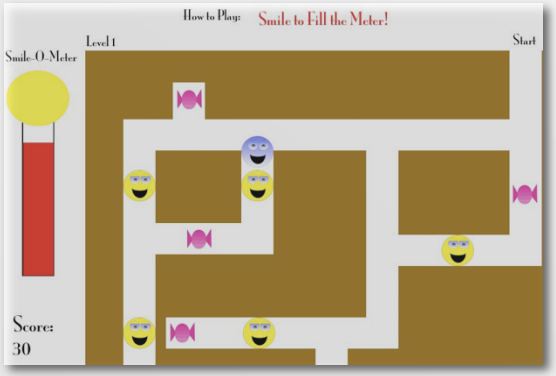
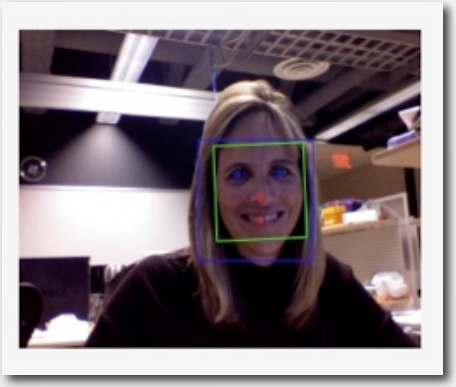
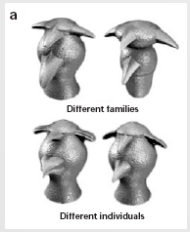
Update: *Let's Face It!/* Face Camp/CERT

Jim Tanaka (Univ. of Victoria)
Matt Pierce (Univ. of Victoria)
Marni Bartlett (UCSD)
Javier Movellan (UCSD)
Bob Schultz (Children's Hospital of Philadelphia)

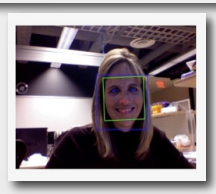




Research, intervention, dissemination: From the lab to the classroom



Research I



Intervention

Dissemination

Time (yrs)

Virtually everyone is an expert at face recognition . . .

Identity

Expression

Gaze

Children with autism are impaired in their face recognition skills

Deficits in processing eye gaze

Volkmar et al., 1986; Joseph & Tager-Flusberg, 1997; Kasari et al., 1990

Deficits in processing facial identity

Langdell 1978; Hobson et al. 1988; Joseph & Tanaka, 2002; Klin et al., 1999

Deficits in processing facial expression

Adolphs et al., 2001; Weeks & Hobson, 1987

Assessing face processing in children with autism: The *Let's Face It!* Skills Battery

RESEARCH ARTICLE

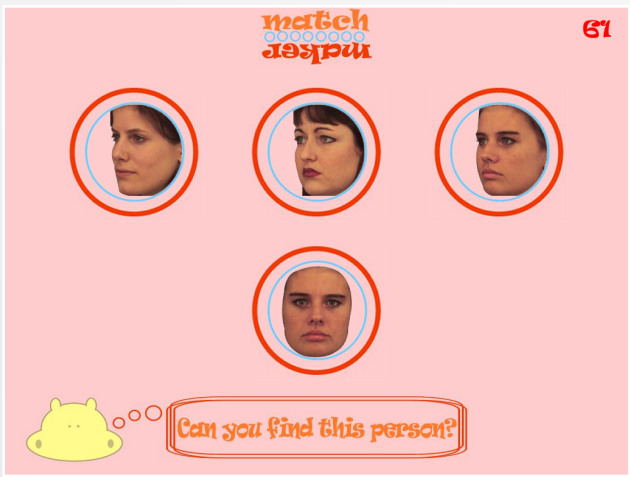
Specific Impairment of Face-Processing Abilities in Children With Autism Spectrum Disorder Using the *Let's Face It!* Skills Battery

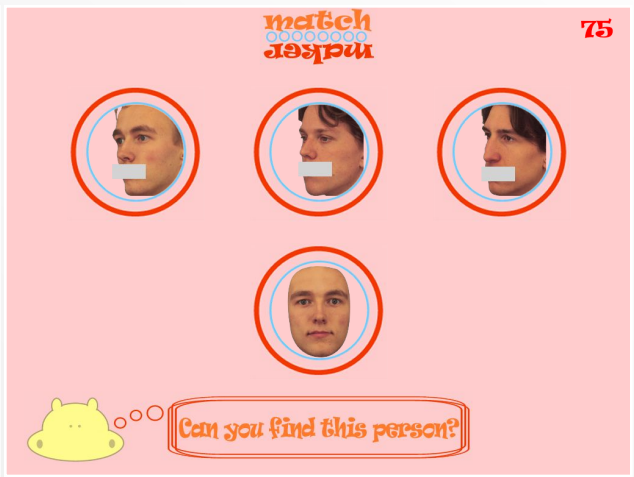
Julie M. Wolf, James W. Tanaka, Cheryl Klaiman, Jeff Cockburn, Lauren Herlihy, Carla Brown, Mikle South, James McPartland, Martha D. Kaiser, Rebecca Phillips, and Robert T. Schultz

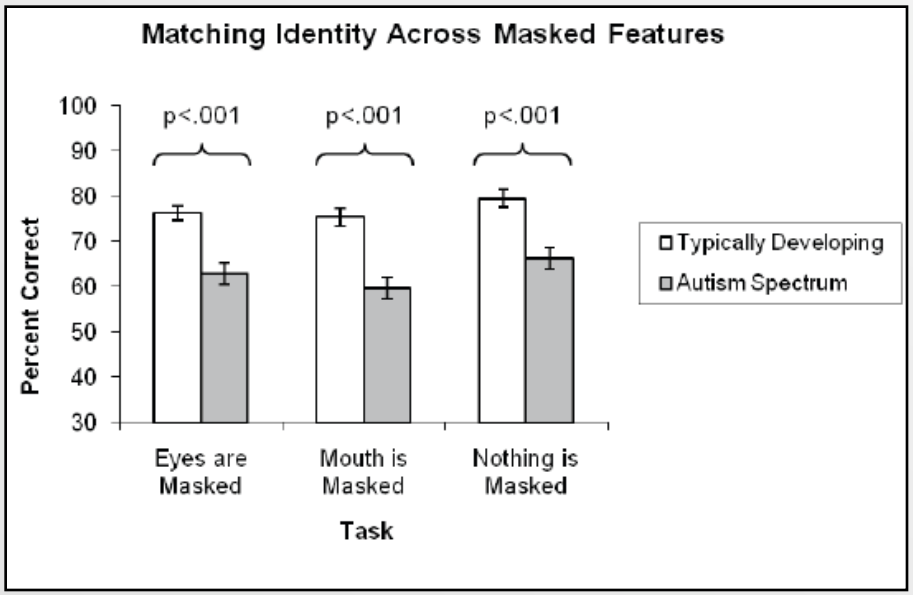
Although it has been well established that individuals with autism exhibit difficulties in their face recognition abilities, it has been debated whether this deficit reflects a category-specific impairment of faces or a general perceptual bias toward the local-level information in a stimulus. In this study, the *Let's Face It!* Skills Battery [Tanaka & Schultz, 2008] of developmental face- and object-processing measures was administered to a large sample of children diagnosed with autism spectrum disorder (ASD) and typically developing children. The main finding was that when matched for age and IQ, individuals with ASD were selectively impaired in their ability to recognize faces across changes in orientation, expression and featural information. In a face discrimination task, ASD participants showed a preserved ability to discriminate featural and configural information in the mouth region of a face, but were compromised in their ability to discriminate featural and configural information in the eyes. On object-processing tasks, ASD participants demonstrated a normal ability to recognize automobiles across changes in orientation and a superior ability to discriminate featural and configural information in houses. These findings indicate that the face-processing deficits in ASD are not due to a local-processing bias, but reflect a category-specific impairment of faces characterized by a failure to form view-invariant face representations and discriminate information in the eye region of the face.

