Social Cognition Lab Newsletter

Good News !

Dr. Francys Subiaul is awarded $440,870 CAREER Award from the National Science Foundation

The award targets how human children and non-human apes (Gorillas and Orangutans) learn from others, in order to gain insights into the uniqueness of human cultural learning. Some of the questions that will be addressed by Dr. Subiaul and his colleagues include: What factors differentiate human and non-human ape imitation? Are species differences in imitation performance best explained by differences in how they copy different types of stimuli (e.g., motor, abstract, spatial), by memory differences or both? Which of these aspects imitation are shared with humans? Answers to these questions will shed light on the nature of imitation and its relationship to human cultural uniqueness. The sponsored studies will be accompanied by a public education program: The Ape Mind Initiative (AMI) that will provide scientific and educational opportunities to students and the public. (See below for more details).

News & Research

Subiaul Social Cognition Lab

Our lab has changed its name. And, a new website is on the way! Our new name is the Social Cognition Lab. The new website will include the newsletter with updated research results and an easier way for parents and students to contact us and participate in research. For those who are interested come check out our new lab website in June: www.subiaul.com

Director's Message

The past year and a half has been a busy year for me and for our lab. In addition to settling into D.C., a new position in The George Washington University (GWU) and the Department of Speech and Hearing Science (SPHR), we had the incredible challenge of building this lab from the ground up. That involved purchasing equipment, recruiting and training students and designing new and probing studies for children that would be safe, fun and insightful. Of course, we also had to locate and enroll dozens of children to participate in these studies—no simple task! But with the support from GWU and the help of extraordinary graduate students from the Departments of Psychology and SPHR and, of course, you and your children, we've overcome many of these challenges and, as a result, have come a long way. Certainly, I hope that in the year ahead, we're able to build on our accomplishments and complete the many exciting studies that are on-going and are planned for the near future.

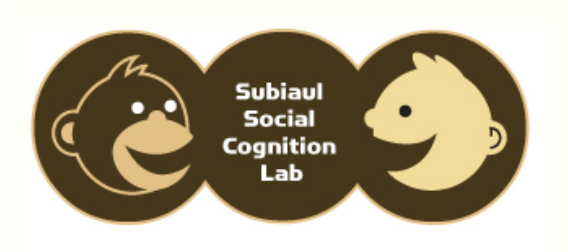
I wanted to use this opportunity to offer many thanks to the directors of the participating daycare centers: Georgetown Hill, Crystal City and Rosslyn Day Center Centers. These directors welcomed me and my students to their centers and made our studies with children possible. It goes without saying that we could have never done it without their support. I would like to extend special thanks to Ms. Naomi Maneres and Ellen Cromwell of Georgetown Hill for introducing me to the directors of Georgetown Hill in the Nuclear Regulatory Commission, the Department of Education and Department of Agriculture of the District of Columbia. To date we've recruited nearly 200 children from these daycare centers; nearly 100 of these children from Georgetown Hill alone.

We have also recruited children from our very own Speech and Hearing Center. We're incredibly thankful to all the parents who have children with autism who've driven (or walked) many miles, in some instances given up their Saturday mornings and circled the block too many times looking for parking so that their child can participate in our studies. But your participation has been critical and preliminary results (reported below) look very exciting and very promising.

Below is a summary of the studies that we've been doing in the past year with your children in their daycare centers, as well as information about on-going and future studies. We're happy to announce that we've recently completed a study with typically-developing 2.5 year olds on the development of learning from others' mistakes (see pages 3 and 4).

With your help we hope to continue to do these and other studies; furthering our understanding of the mind of children in general and their social intelligence, in particular.

Francys Subiaul, Ph.D.
May, 2008



Tell me what you think...

We're always happy to hear from parents. We want to know your thoughts, suggestions and comments. So, please, feel free to contact me directly: (202) 994-7208 or via email: subiaul@gwu.edu.

Research: *Typically-Developing 2-, 3-, & 4- Year Old Children*

When do Children learn from others' mistakes?

An earlier study had shown that when 2 and 3-year olds saw a model use a tool to retrieve a reward, 2-year olds failed to learn from the model. However, 3-year olds learned when they saw the model use the tool incorrectly and then use the tool correctly, but not when the model consistently used the tool correctly or incorrectly. We hypothesized that the motor demands of the task may have negatively affected imitation learning. So we presented children with a task where they had to copy an abstract rule (e.g., first, second, third) without also having to copy motor actions (e.g., up, right, down).

