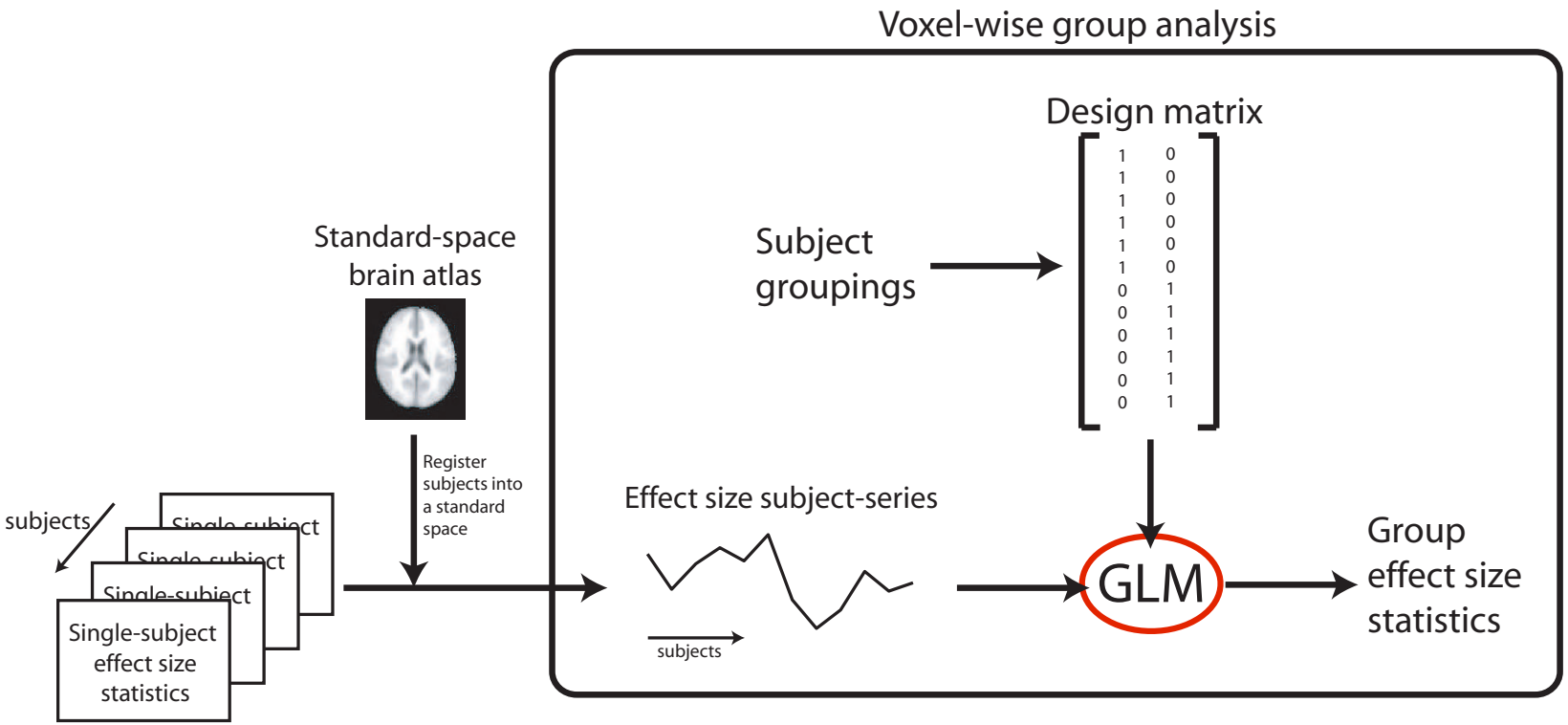
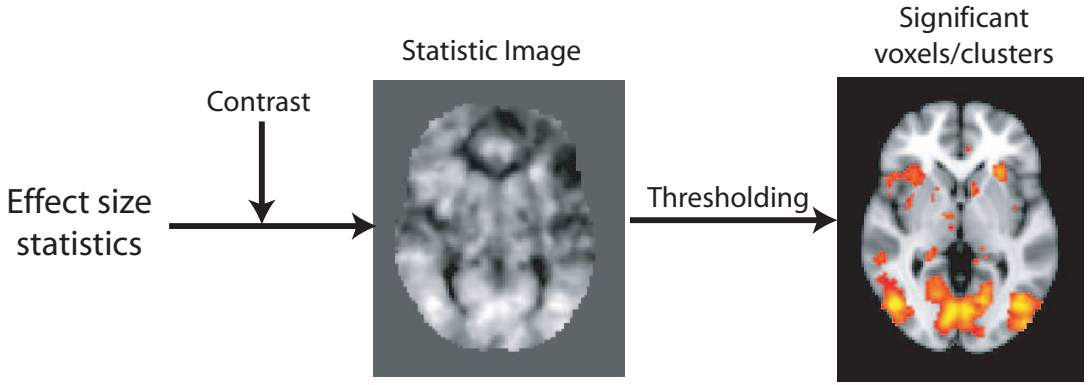
FMRI Group Analysis: Examples





