

Case Study 2

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The client is a graduate student from the Psychology Department

- The client has surveyed 300 volunteers about their motives for volunteering
- She has scores on six conceptually different motives
 - Although conceptually different, the motives are correlated
- The client wants to create a single composite variable from these six scores

Questions for the Client

We had several questions we'd like to ask the client before making any recommendations

- 1 Did the participants volunteer to take the questionnaire?
- 2 What was the response rate to the questionnaire?
- 3 What kind of responses did the questionnaire produce?
- 4 Does each question on the questionnaire contribute to only one motive?
- 5 Why does the client want a single composite variable?
- 6 How does the client conceptualize this variable?
- 7 Is each motive equally important, or should there be data driven, differential weights?

Depending on the answers to the questions on the previous slide we have two possible suggestions for the client

① Exploratory/Confirmatory Factor Analysis

• Pros:

- Reduces the dimensionality of the data
- Relatively common in Psychology

• Cons:

- Requires us to accept some (possibly dubious) assumptions
- Many people don't understand FA - even when they think they do
- The factor rotation solution will not be unique - other solutions are possible and all are mathematically acceptable
- Is known to be affected by reliability/validity of the data
- Requires a large sample size (generally 20:1 is a rule of thumb)

② Principal Components Analysis

- Pros:
 - Reduces the data's dimensionality
 - Simpler to understand than EFA
 - Is the "optimal" orthogonal transformation to a reduced space in that it preserves most of the variance
 - Often used if additional analysis of the results is warranted
- Cons:
 - Principal components are constrained to be orthogonal
 - Requires that the data is continuous
 - Sensitive to the scaling of the variables

A Final Thought

Neither of these methods *guarantee* a single component/factor solution...

...what if more than one component/factor emerges as significant?