Study looks at collaboration, facial recognition

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From left: Dr. Alice O'Toole, Jacqueline G. Castro, Ying (Nina) Hu MS'16, Géraldine Jeckeln, Dr. Eilidh Noyes and Carina A. Hahn at the University's Face Perception Research Lab. Credit: University of Texas at Dallas

Two heads are better than one—so goes the common adage. But are two heads collaborating really more effective at making decisions than two working independently?

When it comes to the task of <u>face recognition</u>, the answer is "no," according to a study from The University of Texas at Dallas' Face Perception Research Lab.

Dr. Alice O'Toole, professor in the School of Behavioral and Brain Sciences and holder of the Aage and Margareta Møller Endowed Chair, was senior author of the study published recently in the *British Journal of Psychology*.

"The comparison this paper makes is between two people discussing a decision before giving a single answer and blindly averaging two individuals' answers," O'Toole said. "We learned that two of us sitting down and chatting doesn't work any better or worse than the blind average."

To conduct the experiment, participants viewed pairs of front views of faces varied in lighting and expression. They had to decide if the two faces shown were the same person, using a 5-point scale with answers ranging from 1, indicating "sure they are the same person," to 5, meaning "sure they are different people."

Each participant viewed half of the set as an individual and half as a social pair or dyad, where two participants worked cooperatively with one another to produce a single response. A nonsocial dyad component was then introduced—two individual response sets were blindly averaged into one response. Comparing social collaboration against blind averaging, the study found that the two methods perform almost identically.

For larger nonsocial groups, the research found performance peaked at near perfection with a crowd size of eight participants.

The paper's conclusions call into question the need to bring people

together for meetings, O'Toole said. In professional settings for this task, such as forensic investigations, the research's implications could lead to cost savings.

Neuroscience graduate student and study lead author Géraldine Jeckeln (left) discusses the testing program with postdoctoral researcher and co-author Dr. Eilidh Noyes. Credit: University of Texas at Dallas

"Investigators often aren't working in close company," O'Toole said. "Is there an advantage to bringing them together? This research says no. You can have a guy in Chicago look at the data and a lady in Philadelphia look at it, and you'll be just as accurate as if they're at the

same table."

Lead author Géraldine Jeckeln, a graduate student in the Applied Cognition and Neuroscience program, explained that, in the case of the social dyad—the interactive pairing—performance did not seem to be hampered by a more assertive partner ignoring a teammate who was better at the task.

"Usually, the more influential partner in terms of making the decision is the one that performed better on the test," Jeckeln said.

"What may be happening is that one of the pair is more detail-oriented, and is making better observations to sway the collaborative decision," O'Toole added. "If they can make a point and the other person says, 'I never noticed that,' then you get a positive effect."

Jeckeln emphasized that for a task such as face recognition, the crowd's wisdom stems from the variations in what we analyze to make our decisions.

"Differences are what help us, no matter the method of collaboration or combination," she said. "Each new participant adds a new strategy, and that pushes the result closer to optimal."

"Combining people's answers is only an effective tool if they are doing a little bit different things," O'Toole added. "You may be looking at eyes and mouth, while she's looking at face shape—we're all doing different things without being told to. Whereas if everybody was looking at the exact same information, your score would just converge to the top performer in the pair or group."

For O'Toole and her team, the next step is seeing how the experts—forensic investigators—do when they collaborate with each

other versus collaborating with computers. For now, she says, the humans are doing just fine.

"In a way, this is a success story for human collaboration; the social dyad does as well as the blind average," O'Toole said. "People with better knowledge can actually take over the process without being overconfident. They can be cooperative and effective without being pushy."

Provided by University of Texas at Dallas

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