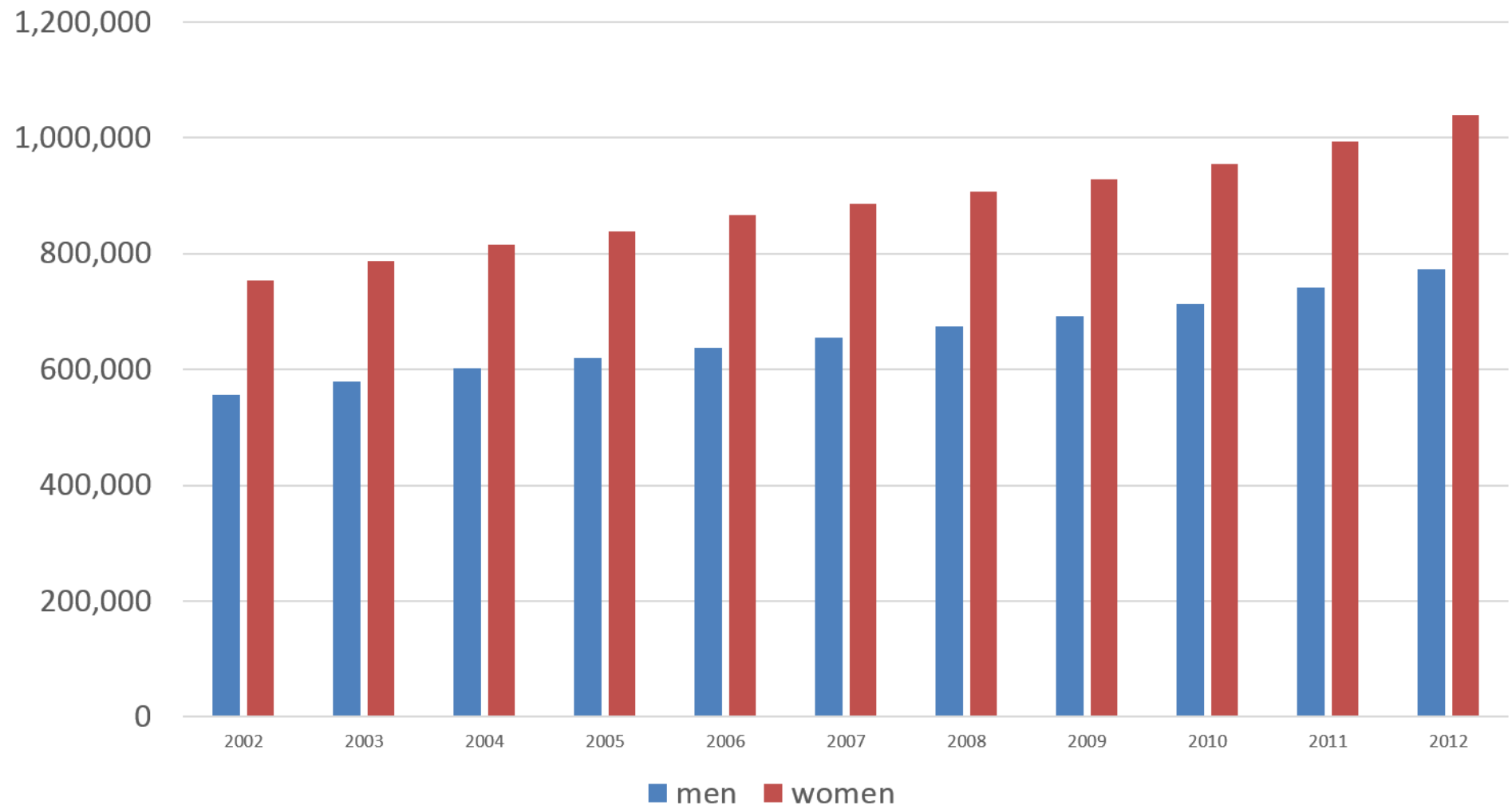# Exploring the
Gendered Space of Attributes
that
Predict Expectations of Success in STEM

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Gender in STEM Research Symposium: Pathways to Parity in STEM
September 19, Northern Illinois University, DeKalb, IL

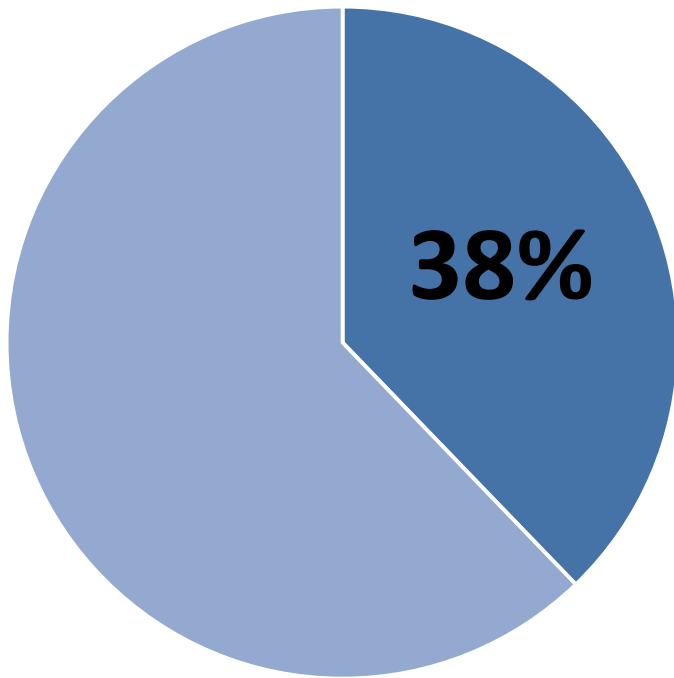# Undergraduate Degrees Awarded by Sex (2002-2012)

