Using a Belonging Framework to Understand Gender Disparities in the Physical Sciences, Technology, Engineering and Mathematics (pSTEM)

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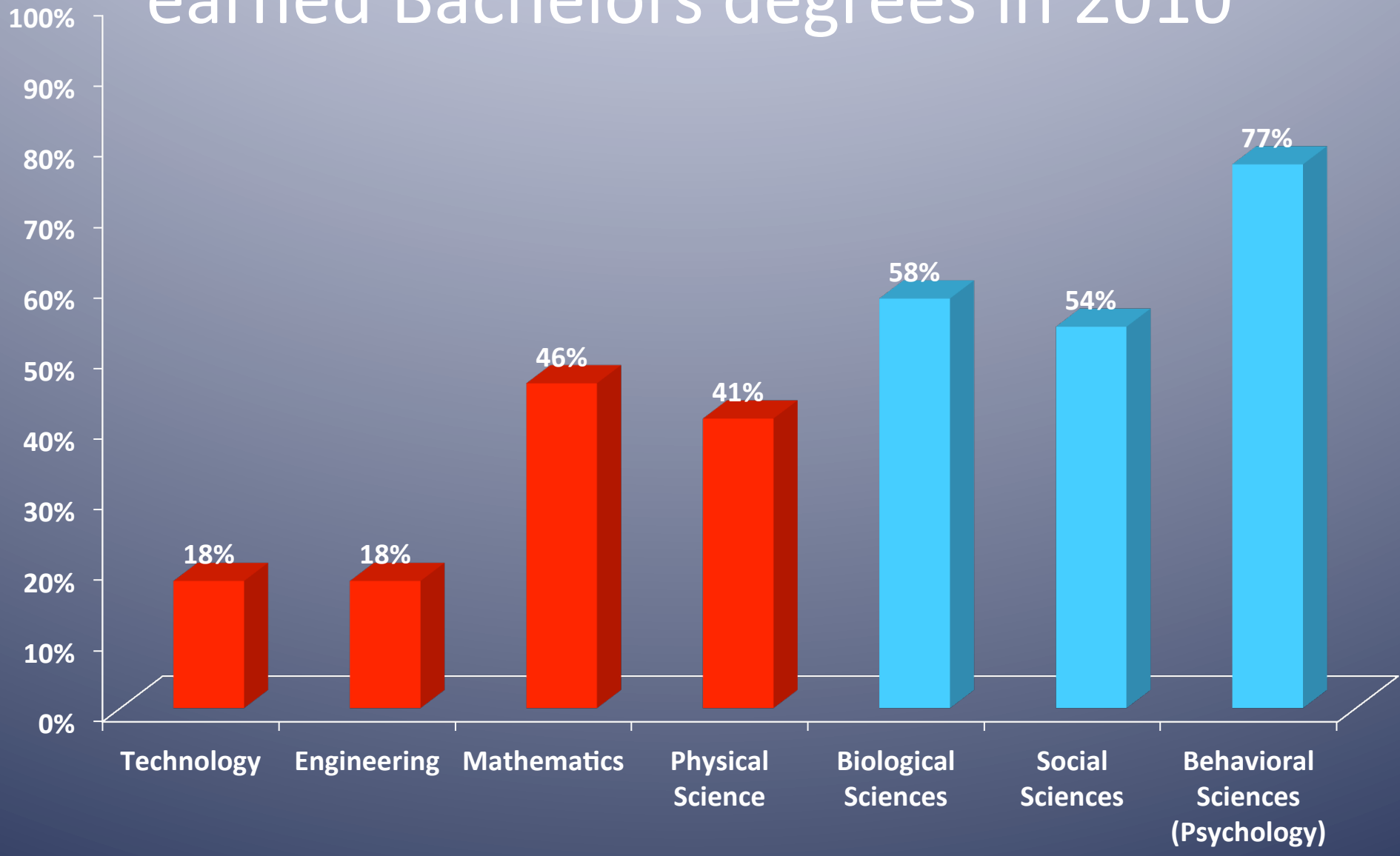
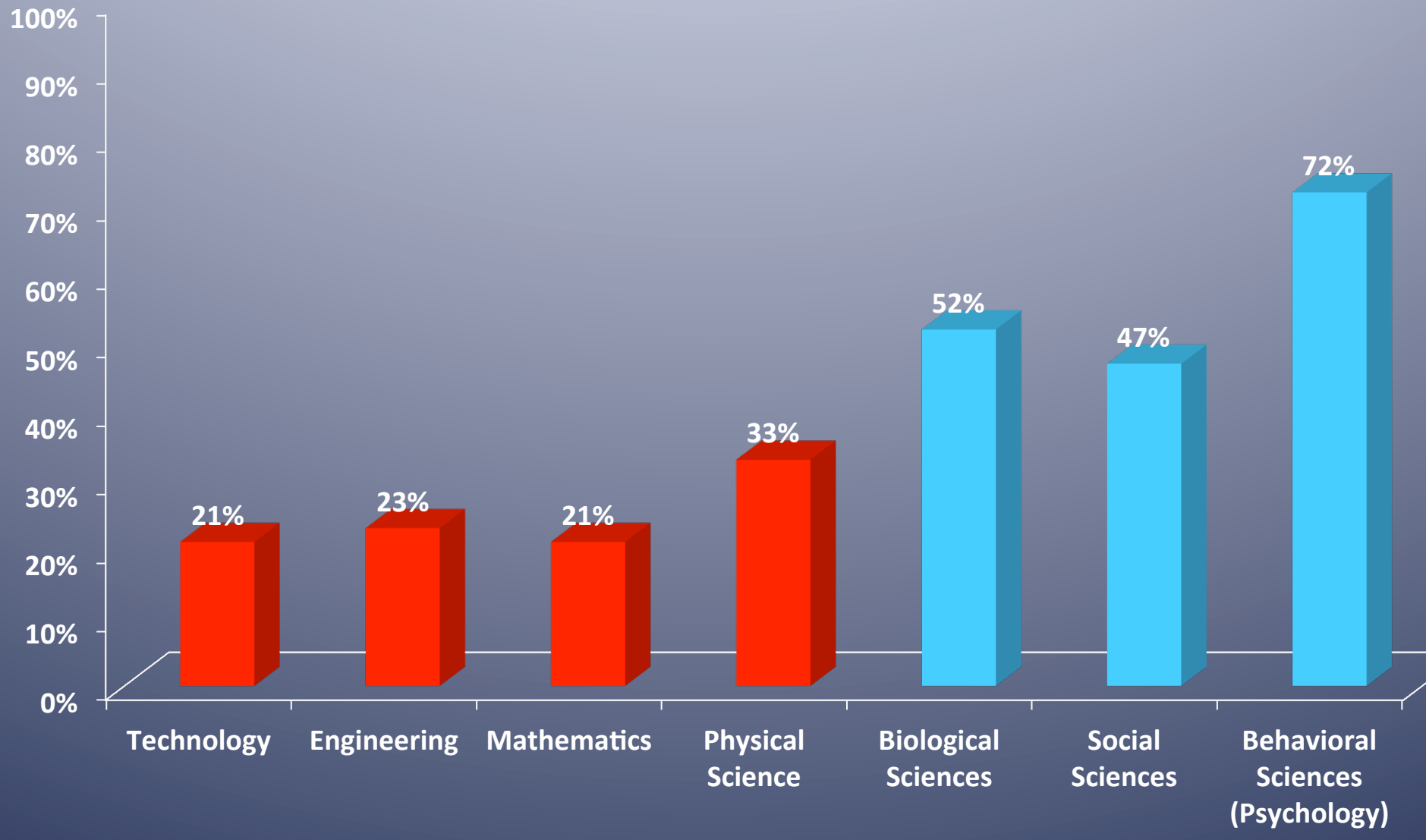
Percent women who earned Bachelors degrees in 2010



