FENS Forum 2008

For posters, morning sessions: 9:30-13:30; afternoon sessions 13:30-17:30.
Authors are expected to be in attendance at their posters at the time indicated.
For other sessions, time indicates the beginning and end of the sessions.

First author Proulx, Michael J. (poster)

Poster board E30 - Sun 13/07/2008, 11:30 - Hall 1
Session 023 - Human cognition 1
Abstract n° 023.30
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Title Object recognition learning with an image-to-sound sensory substitution system.

Text Sensory substitution attempts to provide the blind with visual information by converting it into a format that an intact modality can process. We investigated whether blind and blindfolded-sighted subjects would learn to categorize and identify common objects from the sound patterns generated by image-to-sound conversion software. All objects came from three categories (bathroom, food and kitchen items). In each of 15 training sessions, different exemplars of five objects per category were presented individually in a black box. Subjects examined each object with the device and described what they heard before naming its category and identity. For feedback, they explored the object tactually.

Before and after training, subjects performed a four-alternative-forced-choice categorization task in which pre-converted sound patterns representing exemplars of intact and scrambled objects were presented. Each two seconds of sound was presented four times before subjects responded by pressing one of the four buttons assigned to the intact and scrambled object categories. To assess any impact of general features that might differ across categories, the subjects also categorized sounds representing objects rotated 90degrees in a control condition.

First, in an analysis of the training session performance, the percentages of correctly categorized and identified objects indicated that all subjects learned to both categorize and identify a better-than-chance proportion of the items across sessions, some reaching between 80 to 100% correct scores. In addition, we compared the pre- and post-training categorization results obtained with the pre-converted sounds in the 4-AFC experiment. Subjects performed better with the post vs. pre-training categorization test, provided the objects were presented in the upright orientation. Fifteen training sessions thus enabled subjects to identify actual common objects from the sound patterns resulting from image-to-sound substitution of sight.

Theme F - Cognition and behavior
Human cognition and behavior - Learning and long-term memory