Source: National Science Foundation - Women, Minorities, and Persons with Disabilities in Science and Engineering (2014)
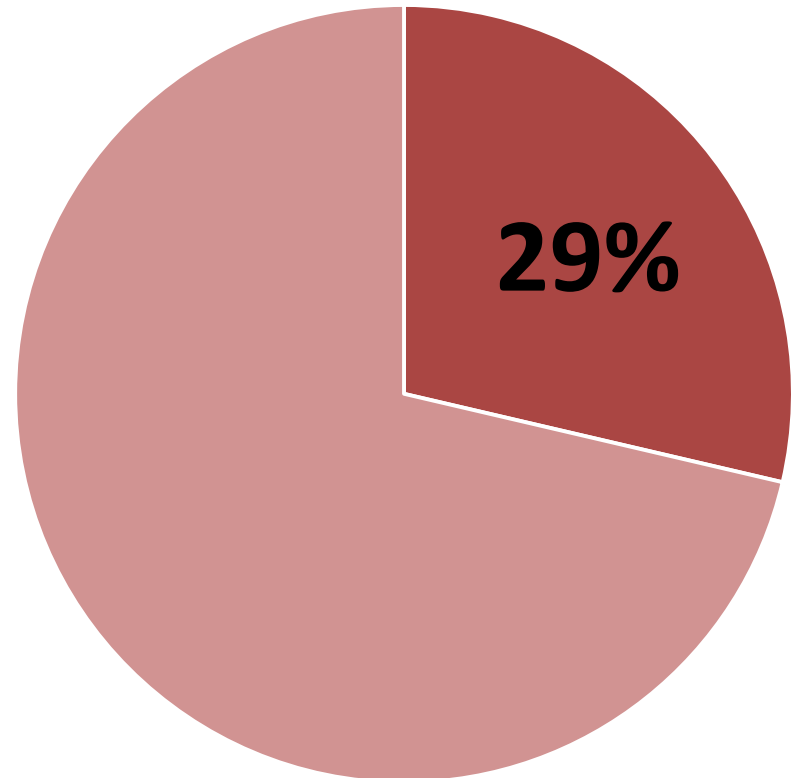