NSF, 2012

Percent women who earned PhDs in 2010

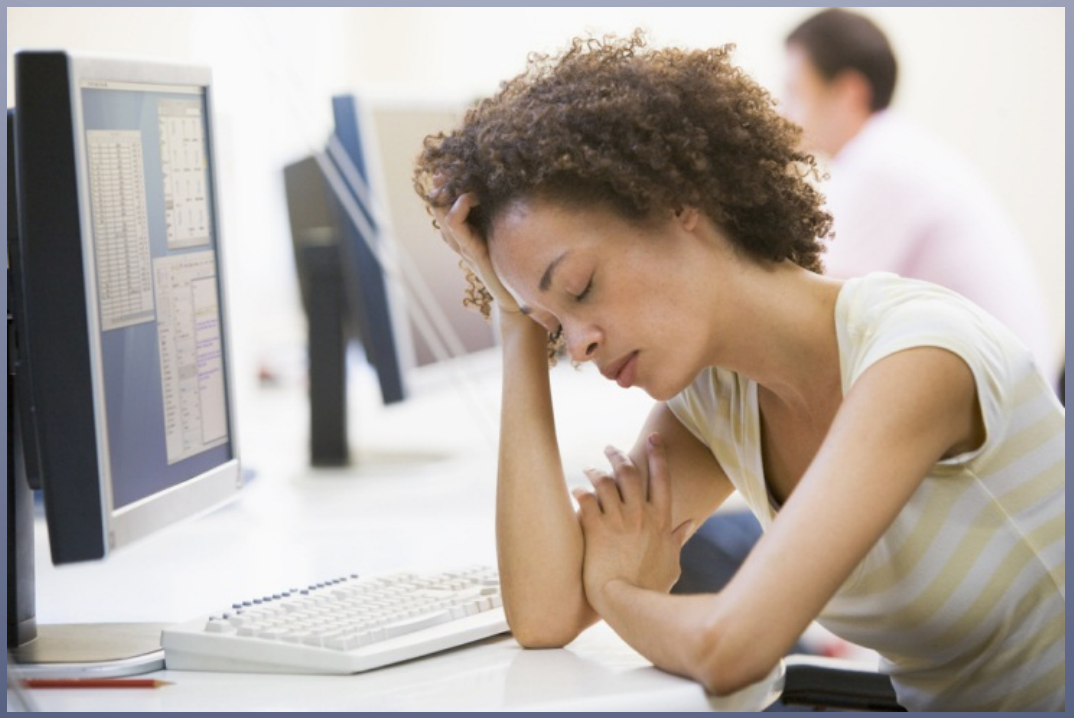


NSF, 2012

Need to belong = Core social need

Thwarted need = negative consequences

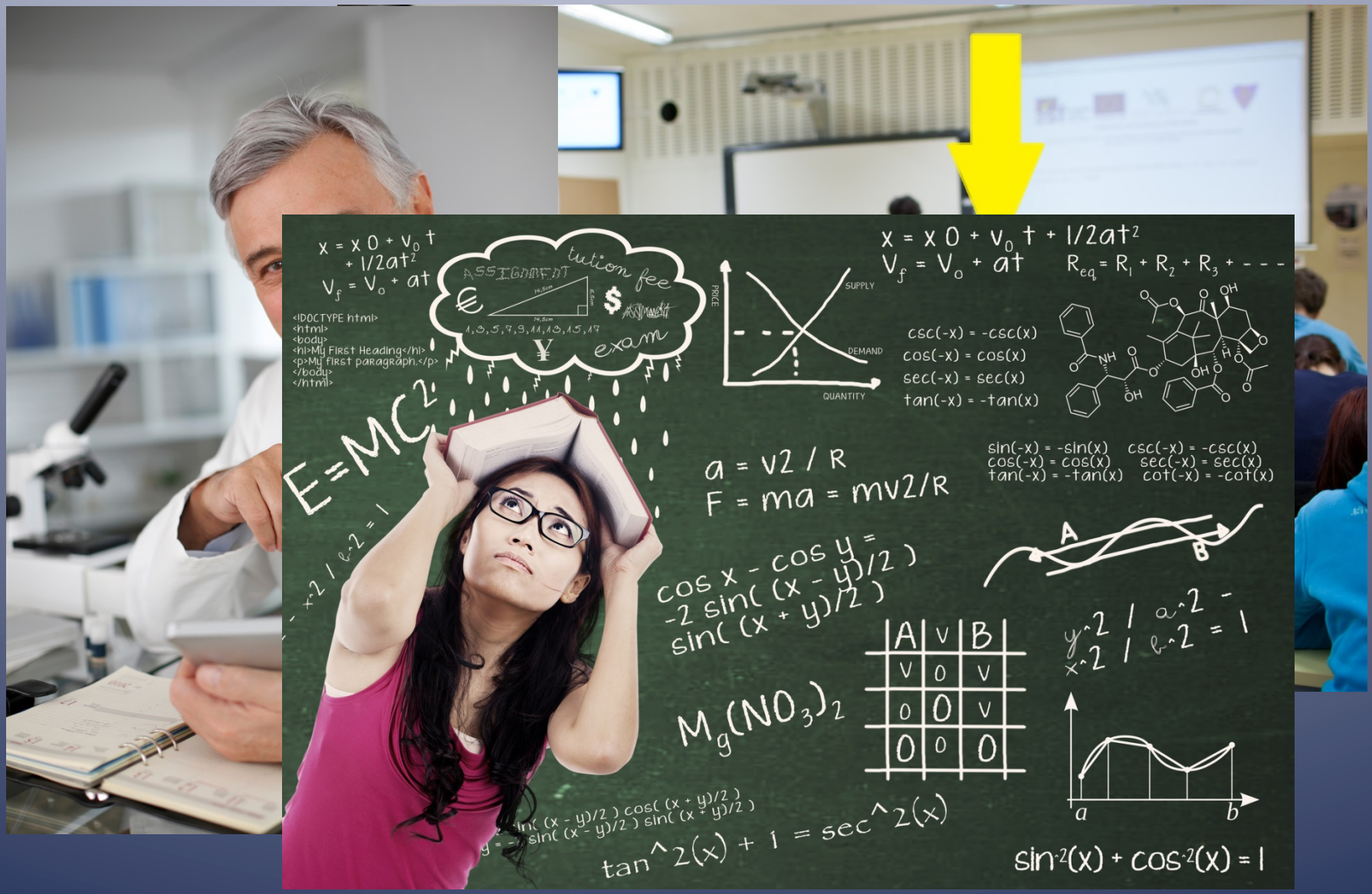
Thwarted need = negative achievement consequences