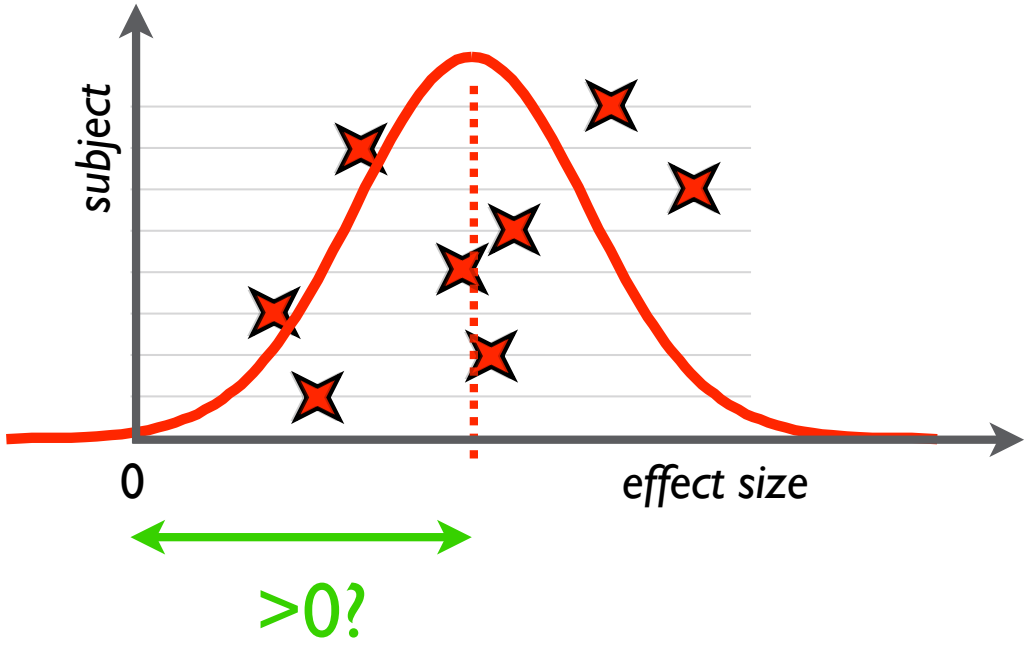
Examples

Single Group Average

- We have 8 subjects - all in one group - and want the mean group average:

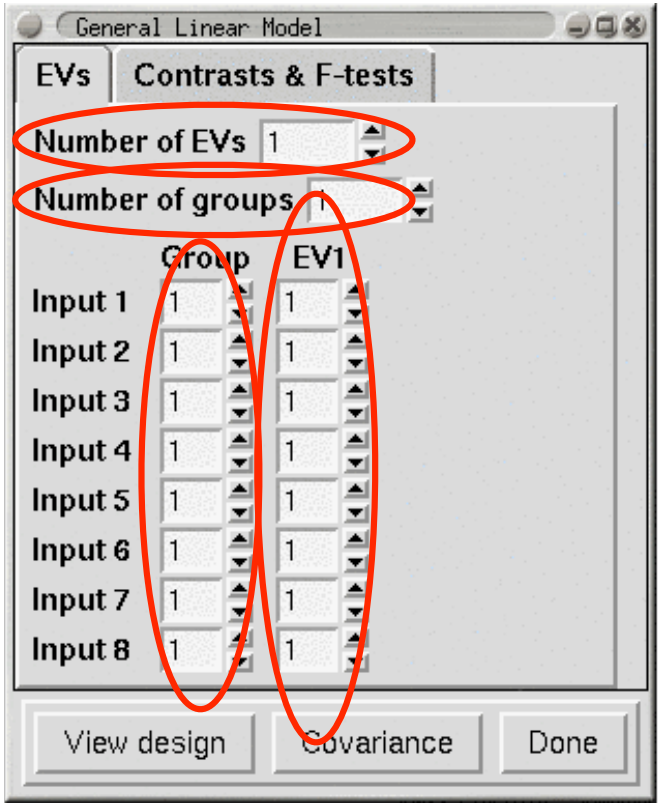
Does the group activate on average?

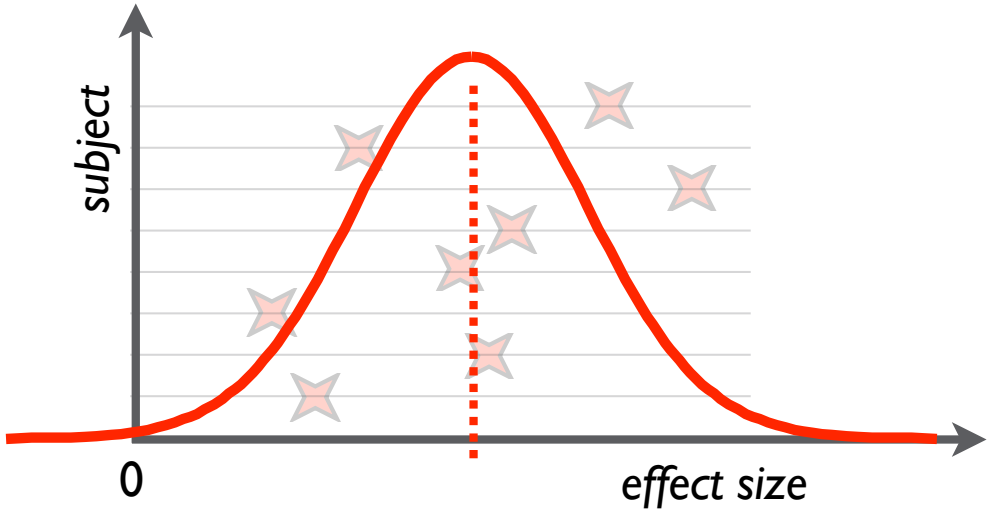
- estimate mean
- estimate std-error (FE or ME)
- test significance of mean > 0



Single Group Average

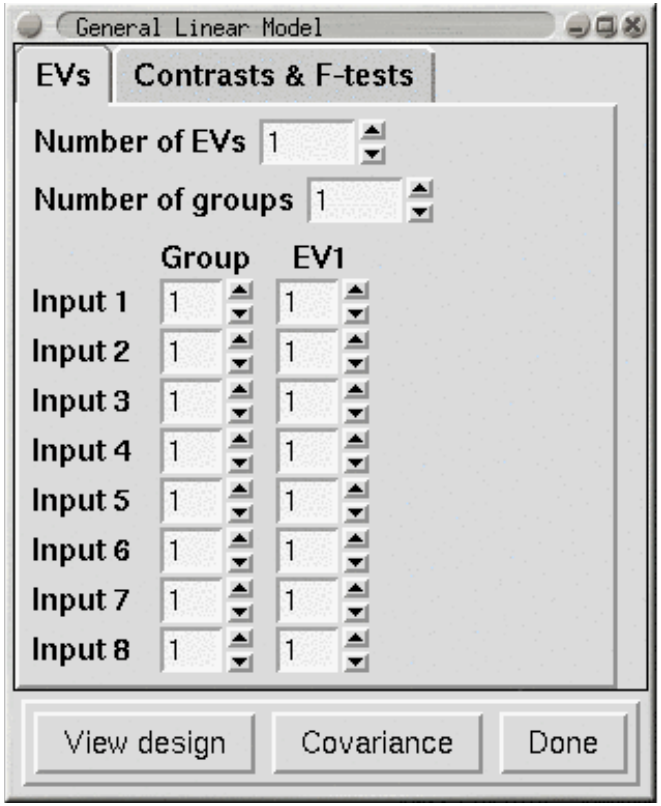
Does the group activate on average?