Wolf et al. 2009, *Autism Research*

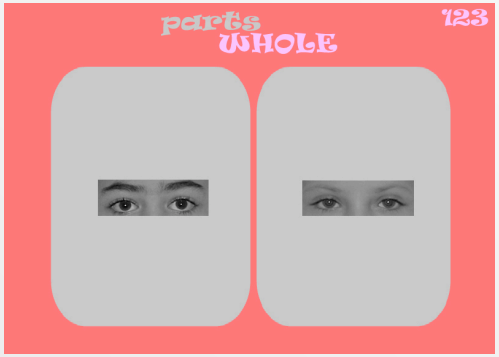
Recognition across changes in expression, viewpoint and features





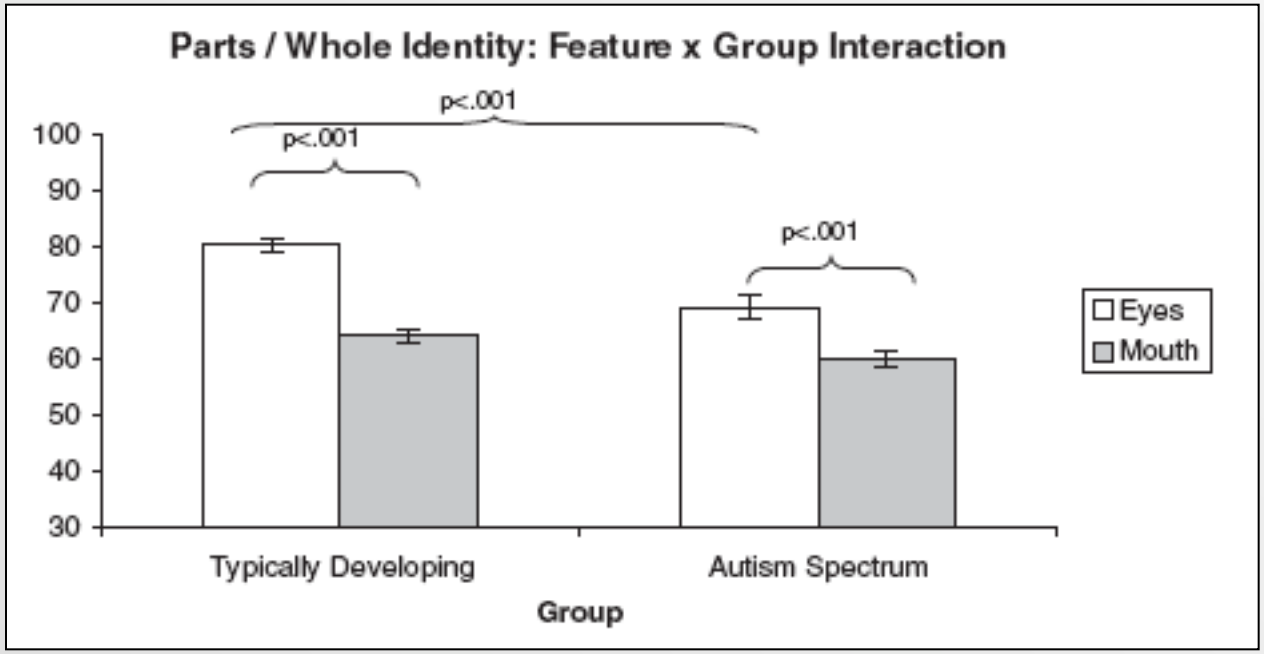


Parts/wholes face recognition

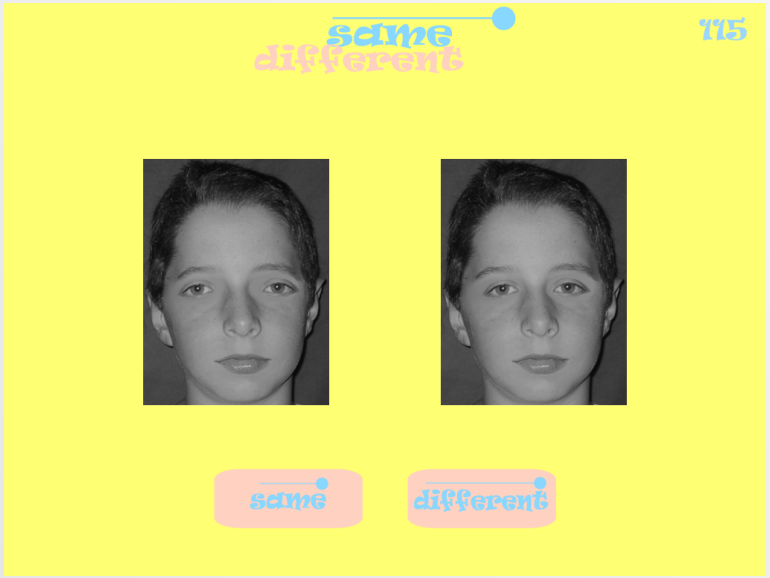


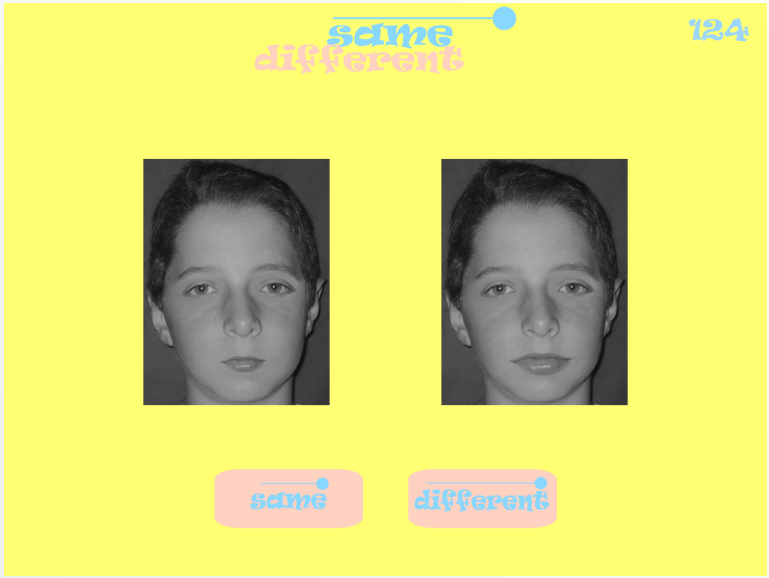
Part Test

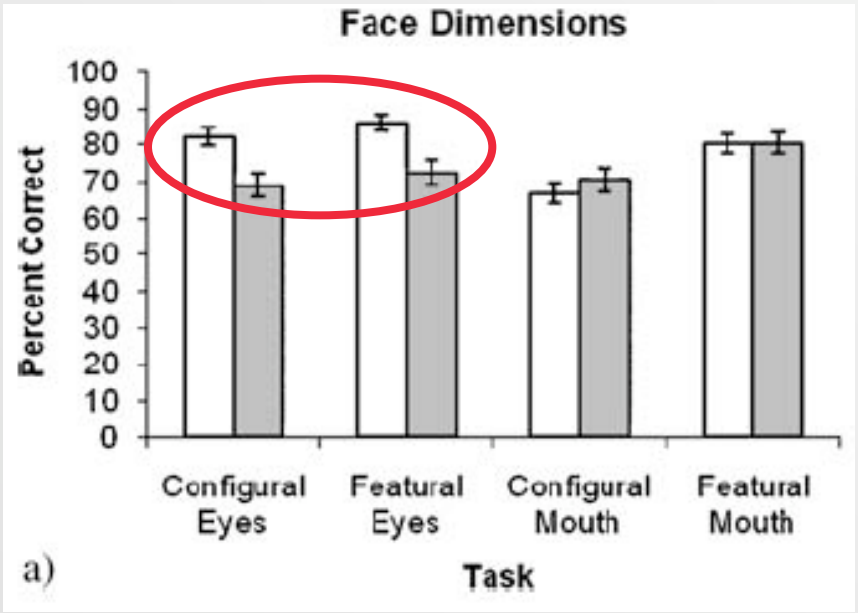
Whole Face Test



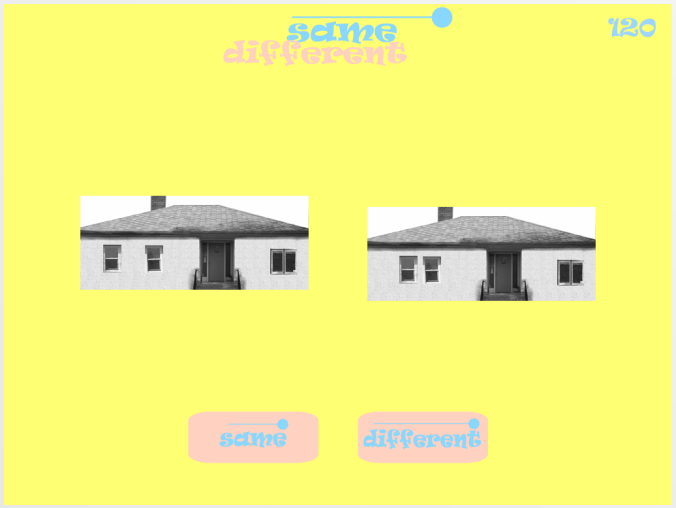
Same/Different Faces







Same/Different Houses



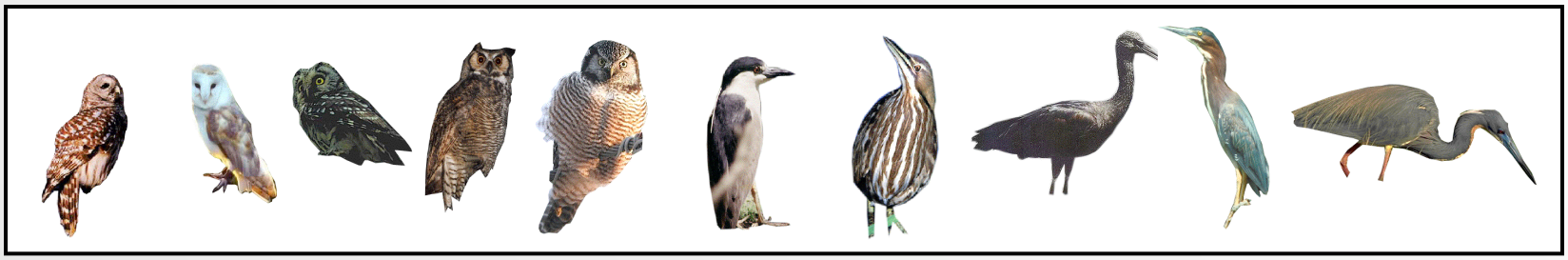
Conclusions

- Children with autism have more difficulty establishing view and expression invariant face representations.

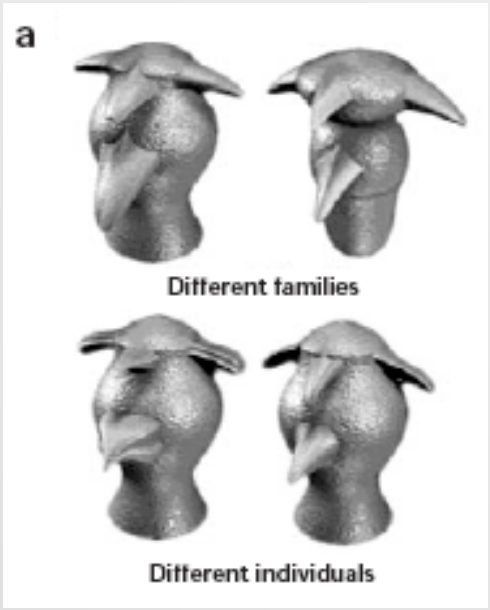
- Children have deficits in processing information in the eye region.

- Children with autism are better than typically developing children in discriminating the fine details of houses.

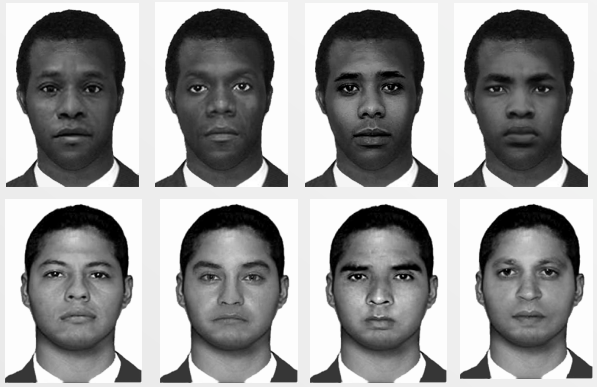
Training up expertise



Owls and Wading Birds (Tanaka, Curran & Sheinberg., 2005; Scott, Tanaka, Curran & Sheinberg 2006)



