Predicting technology acceptance using CAMs as an additional measurement tool to questionnaires

Use of a technology can be predicted according to the technology acceptance model (Venkatesh & Bala 2008). Thereby, questionnaires assess previously known influencing variables. To identify further influential factors on technology acceptance so called "Cognitive Affective Maps" (CAMs) can be applied (e.g. Livanec et al. 2020). CAMs are a quantitative and qualitative research tool to identify, visually represent and analyze existing belief structures or attitudes.

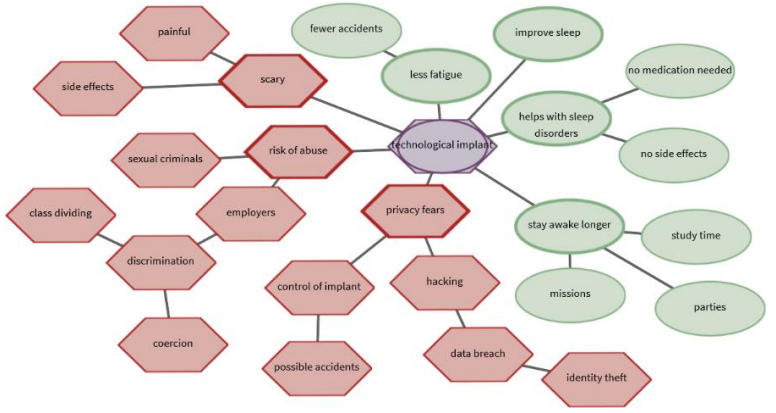

Figure 1. CAM drawn by a participant concerning the acceptance of a fictional nano implant

Only recently have CAMs been increasingly researched quantitatively (e.g. Reuter et al. 2021), and currently Therefore I am working on an R package to quantitatively analyze these kinds of networks (aggregating CAMs, computing complex network indicators…).

Pilot study

- N=90 participants, 2x2 mixed design
- Answered questionnaire scales and drew a CAM regarding a scenario text
- Treatment: participants were presented a CAM with the opposite affective connotation to their previously CAM; Control group

> two central hypotheses (which will result in two publications after replication in a larger sample size):

1. Can CAM data provide additional information to questionnaires and thus have an additional predictive value?
2. Does the treatment have a measurable impact beyond the (possible) temporal instability of CAMs?

Preliminary data analyses

Hypothesis 1. Using structural equation models it is possible to structurally analyze the acceptance process of a fictional technology. To account for the non-normal distribution of the questionnaire items and the small sample, the DWLS estimator was used and the X^2 statistic was mean and variance adjusted (e.g. Hancock & Mueller 2013):

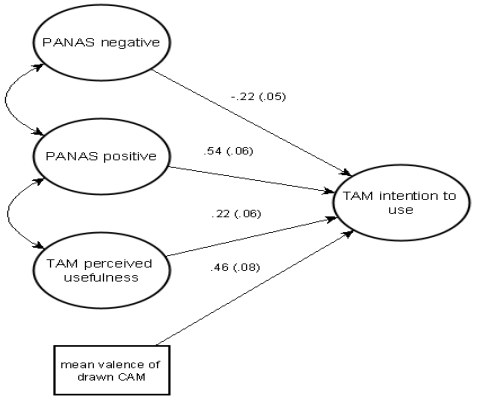

Figure 2. Predicting intention to use the nano implant

Hypothesis 2. The study design is a mixed design with 2 (within) x 3 (between) levels. This allows the use of multivariate multilevel models (Lischetzke et al. 2015) to measure the effect of the treatment:

predictors	est (se)
Constant	-0.120 (0.079)
post	0.149 (0.091)
neg. CAM presented	0.515 (0.142)***
pos. CAM presented	-0.464 (0.145)***
factor scores PANAS neg.	-0.122 (0.059)**
post x neg. CAM presented	-0.757 (0.162)***
post x pos. CAM presented	0.564 (0.169)***
post x factor scores PANAS neg.	-0.131 (0.072)*

Table 2. Predicting mean valence of drawn CAM

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Exploring cognitive affective maps as a new mode of data collection

Julius Fenn, University of Freiburg

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FREIBURG HEIDELBERG LANDAU MANNHEIM TÜBINGEN