

Face to Face

Prosopagnosia Research & Community

Welcome to our seventh edition of *Face to Face*! In these issues, we present information on both new and classic face perception research, as well as a continued look at the experiences of people with prosopagnosia. As always, we look forward to hearing your feedback and questions, and hope that you will enjoy this issue's stories and science!

Prosopagnosia research center (soc.per.lab@gmail.com)

Holistic face processing in developmental prosopagnosia

Lead researcher: **Angus Chapman**



INTERNET TESTING AND BIG SAMPLES

Research into developmental prosopagnosia has relied on small samples of participants (10-30), but below we describe the first study to collect data from 100+ participants. We're able to do this because of the interest and enthusiasm of the thousands of people who have contacted www.faceblind.org. See Page 3 for more info on online studies!

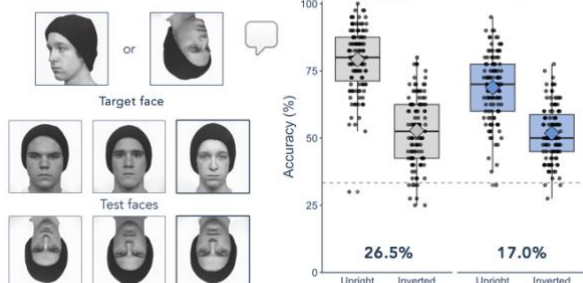
WHAT IS THIS STUDY ABOUT?

Decades of research suggests that faces are recognised as a whole, not just by local features (eyes, mouth, nose) alone. This style of recognition is called holistic processing, and it is widely thought to be important for face perception in upright faces but not upside-down faces. In this study we examine whether prosopagnosia is associated with reduced holistic processing, and if people with prosopagnosia rely more on local features than people with normal face processing.

WHAT DID WE DO?

We measured holistic processing in three ways. In the *Inversion Task*, participants had to match a target face to one of three choice faces in either upright or upside-down orientation. People find this task much easier upright than upside-down, and the difference in accuracy is taken as an index of holistic processing. In the figure below, you can see that DPs showed a smaller inversion effect (17%) than controls (26.5%), which indicates reduced holistic processing in DPs.

Inversion task



Updates

As you might have noticed, our website www.faceblind.org has arrived in the new century. We have updated it, cleaned it up, and gave it a much nicer and more modern look! Feel free to explore and give us feedback; we'd appreciate it!

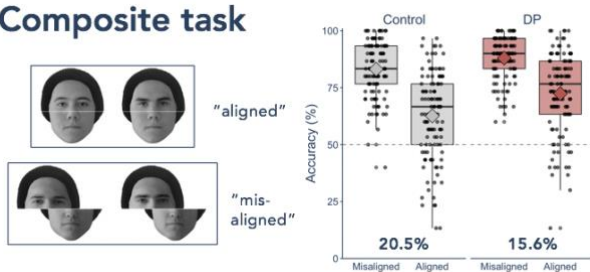
We have found out that there's a subreddit for prosopagnosia that some of you might find to be worth exploring. You can find it here: <https://www.reddit.com/r/Prosopagnosia/>

If you have never heard of reddit before and are confused by its layout (which applies to the author of this newsletter), feel free to check out this link where they give a beginner's guide to Reddit: <https://www.digitaltrends.com/social-media/what-is-reddit/>

We are planning our next newsletter and would love to hear your story. For example, when and how did you find out that you had prosopagnosia? What challenges have you overcome? What is a common problem that occurs when you're explaining your difficulties with faces to other people? We would like to (anonymously) print a few of your stories in our next newsletter. Looking forward to hearing from you at soc.per.lab@gmail.com.

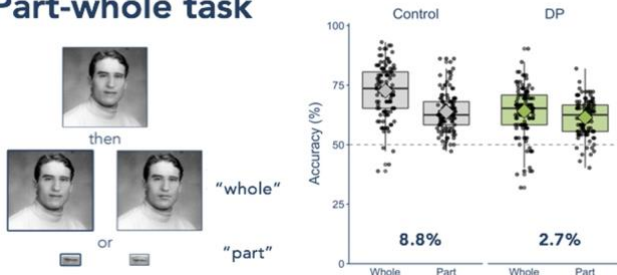
In the *Composite Task*, participants had to decide whether the top half of two faces was the same or different. The top and bottom half of the images were either aligned or misaligned. When the two halves are aligned, people are much more likely to say that the top halves are different even when they are the same. This is thought to occur because two aligned halves are fused together by holistic processing, making it more difficult to make a judgment about just one half. As you can see below, DPs showed a smaller effect of alignment (15.6%) than controls (20.5%).