Greebles (Gauthier & Tarr, 1999)

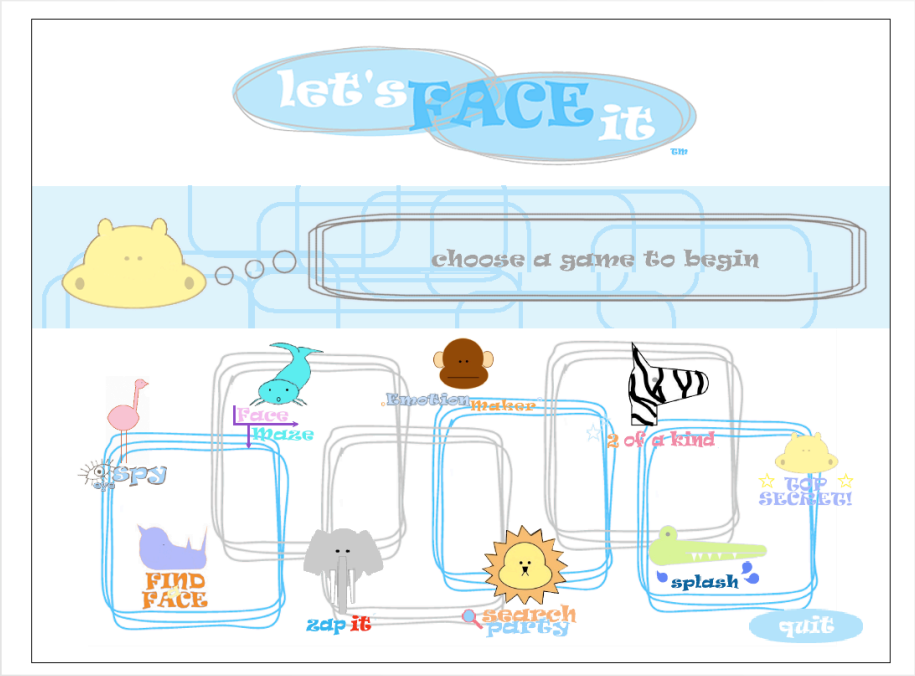


Other-Race Faces

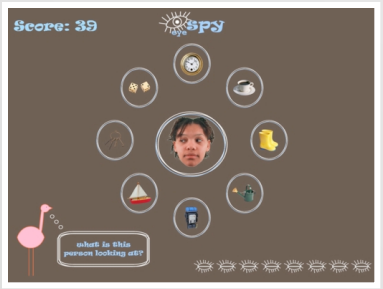
(Lebrecht, Tarr, Pierce & Tanaka, 2009; Tanaka & Pierce, in press.)

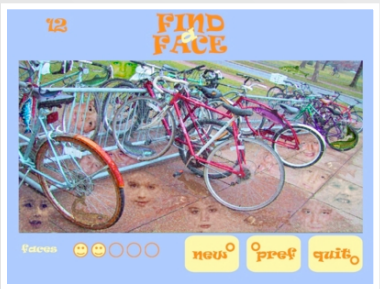
Applying an expertise framework, can we train up face processing skills in children with autism?

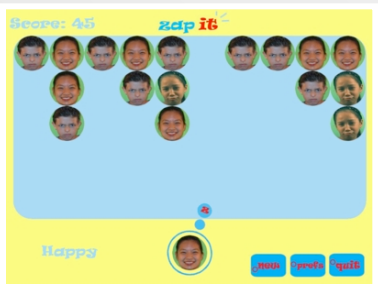
Can face processing deficits in children with autism be ameliorated through instruction?: The *Let's Face It!* Program



- Computer-based intervention in face perception and recognition
- Seven different activities emphasizing face processing skills in eye gaze, recognition of identity and expression
- Program logs the child's high scores and time on game



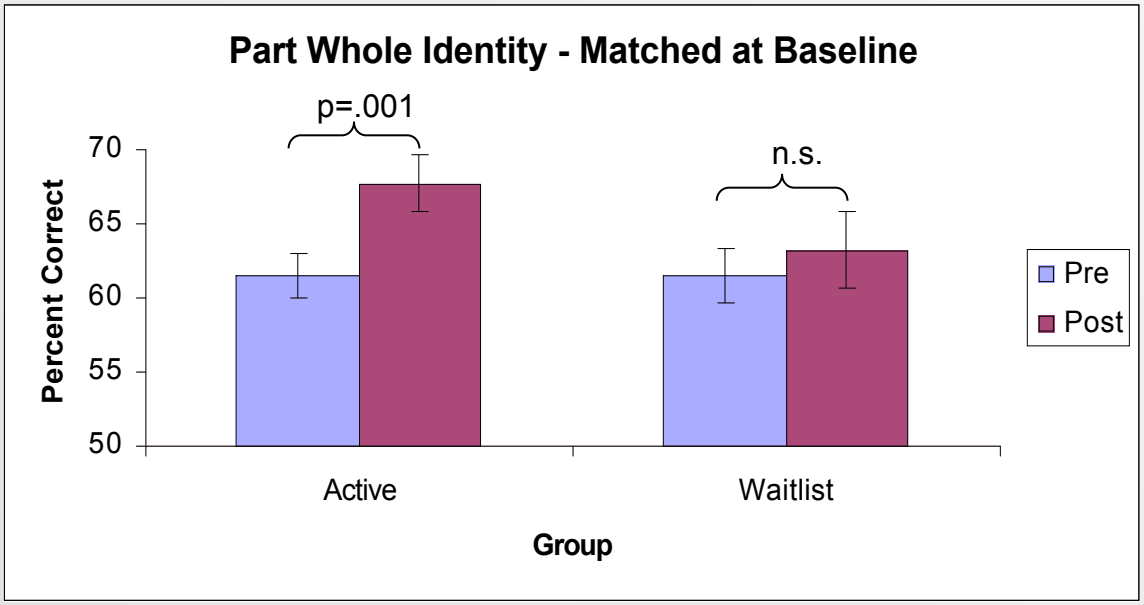




Tanaka, Schultz, Wolf, Cockburn, *in progress*

Results

In a randomized clinical trial, children who played the *Let's Face It!* games for 20 hours or more outperformed children from the ASD control group on measures of part & whole face recognition.



