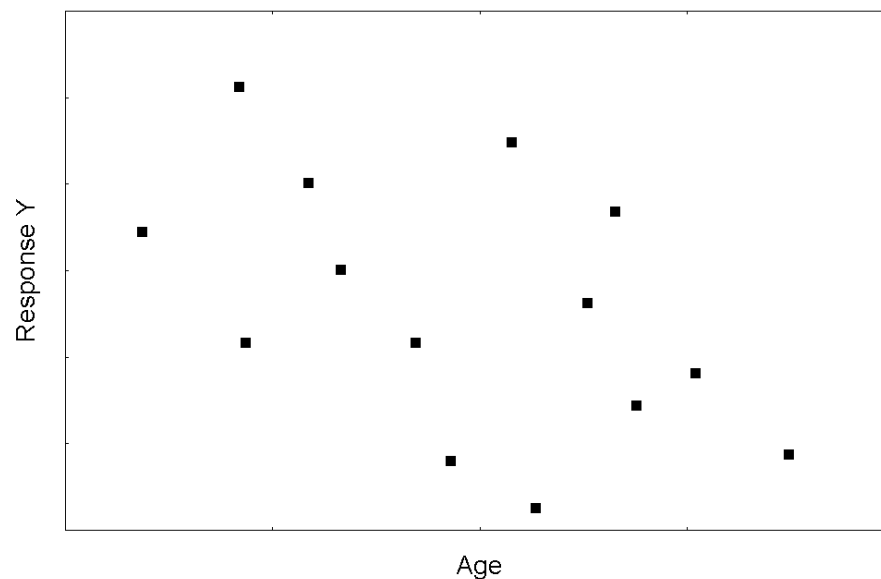


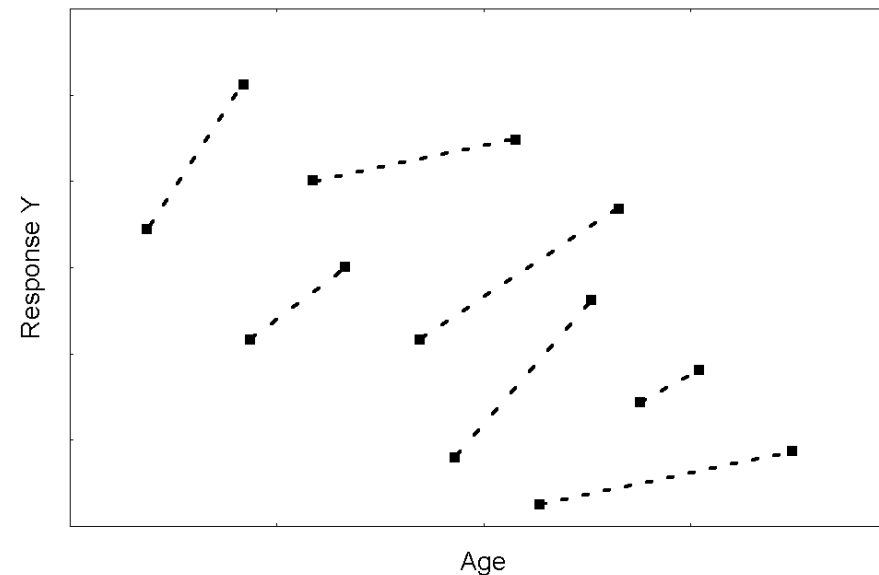
3.3 Cross-sectional versus Longitudinal Data

- Suppose it is of interest to study the relation between some response Y and age
- A cross-sectional study yields the following data:



- The graph suggests a negative relation between Y and age.

- Exactly the same observations could also have been obtained in a longitudinal study, with 2 measurements per subject.
- First case:



Are we now still inclined to conclude that there is a negative relation between Y and Age ?

