Confronting Sexism in Science, Technology, Engineering and Math (STEM): Establishing Women's Perceived Social Costs

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Background

- Controversial remarks that female scientists are 'Distractingly Sexy,' and fashion featuring statements like 'Too Pretty to Do Math' reinforce negative biases toward women in STEM, which in turn contribute to the lack of gender diversity in STEM:

  ✓ Only 30% of STEM graduates are female (Hango et al., 2013).

  ✓ Women's STEM unemployment is greater than men's (i.e., 7% vs. 4.7%), and they earn lower salaries, occupy fewer full-time positions, and experience more sexual harassment, and professional exclusion than men (Blickenstaff, 2005; Ceci et al., 2011; Hango et al., 2013; Rosser, 2006).

- By confronting sexism, reductions in future bias is possible (Czopp et al., 2006; Mallet & Wagner, 2011), however, research has consistently shown how difficult confrontation is, given its social costs (e.g., negative perceptions, retaliation; Czopp et al., 2003; Saunders et al., 2009).

- While the viral hashtag #DistractinglySexy suggests to the world that women will easily confront these biases, confronting may in fact be even more difficult given STEM careers are typically masculine (Nosek et al., 2009) and confrontation contradicts female stereotypes (e.g., submissiveness; Swim et al., 1999).

- As such, women who confront in Science (versus Arts) may therefore incur a 'double-dose' of hostility for violating gender stereotypes in two ways.

Hypothesis

- Consistent with past research, those who imagine confrontation will perceive greater social costs to exist than those who imagine ignoring sexism (i.e., Non-confronters).

- We further predicted that participant major (STEM vs. Arts), confrontation (confront vs. ignore) and context (Science vs. Arts) will interact such that confronting will be perceived as less aversive (i.e., elicit fewer social costs) by STEM majors in an Arts context versus their own STEM context.

Participants & Procedure

- Canadian women (N = 213; 56% STEM majors, 68% Caucasian, M_{age} = 27)

- *STEM majors*: Biology, Chemistry, Health Science, Engineering, Physics, Computer Science and Psychology (at Laurier, Psychology is in the Faculty of Science)

- *Arts majors*: Communications, Humanities, Business and Social Work

- Recruited for an online study in exchange for course credit or a gift card

- Randomly assigned to imagine themselves confronting or ignoring sexism in science or arts, then indicated perceived social and personal costs

Experimental Manipulations

All participants read the following sexism scenario that varied by context (**science** vs. **arts**) and confrontation (**confront** vs. **ignore**):

Imagine that this term, you are enrolled in a **Computer Science (CS1002)**/**Communication Studies (CS1002)** course.

One major part of your grade is a group work assignment. You are paired with a male student named Adam. Each pair must select a group leader to direct the project. They will also have the chance to earn bonus points at the end of the term.

When it comes time to assign roles, Adam says to you, "I'll take the lead so you don't mess up anything important; just take notes and look pretty – that's what girls are good for."

You **confront**/**do not confront** Adam.

You say, **"Excuse me? Actually, women run some of the biggest companies in the world. Ever heard of Pepsi or General Motors? Maybe you should just take notes and look pretty while I take the lead."**

You say nothing and continue reading the assignment sheet.

Measures

Sexism Prime Check

- To what extent was the situation you read about sexist?

- Controlled for perceptions of sexism for all participants

Outcome Measures

Social Costs (Kaiser & Miller, 2001)

- Perceived Competence

  - E.g., To what degree do you think others would see you as intelligent, stupid (reverse coded)? (α = .67)

Personal Costs (Kaiser & Miller, 2001)

- Negative emotions

  - E.g., This situation would make me upset, increase my anxiety, cause me stress, make me sad (α = .76)

- Perceived Subject Difficulty

  - E.g., How difficult is (Communications, Computer Science, Arts)?