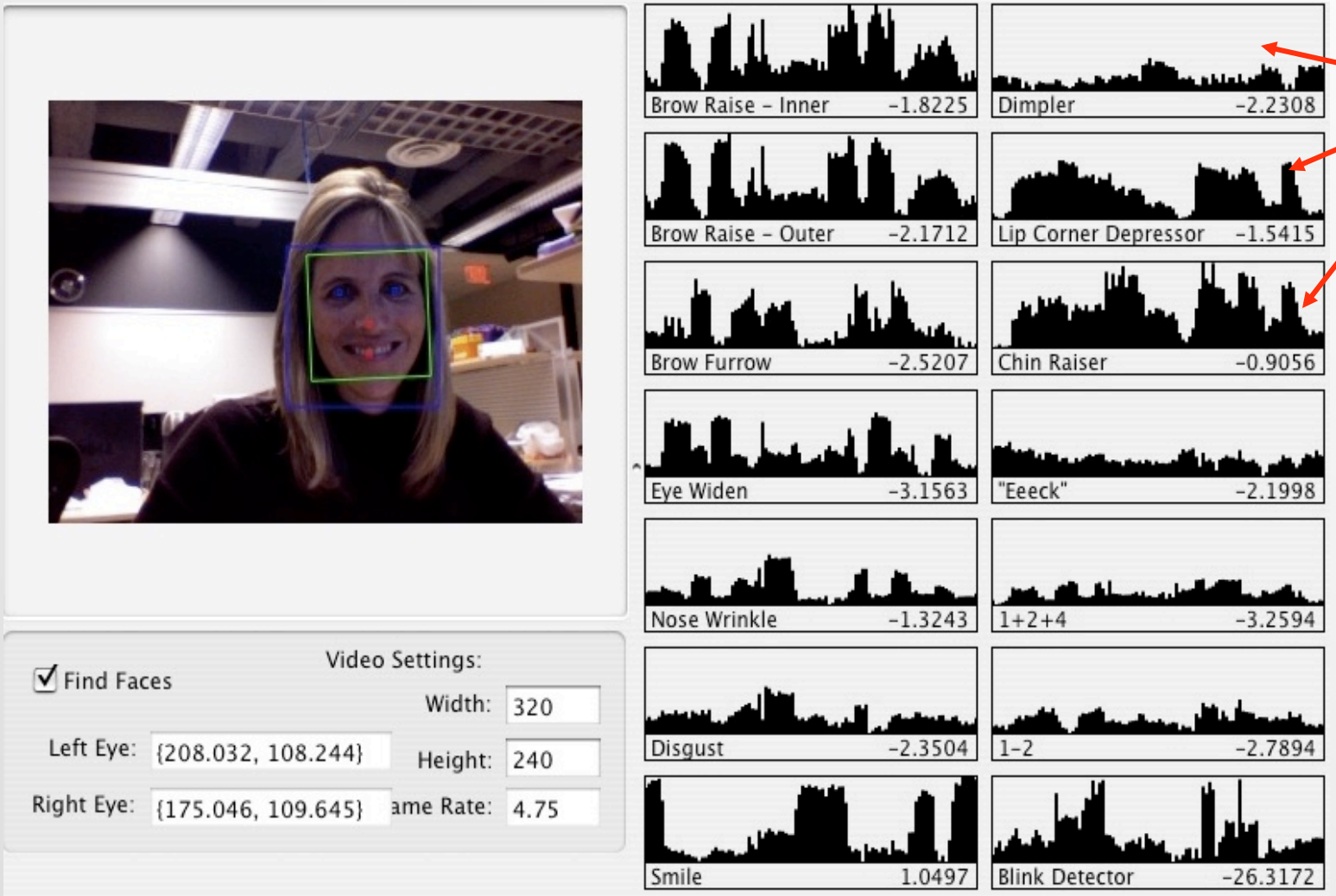
Wolf et al., 2008

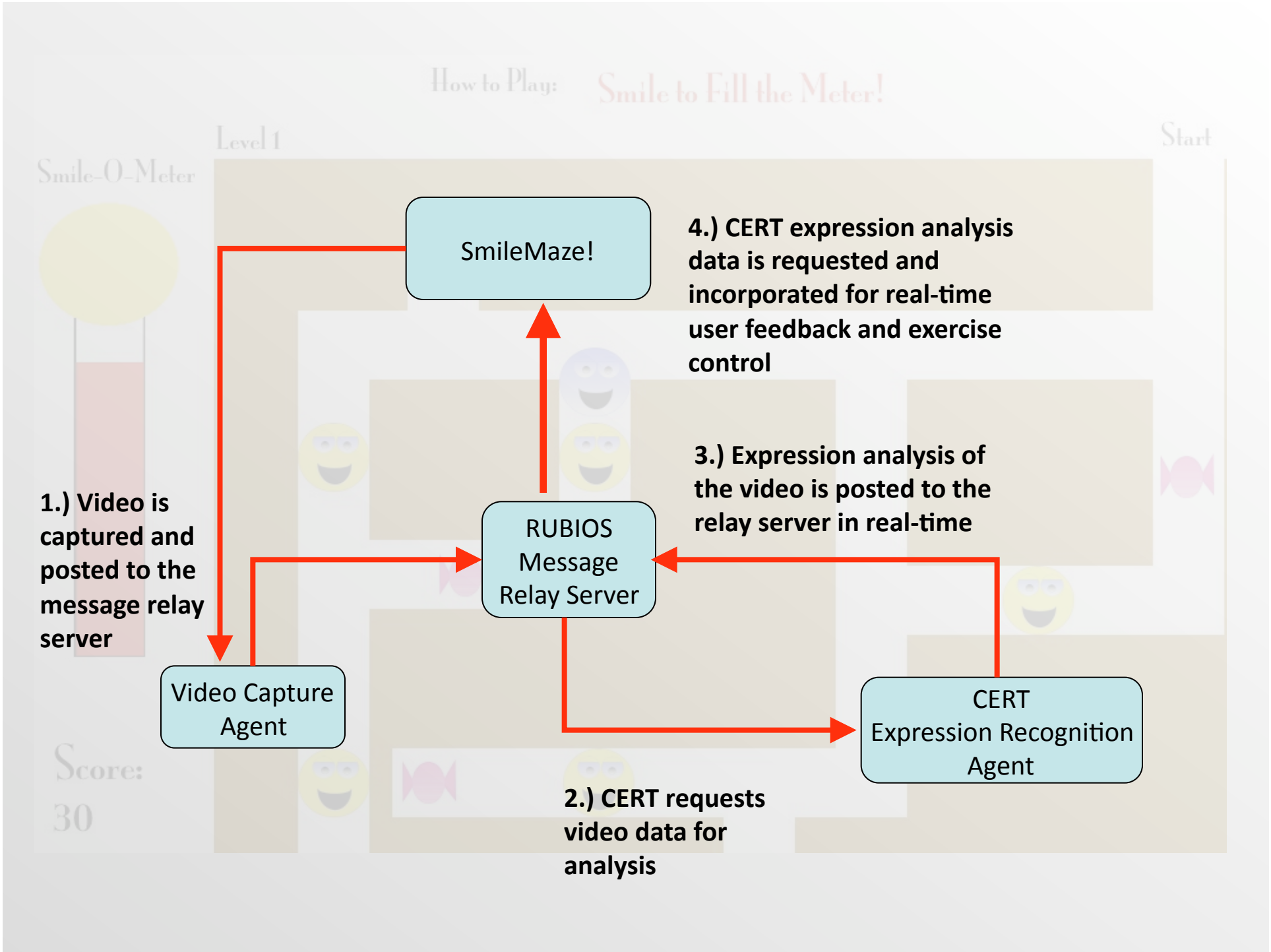
Missing pieces from *Let's Face It!* program