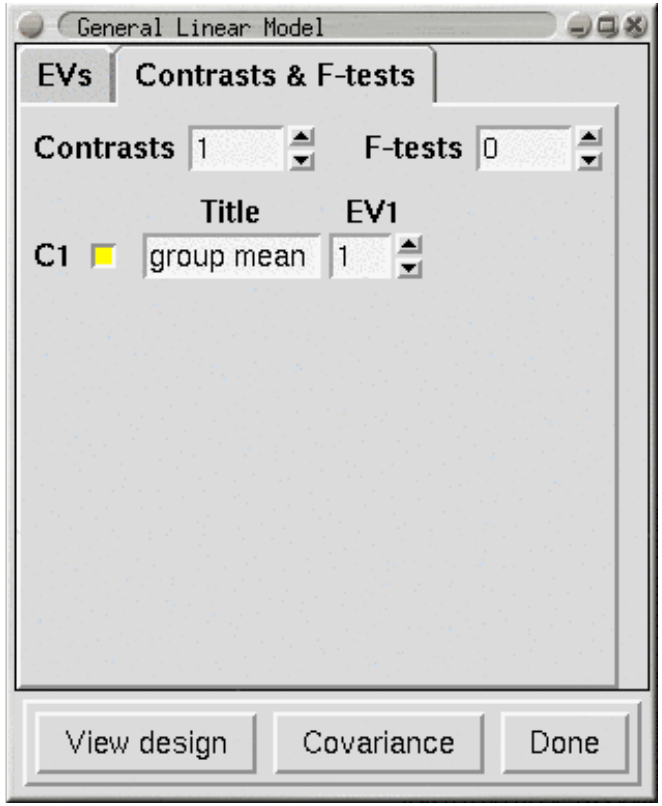


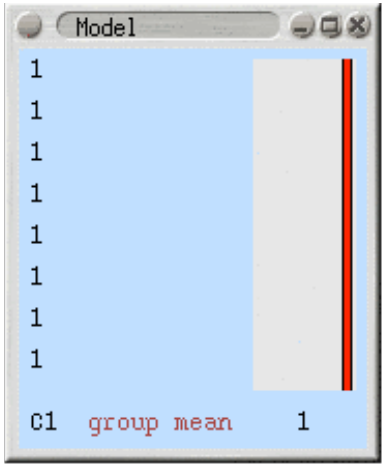


Single Group Average

Does the group activate on average?





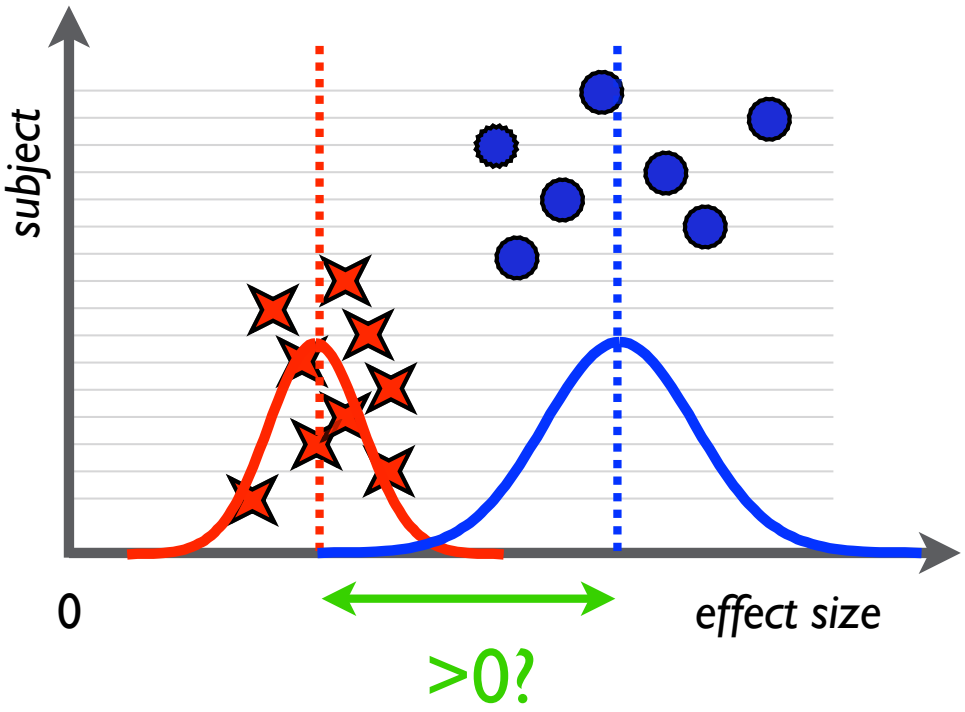


Unpaired Two-Group Difference

- We have two groups (e.g. 9 patients, 7 controls) with different between-subject variance