- All response scales ranged from (1) *Not at all* to (7) *Completely*

Results

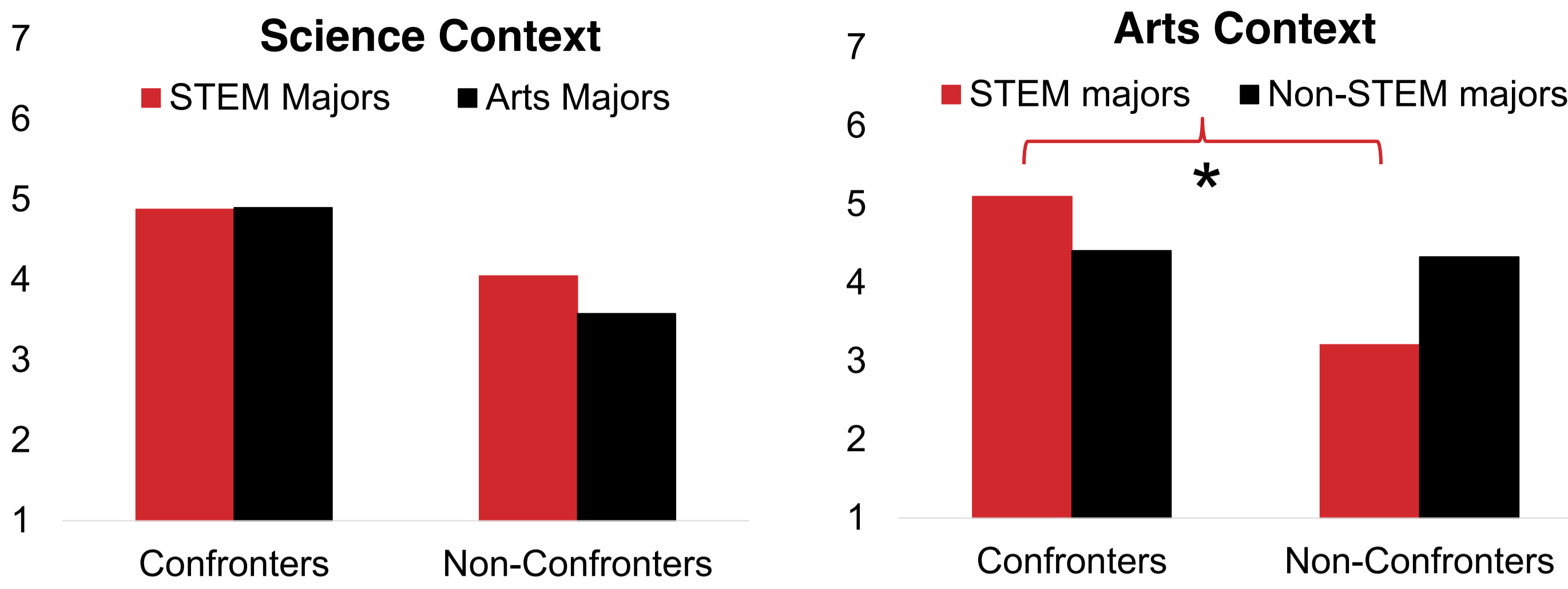### Participant Major X Confrontation X Context On Perceived Competence

Figure 1. A two-way student major x confrontation interaction in the arts context showed that among STEM majors, those who imagined confronting thought others would see them as more competent versus those who imagined ignoring.

$F_{(1, 200)} = 10.04$, $p < .001$, $n_p^2 = .048$

Participant Major X Confrontation X Context On Negative Emotions

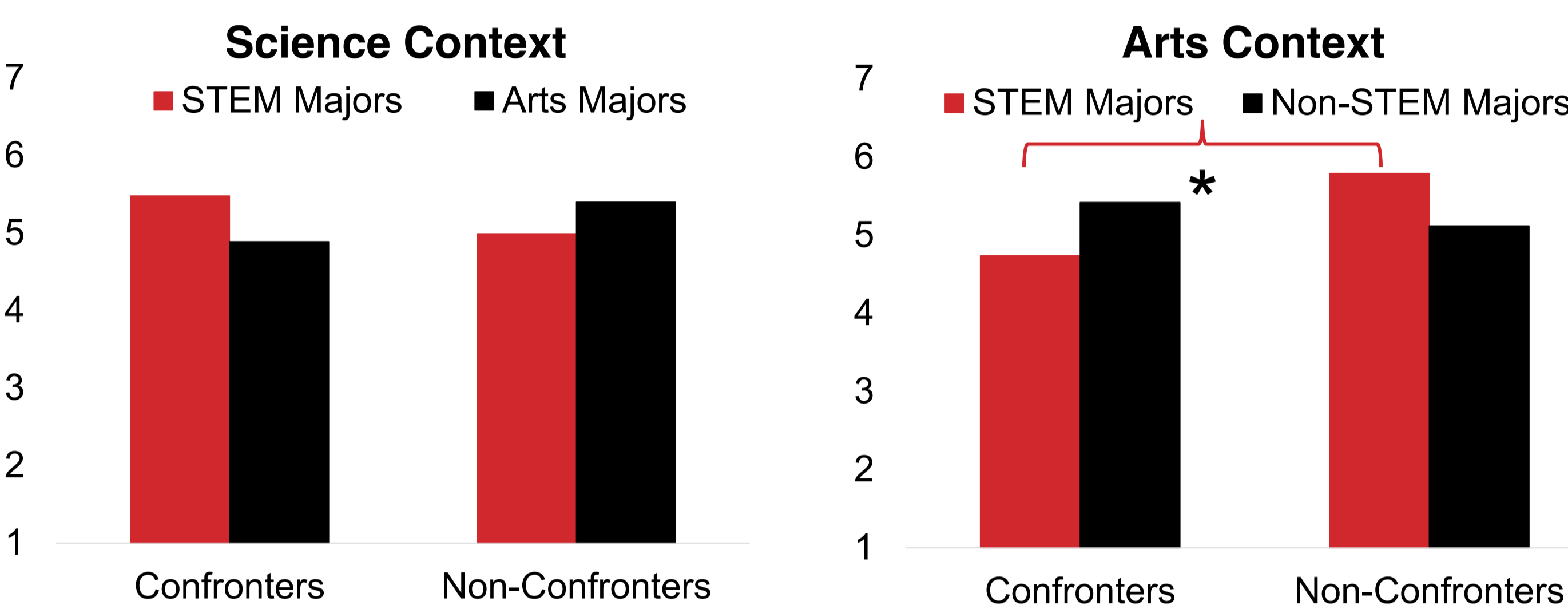$F_{(1, 202)} = 9.35$, $p = .003$, $n_p^2 = .044$

