The Power of the Immediate Situation: Gender Differences in Implicit Math Attitudes

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Abstract

The power of the immediate situation was measured in the expression of relatively uncontrollable attitudes. In the current study, the presence of a male or female experimenter differentially influenced implicit attitudes toward mathematics among female and male subjects. Male subjects’ attitude toward math was unaffected by experimenter gender (neutral attitude toward math). Female subjects, on the other hand, showed negative implicit attitudes toward math in the presence of a male experimenter and slightly positive implicit attitudes toward math in the presence of a female experimenter. These results add to recent discoveries showing that even relatively automatic attitudes are responsive to subtle social features present in the immediate environment. And, they newly suggest that such social cues have a deeper reach than previously assumed: Experimenter gender influenced attributes associated with gender, i.e., attitudes toward mathematics.

Background

• Women typically show more negativity toward mathematics than men do, whether measured explicitly (self-report) or implicitly. Also, men and women tend to show equally strong stereotypes associating male with math (Nosek, et al, in press). The overwhelming amount of evidence supporting this gender difference has led to the assumption that such attitudes are stable – that is, gender differences cannot be removed.

• Recent demonstrations indicate that implicit attitudes are indeed susceptible to changes in the environment. For example, the presence of a black experimenter decreases negativity toward African Americans (Lowery, Hardin, & Sinclair, 2001). This striking results leads to several questions. How generalizable is the effect to other social categories? Would the presence of a Black experimenter have elicted more positive attitudes, not just toward the social group, but attributes associated with the group? Does the presence of a target also shift implicit preferences for concepts associated with the target?

• In this study, we examined implicit math attitudes and gender-math stereotypes in men and women using either a male or female experimenter. A male experimenter represents a group more associated with math than a female experimenter. Since the math+male stereotype excludes women, for women the presence of a male experimenter highlights the math+male link. In so doing, will it decrease the math+good association compared to when the experimenter is female?

Method

• Participants. 38 men and 38 women

• Materials.
  o The Go/No-go Association Task (Nosek & Banaji, 2001)
    ▪ Implicit math attitudes. (Math+good) – (Math+bad)
    ▪ Implicit gender-math stereotype. (Math+male) – (Math+female)
  o Explicit math attitudes and gender stereotypes
    ▪ Explicit math attitude. Warm/Cold ratings
    ▪ Gender-math stereotype. Rating agreement to items such as “Men are better at math than women are”

• Procedure. Participants interacted with a single experimenter, either male or female. Implicit and explicit measures were presented in counter-balanced order. Within measurement type, attitude and stereotype measures were randomized.

The Go/No-go Association Task (GNAT)

Words are briefly presented (~600ms) on a computer screen and participants must ‘catch’ items that belong to two target categories (e.g., all words that mean ‘math’ [e.g., calculus] or ‘good’ [e.g., love]) and ignore all words that do not belong to the target categories. Accuracy is assessed by computing d-prime to index the ability to separate the two target categories (signal) from the distracters (noise). The ease of ‘catching’ target stimuli and ignoring distracters indexed by d-prime is taken as a reflection of the association between the two target categories. The GNAT has two critical conditions: (1) participants catch items representing math or good, and (2) participants...
catch items representing math or bad. Participants who have positive automatic evaluations of math should be more accurate in the first condition; those with negative automatic evaluations of math should be more accurate in the second condition.

**Implicit math attitudes by participant gender and experimenter gender**

Y-values reflect the difference in d' scores between math+good and math+bad.

Interaction of participant gender and experimenter gender: F(1, 72) = 5.48, p = .02
- Women showed greater negativity toward math with male experimenter: t(36) = 3.48, p = .001
- Men showed no difference across condition: t(36) = 0.00, p = .99
- No differences were observed with explicit attitudes

**Implicit gender stereotypes by participant and experimenter gender**

Y-axis values reflect the difference in d' scores between math+male and math+female.

Interaction of participant gender and experimenter gender: F(1, 72) = 2.5, p = .12
- Women show more stereotyping with male experimenter: t(36) = 1.84, p = .07
- Men show similar stereotyping across condition t(36) = .32, p = .76
- No differences were observed with explicit gender-math stereotypes.

**Conclusion**

- Gender differences in implicit attitudes toward math that were apparent with a male experimenter, were absent (even slightly reversed), when the experimenter was female. Women showed greater positivity toward math with a female compared to a male experimenter. Men showed no sensitivity to the gender of the experimenter. The presence of a target (male) can shift evaluations of the target, but also evaluations of concepts related to the target (math).
- Women also showed somewhat stronger associations between math and male when the experimenter was male. Again, men were not sensitive to the gender of the experimenter.
- The immediate situation is sufficiently powerful to alter automatic responses to social categories and to wipe out a gender difference in math attitudes that is linked to math performance, participation, and perseverance raising potential for the impact of immediate situations on long-term consequences.

**References**