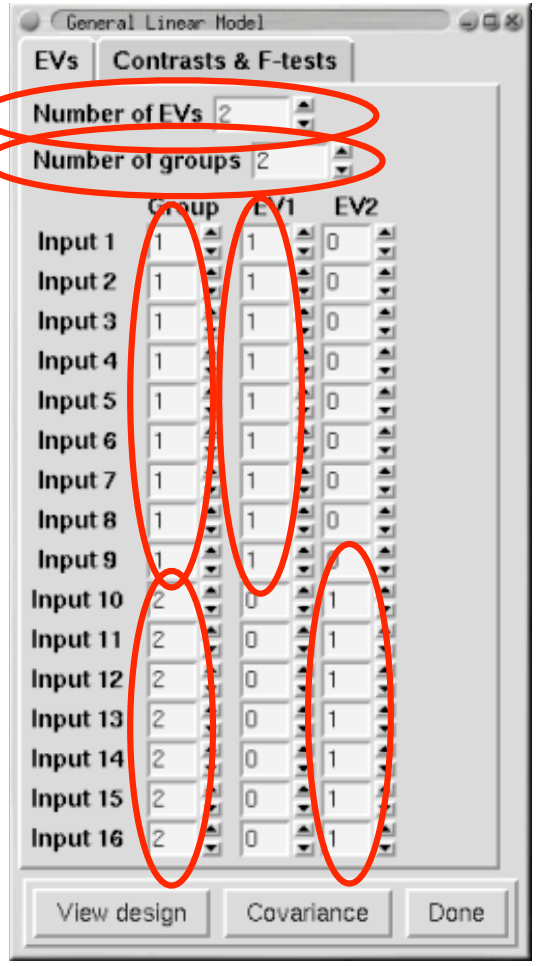
Is there a significant group difference?

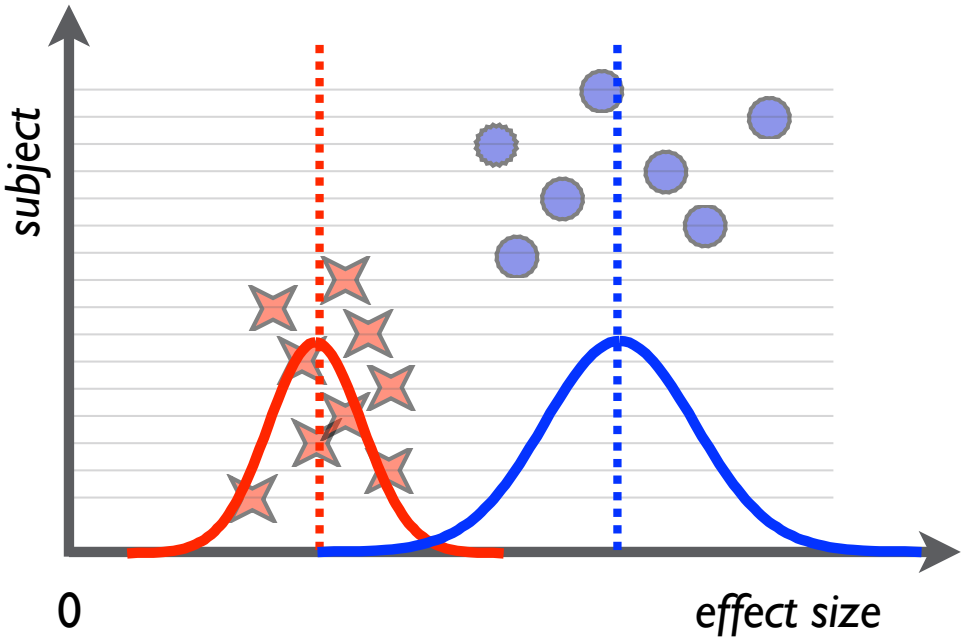
- estimate means
- estimate std-errors (FE or ME)
- test significance of difference in means



Unpaired Two-Group Difference

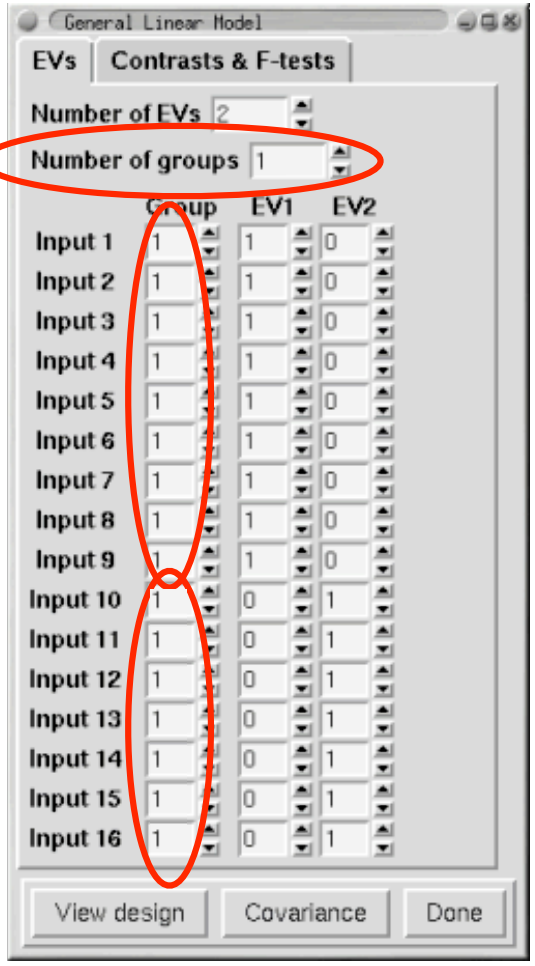
Is there a significant group difference?