Figure 2. A two-way student major x confrontation interaction in the arts context showed that among STEM majors, those who imagined confronting reported less negative emotion versus those who imagined ignoring.

Participant Major X Confrontation X Context On Perceived Difficulty of Computer Science

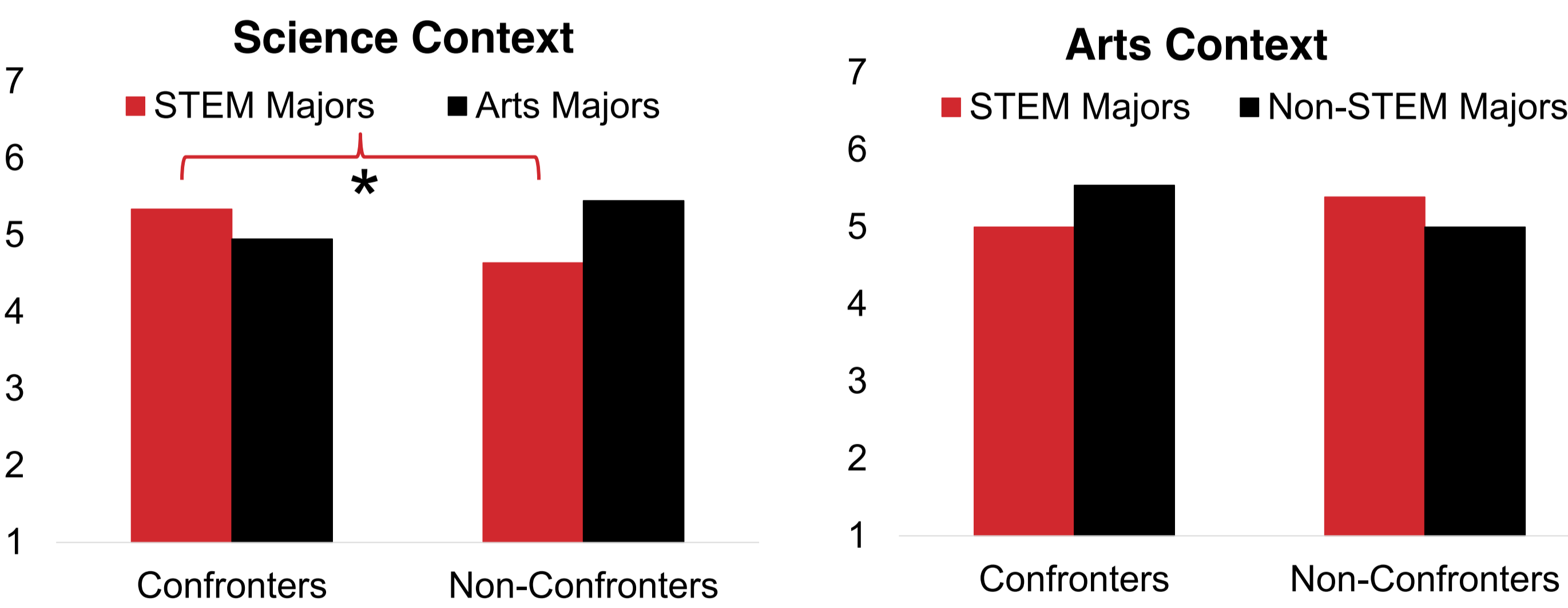$F_{(1, 197)} = 6.37$, $p = .012$, $n_p^2 = .031$

Figure 3. A two-way student major x confrontation interaction in the science context showed that among STEM majors, those who imagined confronting perceived computer science as more difficult versus those who imagined ignoring.

Conclusions & Implications

- Among STEM majors:
  ✓ Imagining confrontation vs. ignoring in arts led to higher perceived competence and lower negative emotion
  ✓ Imagining confrontation vs. ignoring in science led to greater perceptions of computer science difficulty

- For STEM women, arts vs. science contexts may be more conducive to confronting sexism.

- Future research must examine how to reduce perceived social costs so women are encouraged to confront sexism in STEM where gender imbalances persist.