

Deaf children perceive signs in their ‘mind’s eye’

What this research was about and why it is important

When children perceive language, they must retrieve words from their ‘mental lexicon,’ which is like a dictionary in the mind. Many words can be active in their mind at once. For example, when hearing the word *pear* children might activate words like *bear*, which sounds like *pear* (they share a similar form), or *apple*, which is in the same meaning category as *pear*. We wanted to know whether deaf children learning American Sign Language (ASL) perceive signs in a similar way, to understand the similarities and differences between learning sign and spoken languages. We found that children are fast and efficient at recognizing familiar signs, and that many features of sign language perception are similar to spoken language perception.

What the researchers did

- We tested 20 deaf children between the ages of 4 and 8 years who were learning ASL. Children had been learning ASL either from birth or started learning by the age of 2.
- Children watched a computer screen that included a video of an ASL sign (e.g. TRAIN), and four pictures: one matched the sign (train), one overlapped in form (e.g. chair, as the sign CHAIR looks like the sign TRAIN), one overlapped in meaning category (e.g. car, as train and car are both vehicles), and one that was unrelated (e.g. butterfly).
- As children saw the signs and pictures, we used a camera to record their gaze. We measured how fast they looked at the matching picture, how much time they spent on the matching picture, and how much they looked at the other pictures on the screen.
- Using eye-gaze is a helpful way of measuring what words children are considering, because we naturally tend to look at something if it is active in our mind. We also asked children to point at the matching picture.

What the researchers found

- Children pointed at the correct picture most of the time. When they pointed at the wrong picture, they tended to choose the picture that overlapped in form with the target.
- Overall, children were fast and efficient at recognizing signs. They watched the sign video and quickly shifted their gaze to the matching picture, sometimes looking at the matching picture even before the sign had finished.
- When we analyzed where children’s gaze was on the screen, we found they generally looked at the matching picture. However, they also looked at the picture that was in the same meaning category as the target.
- We did not find any differences in looking patterns based on the age of the child.

Things to consider

- We show that deaf children are sensitive to both the form and meaning of ASL signs, and that many aspects of recognizing ASL signs are similar to the ways in which hearing children recognize spoken words.
- Our sample was somewhat small, so in future research it will be important to test a larger number of deaf children, and to include children who started learning ASL later in childhood.

Materials and data: Data are publicly available at <https://osf.io/gx6dj/>.

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