The Mediation of Gender-Specific Interests in Science: A Self-to-Prototype Matching Approach

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Gender Differences in Science

- Preferences: The gender gap in preference of science occurs in 12th grade, for career aspirations in science/engineering already in 8th grade (U.S. Department of Education, 1997).
- Self-assessment: Men's assessment of their competence is higher than women's (Cornell, 2001) suggesting that women perceive scientific tasks to be more difficult than men.
- Attribution of success: Women tend to attribute their success less likely to ability and more likely to effort than men (Swim & Sanna, 1996).

Self-to-Prototype Matching (STP)

- To make a decision on a field of study a person assesses the match between the self-concept and the prototype of a person who has already chosen that field (e.g. a scientist).
- The more similar the self-concept is to the prototype the more likely is an individual to make a choice similar to the prototype (e.g., Nenedthal, 1985).

“Mismatch” of Women’s Self-Concepts and Scientist-Prototype

**Hypotheses**

- Gender predicts the perceived difficulty of science and patterns in attribution of success.
- STP mediates the relationship between gender and preference of science.
  - Even when controlling for perceived difficulty.
  - Even when controlling for perceived difficulty and attribution of success.

Results

Perceived difficulty of science:

- Women rated science as more difficult than men.
- The preference of science decreases with increasing difficulty ratings.

Men's and Women's Attributions of Success in Science

Hypothesis 1: Gender predicts the perceived difficulty of science and patterns in attribution of success.

Hypothesis 2: STP mediates the relationship between gender and preference of science.

Method

Participants:

- 110 women and 139 men from two U.S. colleges, mean age: 22 years, range: 17 to 50 years

Relevant variables:

- Gender
- Preference of science: rating scale from 1 to 4
- Self-to-prototype discrepancy: difference-score between ratings from 1-7 for the self and the scientist on a series of gender-stereotypic attributes (24 masculine; 32 feminine traits)
- Perceived difficulty of science: rating scale from 1-7
- Attribution of success in science: categorical ratings (internal, external, stable, unstable)

Mediation Analyses

Three regression analysis testing for mediation were performed (Baron & Kenny, 1986):

- **Self-to-prototype matching** mediated the gender effect on preference of science.
- The relationship between gender and preference of science decreased significantly when controlling for STP (β = 0.407, p < .001).
- The relationship between gender and preference of science is non-significant when controlling for STP and difficulty.
- The relationship between STP and preference of science remains significant even after adding difficulty and attribution of success to the equation (β = 0.300, p < .001).

**Discussion & Implications**

Self-to-prototype matching, perceived difficulty of science, and attribution of success:

- Each has unique predictive power.

Self-to-prototype matching is documented as a powerful mediator of the relationship between gender and preference of science even when controlled for other crucial variables.

General implications:

- Women prefer science less than men because of a “mismatch” between women’s self-concepts (feminine) and the scientist-prototype (masculine).
- Individuals make decisions in congruence with gender schemas of their self-concept and a prototype.
- Crucial for these decisions is not the biological sex of a person but a person’s gender schema contained in the self-concept.

Applied implications:

- Reducing the “mismatch” of women’s self-concepts and/or the prototype of a scientist could lead to more women choosing to enter a scientific career.
- The “mismatch” can be reduced by a change of gender stereotypes and/or the prototype of a scientist.

- Design of educational programs
- Female scientists as role models
- Change of the representation of men and women as scientists in the media.