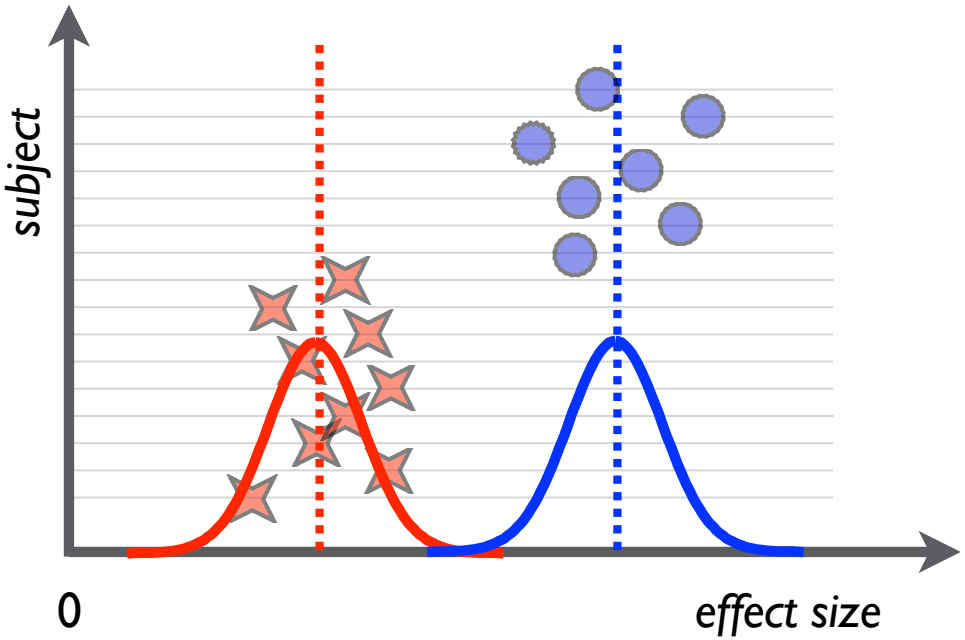




Unpaired Two-Group Difference

Is there a significant group difference?





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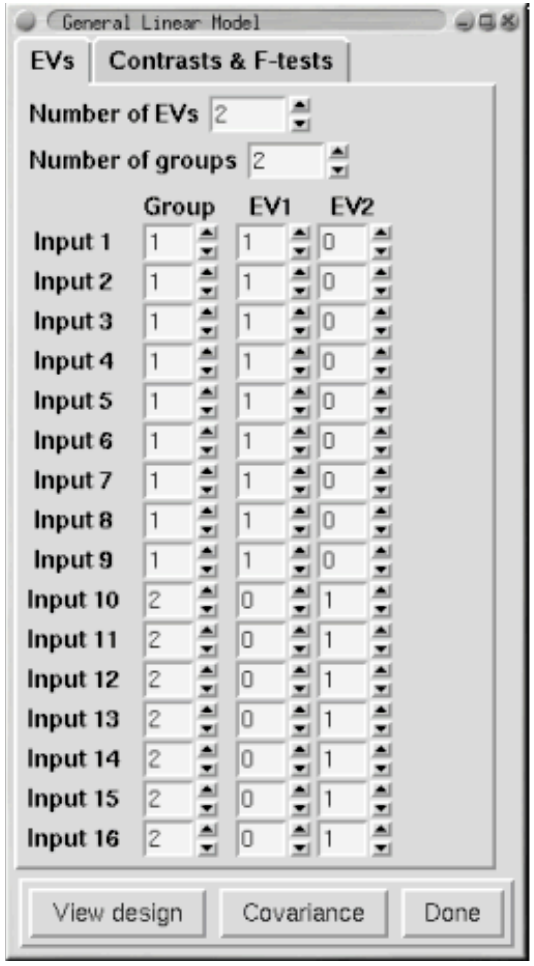
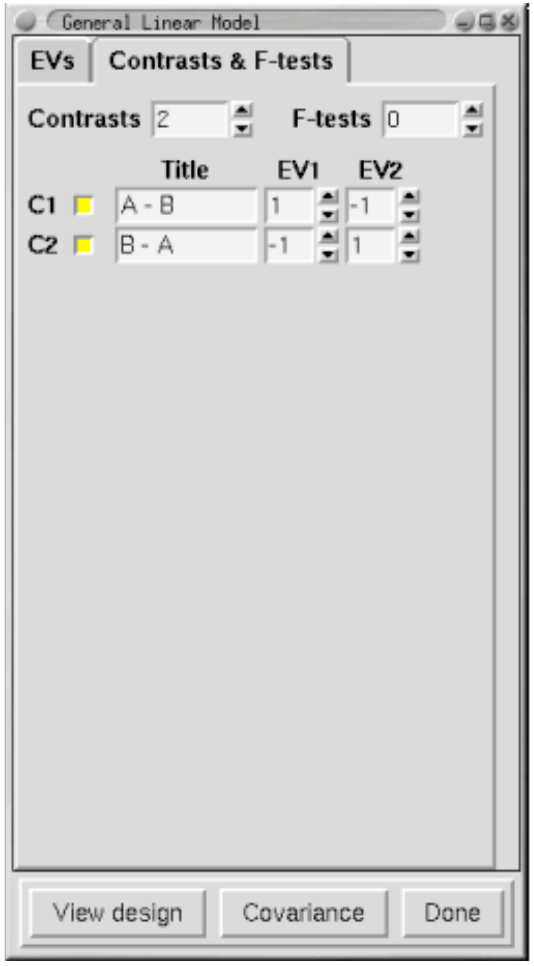
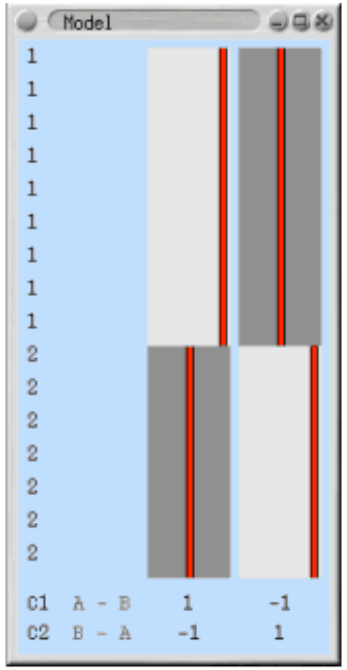