STEM Degrees Awarded by Sex (2002-2012)
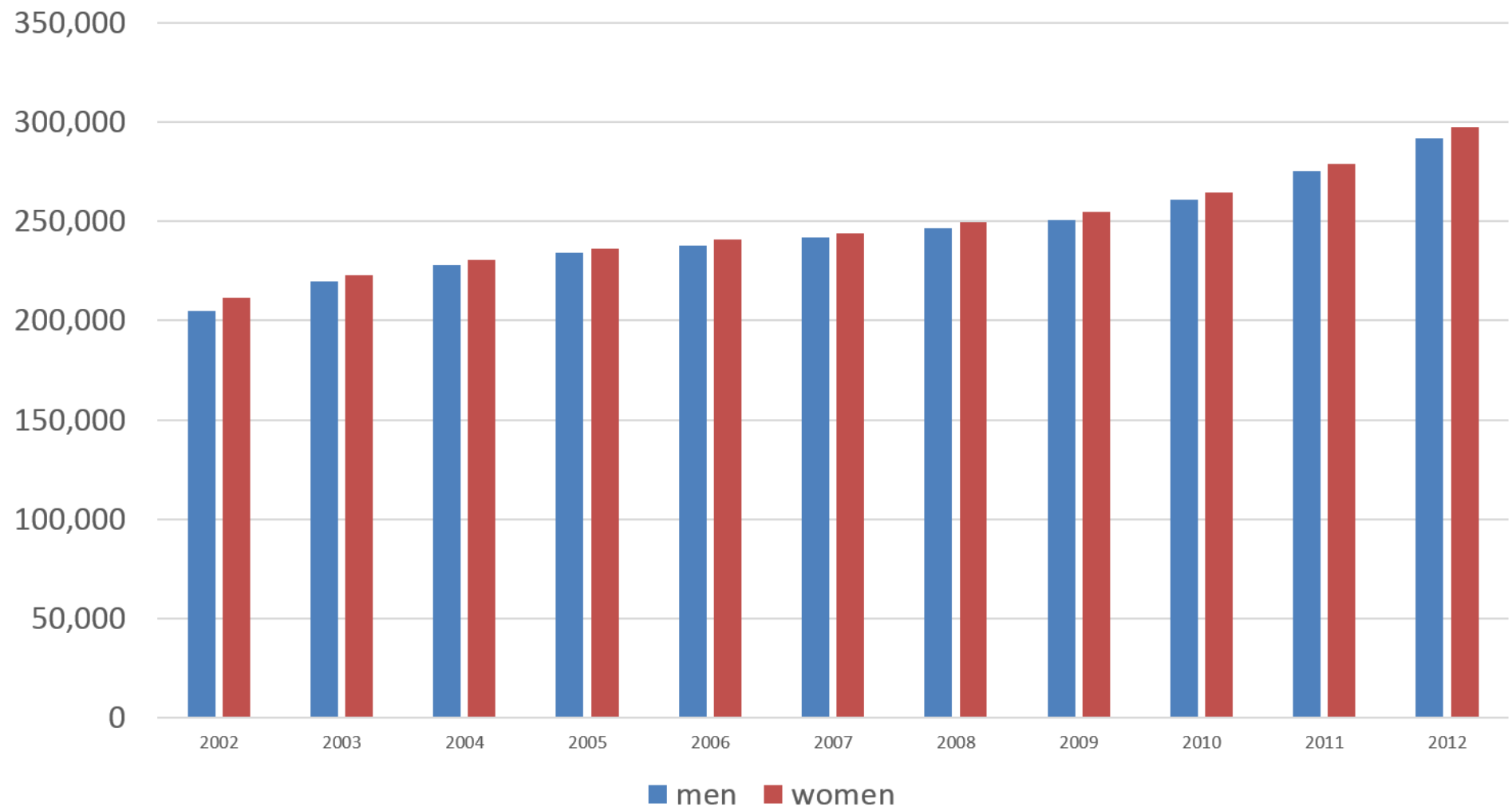
Proportion of men and women receiving undergraduate degrees in STEM (2012).
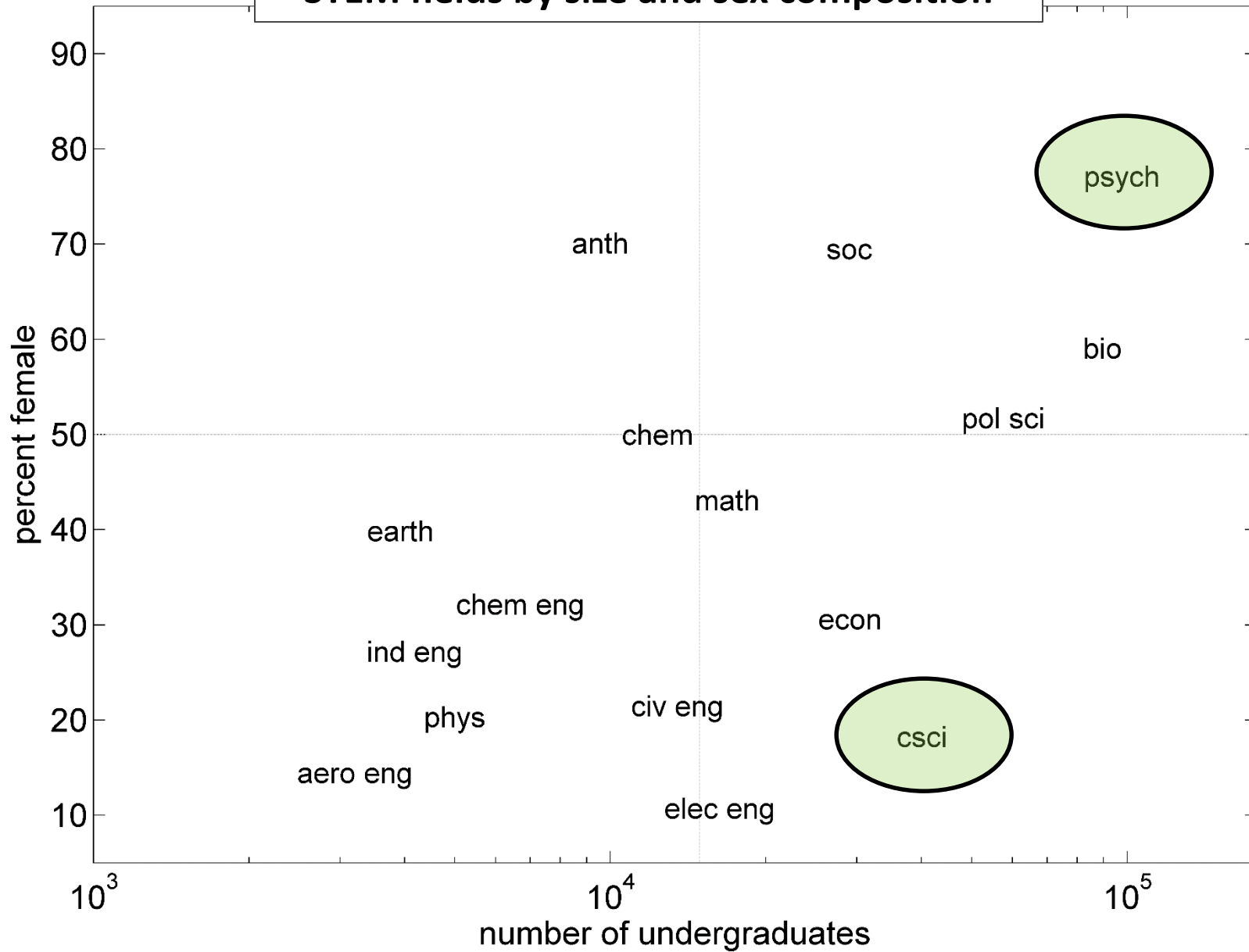

