



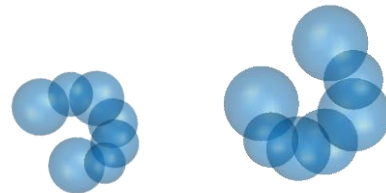
Abstract

Categorization learning is a crucial element of cognition that poses several challenges on stimulus design. We have developed a novel stimulus type to study categorization learning: **Bubbles!**

→ high degree of customization + low computation costs

→ various parameter can be manipulated individually

→ use to investigate different characteristics + strategies of categorization learning



Related publication:

– <https://www.ikn.psy.ruhr-uni-bochum.de/download/RUBubbles.html>

Techniques & Methods

base stimulus design

number of spheres set via **user input**

random generation

- position
- size
- color

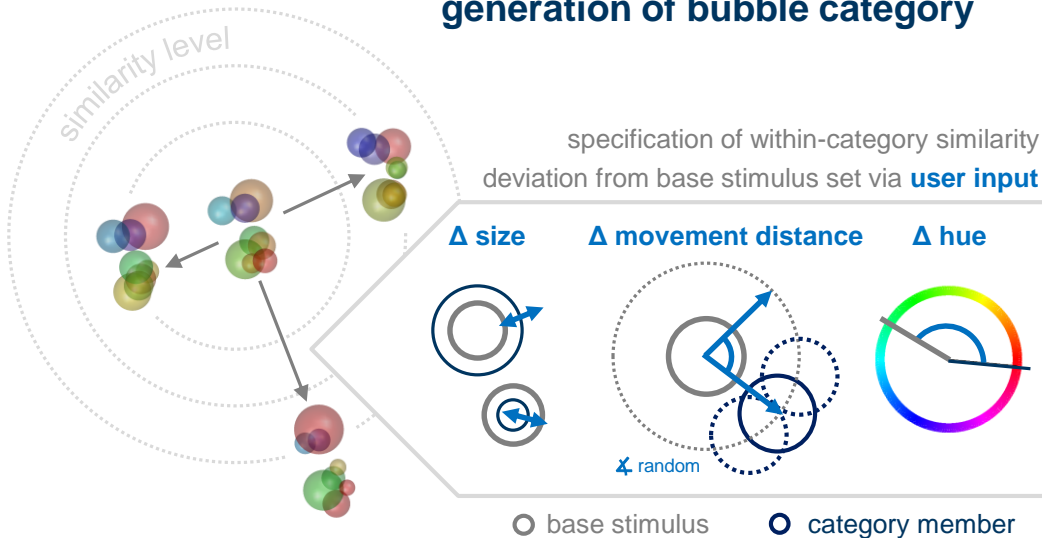


later modifications (optional)

- density, viewing angle
- absolute size and size differences
- color (custom, black/grey)

generation of bubble category

specification of within-category similarity deviation from base stimulus set via **user input**





Techniques & Methods

different parameter statistics

deviation from base stimulus defined via

→ minimum – maximum range (**uniform**)

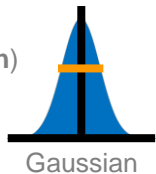
→ standard deviation (**Gaussian**)



specific characteristics

→ clear category boundaries (**uniform**)
flat, even distribution, more variation

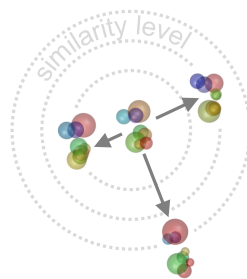
→ gradual category boundaries (**Gaussian**)
mostly similar stimuli



values used for category generation based on **user input**
(Δ size, Δ movement distance, Δ hue)

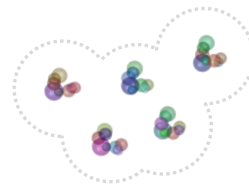
various category structures

prototype-based



different abstraction
(= similarity) level (optional)

exemplar-based



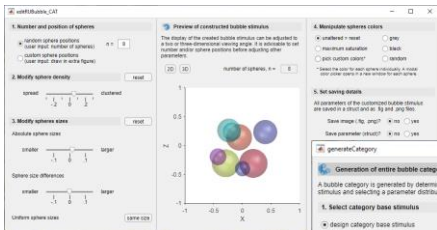
exception



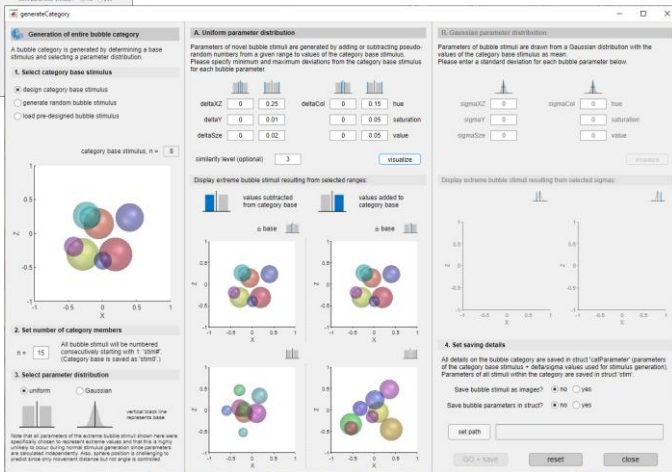
continuum



RUBubblesAPP & Implementation



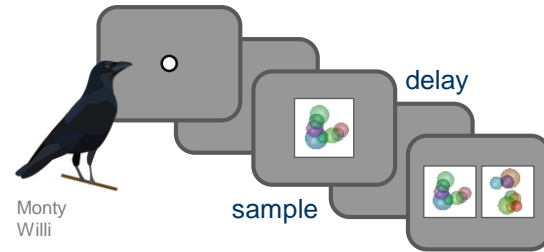
design category base stimulus
+ generate bubble category



RUBubblesAPP

categorization learning

delayed match to category



prototype- and exemplar-based training sessions

→ minimum – maximum range (**prototype**)

→ standard deviation (**Gaussian**)