- Conclusion:

Longitudinal data allow to distinguish differences between subjects from changes within subjects

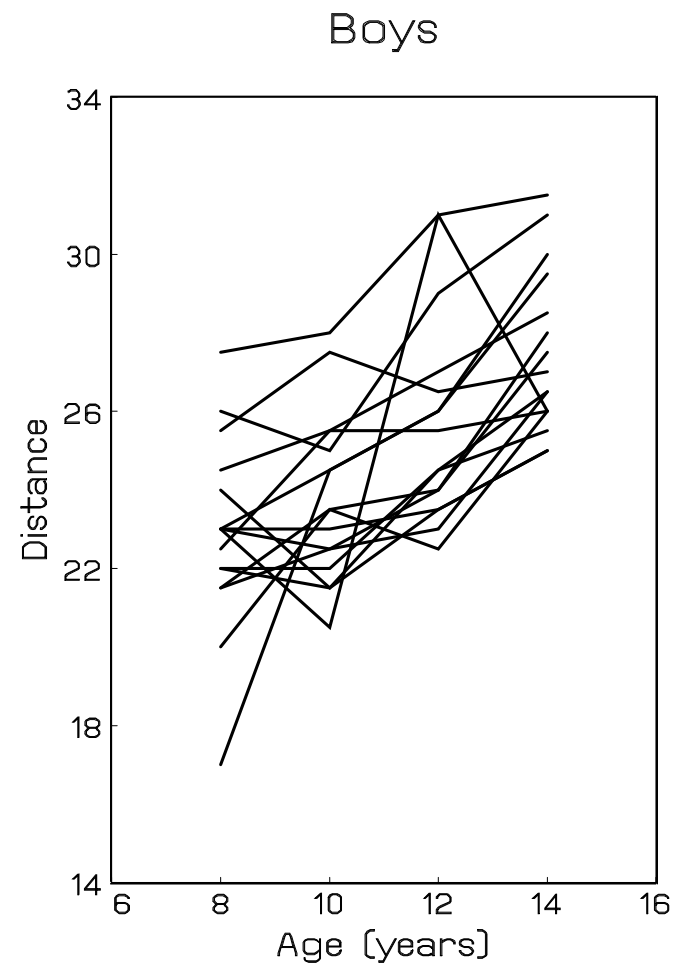
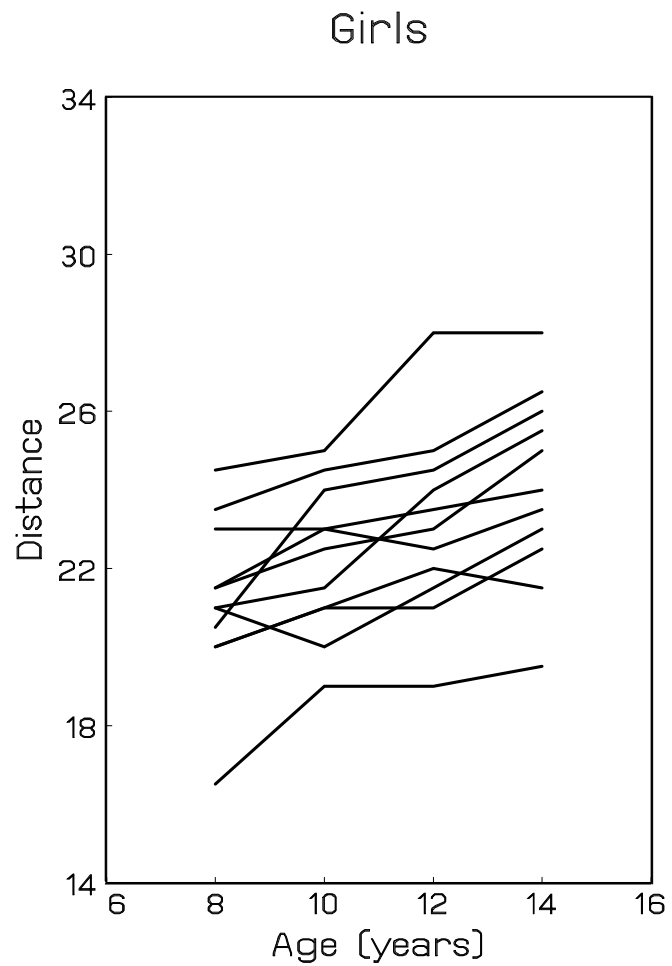
- Application: Growth curves for babies (next page)

2.4 Growth Data

- Taken from Potthoff and Roy, Biometrika (1964)
- The distance from the center of the pituitary to the maxillary fissure was recorded at ages 8, 10, 12, and 14, for 11 girls and 16 boys
- Research question:

Is dental growth related to gender ?

- Individual profiles:



- Remarks:
 - ▷ Much variability between children
 - ▷ Considerable variability within children
 - ▷ Fixed number of measurements per subject
 - ▷ Measurements taken at fixed time points