As in the original study, we presented children with a model that always responded correctly in some instances and incorrectly in others. We found that children between 30 and 35 months (but not 24-29 months) learned best when the model always responded incorrectly. This is evidence that very young children infer accurate solutions to problems when presented with novel incomplete or incorrect information. See Fig. 1 below for a graphical summary of the results.

Four-year old child participating in one of our imitation studies where pictures must be touched in a specific motor-spatial sequence. For example: down, up, right.

Cognitive versus Motor-Spatial Imitation

Children are incredibly imitative. As infants, they mimic smiles and tongue protrusion; as toddlers, they copy all sorts of actions and habits. And, perhaps most significantly, they begin to imitate various aspects of their parents' language. So, understanding how different imitation learning skills develop in children is critical given its role in development but also its use by teachers when children enter pre- and elementary school.

Over the past year, we've tested many children, including yours. What we've found is quite surprising. As it turns out, children appear to have multiple imitation learning abilities. And these abilities are not the same. They may even be independent of one another. Specifically, children appear to develop the ability to imitate new abstract rules such as 'first, second, third' before they're able to imitate new motor-spatial actions like 'up, down, right.' (See Fig 2). These dissociations in performance are not easily explained by children's motor or spatial abilities, as all children tested are able to perform these problems by trial and error. These differences in imitation learning performance appear to be specific to the type of imitation learning that is being tested (cognitive versus motor-spatial).

In the year ahead we will continue to probe further and deeper into the different imitation learning skills of children; getting a better sense of when these abilities develop and what is the relationship (if any) between these different imitation learning skills to other psychological skills such as understanding cause-and-effect and others' goals or intentions.

Subiaul Social Cognition Lab

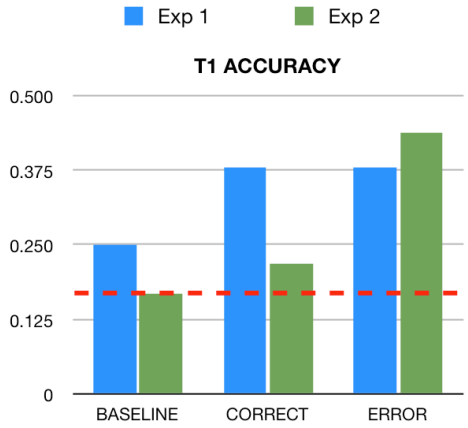


Fig 1. Learning from Others' Mistakes. Children's accuracy (vertical axis) on the very first attempt to respond (T1) in two studies (Exp. 1 and 2). The dashed line shows chance performance. As can be seen 2.5 year olds in both studies learned significantly above chance in the 'error' condition, where the model always showed an incorrect response. Performance in the 'correct' condition, where the model always responded correctly, was inconsistent between studies and children.

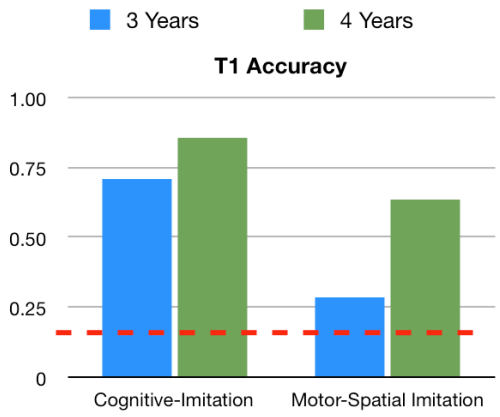


Fig 2. Imitation of motor-spatial actions versus abstract 'cognitive' rules. Children's accuracy (vertical axis) on the very first attempt to respond (T1). The dashed line represents chance. As can be seen, typically-developing 3- and 4-year olds excel in 'cognitive' imitation (copying: 'first, second, third' independently of copying specific actions), but these same children had difficulties copying novel motor-spatial actions ('up, down, right'). Four-year olds excel in both. types of imitation.