- Static images (no temporal dynamics)

- Passive engagement
- No effects on facial expression

The Computer Expression Recognition Toolbox (CERT)



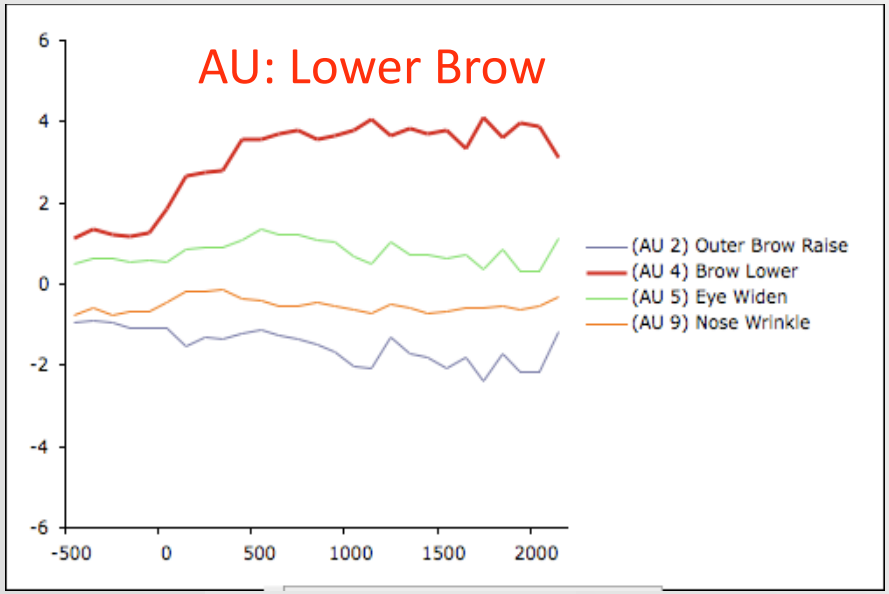

SmileMaze!
4.) CERT expression analysis data is requested and incorporated for real-time user feedback and exercise control
3.) Expression analysis of the video is posted to the relay server in real-time
1.) Video is captured and posted to the message relay server
RUBIOS Message Relay Server
Video Capture Agent
CERT Expression Recognition Agent
2.) CERT requests video data for analysis

(Insert Demo here)

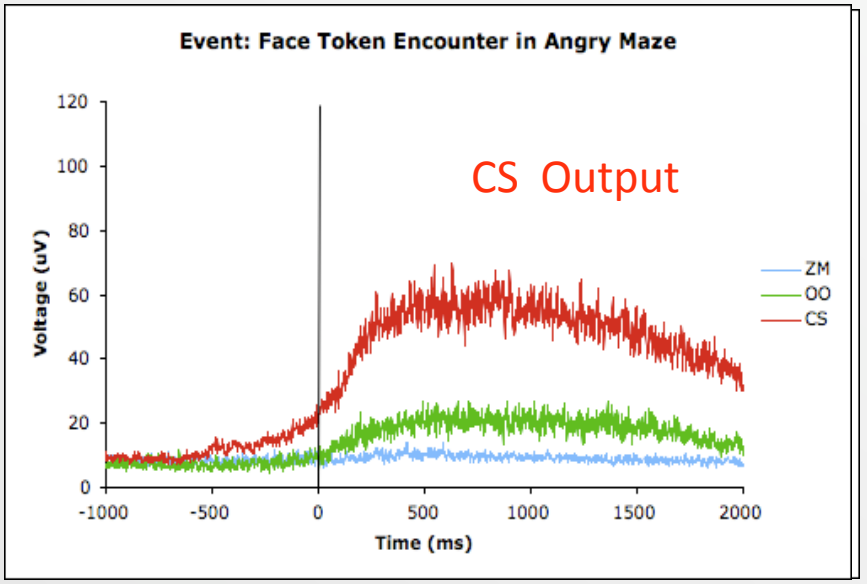
Comparing CERT to electromyography (EMG)

Corragator Supercilli (CS)

Zygomaticus Major (ZM)

