



GÖTEBORGS UNIVERSITET

STUDENT

0003-LBF

TENTAMEN

TIG109 Tentamen

Kurskod	--
Bedömningsform	DO
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i**TIG109: Metod 2 och projekt, 15 hp, VT 2024**

Delkurs 1: Experimentdesign, 4 hp

OMTENTAMEN

Maxpoäng är 20, gränsen för **Godkänt** är 10 och för **Väl godkänt** 15 poäng.

Frågorna är formulerade på engelska. Svara på svenska eller engelska med max ca 200 ord per fråga (1, 2, 3, osv.).

Tillåtet hjälpmedel: tryckt engelskt lexikon (utan anteckningar)

1 Why do researchers use repeated measures designs?

Skriv in ditt svar här

Repeated measures designs are commonly used if there are a small number of subjects available, making an independent group design unsuitable to pursue. There is also an advantage for repeated measures designs since every person is tested on every condition, including control, and thus we can eliminate individual differences as a variable for confounding.

Another reason to use repeated measures designs is that it is very effective, if for example the experiment is built up by having subjects viewing numerous images and measuring their response for each image. Should you do this type of study with independent groups, a very large number of subjects would be required and it would consume a lot more time for it to be completed.

Ord: 120

Besvarad.

2 Describe the relationship between the concepts factor, level, and condition.**Skriv in ditt svar här**

In for example a complex design, which has 3 independent variables (factors) with 2 levels each, would have a total of $2 \times 2 \times 2 = 8$ conditions.

An example of this would be a study where levels of mental health are measured (dependent variable) for subjects receiving different forms of treatment. One factor could be therapy, where the levels would be yes/no. Another factor could be medication, again with the levels yes/no. The final factor could be physical exercise, with levels mild/intense. The total would be $2 \times 2 \times 2 = 8$ total conditions, with one being for example: no therapy/no medication/intense physical exercise.

Ord: 99

Besvarad.

3 Describe the concepts

- a) Main effect
- b) Interaction effect
- c) Simple main effect

Skriv in ditt svar här

In complex design

a) main effect is the effect of each independent variable on the dependent variable, alone. If for example the study was a 2×2 complex design, with independent variables being therapy yes/no and medication yes/no, the Main effect of one independent variable, for example therapy, would look at the difference in score on the dependent level between those who had therapy and those who did not, not concerned with whether they took medication or not (averaging scores over both levels of that factor).

b) Interaction effect is when the effect of one independent variable is dependent on the level of another independent variable, i.e. their effect in combination. In the example above, had there been an interaction effect, we might have found that those receiving therapy and medication scored "better" on the dependent variable than other groups, for example those who received no therapy and medication or those receiving therapy but no medication, indicating an interaction effect.

c) in complex design, a simple main effect is the score of one independent variable measured on a specific level of another independent variable.

Ord: 183

Besvarad.

4 Researchers investigated memory of stories in people with aphantasia, that is, with the inability to mentally visualize. The researchers hypothesized that people with aphantasia will have poorer memory of stories than other people, but only for stories that use rich verbal descriptions. Fifty participants with aphantasia and 50 controls read either a story with rich verbal descriptions or the same story but with sparse verbal descriptions. After a filler task, all participants were tested on the contents of the story using ten multiple-choice questions.

- a) Which research design was used?
- b) What were the factors and levels involved?
- c) Which control techniques were used?

Skriv in ditt svar här

a)

It is a complex design, since there are more than one independent variable. It is also a natural groups design, since they are divided into groups based on pre-existing individual differences, in this case aphantasia.

Moreover it is **not** a repeated measures design, since they were tested only once.

b)

2x2

One factor was the group formation, where one group where people with aphantasia, and the other without.

The other factor was which story they were presented, with one level being rich verbal descriptions, and the other sparse verbal descriptions.

c) They used a control group, which where the sparse verbal descriptions group, so that they could confirm that if the hypothesized difference in performance in the rich verbal descriptions group was statistically significant, it could be compared to the control group, thus establishing that the difference is dependant on rich verbal description and not memory ability overall.

They also used a filler task, to decrease the effect of individual characteristics as a potential explanation for performance, such as ability of short term memory (working memory).

Ord: 177

Besvarad.

- 5 Design an experiment to study whether people are faster to determine whether a face is angry compared to if it is neutral.

Specify **research design**, **factors**, **levels**, and **control techniques**.

Skriv in ditt svar här

For this task I would suggest a repeated measures design, since it would be effective at removing individual differences as a variable for the dependent variable, as well as very effective.

It would be a complete measures design, since there are only one independent variable, that is looking at faces on a screen and then two levels, which are Angry and Neutral. This means that each participant experiences each condition more than once. They would be tasked with pressing a button with the options Happy and Neutral, and measuring the time, which would be the dependent variable, that it takes for the subjects to make the decision. Then you would take the mean (or median) score for each level, which could look like this: Subject 1: Neutral: 1 second. Angry: 0.5 seconds.

I would use block randomization for the images, so that the subjects cannot use anticipation effects, for example it could look like NA / NA / NH / HN / NH / NH etc. making sure that each condition occurs equally often in each position, but in random order, reducing the effect of practice effects.

Another good idea would be to do a warm up trial to make sure that the subjects are aware of the test procedure.

research design: (complete) repeated measures groups design

factors: Looking at different faces on a screen

levels: Angry or Neutral

control techniques: Balancing (block randomization). Warm up trial.

Ord: 238

Besvarad.