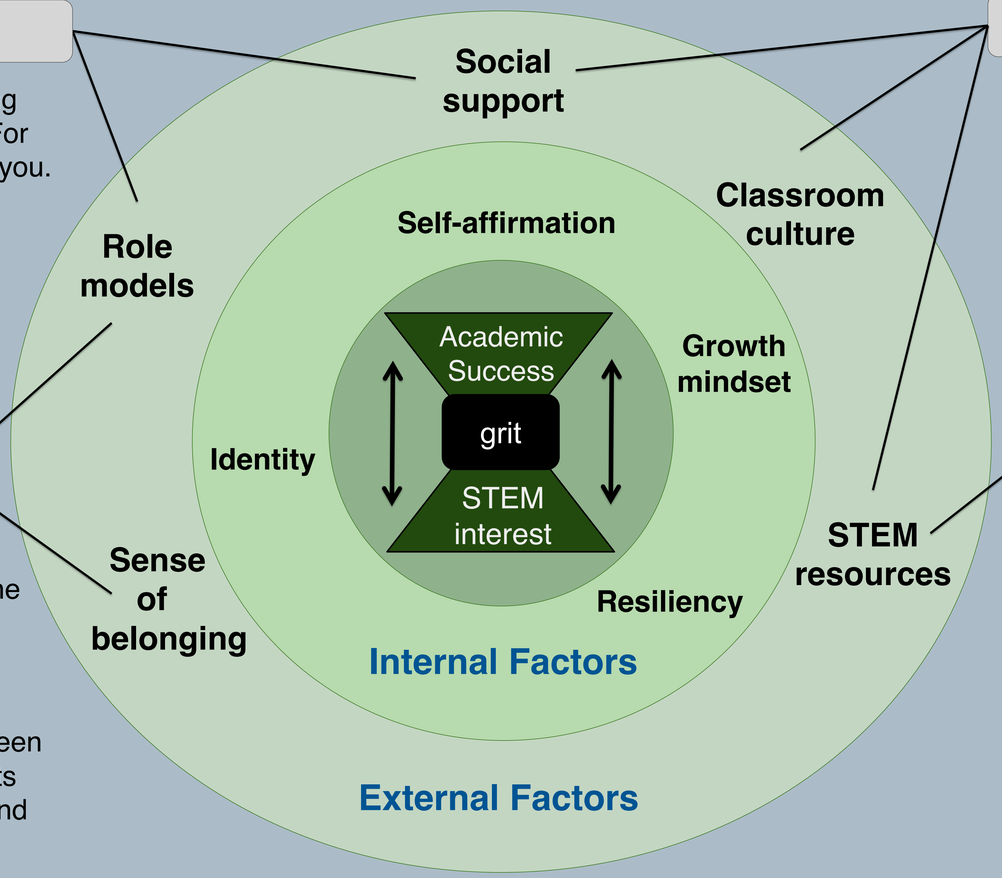
Activity: Write your name in the circle. For outward pointing arrows, write phrases describing aspects of your identity. For inward arrows, write phrases others might use to describe you.

Goals:
- Increases a sense of belonging, which can enhance academic success among women in STEM.
- Encourages students, particularly girls, to make early connections with their support system.

Self-Affirmation Cards

Activity: Each student chooses a card (i.e., "I am Brave", "I am Loved"). They can self-reflect or share their card to the group and explain why they chose the card.

Goals:
- Creates feelings of inclusion and security, which have been shown to protect women against stereotype threat effects
- Provides students with a resource for self-affirmations and allows students to connect with the teacher.



"Shout Outs" - Sharing Acts of Kindness

Activity: Students post a public shout-out to their peers when observing thoughtful actions. "Special agents" can also write personal notes of encouragement to a classmate.

Goals:
- Increases perceived social support, which is positively associated with their level of grit.
- Promotes student relationships and fosters a growth mindset by acknowledging signs of improvement.

Classroom Scientist

Activity: Draw a "scientist" with the class, starting with a blank stick figure and asking them what it should wear and do. Guide students to imagine the figure as a "girl".

Goals:
- Challenges stereotypical STEM beliefs and helps girls without role models imagine a new career possibility.
- Encourages girls to form a different identity, which can increase their motivation to pursue STEM.