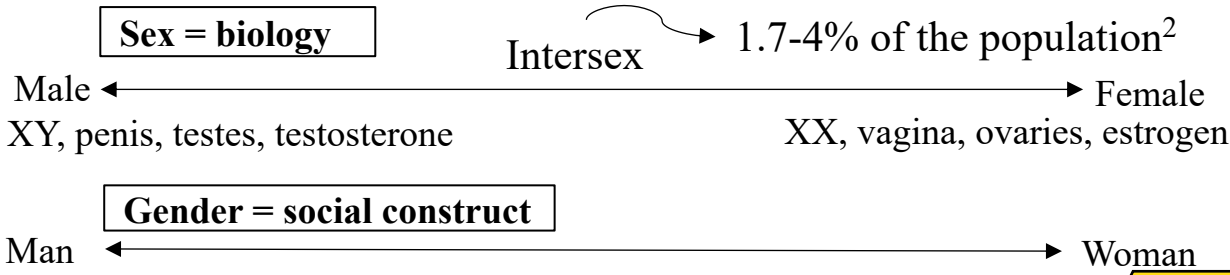


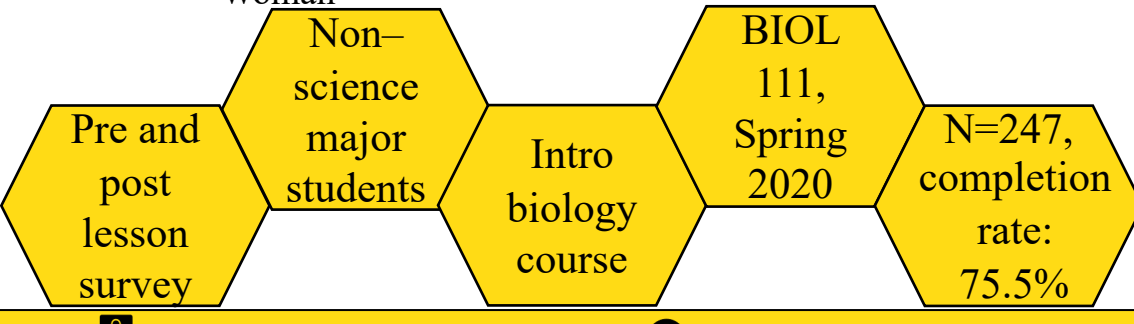


## Research question: What reasoning are non-science major students using to think about biological sex determination?



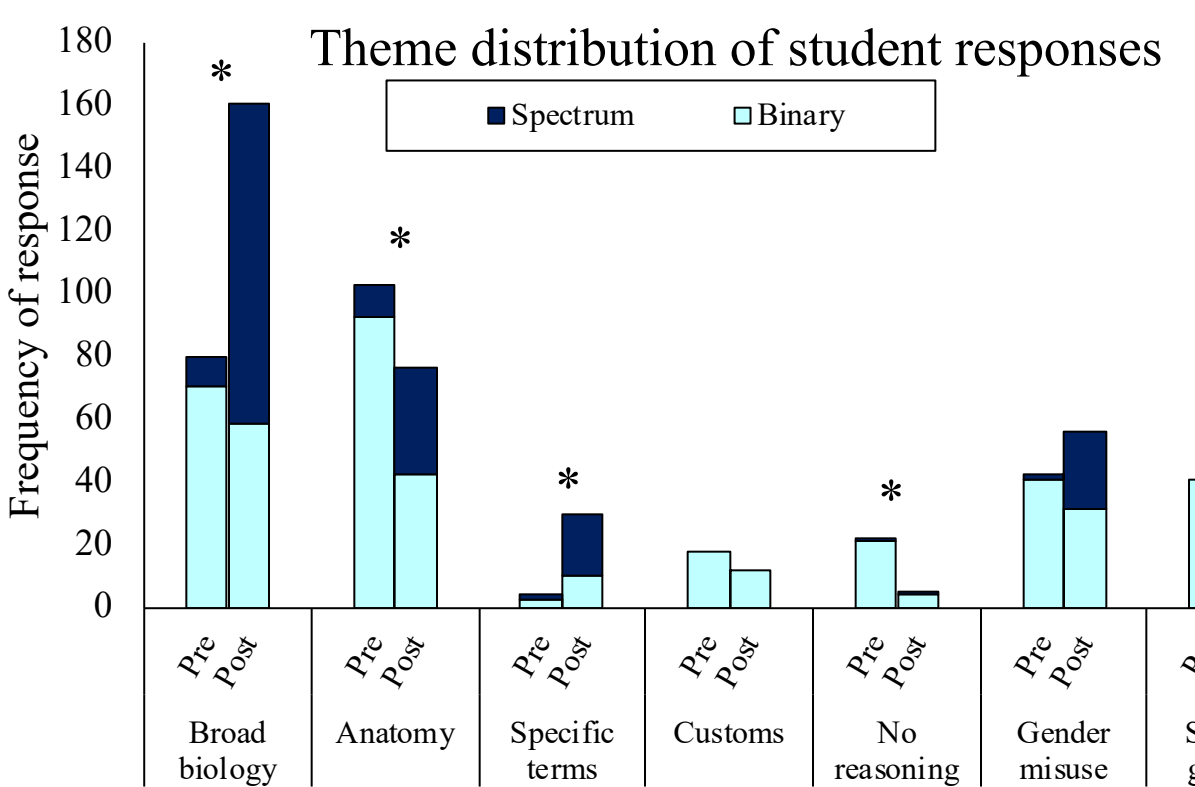
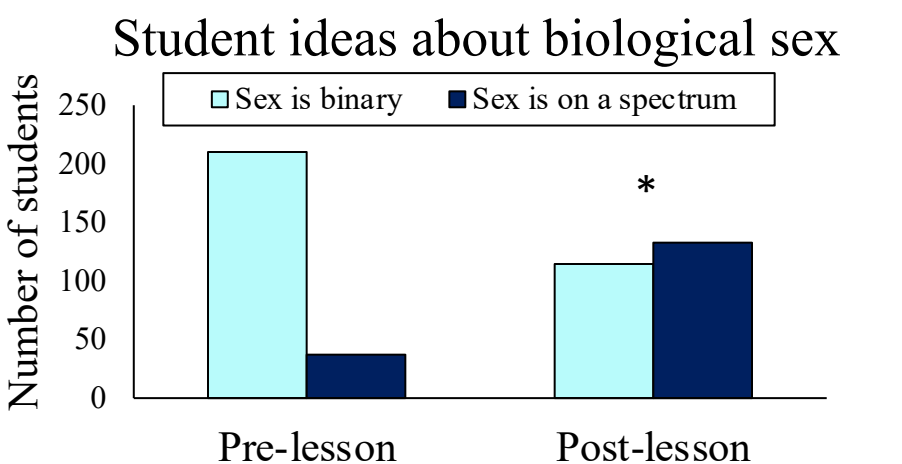
Teaching and learning about sex determination can help enact cultural change and reduce stigma around people who don't fit into the typical binary.<sup>1</sup>

**Survey question:** Which of the following accurately represents your perception of sex: a) sex is binary or b) sex is on a spectrum. Please explain your reasoning.