Composite task



In the *Part-Whole Task*, participants first viewed a whole face and then had to choose which one of two stimuli showed a face part from the previously studied face. The features were shown either in the context of a whole face or as individual parts.

Part-whole task



People generally match the features better when they are shown within a face than in isolation. DPs show little difference between the whole and the part conditions (2.7%), whereas controls showed a substantial difference (8.8%).

WHAT DID WE FIND?

As a group, participants with prosopagnosia ($n = 124$) show reduced (but not abolished) holistic processing. This is true across all three tasks. This finding suggests that prosopagnosia may result from reduced ability to perceive faces as a whole. However, for each participant, reduced holistic processing in one measure (say, the inversion task) doesn't seem related to reduced processing in another measure (say, the part-whole task). This interesting finding raises the possibility that there are multiple holistic processes, all of which are implicated in prosopagnosia.

WHY DOES THIS STUDY MATTER?

One of the biggest questions in prosopagnosia research is how people with prosopagnosia recognise faces. This study indicates that people with prosopagnosia are more dependent on a part-by-part strategy rather than a holistic strategy. This conclusion suggests that interventions improving holistic face perception might improve face recognition ability.

PRESENTATION/PUBLICATION

This study was presented in the Vision Science Society Meeting (Florida, USA, May 2018) in a poster entitled "Varieties of holistic processing deficits in developmental prosopagnosia" by Angus Chapman, Lauren Bell, Brad Duchaine, and Tirta Susilo. We're currently writing up the paper and when we're finished we will submit it to a journal.



susilolab.org



At Victoria University of Wellington, New Zealand, in the Vision and Cognition Lab, **Dr Tirta Susilo** and his students are conducting large-scale, online research to add to our understanding of lifelong or

developmental prosopagnosia (DP). The face-recognition difficulties in DP do not result from brain trauma like they do in acquired prosopagnosia, but rather because the face-recognition skills never develop properly for a multitude of different reasons (e.g. genetic factors, low-level visual problems).

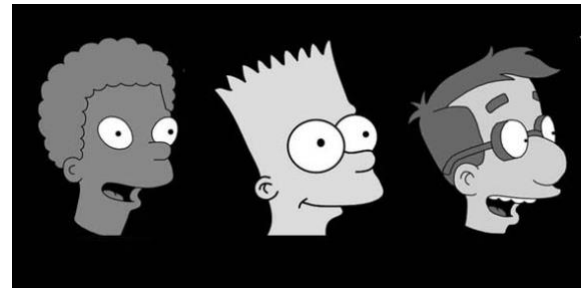
What's unique about our approach is that all our studies run online over the web, which means anybody anywhere with a good internet connection can take part. This also means we can work with larger samples of DP than ever before, which is important if we want to get a better and more detailed understanding of the condition.

We first get in touch with people who think they have DP and registered in www.faceblind.org. We invite them to complete a set of tasks that tests whether the person does, or does not, have trouble with faces. A typical task would ask you to learn faces and discriminate them from foils later on.

For example, you would be asked to remember the face in the image below:



Then you would be tested to see if you could recognise the faces in a novel view. For example:



If you can do this reliably with many faces over many trials, that tells us that you can recognise a face beyond a specific image. If you can't, this may be a sign of DP. We examine each individual's performance on all six tasks (three tasks of face recognition, two questionnaires, and an assessment of general visual processing) to statistically determine if DP is likely or not. We then send individualised feedback that describes how you fare on all those tasks compared to control participants.

If you satisfy the criteria of DP, then we invite you to do a variety of online studies, and ask you to complete different kinds of tasks depending on the particular research questions. Each study takes between 30-minutes and 1-hour with breaks and can be completed in one sitting. See next page for information about current studies and how you can participate.

Currently we are asking questions such as:

Is DP associated with impaired recognition of non-face objects like bodies, cars, and houses?

Is DP associated with trouble recognising facial expression of emotion?

Do face recognition deficits in DP extend to the ability to detect the mere presence of a face?

We know little about DP, so we hope our research may tell us more about it, such as whether different kinds of DP exist, the specific brain processes that are disrupted in DP, whether DP tends to co-occur with other visual or cognitive deficits, and eventually how we may improve face recognition in DP. We recently completed a study on whether DP is related to a reduction in the ability to perceive faces as a whole – a skill known as holistic face processing. We summarise the findings below.

DP research can only advance if we have more data to work with, and that's why the contribution of worldwide participants is essential. If you are interested in completing our test battery to see if you have DP, please sign up at faceblind.org. We are currently screening at least twice a year (around January and July). It might take a little while to hear from us but we will get in touch.