

Posture affects infants' capacity to identify objects, study finds

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Generally taken for granted, our capacity to immediately recognise, name and associate thousands of objects with memories – under various viewing conditions – still remains a mystery. It is well-known that top-down knowledge arising from previous experience with our environment plays a key role in this process. But what if there is no such knowledge, like when infants suddenly start mapping words to objects? Is the learning process strictly relying on repeated word-object associations, or do things like spatial location and body posture have an impact as well?

To find out, scientists at the Indiana University teamed up with two EU-funded projects – ITALK and POETICON++ – to run tests on a humanoid robot model and later verify the results in new infant studies.

Various experiments were conducted on the robot, including one with two different objects being placed on its right- and left-hand side – in a way that forced the robot to position itself differently to view one or the other. Once the robot turned left, the name of the left-hand object was pronounced, and the other way around.

After repeating the two object presentations several times, the team proceeded with no object in view, and then with objects visible but not being named. Finally, the locations of the two objects were changed, and the robot kept making the right name-object association in 71 % of tests. When the body variable was removed from all experiments, however, this score only reached 46 %. Tests on infants showed very similar results.

'This study shows that the body plays a role in early object name learning, and how toddlers use the body's position in space to connect ideas,' said Linda Smith from Indiana University, who conducted the study. 'A number of studies suggest that memory is tightly tied to the location of an object. None, however, have shown that bodily position plays a role or that, if you shift your body, you could forget.'

The robot used for this study is non-other than iCub, a [humanoid robot](#) developed under the EU-funded project RobotCub and adopted by over 20 laboratories worldwide. The robot, which is characterised by its highly realistic body movements, is also central to the ITALK and POETICON++ projects, which provided it with the capacity to acquire complex cognitive and behavioural skills based on infant-inspired language learning.

'The creation of a [robot](#) model for infant learning has far-reaching implications for how the brains of young people work,' Smith concludes. Whilst additional research is needed to determine whether the tie to posture for learning is limited to infants, this link has potentially far

reaching implications. Many problems related to motor development come along with cognitive developmental disorders, and this relation is still not well understood. It is hoped that the study helps to advance scientific knowledge in this field.

More information: For further information, please visit ITALK:
www.italkproject.org/

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