SOS3003
Applied data analysis for social science
Some last words

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Test for Curvilinear Relations

- Testing for curvilinearity in age
  - Set age squared = age2
- Remember:
  - Age is one substance variable that may be represented either by one technical variable or by two technical variables (somewhat like one variable being represented by different ways of coding)
    - Substance variable Age is represented by age
    - Substance variable Age is represented by age + age2

Testing

- Model 0
  - (some variables)
- Model 1
  - (some variables) + age
- Model 2
  - (some variables) + age + age2
- In model 1 the impact of Age is tested by the t-test and the corresponding p-value (there is no difference between the substance variable and its technical representation)

Testing 2

- In model 1 the test may conclude that Age does not contribute to the model. If so we go to model 2
- In model 2 the testing of the impact of the substance variable Age (represented by age and age2) is done by an F-test of Model 2 against Model 0
- The F-test may conclude that Age does not contribute to the model. Then we drop both age and age2.
- The F-test may conclude that Age (represented by age and age2) contributes significantly to the model. Then we keep both age and age2

Testing 3

- In model 1 the test may conclude that Age does contribute to the model. If so we may still go to Model 2
- If either the t-test of model 1, or the F-test of model 2, or both show that Age contributes significantly to the model, there are several possibilities
  - T-test significant, F-test not significant: drop age2, keep age
  - T-test significant, F-test significant, p-value of age is unchanged or higher (compared to model 1) while p-value of age2 is clearly insignificant: drop age2, keep age

Testing 4

- (continued)
  - T-test significant, F-test significant, p-value of age improves (compared to model 1): keep age2 no matter what p-value for age2 is
  - T-test significant, F-test significant, p-value of age shows no significance (compared to model 1) while p-value of age2 shows clear significance: keep age2 no matter what p-value for age is
  - T-test significant, F-test significant, p-value of both age and age2 show no significance but are fairly close. Then the F-test decides. Keep age2.

- And remember: age2 never appears alone, always with age