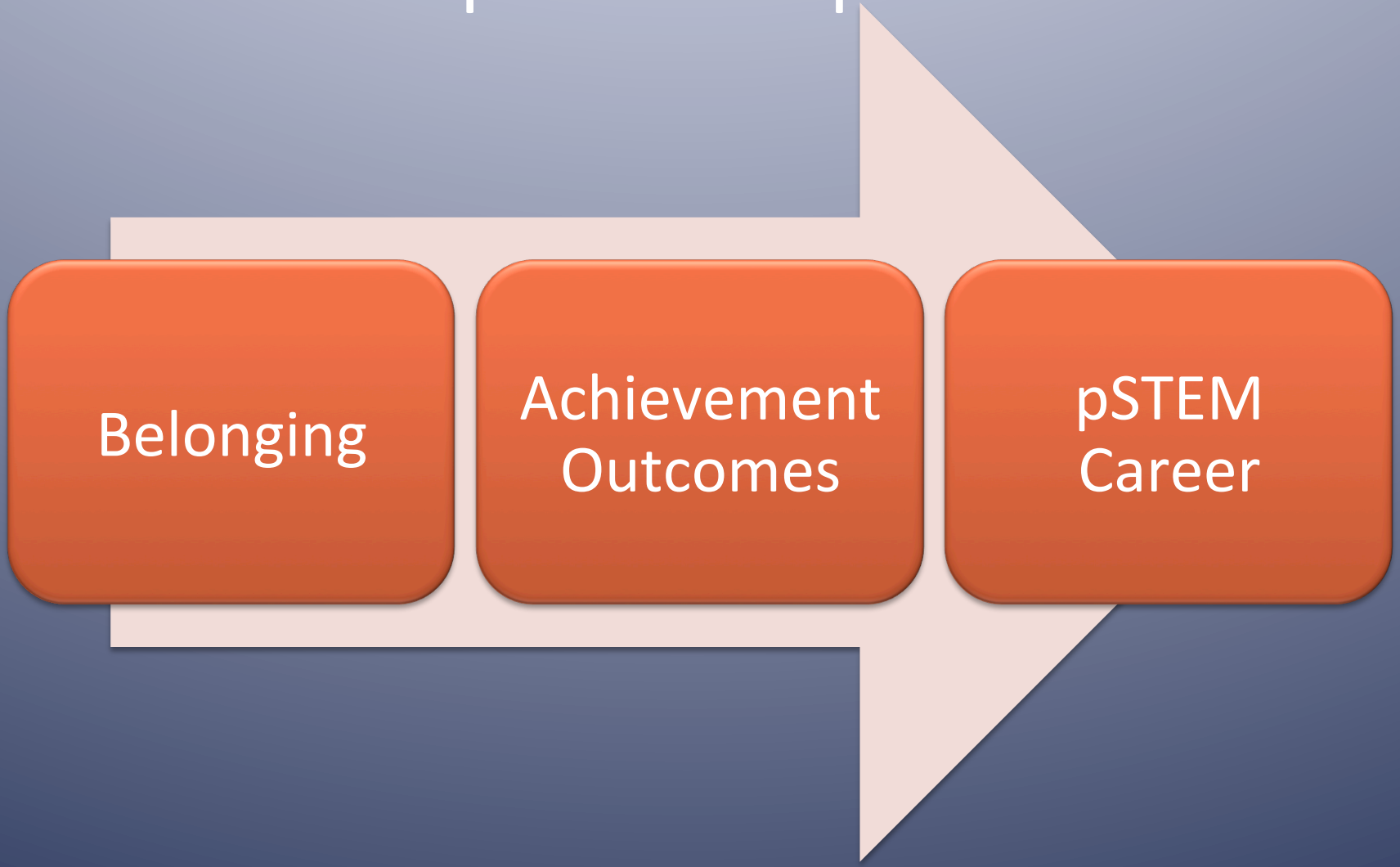
Gender disparities in pSTEM

- Self-efficacy
  - Stout et al., 2011
- Achievement
  - Miyake et al., 2010
- Persistence
  - NSF, 2012

