

## **Research from Emily Farran and the CoGDeV Lab**

<http://cogdevlab.weebly.com/>

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It was lovely to see so many of you at the WS convention in October. Thank you for your positive feedback on our research, and for your continued support. Since the last WSF News, Jo Camp has submitted her PhD thesis and started a Postdoctoral role at Goldsmith's University. You can read more about her new study in her contribution to the WSF News. I have two new projects starting this year. As I mentioned in the previous WS news, Louise Ewing joined the team in January to work on a new project (funded by the Leverhulme Trust, in collaboration with Marie Smith and Annette Karmiloff-Smith). She has provided a brief overview of the project below. I have also recently secured funding from the Waterloo Foundation (in collaboration with Annette Karmiloff-Smith and Elisabeth Hill) to investigate motor abilities in WS. This project will start in June, and I look forward to telling you more about it in the next WS news.

### **Kerry Hudson**

#### **Finding your way (project ELSTRAD; funded by the ESRC)**

Emily and I are continuing work on project ELSTRAD ([www.elstrad.eu](http://www.elstrad.eu)) which aims to understand and develop wayfinding abilities in Williams syndrome (WS) and Down Syndrome (DS). We have recently moved the project in a new direction to try to look at the link between anxiety and people with WS and DS's ability to find their way. There is some research in typically developing adults and mice that suggest that anxiety reduces the ability to remember landmarks along a route and to put the landmarks together into a mental map of the environment. This might be caused by changes to the area of the brain that is associated with navigation (the hippocampus) or competition between worrying thoughts and strategies to remember a route which overburdens memory ability. If there is a link between anxiety and wayfinding ability in WS and DS then this likely has an important impact on navigation training: techniques such as encouraging people to learn landmarks along a route might be less effective if anxiety is affecting how well those landmarks can be remembered and related to each other. To look at whether anxiety and route learning are related we put together a questionnaire that asked specific questions about anxiety, wayfinding ability, wayfinding anxiety and also questions about experience of travel training and independent travel. The questionnaire also allows us to understand the provision of travel training and barriers to people taking up independent travel. We are still looking at the data but hope to be able to use the results to suggest ways to improve route learning and travel training schemes. To follow on from this questionnaire we have sent a questionnaire to real-world travel training schemes that are run by council funded centres to understand how these schemes operate and how effective they are for people with WS and DS. We hope that this questionnaire will show us what techniques are being used and how well they encourage wayfinding ability and independent travel for people with WS and DS.

We will also be contacting some of you soon to take part in a computer-based study to look at exploration strategies in a virtual environment. This will be a treasure-hunt type task where we are interested in how people with WS and DS explore the environment to collect treasure and how exploration strategies develop. We would like to thank everyone for their continued assistance with work for project ELSTRAD.

## **Hannah Broadbent**

I am now in the final stages of writing up my PhD thesis, and would really like to thank all the families and individuals with WS who have been involved in my studies over the past few years, and for the WS Foundation for their support of my research. It has been an absolute pleasure working with you all!

The results of my previous study showed that individuals have difficulties in using the same strategies that typically-developing (TD) children and adults use to navigate through an environment. Unlike TD children 5-10 years of age, individuals with WS did not rely on the use of a body-based strategy to recall the sequence of body turns along a route (known as ‘egocentric’ knowledge), and were specifically impaired in understanding the spatial relationships between landmarks and environmental features (‘allocentric’ knowledge), which is useful for being able to take short-cuts or reorient oneself after getting lost. My most recent study, therefore, aimed to further investigate the strategies that individuals with WS might be using instead. In particular, the study examined the extent to which individuals with WS rely on landmarks to guide the learning and retracing of a route. This was important to look at to give us a better idea of whether people with WS are able to use an egocentric strategy when they need to (for example, when landmarks are not available, e.g. school corridors often have very few landmarks, and an individual must rely on their memory of left-right body turns), or whether they need the landmarks to guide them, and get lost without them.

My results show that people with WS rely on the presence of landmarks in an environment (both for learning a route and for retracing a recently-learned route) even more than TD children. When landmarks are removed, TD children, but not individuals with WS, were able to fall back on an ‘egocentric strategy’ to navigate, and remember the correct sequence of body-turns. Individuals with WS were good at remembering correct visual scenes from an environment, and are likely to rely on the use of this information to navigate instead. However, the use of this ‘visual-matching’ strategy and reliance on landmarks in WS is likely to result in inefficient searching and way-finding strategies. This suggests that changes in the layout or appearance of features within even a well-known environment may result in difficulties with navigation in people with WS. These findings give us insight into not just the type of difficulties that individuals with WS have in finding their way around, but what type of strategies people with WS tend to use (and are able to use), and indicate how we can best support people with WS in finding their way around (i.e. by pointing out landmarks).

## **Louise Ewing**

### **Face processing**

I have recently begun research into WS and look forward to meeting many of you over the next two years. My research focuses on face processing in both typically developing children and people with WS. Faces can provide us with a wealth of social information. By adulthood, most people have a finely-honed ability to read subtle cues to things like identity, age, gender, ethnicity, emotional state, focus of attention, and even personality characteristics from faces. This ability is remarkable given the difficulty of the discriminations required; they are, after all, very similar as visual patterns. Still, being able to quickly and accurately read face cues is critical for social cognition.

As you know, individuals with WS are typically fascinated with faces, and research is revealing how face processing in this group differs from that of typically developing children and adults. Critically however, we still know little about how the characteristics critical for making face judgments change as children with WS move towards adulthood. With the current project,

we are investigating the development of the strategies used by children and adults with WS when they extract information from faces - things like someone's identity or emotional expression. We are also investigating the development of these strategies in the typical population. We are interested to see whether the cues that inform face judgments might change with age, which could contribute to the improvements in face processing that we see across development.

We've recently launched a website that describes the study in more detail:

<http://www.bbk.ac.uk/psychology/understandingfaceperception>.