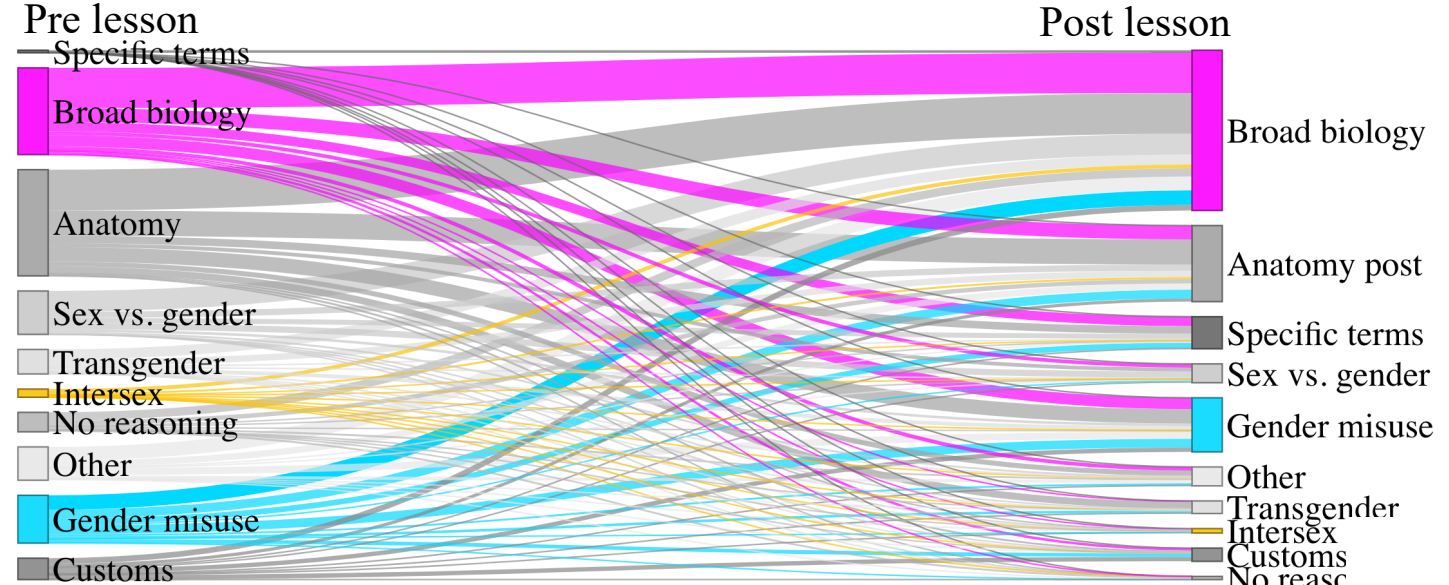
2 coders    Thematic analysis    Cohen's kappa .729-1    Chi-square<sup>4</sup>

**Students change their answers to say sex is on a spectrum rather than binary after learning the biology behind sex determination.**



More students used broad biology and specific terms when discussing sex determination post-lesson. Less students used anatomy, no reasoning, and explanation of sex vs. gender post-lesson.

-Broad biology grows in the post, and has students who were coded in every category in the pre  
 -For gender misuse, responses originally coded in this in the pre disperse into all categories, while in the post, responses from all categories go into it  
 -Intersex is small in the the pre and post lesson



**People who answered using broad biology said sex is a spectrum more than binary. However, students who answered using sex vs. gender and customs said sex is binary more than spectrum**

Students are confused about the difference between sex and gender.  
 Students do not use the term "intersex."  
 Students used biological-based reasoning more after the lesson.

- Students may not be indicating their true beliefs about sex if they mean gender.
- **Sapir-Whorf hypothesis:** language shapes reality – using sex and gender terminology may change how people view one or the other.<sup>3,6</sup>
- The term "intersex" was mentioned in class but wasn't a focus – indicates that for students to absorb vocabulary it may have to be a learning objective.
- Not all people who fall in the middle of the sex spectrum will prefer the term "intersex;" using a person's preferred terminology should be taught in class when the terminology is used.<sup>5</sup>
- More people who used broad biology said sex was a spectrum over binary.
- Suggests acceptance or understanding of the biology of sex determination is influential to students accepting sex as a spectrum.

**Future directions**

- How do responses change or stay the same if gender is also taught in class?
- How does student rationale change between a topic that might not directly affect them vs one that does (such as sex determination vs. COVID-19)?

