Research shows seven-year-olds can think strategically

September 2 2014, by Marcia Malory

Credit: Robert Kraft/public domain

(Medical Xpress)—A study by Melissa Koenig of the University of Minnesota and colleagues shows that by the time they reach the age of seven, children can think strategically, in an adult manner. The researchers found that when playing games, children older than 6.5 use strategies comparable to those used by adults. The research appears in

the *Proceedings of the National Academy of Sciences*.

Developing a strategy requires theory of mind, the ability to infer how other people think and to predict how they will behave based on what incentivizes them. It also requires recursive thinking, the ability to use one step of the reasoning process to formulate the next step. Koenig's team calls the combination of theory of mind and recursive thinking Strategic Theory of Mind (SToM).

As an example of SToM, consider a situation in which it might appear, initially, that lying to another person is to your advantage. Using SToM, you would realize this person has an incentive to lie to you, and they also understand that you have an incentive to lie to them and would, therefore expect you to lie. Based on this reasoning, you tell the truth.

To understand when SToM develops, the team studied the behavior of 69 children between the ages of three and nine when playing two different games. In the first, the sender-receiver game, a child takes the role of either sender or receiver, with an experimenter playing the other role. The sender knows which of two boxes contains a piece of candy. The receiver does not. The sender points to one of the boxes, which does not necessarily have the candy. The receiver then chooses a box. If the receiver selects the box with the candy, the receiver keeps the candy. If the receiver chooses the empty box, the sender keeps the candy.

In the second game, the stickers game, a child and an experimenter simultaneously chose between one and five stickers. The player who selects the fewer stickers gets to keep their stickers; the player who chooses the most stickers receives no stickers. If both players choose the same number of stickers, neither player keeps any stickers.

Koenig's team found that as the children's ages increased, their strategies became more sophisticated. They appeared to develop SToM by the age

of six or seven. The researchers had adults participate in a version of the stickers game that used money instead of stickers and found that by age 6.5, the children's strategies resembled those of adults. The team says the study shows that children develop an ability to think strategically, understanding how to use deception and competitiveness to their advantage, at an unexpectedly young age.

More information: Children's strategic theory of mind, *PNAS*, 2014. www.pnas.org/cgi/doi/10.1073/pnas.1403283111