38%

male

29%

female

STEM fields by size and sex composition

- More men than women are computer science majors.
  - Is / in what way is CS seen as masculine?

- More women than men are psychology majors.
  - Is / in what way is psychology seen as feminine?

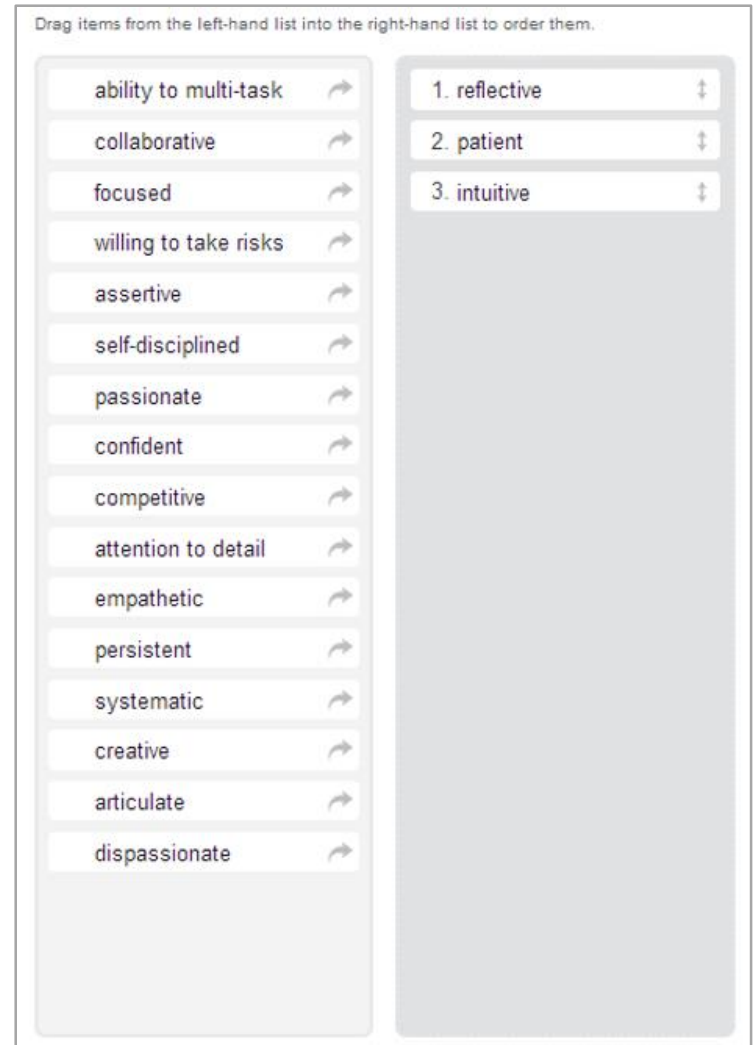- **What can be done to change these perceptions?**

Multiple factors in college major selection

- Economic rationalist
  - Ability sorting and returns to major (Arcidiacono 2004)

- Gender Impacts
  - Stereotypes and gendered perceptions of ability (Correll 2004)

- Personality factors
  - Personality mediates gender effects (Korpershoek et al. 2012)
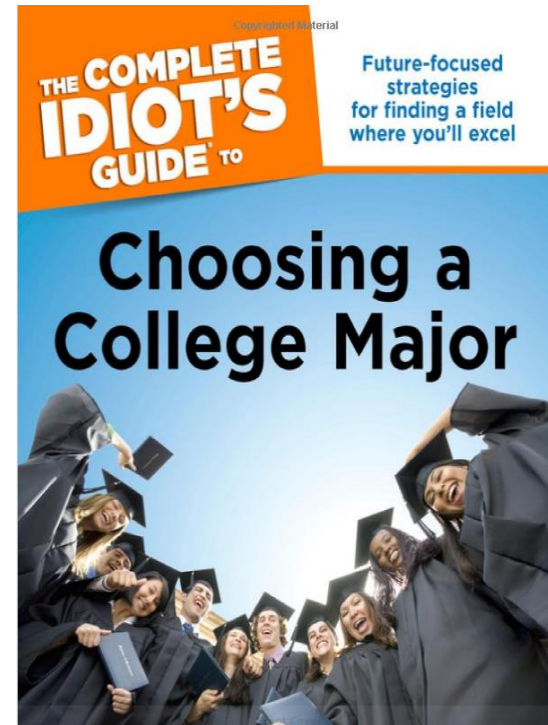
Methods

- Online survey of undergraduates
  - n = 375; 63% male
- **Ranked themselves as to how well they felt that a list of 19 attributes described them.**
- **Ranked the importance of these attributes for "success as an undergraduate" in four randomly selected fields**
  - Anthropology, Geography, or Psychology
  - Computer Science, Engineering, or Mathematics
  - Biology, Chemistry, or Physics
  - Business, Education, Foreign Languages, or History

Drag items from the left-hand list into the right-hand list to order them.