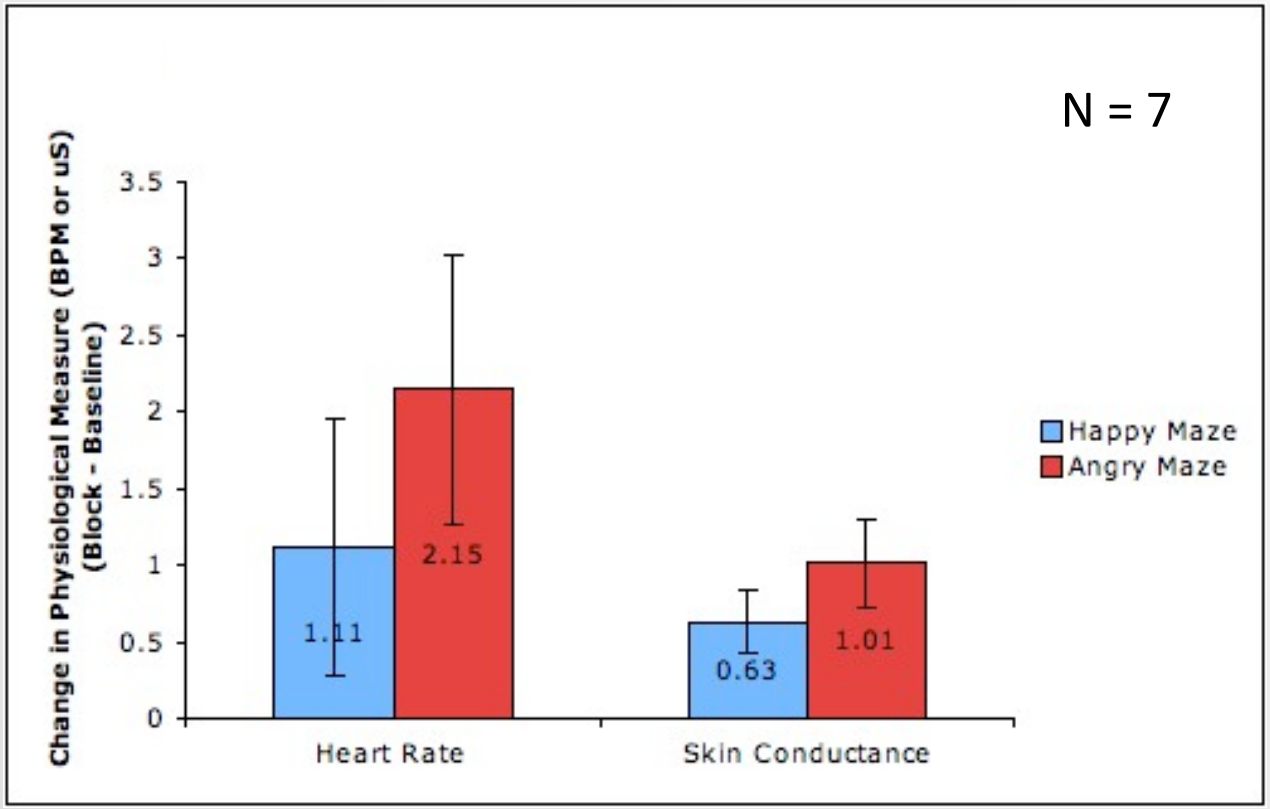


CERT Output

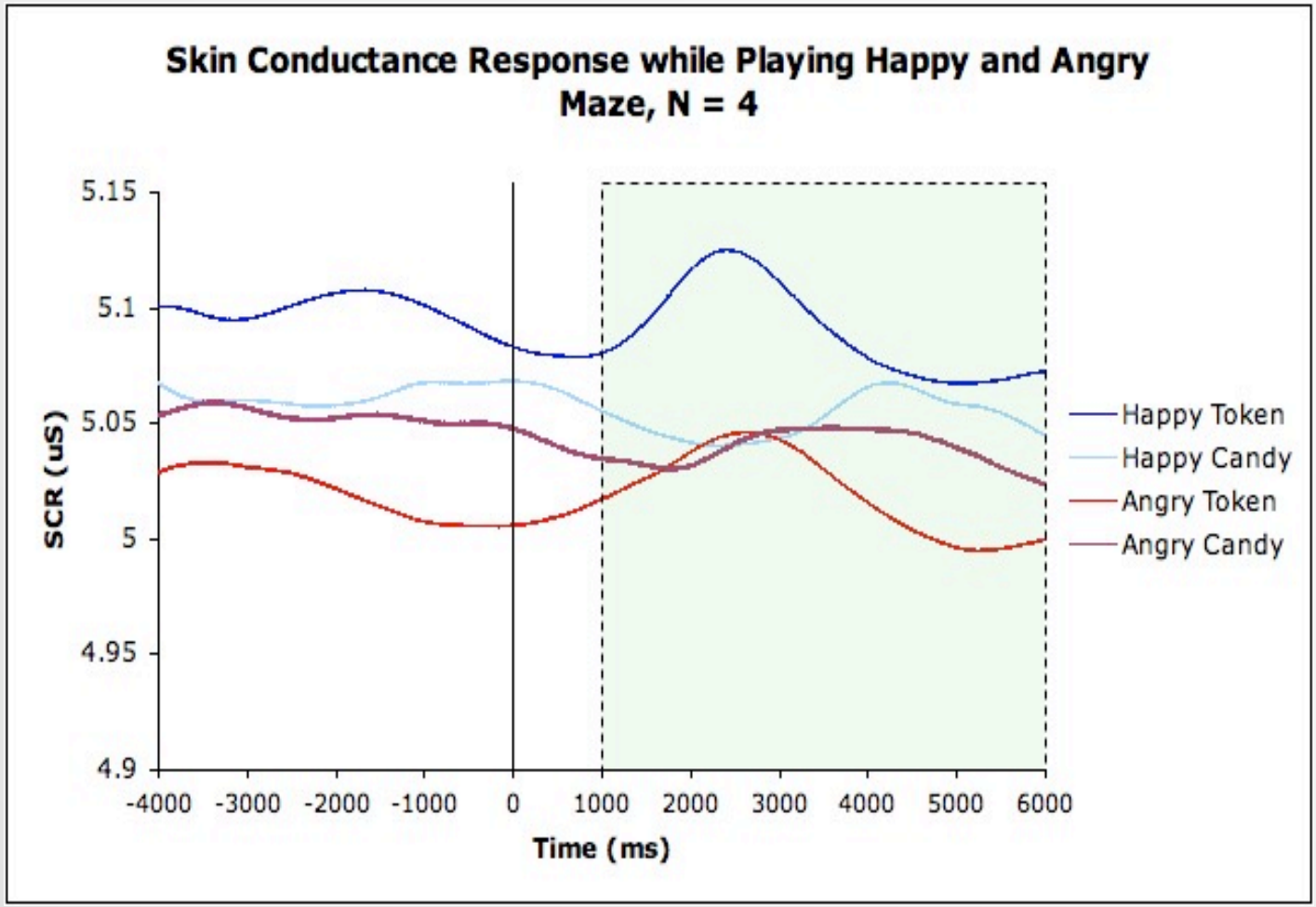


EMG Output

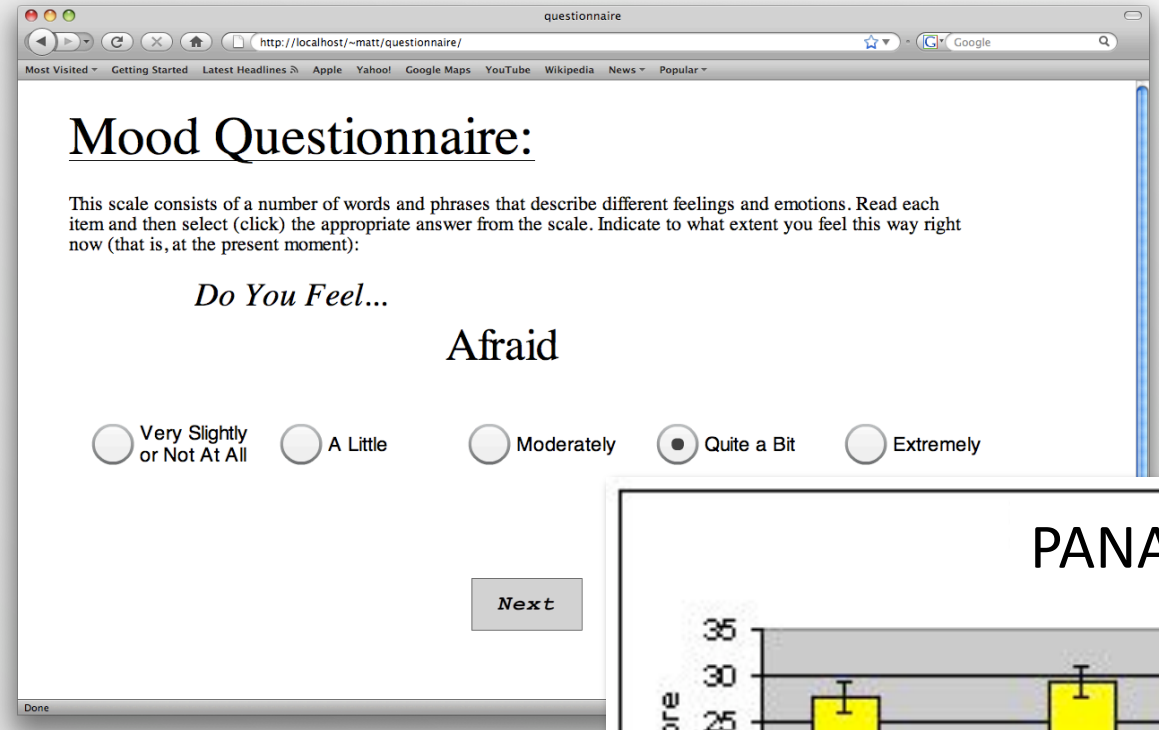
Physiological measures (Heart Rate, Skin Conductance) while playing SmileMaze

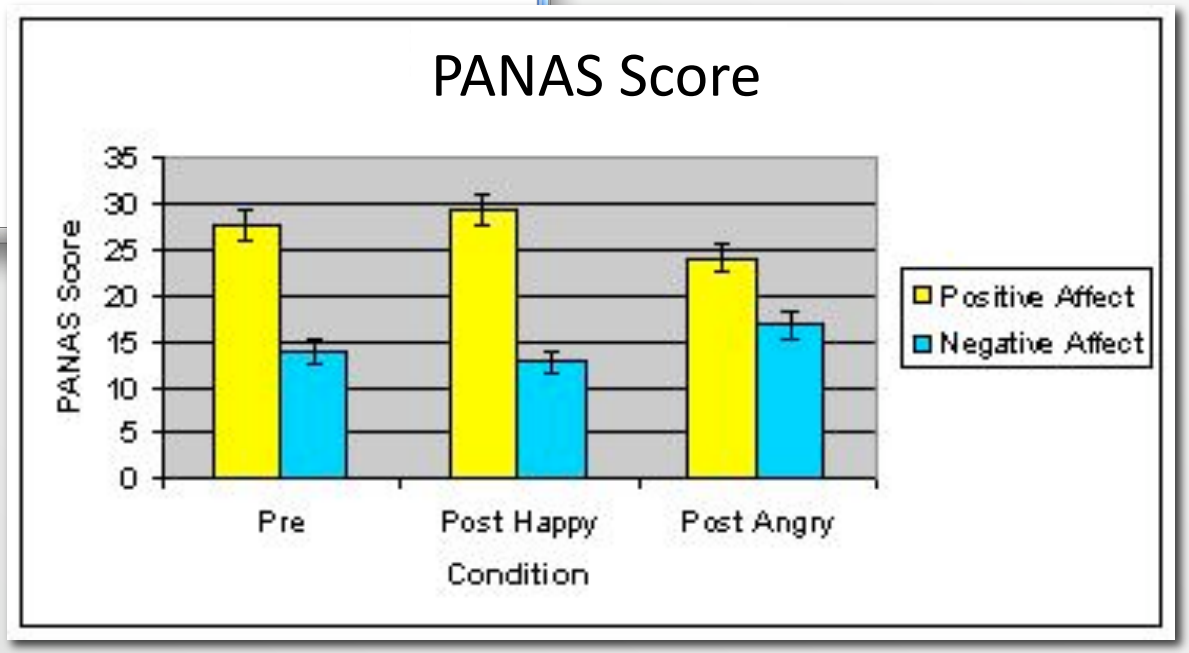


Event-related skin conductance



Self-report measure of affect (PANAS) after playing Smile/Angry Maze



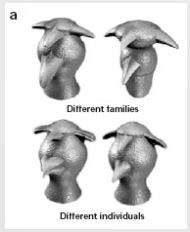


Questions for future research

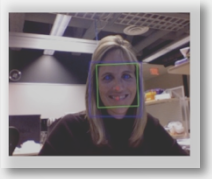
Do children with autism perceive and produce dynamic facial expressions differently than typically developing children?