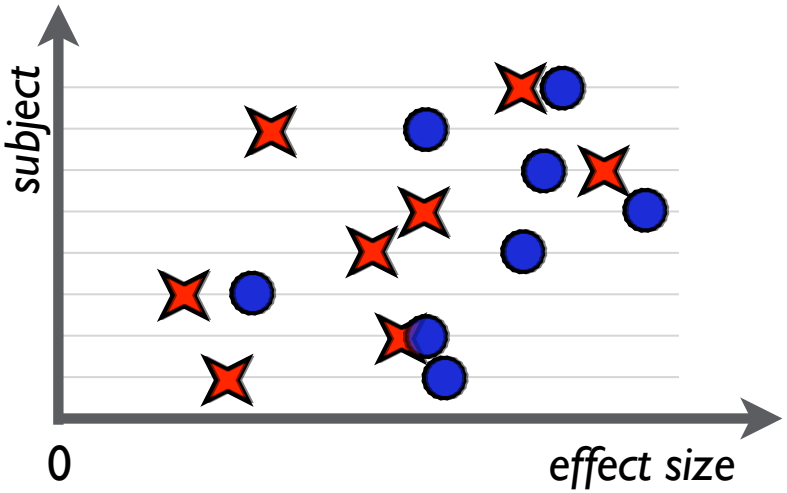




Paired T-Test

- 8 subjects scanned under 2 conditions (A,B)

  Is there a significant difference between conditions?

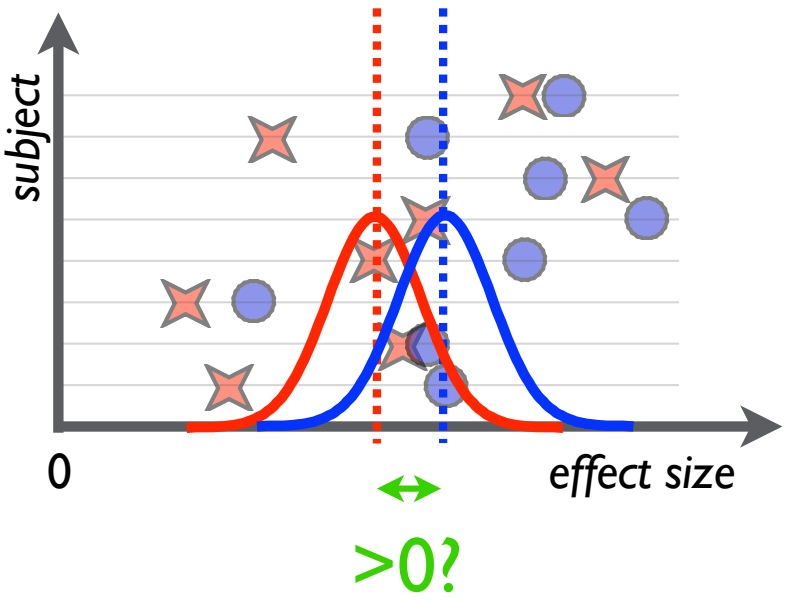


Paired T-Test

- 8 subjects scanned under 2 conditions (A,B)

Is there a significant difference between conditions?

try non-paired t-test

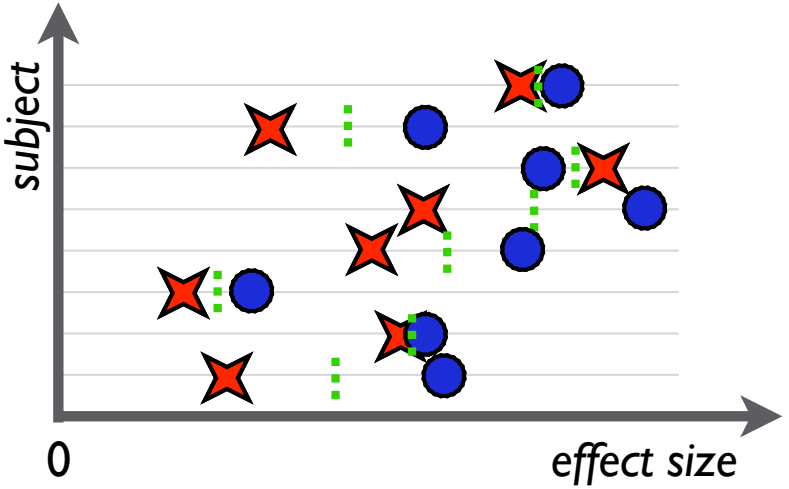


Paired T-Test

- 8 subjects scanned under 2 conditions (A,B)

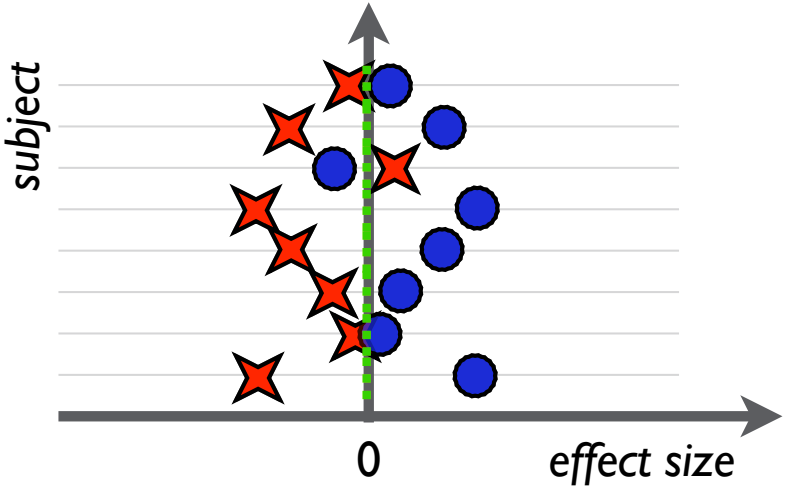
Is there a significant difference between conditions?

data



subject mean
accounts for large prop.
of the overall variance

de-meaned data



Paired T-Test

- 8 subjects scanned under 2 conditions (A,B)