Left-hand list	Right-hand list
ability to multi-task	1. reflective
collaborative	2. patient
focused	3. intuitive
willing to take risks	
assertive	
self-disciplined	
passionate	
confident	
competitive	
attention to detail	
empathetic	
persistent	
systematic	
creative	
articulate	
dispassionate	

As an aggregate, some self-described attributes are more **popular** (have a higher average rank) than others.
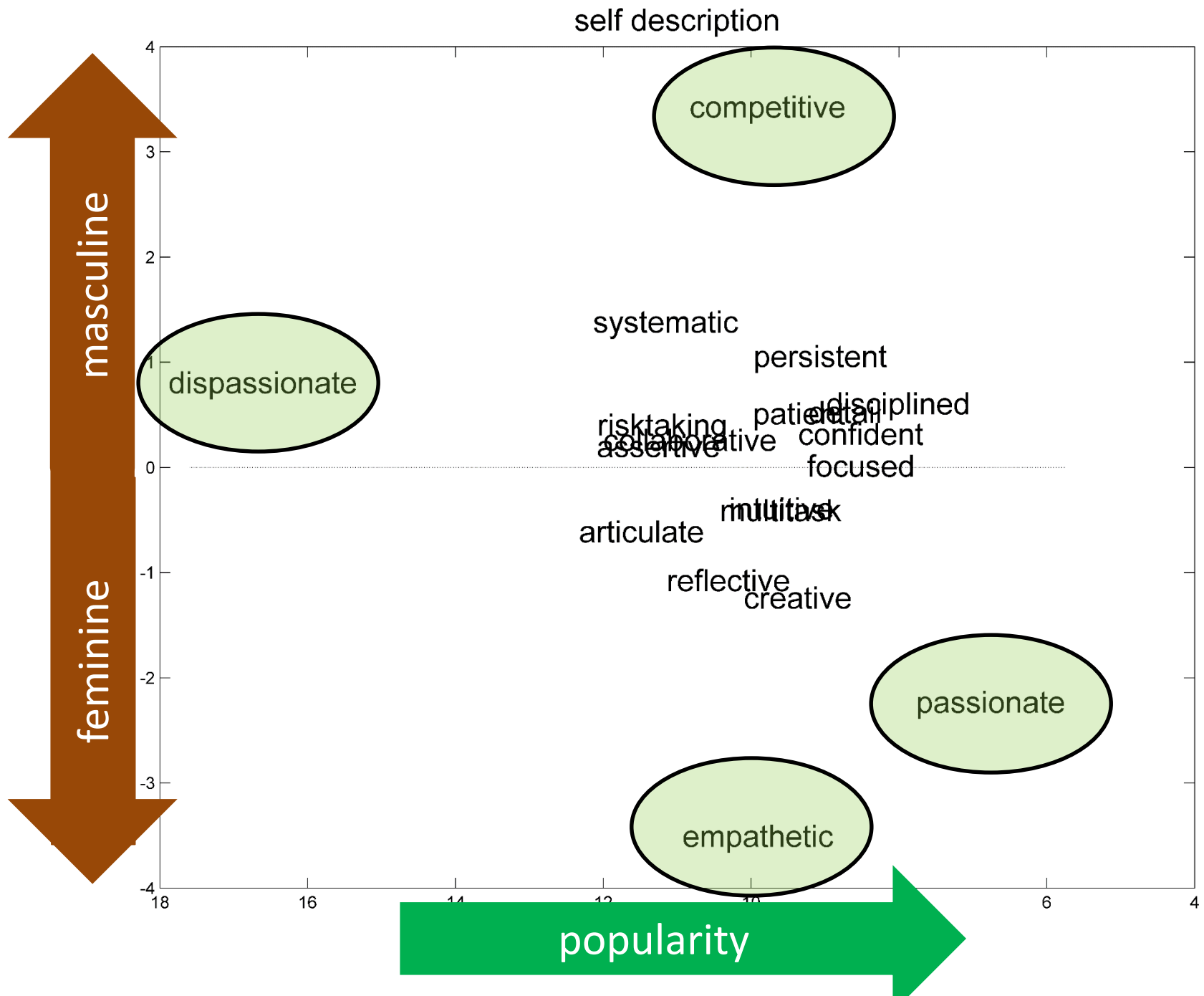
Ranked high
- **passionate**
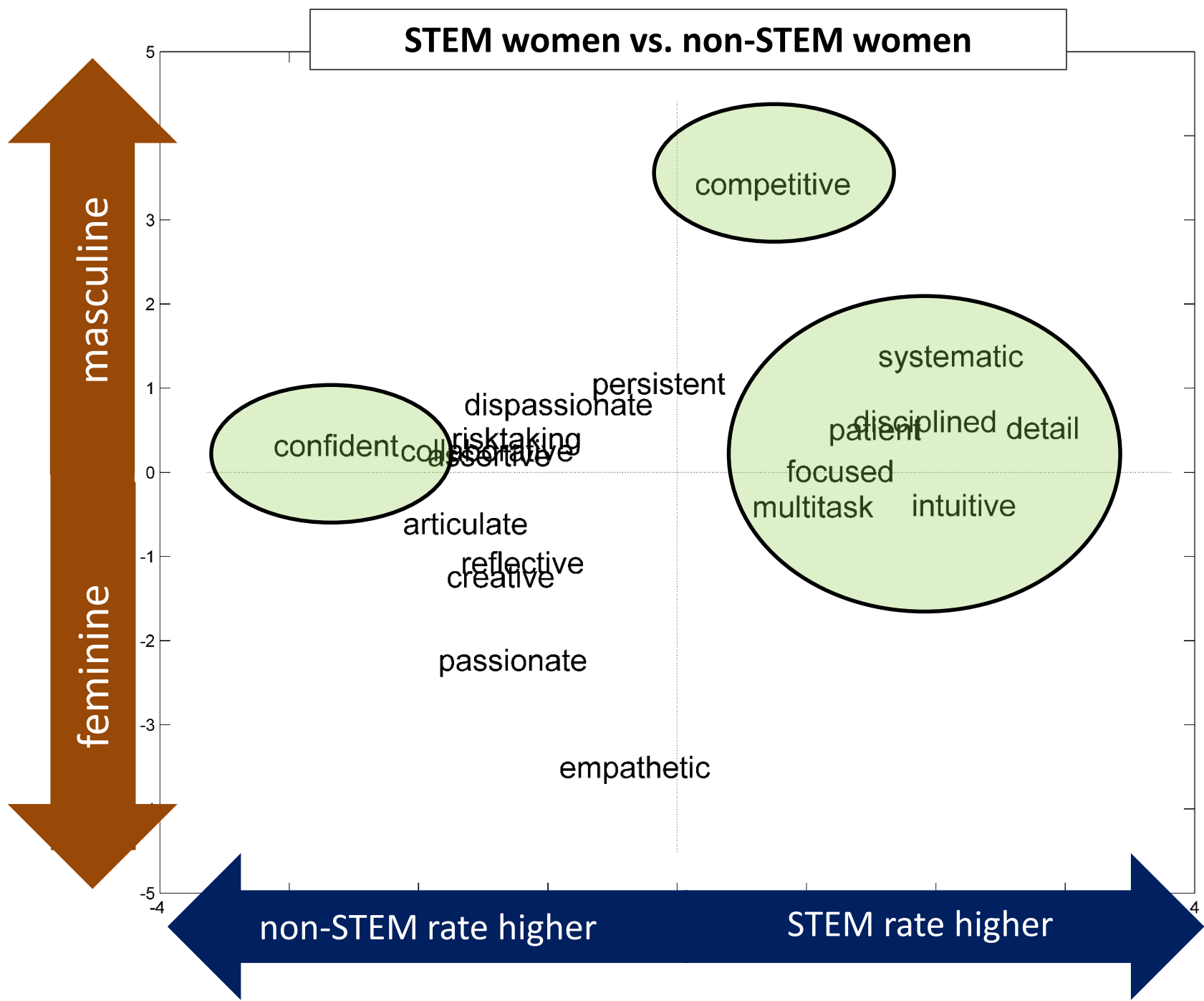- disciplined
- focused
- confident

