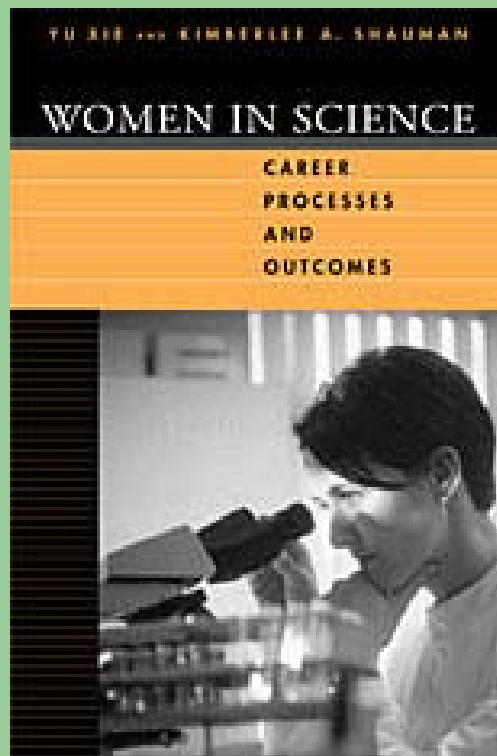


# Possible Explanations for Gender Segregation in Science



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## Why Do We Care?

- ⇒ (1) Certain fields of science are of higher status than others.
  - Under-representation of women in higher status fields => lower status for women science.
- ⇒ (2) A shortage of scientific personnel in demanding fields?
  - If talent for doing very demanding scientific work is unrelated to sex, the pool for these fields would be much larger with women fully participating in science.



## Importance of Heterogeneity

- ⇒ Key to understanding social phenomena.
- ⇒ Example: about 1/3 of sex difference in earnings is attributable to sex segregation in occupations (Treiman and Hartmann 1981), but almost all of it can be attributed to sex segregation in specific jobs (Petersen and Morgan 1995).



## Danger of Aggregation

- ⇒ Aggregation across fields may mask important gender differences at lower levels.



# Costs of Disaggregation

- ⇒ Loss of parsimony
- ⇒ Demand for more and higher-quality data.