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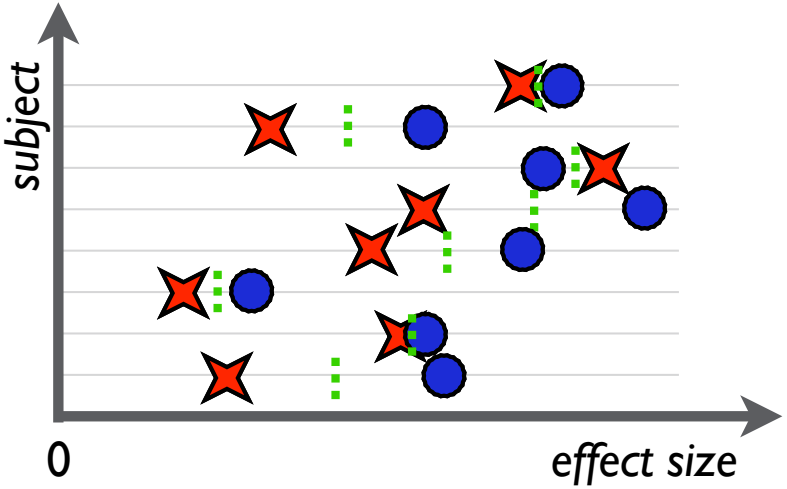
data



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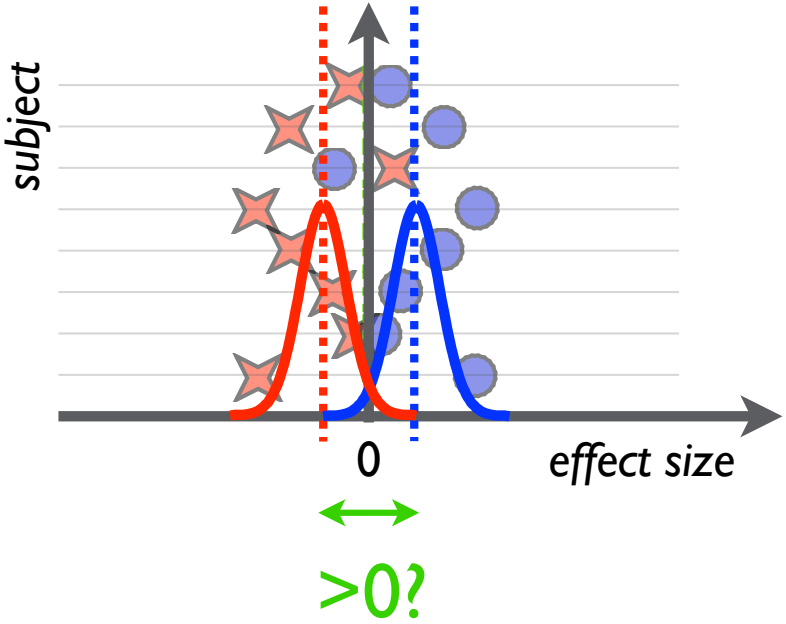

Paired T-Test

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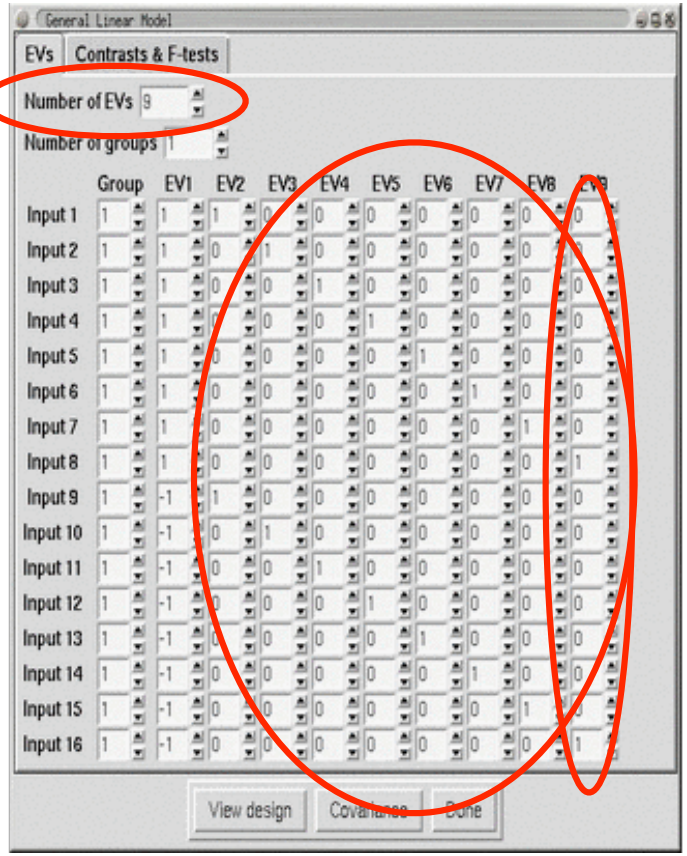