Ranked low
- systematic
- risktaking
- assertive
- **dispassionate**

An attribute is masculine or feminine to the degree that women or men would differentially self-identify with that attribute.

gender loading = **average female rank** - **average male rank**

self description

masculine

feminine

popularity

competitive

dispassionate

systematic

persistent

disciplined

risktaking
patient detail
confident
collaborative
assertive
focused

intuitive
multitask

articulate

reflective
creative

passionate

empathetic

STEM women vs. non-STEM women

masculine

feminine

non-STEM rate higher

STEM rate higher

competitive

systematic

persistent

dispassionate

risktaking

disciplined detail

confident collative

patient

focused

assertive

multitask   intuitive

articulate

reflective

creative

passionate

empathetic

STEM men vs. non-STEM men

masculine
feminine

competitive

systematic
persistent
dispassionate
disciplined
patient
confident
collaborative risktaking
focused
intuitive multitask
articulate

creative

reflective

passionate

empathetic

non-STEM rate higher   STEM rate higher
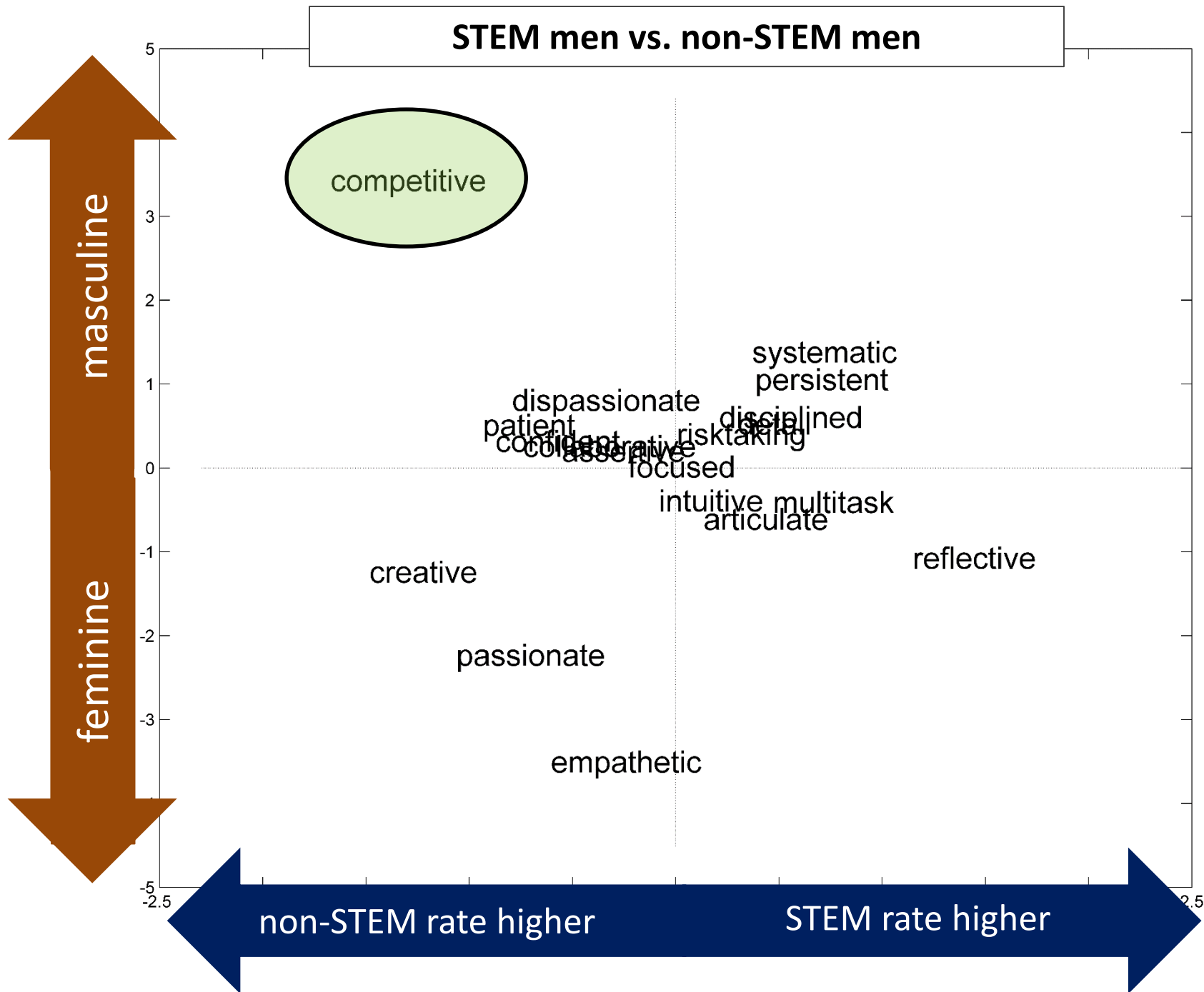
There was a different pattern for the attributes that participants perceived as **important predictors of success**.