Do children with autism differ in the physiological correlates of emotion?

If there are deficits, can they be remediated through CERT training?



Research I



Intervention

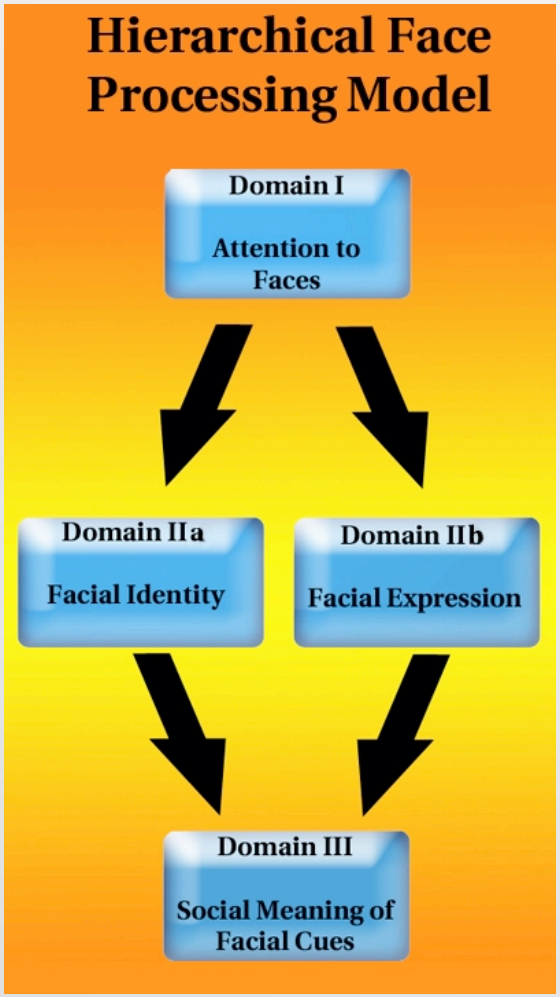
Dissemination

Time (yrs)

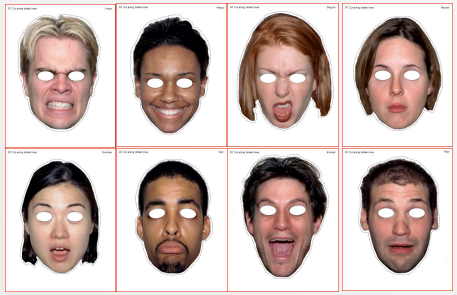
The challenge of dissemination

web.uvic.ca/~jtanaka/letsfaceit

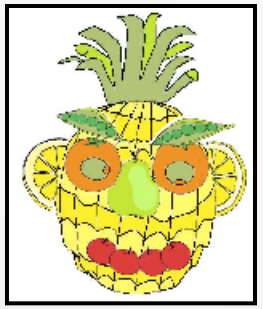
A curriculum in face processing



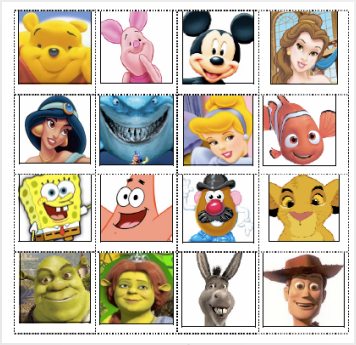
Downloadable hands-on activities



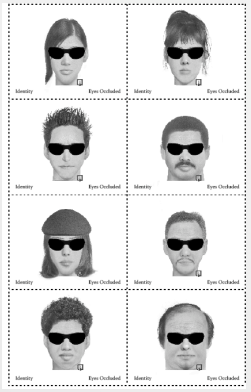
Face masks



Arcimboldo fruit faces



Face bingo



CSI lineup

Spreading the *LFI!* Gospel

University of Victoria Continuing Studies

Spring 2009
Professional Development for Teachers

TO REGISTER OR FOR MORE INFORMATION: **www.uvcs.uvic.ca/register/**
Phone: 250 721 6192 Email: education uvcs.uvic.ca
Continuing Studies in Education

Sex, Drugs and Rock & Roll: Adolescent Risky Behaviour

Dr. Carmen Gress

April 17, 2009: 10:30 am – 2:30 pm (one hour lunch break)
Fee: $55 plus GST

This workshop is geared to in-service and pre-service teachers from middle and high schools. Research suggests that risky behaviours among adolescents are on the rise. For example, the number of young and older adolescents engaging in oral sex has increased over the past 15 years. This behaviour among young adolescents in particular was once thought to be an indicator of previous victimization or perpetration, but times have changed. Younger adolescents engaging in sexual behaviour is still a concern, however, because research suggests they are likely to do so without proper protection. The purpose of this workshop is to review current research on adolescent risky behaviour and discuss what is and what isn't problematic. The first half of the workshop will provide an overview of the latest research results while the second half will discuss practical steps on evaluating individual behaviours (i.e., what questions to ask) and how the answers can inform, if necessary, appropriate interventions.

Dr. Carmen L. Z. Gress is a sessional instructor at University of Victoria and the Director of Research Planning and Offender Programs with the Corrections Branch, BC Ministry of Public Safety & Solicitor General. Her research interests include the assessment and facilitation of self- regulatory processes throughout the life span and with all learners in and outside of regular educational settings.

Cameras in the Classroom—Digital Photography Across the Curriculum

Dr. Laurie Rae Baxter

April 17, 2009: 10:30 am – 2:30 pm (one hour lunch break)
Fee: $55 plus GST

There are very few people now that don't own or have access to a digital camera, kids included. The direct and simple interface of digital cameras to portable printers and computers has made photography virtually instant and very economical. The intent of this workshop is to take advantage of the digital revolution and bring cameras into the classroom. Through hands-on activities, teachers will explore the countless ways for digital images/photos to be used across the curriculum to enrich and enhance student learning. Bring a camera if you have one; a few will be available for participants' use.

Dr. Laurie Rae Baxter is passionate about teaching and photography and has been actively involved in both for nearly 25 years. Laurie enjoys getting the most from new digital photography technologies, starting with composing and taking the picture; to the computer darkroom for image processing; to the final archival printing of the photograph for exhibition. Her images span the globe: exhibitions and slide presentations from the Galapagos Islands and the Amazon basin to the highlands and the people of northern Mexico. "Stone Angels," Laurie's most recent exhibition, was a collection of her work from the Necrópolis Cristóbal Colón in Havana, Cuba.

Let's Face It—A Breakthrough Intervention in Autism

Dr. Jim Tanaka, Rebecca Phillips and Magali Segers

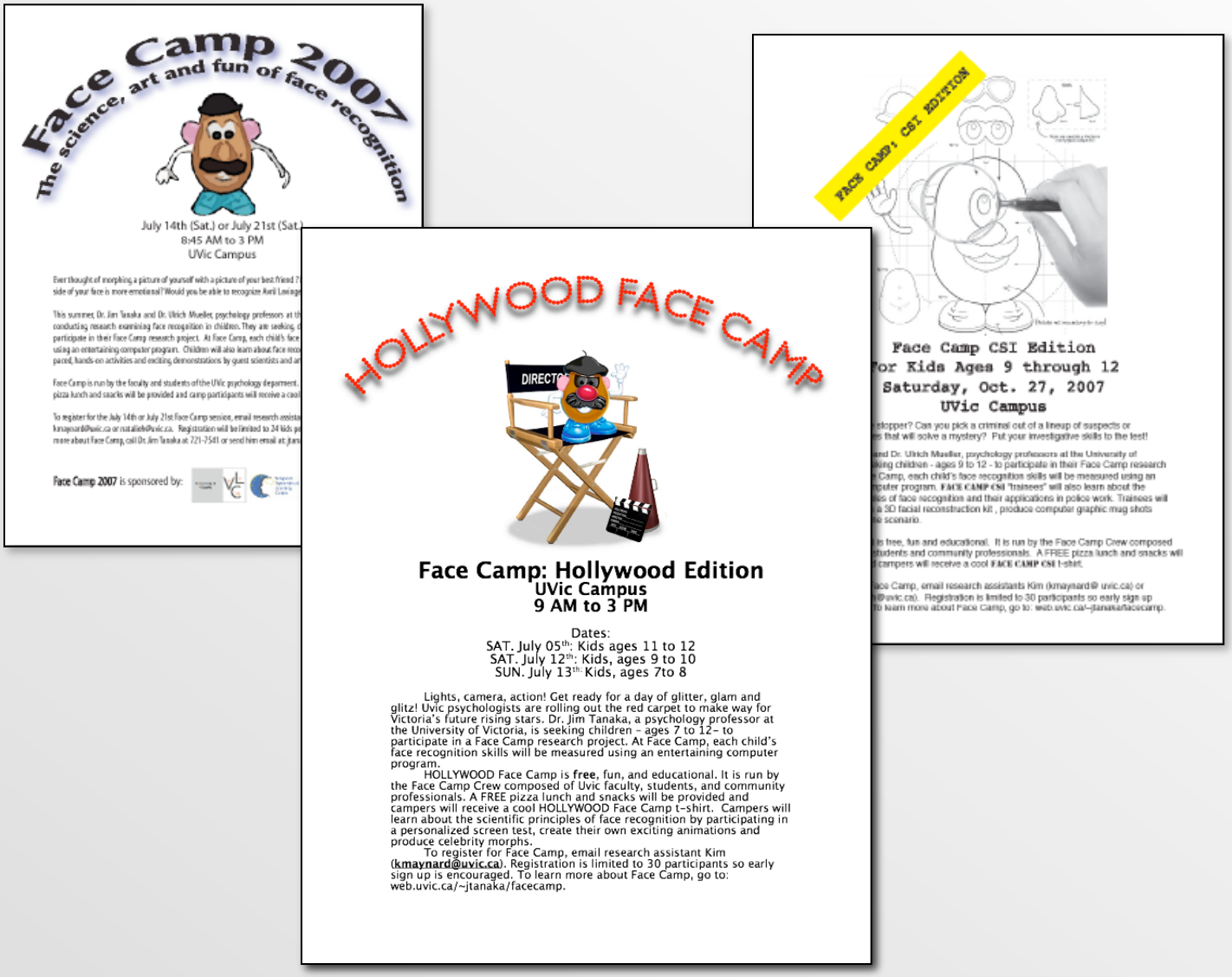
April 18, 2009: 10:00 am – 2:00 pm (one hour lunch break)
Fee: $55 plus GST