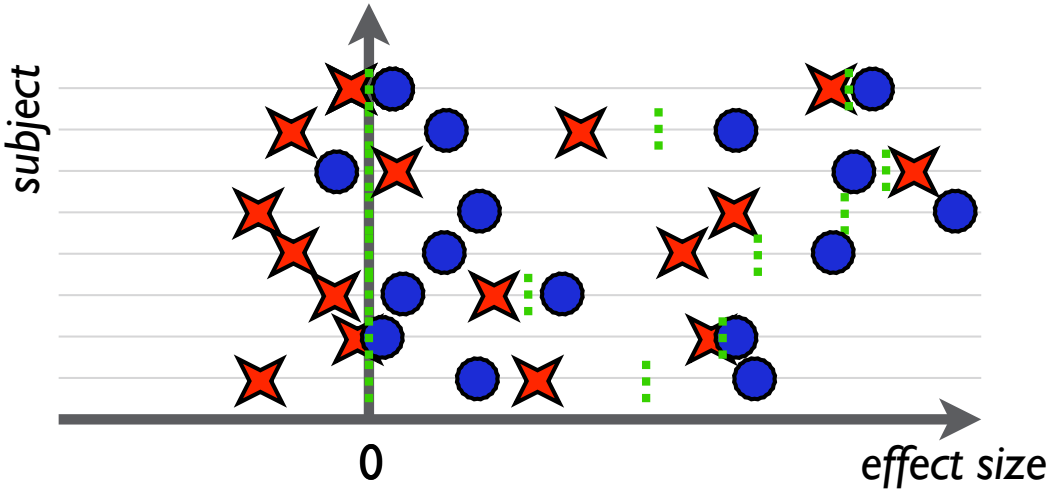

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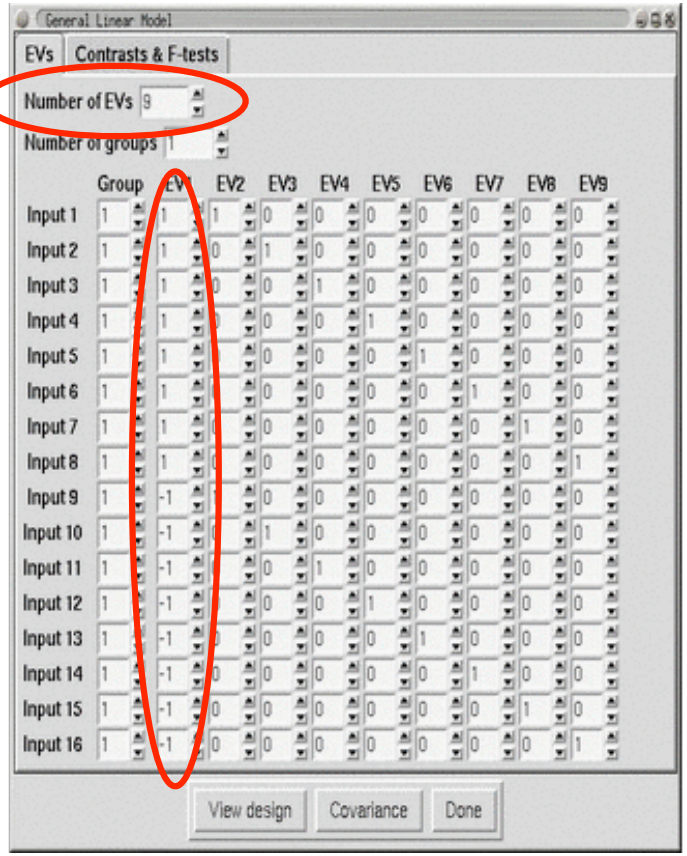

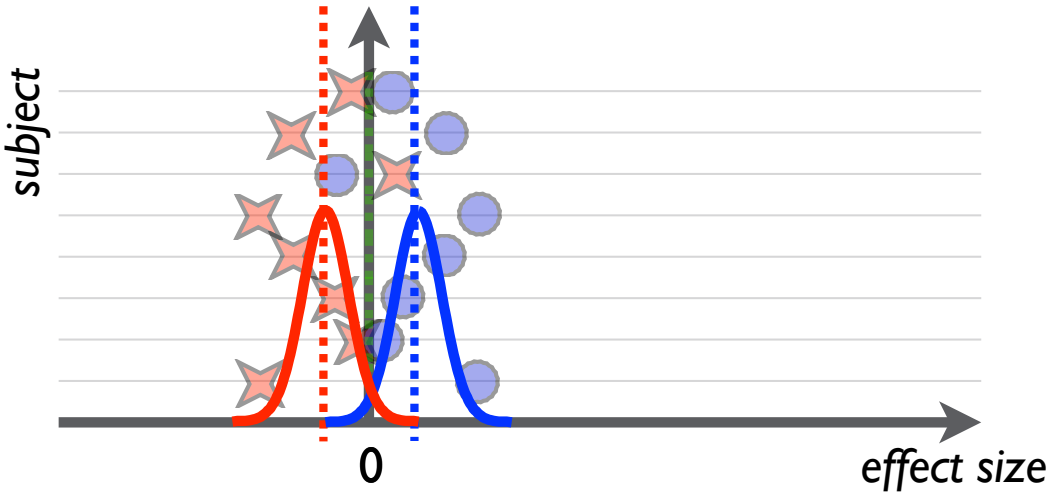

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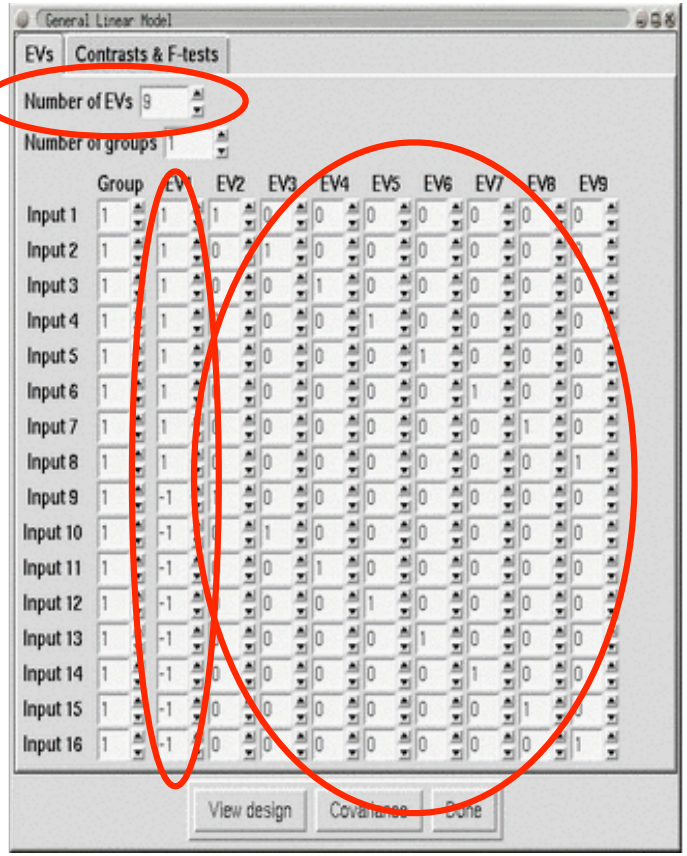

EV1 models the A-B paired difference; EVs 2-9 are confounds which model out each subject's mean

Paired T-Test

Is there a significant difference between conditions?