## Cognitive-Affective Maps

Cognitive-Affective Maps (CAMs) represent a belief system as a network, using shapes and colors to represents concepts and their associated emotions with lines indicating relations between concepts.


Figure 1. CAM drew by a participant concerning the acceptance of a fictional nanoimplant.

Overall aim of my dissertation: Explore and validate cognitive affective maps as a new mode of data collection by means of quantitative methods

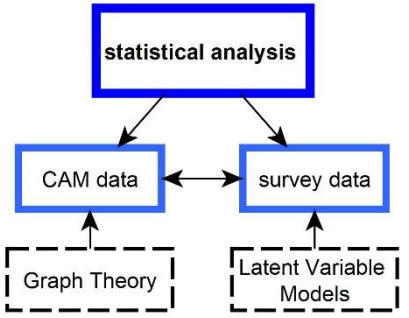


Figure 2. Heterogenous data sources will be integrated in the future.

Only recently have CAMs been increasingly researched quantitatively (e.g. Reuter et al. 2021), and currently I am working on an R package to quantitatively analyze these kinds of networks (e.g. aggregating CAMs, computing complex network indicators, splitting CAMs in components) and we have developed a new software to collect CAM data (devployed on github for testing purposes: https://camgalaxy.github.io/).

## Pilot study: Predicting technology acceptance using CAMs

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).

Can CAM data provide additional information to questionnaires and thus have an additional predictive value?

- Participants (N=90) answered questionnaire scales and drew a CAM regarding a scenario text about a fictional nanoimplant to to regulate the sleep-wake cycle of humans.

## Preliminary data analyses

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 adjusted. As a preliminary result, there is a highly significant influence of the mean valence of the drawn CAM on the intention to use the nanoimplant.

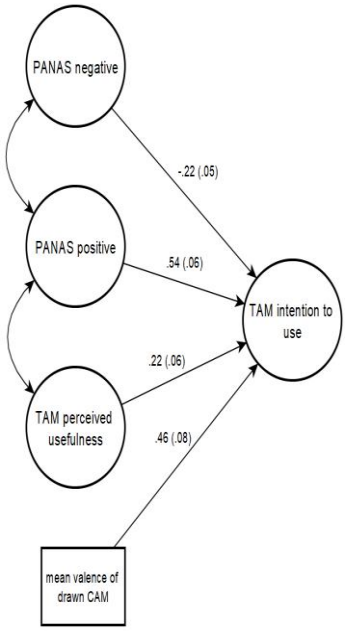


Figure 3. Predicting intention to use the nanoimplant.

## Future Research Plans

- Replicate the pilot study with sample size determined by a Monte Carlo study.
- Systematically analyze CAM and questionnaire data for at least three studies (one dataset already collected) using different outcome variables and including additional structural network indicators.
- Identifying clusters of similar CAMs using similarity algorithms and compare these clusters results with cluster results of questionnaire data


Livanec S., Stumpf, M., Reuter L., Fenn J. & Kiesel A. (2021). Who's gonna use this? Psychological acceptance prediction of emerging technologies and transdisciplinary considerations in the Anthropocene. Manuscript submitted for publication.

Reuter, L., Fenn, J., Bilo, T. A., Schulz, M., Weyland, A. L., Kiesel, A., & Thomaschke, R. (2021). Leisure walks modulate the cognitive and affective representation of the corona pandemic: Employing Cognitive-Affective Maps within a randomized experimental design. *Applied Psychology: Health and Well-Being*.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Science* 39(2), 273-315.


# Exploring cognitive affective maps as a new mode of data collection


Julius Fenn, University of Freiburg

STATISTICAL MODELING in PSYCHOLOGY
FREIBURG HEIDELBERG LANDAU MANNHEIM TÜBINGEN