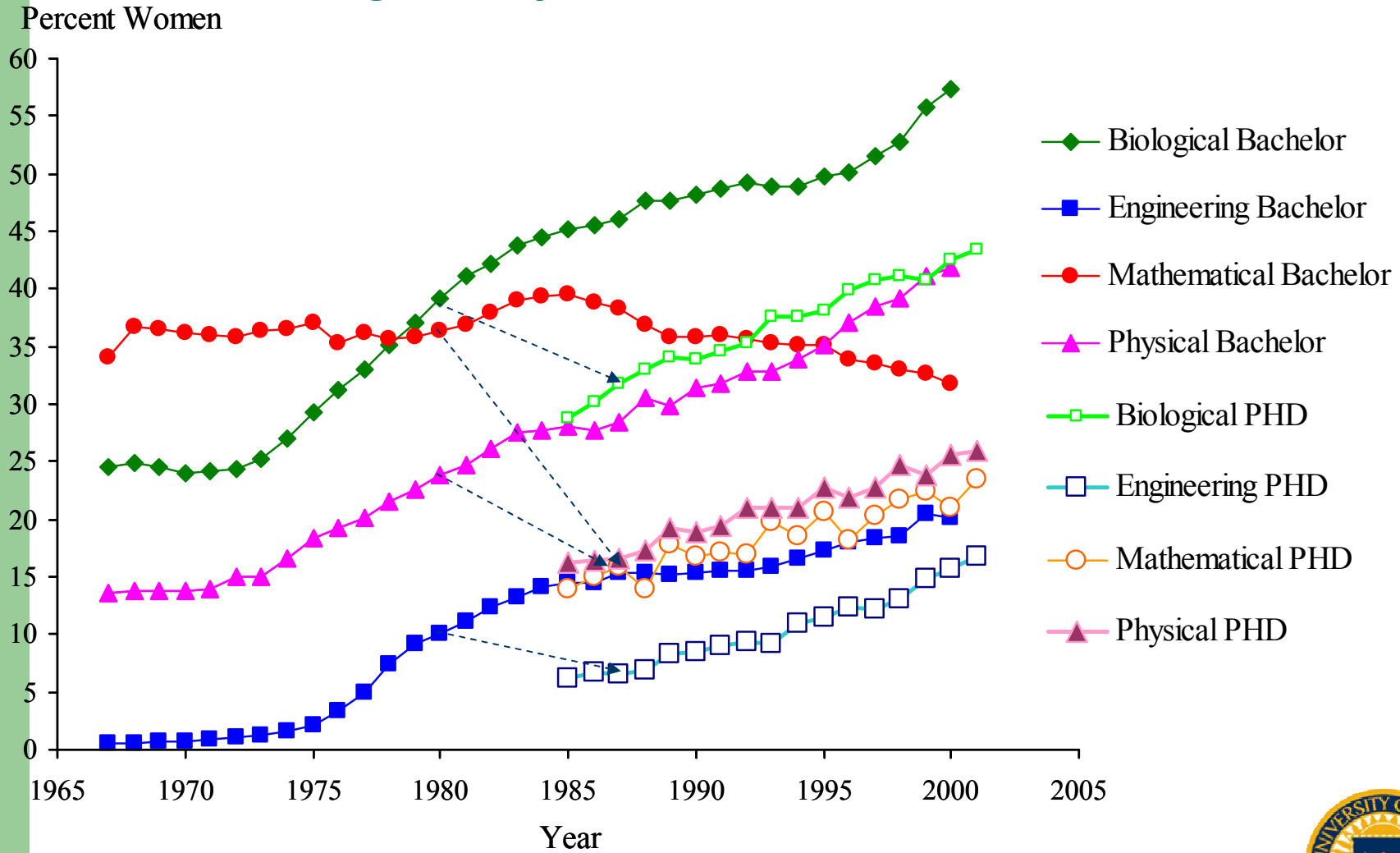


## A Pragmatic Approach

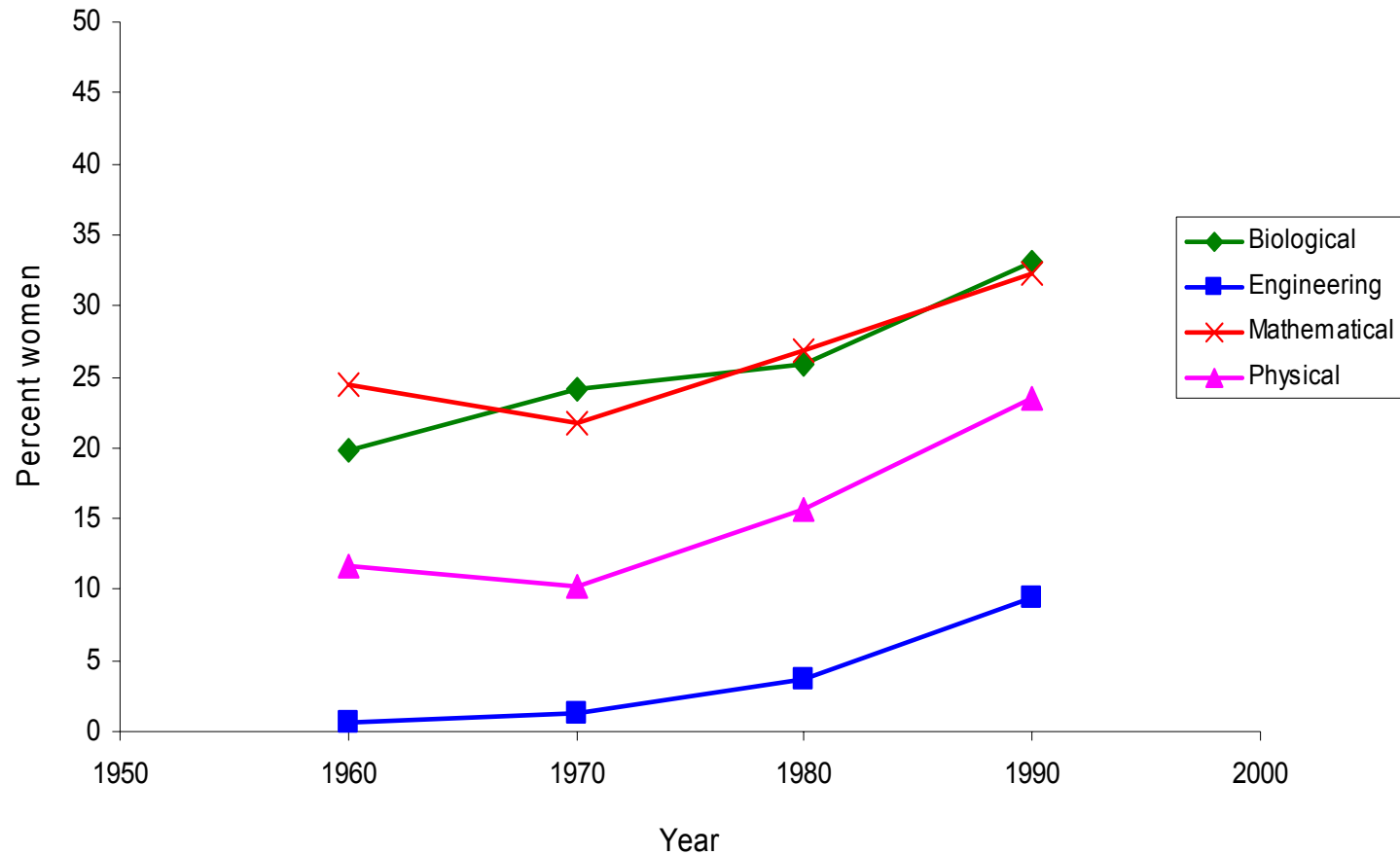
- ⇒ Examine between-group sex differences, but realizing that there can be hidden biases due to aggregation within groups.
- ⇒ Groups are “fields,” provisionally defined. They are not true social realities.