Should women feel low belonging?



Theoretical Model of Gender Disparities in pSTEM



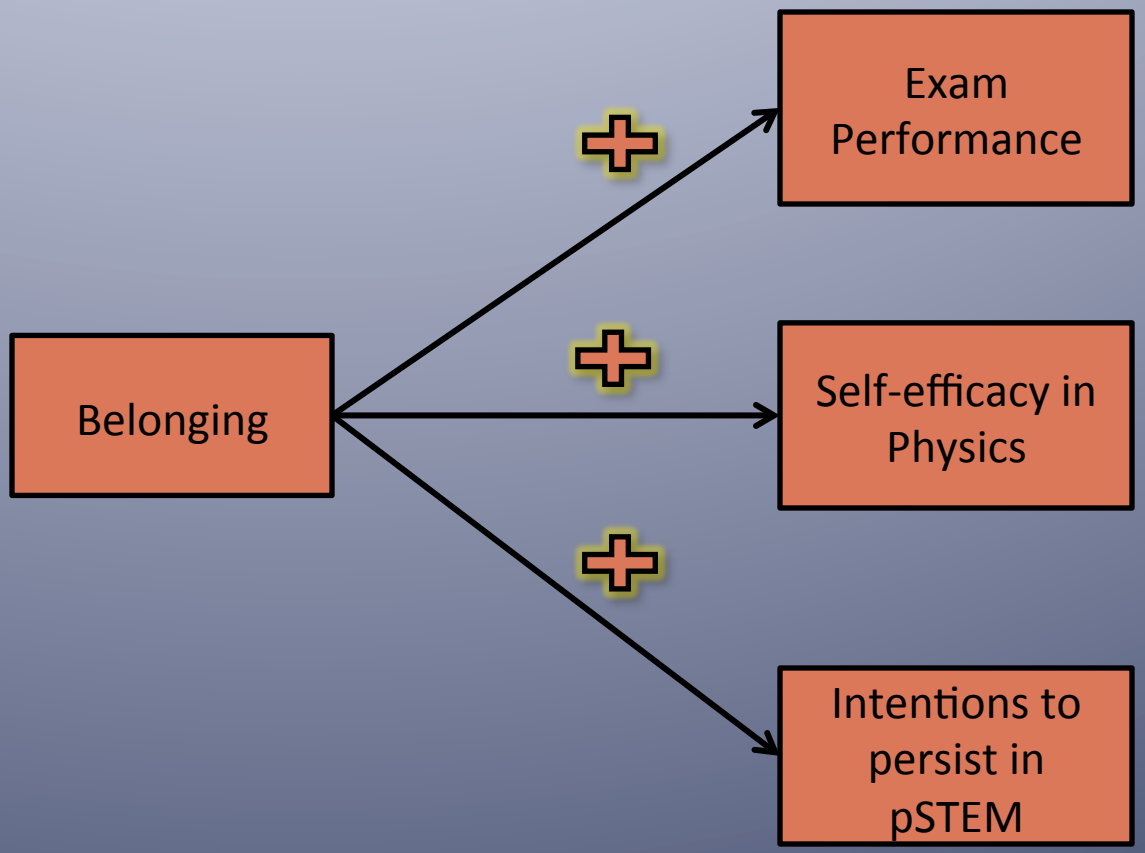
Theoretical Model of Gender Disparities in pSTEM