Ranked high
- **focused**
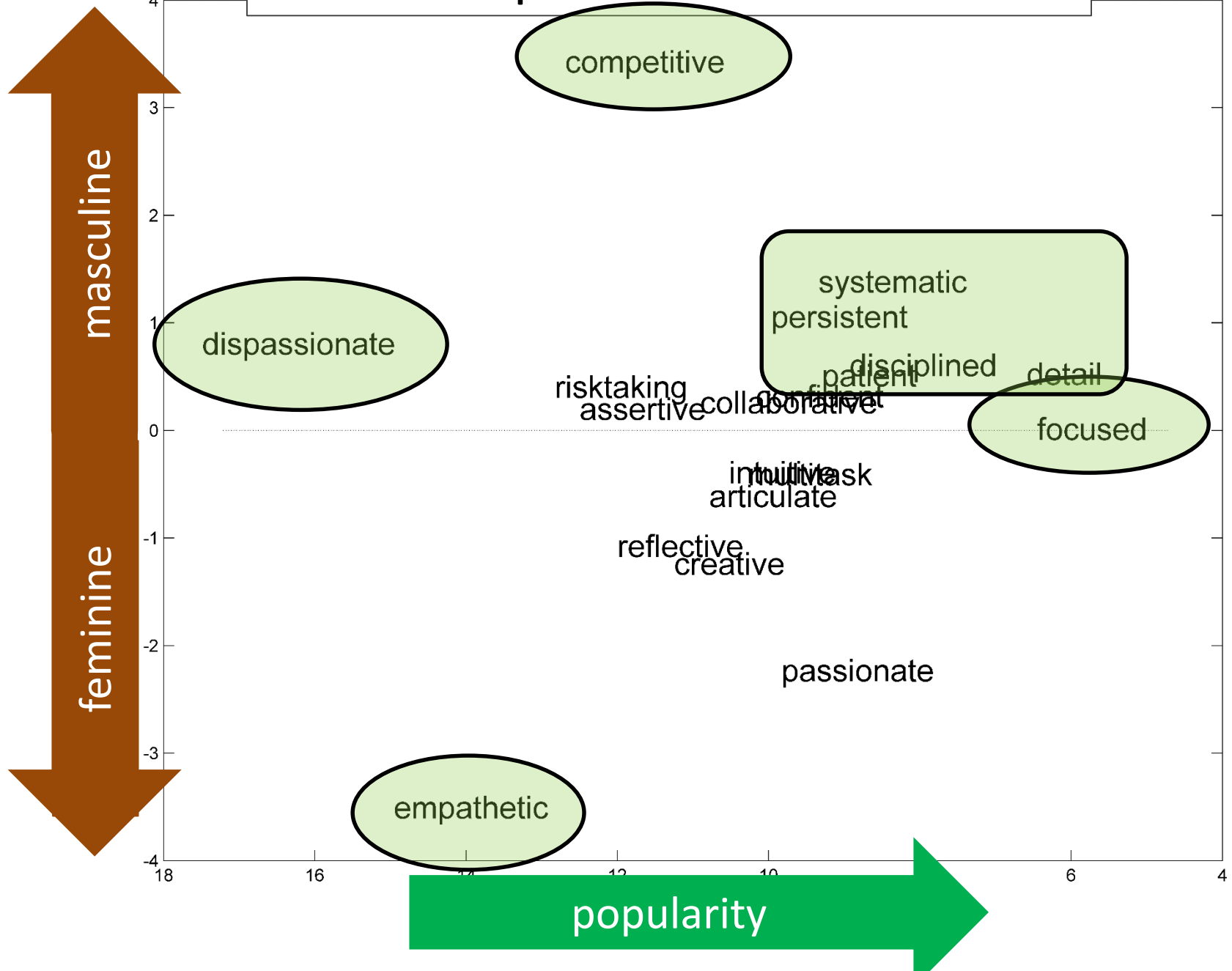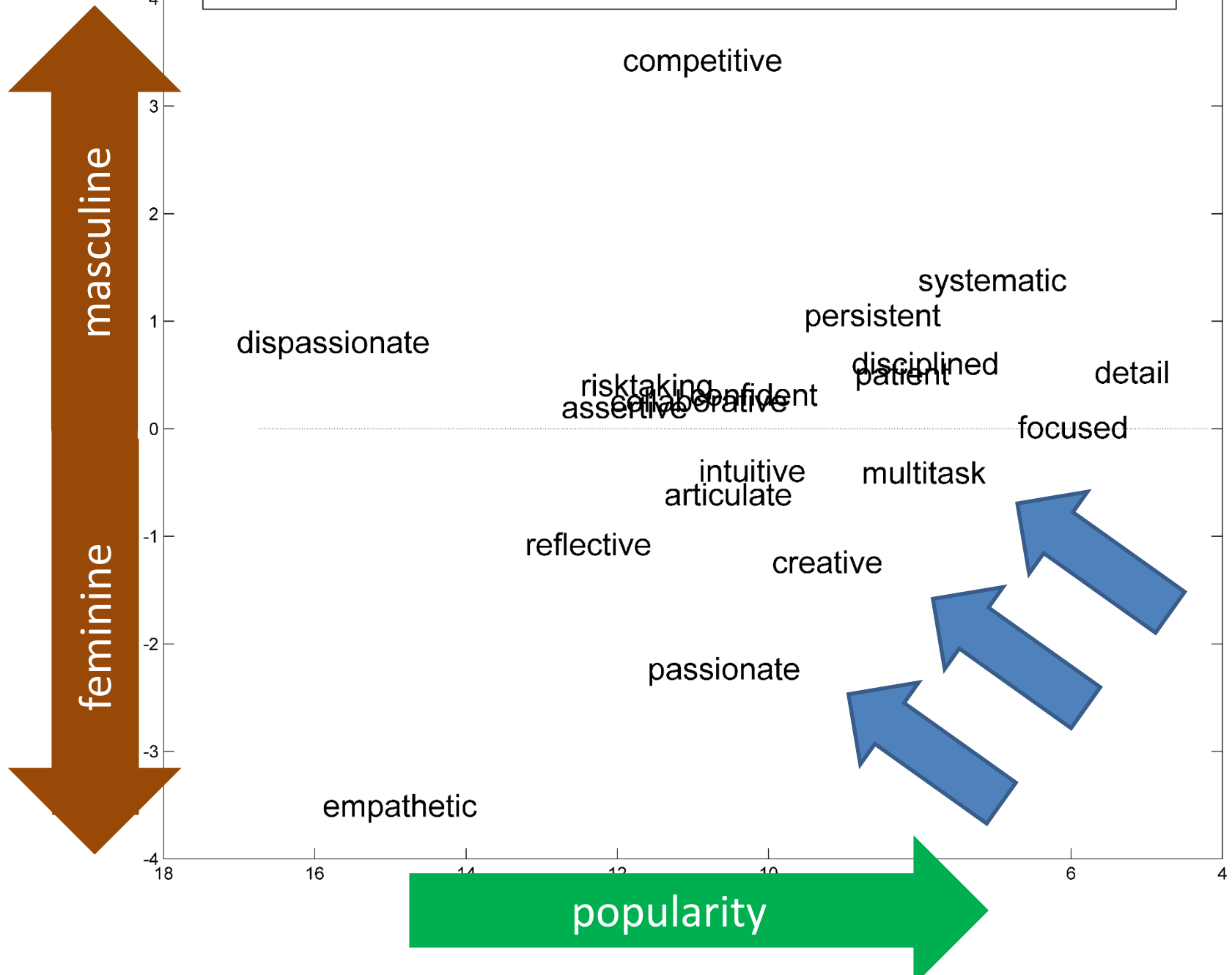- detail oriented
- disciplined

Ranked low

greatest gender difference
- **competitive**
- assertive
- risk-taking
- **empathetic**
- dispassionate

Perceived predictors of success in STEM

Perceived predictors of success in Computer Science

Conclusions

- The attributes with the highest gender loading, **competitiveness and empathy**, **are not seen as particularly important for success in STEM**.

  - More subtly male-biased attributes like **discipline** and **attention to detail** are likely more important influences.

- Compared to their non-STEM counterparts:

  - **STEM women self-describe as less confident**.

  - **STEM men self-describe as less competitive**.

- The use of high female loading attributes like **creativity** and **passion** may be an effective avenue for marketing STEM.