

In learning, communication overrides the 'statistics' of events

April 9 2015

It is cultural transmission - the ability to pass knowledge on from one individual to another even across generations - that makes us unique among animals. True, we also learn by observing what happens in the world around us, for example, by associating events that frequently occur together (or in a rapid sequence). However, human "communication" may constitute such a powerful instrument that it overrides "statistics", as observed in a study just published in *PLOS One* and conducted by Hanna Marno, researcher at the International School for Advanced Studies (SISSA) in Trieste.

"Human beings learn from statistical associations between events and objects. If, for example, one event very frequently follows another, we'll learn to associate the first with the second and to use this association in our daily lives" explains Marno. "However, this is not the only way we learn. For humans, in fact, sharing information by [communication](#) is a vitally important factor". This means that whereas normally we will associate an object with an action after observing their co-occurrence for a certain number of times, when certain communicative "cues" intervene (eye contact or verbal reinforcement from another person), then learning could take place far more rapidly and without any need for repeated observations.

"In our experiments, infants aged about 18 months watched an adult interact with a box that had two buttons and a heart-shaped lamp on it; when either of the two buttons was pressed the heart lit up" explains Marno. In the "baseline" condition only the efficiency of the action

varied: in one case, the button on the right would light up the heart-shaped lamp two-thirds of the time ([high efficiency](#)) and the one on the left only the remaining one-third (low efficiency), whereas in the other case the situation was reversed. In the experimental condition, a "communication" variable was added: the demonstrators could remain neutral (as at baseline) or interact with the child through non-verbal ([eye contact](#)) and verbal cues (in so-called "motherese", the typical way adults talk to young children) to emphasise their action. Then, in a later phase, the children were left alone to interact with the box and the investigators recorded which button they pressed first.

"The results demonstrate that in these experiments the 'communicative' signals are more important than the efficiency of the action" explains Marno. "Compared to children's tendency to choose the more efficient button in the neutral condition, in the experimental situation they tended to prefer the button with low efficiency if this had been highlighted by the adult's communicative signals".

More in detail

Marno started her studies on the effect of communicative signals by testing adult subjects. In fact, communication seems to play a specific, powerful role for adults as well. "Information about an object may be contingent or general. For example, when learning about an object, we can learn its position, which is most of the cases transitory information related to a specific moment in time, or we can learn more general features like its shape and function, which are not bound to any specific time period".

In her experiments with adults, Marno observed that while mere observation of objects can contribute to the acquisition of contingent and transitory information, when communicative signals are also present, there is a bias to acquire some permanent, more general information.

"Our studies clearly demonstrate the huge importance of communication in human learning".

Provided by International School of Advanced Studies

Citation: In learning, communication overrides the 'statistics' of events (2015, April 9) retrieved 3 May 2024 from <https://phys.org/news/2015-04-overrides-statistics-events.html>

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