Research: *Children With Autism*

Understanding Imitation Deficits in Autism

A major objective of the Social Cognition Laboratory is understanding what underlies the imitation learning problems common in children with autism (CWA). Our lab has approached this problem in a unique way: by breaking down 'imitation' from one thing that children can either do or not do, to one that investigates whether CWA can engage in some types of imitation but not others. To address this issue, we've been presenting CWA with three different imitation learning problems: (1) copying a new serial rule such as first, second, third without having to copy new motor actions (Novel Cognitive Imitation); (2) copying a new serial rule (as above) but also copying a familiar motor action (Familiar Motor Imitation). Specifically, touching a picture on the screen twice, rather that just once; (3) copying a new motor-spatial sequence such as up, down, right (Novel Motor-Spatial Imitation). All these problems are novel and abstract and are all quite challenging. But they may ultimately reveal why children with autism excel in certain imitation learning problems and not others. Fig 3 presents some preliminary results.

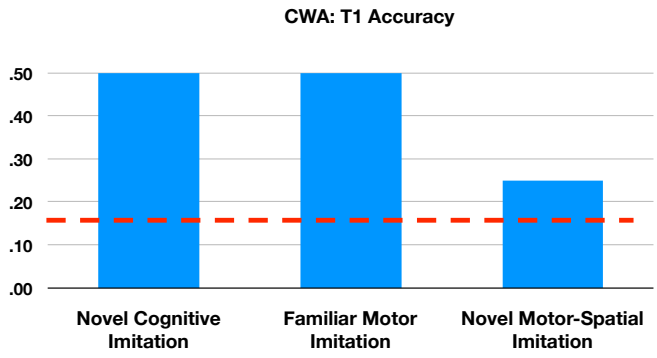


Fig 3. Different Types of Imitations. Here's a summary of accuracy (vertical axis) on the very first trial (T1). The dashed line represents chance. CWA learned best in the familiar motor and novel cognitive imitation problems, but were at chance in the novel motor-spatial imitation problem.

Subiaul Social Cognition Lab

On-Going Activities & Future Projects

Imitating a 'Ghost'

In the quest to understand what underlies imitation learning, researchers have invented a test condition where children see objects moving or actions occurring without anyone moving those objects or generation those actions– as if done by a ghost. Hence, the name "ghost condition." This condition tests whether children learn by imitation by focusing on the actions of others or from the results of actions. Research has demonstrated that children learn in conditions where a model does certain action as well as conditions where the 'ghost' does the actions. In our lab, we're exploring what allows children to be such flexible imitators. One idea we're testing is whether children learn in such strange conditions because they attribute 'aliveness' or 'animacy' to the inanimate object that's moving in a goal-directed fashion.

Using our computerized imitation learning tests, we're manipulating children's perception of the computer prior to testing to see if this affects how they learn from the computer. So, for instance, prior to learning, some children are told that 'This is a special computer; it's like you and me.' Other kids are told, 'This is a regular computer; it's just a machine.' Do kids that think that the computer is 'alive' learn better than those that think 'It's just a machine?' Stay tuned...

Ape Mind Initiative

This research & educational initiative will provide students and the general public new opportunities to learn about human cognitive uniqueness. AMI highlights include:

National Zoo

Research will explore great ape imitation skills in the Great Ape House and Think Tank of the National Zoo. Students from High School to College will have an opportunity to develop and execute research studies

Courses & Public Lectures

Dr. Subiaul and other scientists will offer courses through GWU on primate intelligence and primate research in the Zoo. There are also plans to present public lectures on ape and human intelligence every 3 months.

Tell your friends!

We're always looking for kids to participate in our fun studies. So, if you know of parents with children who might like our studies, please tell them about us. You can call us: (202) 994-1344 or email Prof. Subiaul: subiaul@gwu.edu

Explaining Social v. Physical Dilemmas

Over the past couple of years we've been exploring how typically-developing children and CWA understand different types of problems. For instance, research suggests that CWA are particularly good at explaining physical problems (how the physical world works) but they have difficulties explaining social problems (how people work). To address this unique feature of autistic intelligence, we're presenting typically-developing children as well as CWA with two types of 'dilemmas.' Some groups of children are presented with a 'physical dilemma' where, for example, an object that when placed upright on a table would stand (without falling) but after a couple of trials, the same block would unexpectedly fall. Another group of children will be presented with an experimenter who consistently gives them stickers but after a couple of experiences, the experimenter unexpectedly stops giving them stickers. Preliminary research suggests that CWA try to explain the physical dilemma. The question is, do they also try to explain the social dilemma? Stay tuned...