## Percent women among recipients of S/E bachelor's and doctorate degrees by field, 1967-2001, US



## Percent women in S/E occupations by field, 1960-1990, US



## Possible Explanations

- ⇒ Math Ability
- ⇒ Human Capital
- ⇒ Values
- ⇒ Role Models
- ⇒ Family Responsibility
- ⇒ Sex Discrimination



## Math Ability (Xie and Shauman 2003)

- ⇒ Hypothesis: women are handicapped by deficits in high school mathematics training.
- ⇒ However, we find
  - (1) gender gap in average mathematics achievement is small and has been declining.
  - (2) gender differences in neither average nor high achievement in mathematics explain gender differences in the likelihood of majoring in S/E fields.



# Human Capital 1

- ⇒ Becker (1973, 1974, 1991): Role specialization, with the wife specializing in household work and the husband specializing in market labor.

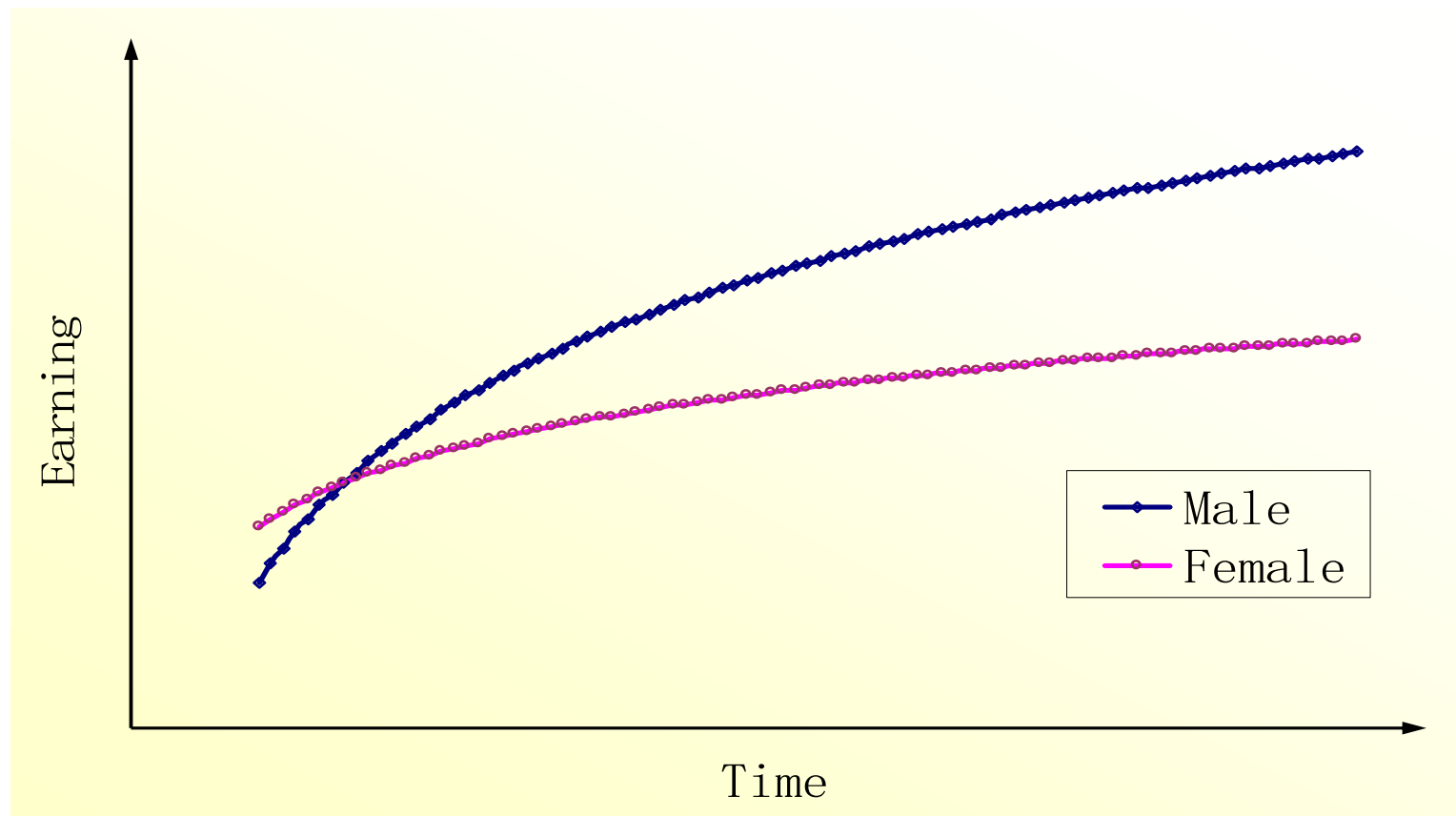


## Human Capital 2

- ⇒ Polachek (1979, 1981):
- Characteristics of female-typical jobs: relatively high starting earnings, no penalty for withdrawal, flat growth over life-cycle.
  - Not well supported (see Paula England's work).
  - Implication: certain fields have trajectories that are more typical for female jobs than others.

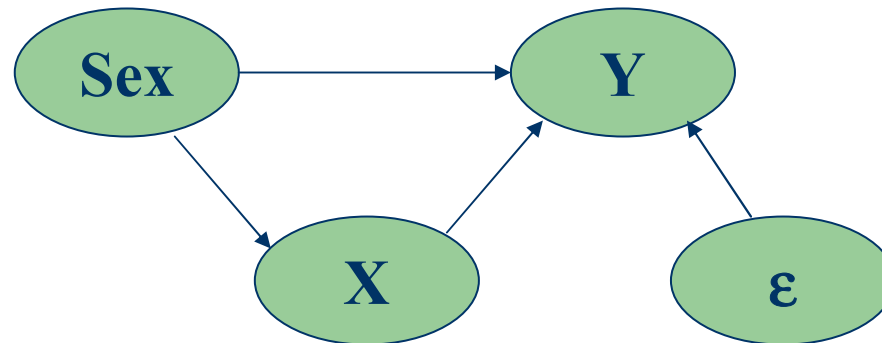


# Trajectories Hypothesized to be typical of “Female” versus Male Fields



## Values (Davis 1965)

- ⇒ Females score high on “people.” => soft fields
- ⇒ Males score high on “money” => hard fields.



## Role Models (Bandura 1986; Xie and Shauman 1997)

- ⇒ Role models: persons actually working in the labor force
- ⇒ Youth make occupational choices on the basis of adult workers' experiences.
- ⇒ The choice of role models is sex linked.
- ⇒ Rational choice is bounded by social structure and acts as an agent for social structure.



## Family Responsibility (Xie and Shauman 2003)

- ⇒ Marriage per se does not seem to matter much.
- ⇒ Married women are disadvantaged only if they have children:
  - less likely to pursue careers in science and engineering after the completion of S/E education
  - less likely to be in the labor force or employed
  - less likely to be promoted
  - and less likely to be geographically mobile



## Sex Discrimination

- ⇒ Hard to pin down.
- ⇒ Need to distinguish between discrimination of material impact (such as denial of job or tenure) versus covert or perceived discrimination that discourage women.



## Also

- ⇒ Women may take failure or setback differently than men.
- ⇒ The theory of limited differences (Cole and Singer 1991).



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