Most people are considered face experts, quick to recognize a familiar face or interpret a facial expression in a moment's glance. However, recent research suggests that children with Autism Spectrum Disorder (ASD) are less expert in their face recognition abilities and have difficulty identifying faces and understanding facial emotions. Can facial processing abilities, like other forms of perceptual expertise, be taught through direct instruction and training? This workshop will offer educators insight into the theories behind facial processing and how these theories can be put into practice to improve facial processing skills in children with ASD. The workshop will present how the Let's Face It! curriculum uses computer software and hands-on activities as dynamic teaching tools to promote face processing skills in youth.

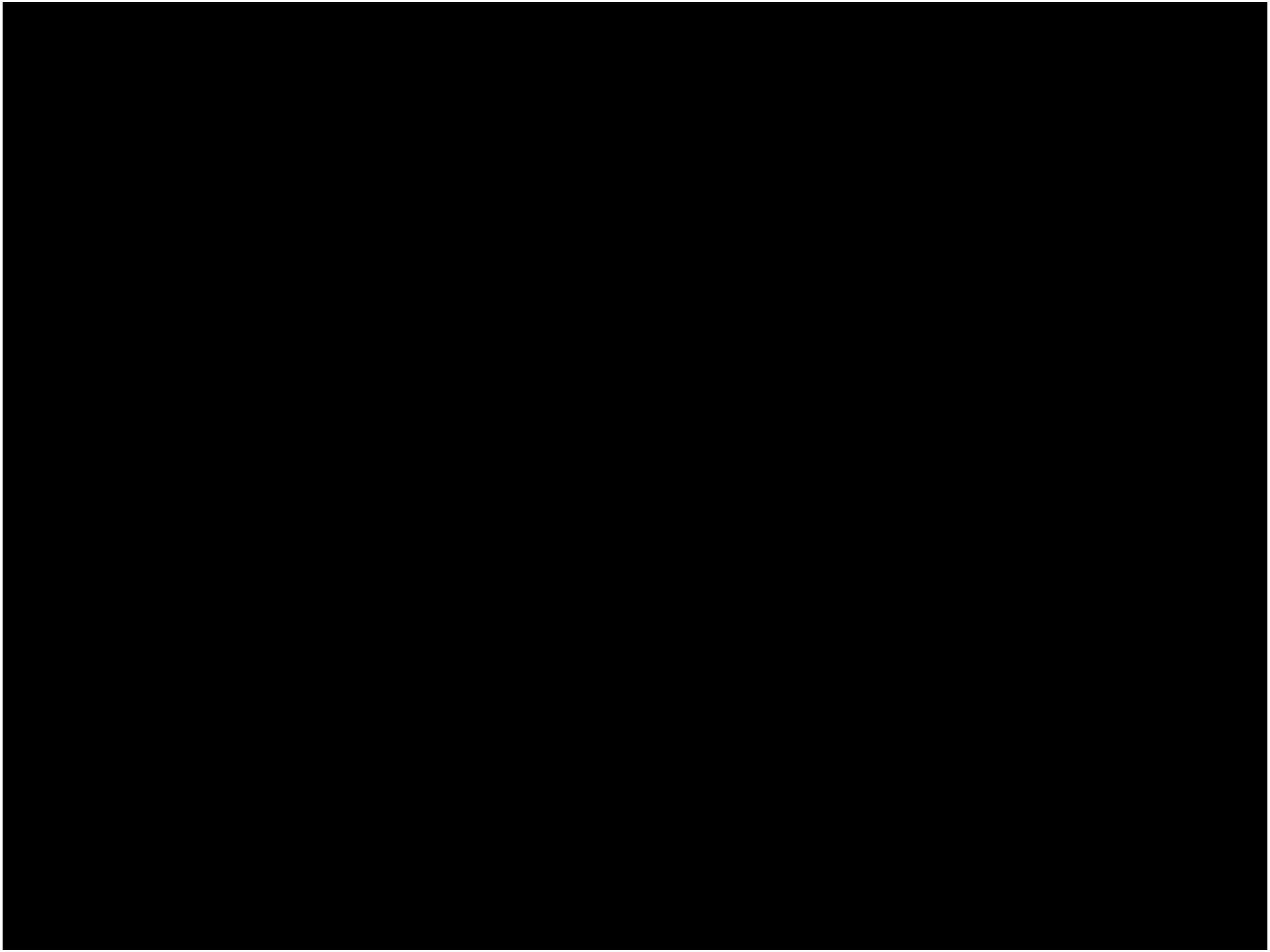
Jim Tanaka is a professor of psychology at the University of Victoria. Rebecca Phillips is a counsellor/autism interventionist at Child and Family Counselling Association (CAFCA) in Victoria and doctoral student at Fielding Graduate University, Santa Barbara. Magali Segers works as an autism interventionist with Family Centred Practices Group.

- Presentation to Tri-district meeting of the children's mental health centers, Queen Alexandria Children's Health Centre, September 2008
- Presentation to Research in Early Childhood Care and Education and Health (REACH), University of Victoria, Nov. 2008
- Autism Community Training (ACT) Conference, Vancouver, Dec. 2008
- Applied Behavior Analysis International Conference, Feb. 2009
- BC Applied Behavior Analysis Conference, Mar. 2009
- Saanich Autism Parent Group, Victoria, BC, Mar. 2009

Science meets science education. . . FACE CAMP



Snippet from the closing ceremony

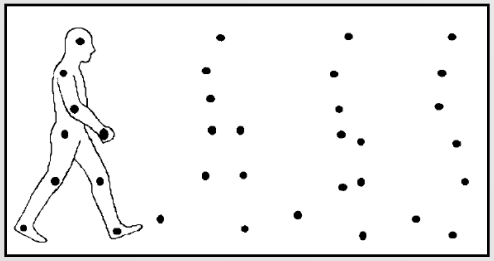


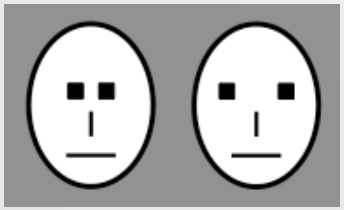
Face Camp Guest Scientists

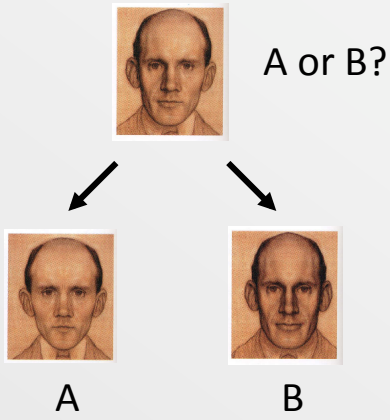
Maggie Shiffrar
Rutgers University

Suzy Scherf
CMU
(TDLC Trainee Fellow)

Janet Hsiao
UCSD







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