Strategies for dealing with Missing Data

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- analysis strategy is just there to summarize the observed stuff so we can see the answer

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    - regression with multiple variables
- you may not measure what you want to measure (bias)
    - prices more often forgotten remembered when collected small amounts

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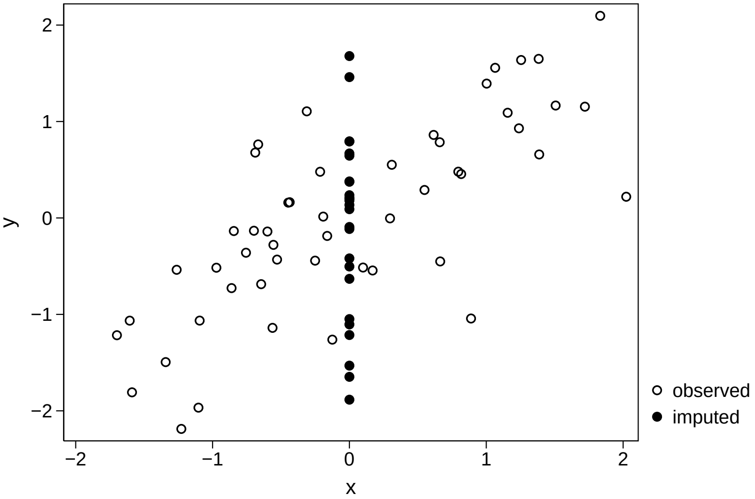
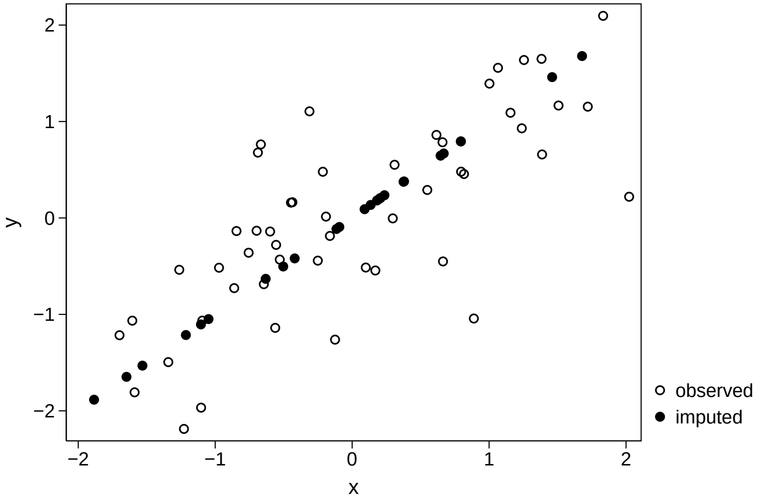
- Reproducing patterns in observed data on the missing data, so we can use the observed part of a case
- Not recovering the lost observation

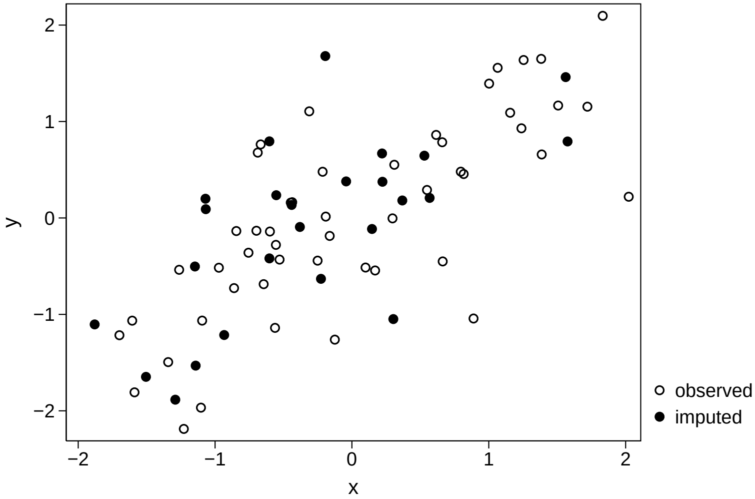
mean median mode imputation



regression imputation



regression imputation + uncertainty



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- b_1 is now a mixture of the effect of x while controlling for z, and the effect of x while not controlling for z.

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- This is where multiple imputation comes in

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- Summarize the results:
    - point estimate is the average of the point estimates
    - Uncertainty about the point estimate (standard error) is a combination of:
        1. the average uncertainty and
        2. the degree to which the results in the different datasets differ from one another

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- Including your dependent variable.

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- Criteria
  - document what is real and what is imputed
  - useable for users
  - conservative (don’t impute everything)

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- So this is where there are 4 opportunities of getting a missing value, and each imputed value adds relatively little information.

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- If you do your own imputation go for multiple imputation.
  - Use all explanatory variables *and* the explained variable.
  - Look at the imputed and observed values (graphs).
- If you impute for general use data
  - Document the imputed values.
  - Get an idea of how the data is going to be used.
  - Make a trade-off between ‘correct’ statistical procedure and what the users are comfortable with using.