Title of project

Why are cluttered environments so challenging for children with brain-related visual impairment?

About the project

Background

When children have a brain injury around birth (e.g. lack of oxygen), parts of the brain that are responsible for vision can be damaged. These children may have problems with finding their toys, recognising their parents' faces, or dealing with busy classrooms. This is called Cerebral Visual Impairment or CVI.

For about 80 percent of children with CVI cluttered spaces are particularly difficult. Classrooms, playgrounds, and children's parties all have an overwhelming amount of visual information which their brain cannot process as quickly as typically developing children. So, these children get distressed and cannot concentrate on tasks like learning, playing, or listening.

We have little understanding of what is causing these difficulties. Two possible explanations are:

1. They have difficulties combining visual elements like colours and shapes that belong to one object (apperceptive agnosia). With a lot of clutter, for instance a full breakfast table, a yellow splash of colour can be part of a banana, a cereal box, or orange juice. With little clutter, for instance a glass of juice on an empty table, this is much easier.

2. They can only see one object at a time (simultanagnosia). Imagine pouring a drink but you can either only see your glass or the water, but never at the same time.

The project aims to understand why children with CVI have difficulties with clutter. Is it because of apperceptive agnosia or simultanagnosia?

In the first study, you will explore how common difficulties with cluttered environments are in children with CVI compared to children without CVI through secondary data-analysis of two international surveys on CVI-like symptoms.

In the second study, you will evaluate the association between difficulties with cluttered environments, on the one hand, and symptoms and management strategies of apperceptive agnosia or simultanagnosia, on the other hand. In a new survey, you will ask parents of children with CVI what symptoms they notice in their children and what strategies help. We will categorise the symptoms and strategies in those that are typical for apperceptive agnosia, and those that are typical for simultanagnosia.

In the final study, a group of children with CVI and difficulties with clutter will complete three experimental tasks: counting dots, naming shapes, and viewing photographs of everyday scenes while we measure their eye movements. For this you might collect data in the UK, Denmark, and Belgium. Through sophisticated analyses, you will find out if children make the type of mistakes expected from someone with apperceptive agnosia (e.g. difficulties with

recognising the shapes) or from someone with simultanagnosia (e.g. difficulties with counting the dots).

The results of the research will contribute to development of free webtools for parents and professionals who support a child with difficulties with cluttered environments.

Further reading

- Ben Itzhak N, et al. (2020), Visuoperceptual profiles of children using the Flemish cerebral visual impairment questionnaire. *Dev Med Child Neurol*, 62, 969-976. https://doi.org/10.1111/dmcn.14448
- Gorrie F, et al. (2019) Towards population screening for Cerebral Visual Impairment: Validity of the Five Questions and the CVI Questionnaire. *PLoS ONE,* 14(3), e0214290. https://doi.org/10.1371/journal.pone.0214290
- Riddoch MJ, et al. (2008). A tale of two agnosias: Distinctions between form and integrative agnosia. *Cognitive Neuropsychology*, *25*(1), 56–92. https://doi.org/10.1080/02643290701848901
- Mazza V (2017). Simultanagnosia and object individuation. *Cognitive Neuropsychology*, *34*(7–8), 430–439. https://doi.org/10.1080/02643294.2017.1331212
- https://cviscotland.org/lessons.php?id=44 and other pages on this website

Skills and training

You will be enrolled in a Doctoral Training Programme in Health-Related Research, which provides training, mentorship, career development support, and practical guidance on interdisciplinary research in health and pathways to implementation through monthly workshops.

You will have regular supervision meetings with your supervisors. Formal mentoring is provided by a review team that is independent of the supervisory team, with progress reviews scheduled after 9, 18, and 30 months.

You will get training in CVI, surveys, experimental design and programming, neuropsychological assessment, eye tracking, and advanced statistical methods. You will build your interpersonal and communication skills through interactions with families and in dissemination of research findings to healthcare professionals. Visits to the research groups of Dr Robotham (Denmark) and Prof Ortibus (Belgium) will give insight into clinical practice and different research environments.

Supervisory team:

Dr Kathleen Vancleef, kathleen.vancleef@durham.ac.uk

Dr Alison Lane, a.r.lane@durham.ac.uk

Dr Sara Spotorno, sara.spotorno@durham.ac.uk

Other partners: Prof John Ravenscroft (University of Edinburgh), Prof Els Ortibus (University of Leuven) and Dr Ro Robotham (University of Copenhagen).

Start date: 1st October 2025

Selection criteria:

1. You must have, or expect to achieve, at least a 2:1 honours degree, or international equivalent, in a relevant subject. A MSc degree is desirable but not essential.
2. Language requirements: https://www.durham.ac.uk/study/international/entry-requirements/english-language-requirements/
3. Research experience.
4. Foundational skills in quantitative research methods and willingness to learn more advanced methods.
5. Demonstrated ability to work independently, manage time and workload, and seek support when needed.
6. Demonstrated interpersonal skills through personal or professional experience in working with vulnerable populations (e.g children, people with neurological conditions) or their families.
7. Experience in working as part of a team preferably with stakeholder organisations like charities, patient groups, or community groups.
8. Prepared to travel within the UK and visit collaborators abroad for research visits of 1-2 months.

How to apply

See https://www.durham.ac.uk/study/postgraduate/research-degrees/how-to-apply/

Further instructions:

- On the Applicant Portal, search for PhD -Psychology
- Under 'Field of Study', mention the title of this PhD studentship
- When asked about previous contact with a potential supervisor, select 'Yes' and list 'Kathleen Vancleef'
- In your personal statement explain why you are interested in this opportunity and if/how you meet criteria 3-8 listed above (max 2 pages).
- Only provide contact details of two referees. Do NOT upload letters.
- Under supporting information, upload your CV and an example of your writing. This can be an essay you have already written for a BSc or MSc module.

Once you have submitted your application on the portal, email pgrinfo.psy@durham.ac.uk saying that you want to be considered for this studentship.

Deadline: 14th May 2025

Funding notes

Funding by Fight for Sight covers 'Home fees' and a stipend of £18,386 per year for 4 years. In addition, a research budget of £28,000 is available to cover travel, patient and public engagement, training, publication and equipment costs. International students are eligible to apply, but they will need to find other funding sources to cover the difference between the home and international tuition fees.