Field study

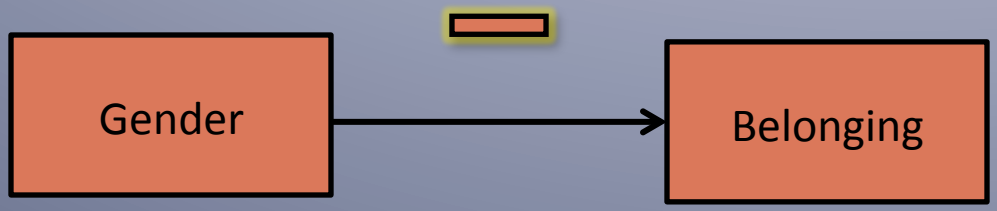
- Participants
  - Intro Physics students
    - Women = 95; Men = 193
- Predictors (beginning of the semester)
  - Sense of belonging
  - Self-efficacy
  - Prior ability
- Outcomes (end of the semester)
  - Exam scores
  - Self-efficacy in future Physics
  - Intentions to persist in pSTEM

Beginning of Semester

End of Semester

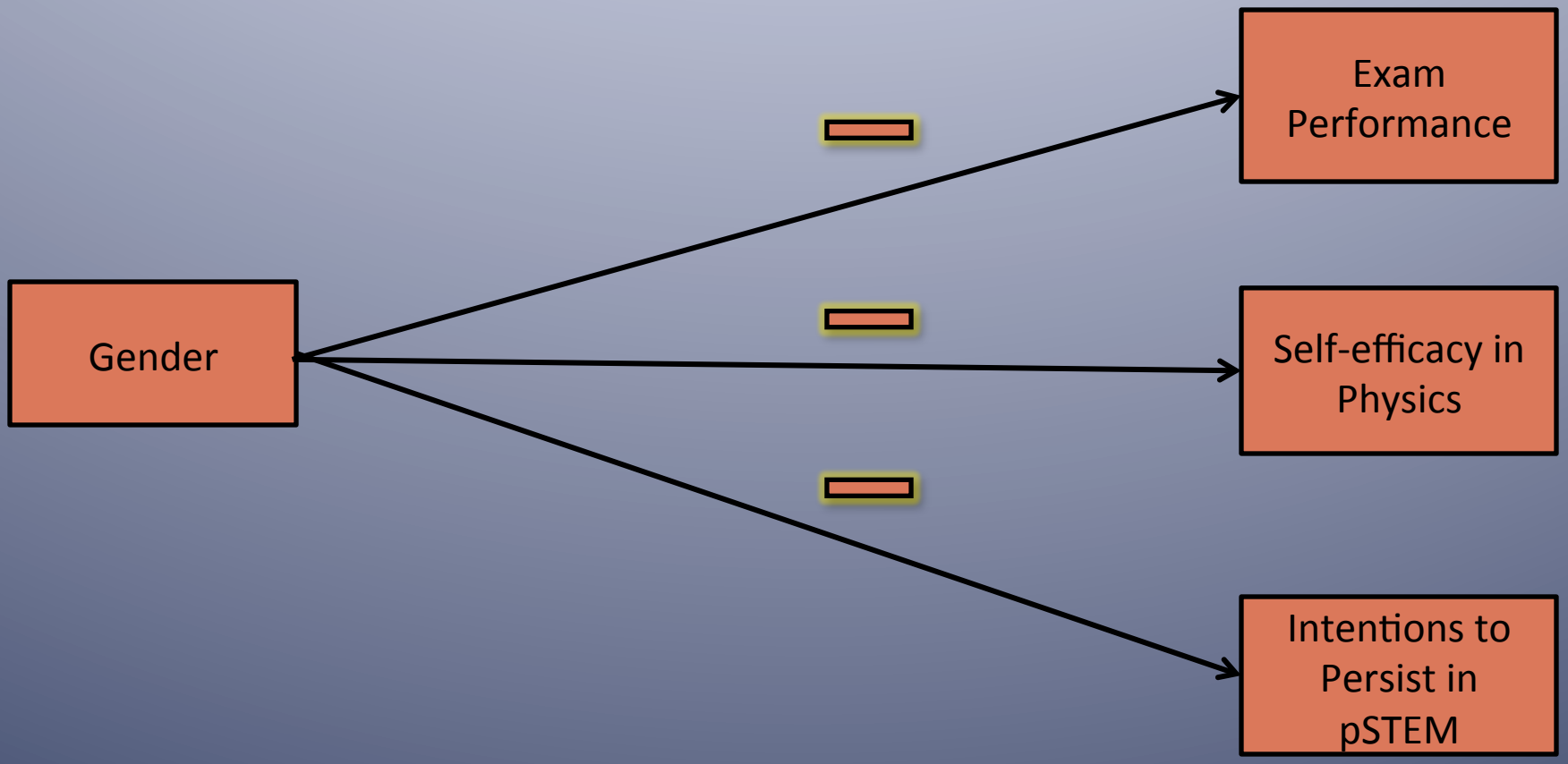


Beginning of Semester

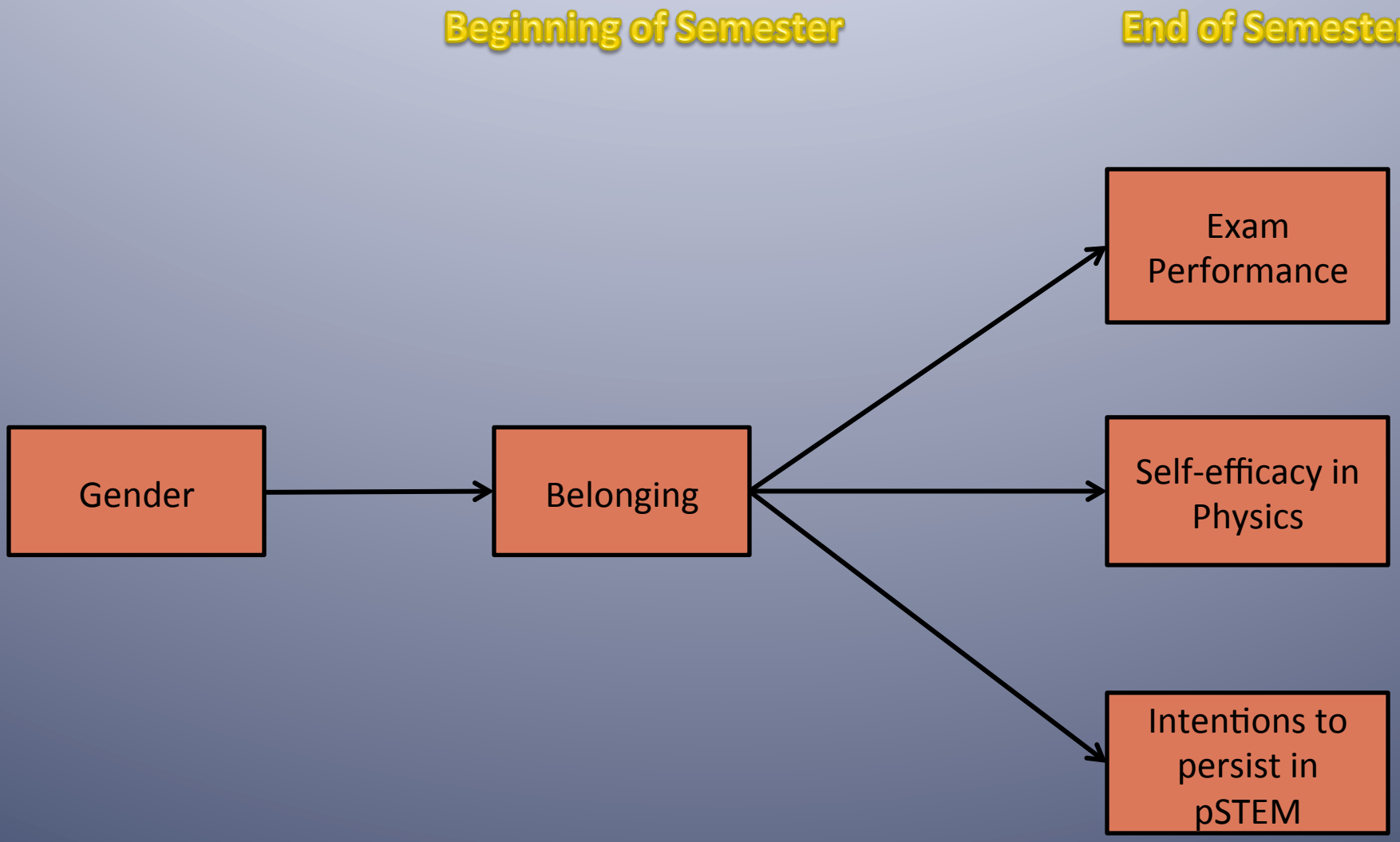


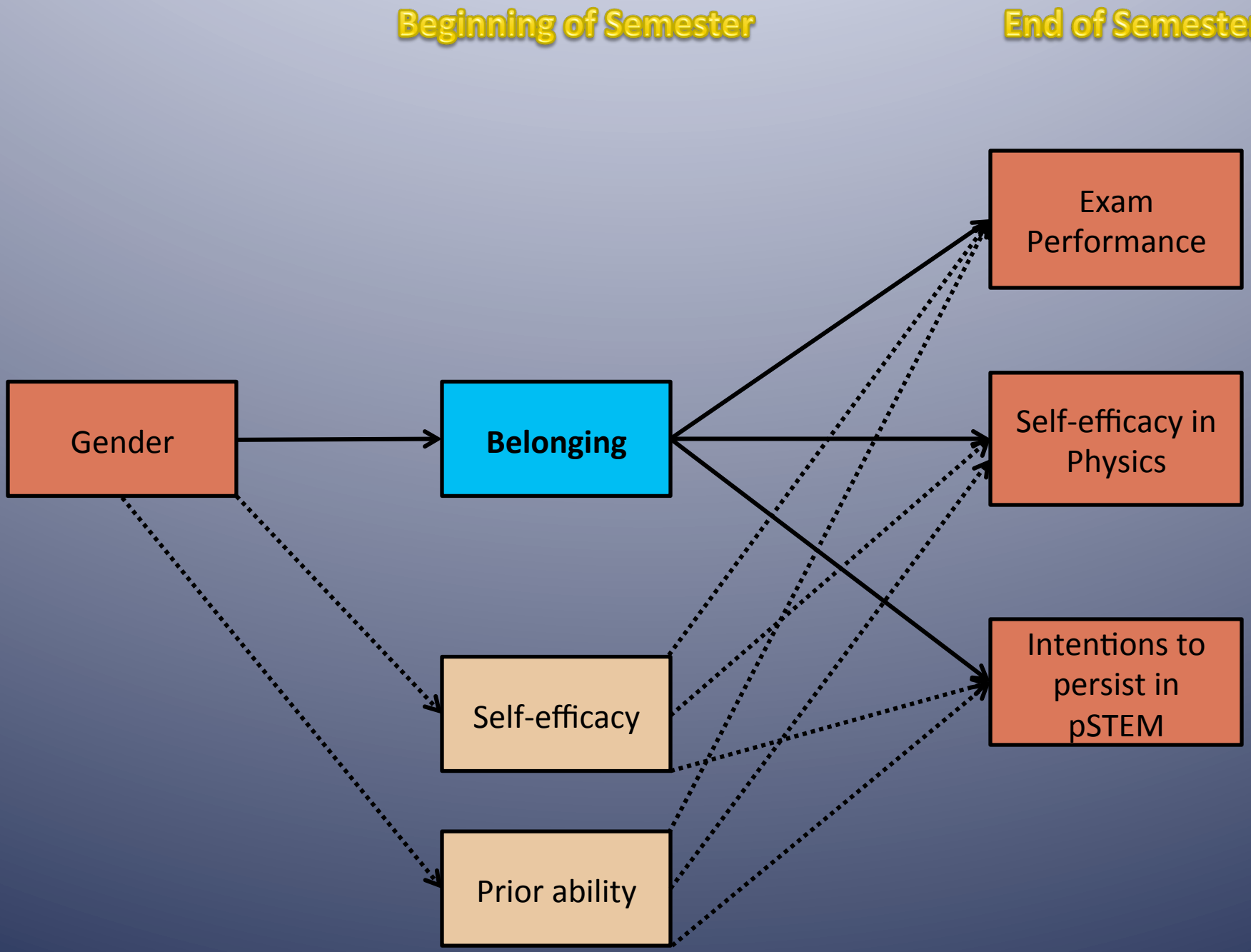
Women < Men

End of Semester



Women < Men


Beginning of Semester
End of Semester
Gender
Belonging
Exam Performance
Self-efficacy in Physics
Intentions to persist in pSTEM


Beginning of Semester
End of Semester
Gender
Belonging
Exam Performance
Self-efficacy in Physics
Intentions to persist in pSTEM
Self-efficacy
Prior ability

Summary and Implications

- Belonging is critical to achievement
- Gender disparities in belonging predict gender disparities in achievement
- Endeavor to enhance women's sense of belonging in pSTEM
  - Women role models
  - Inclusive and gender-neutral pSTEM environments

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