THE IMPACT OF CLUTTER ON CHILDREN WITH CEREBRAL VISUAL IMPAIRMENT

NICOLA MCDOWELL
WHAT IS CVI?

Verifiable visual dysfunction which cannot be attributed to disorders of the anterior visual pathways or any potentially co-occurring ocular impairments

(Sakki, Dale, Sargent, Perez-Roche, and Bowman, 2018)
WHAT IS CVI?

An umbrella term

Lower visual acuities
Abnormal visual fields
Difficulty controlling eye movement
Accommodation disorders
Perception of movement difficulties

Concerns with visually guided movement
Difficulties with object recognition
Difficulties with visual attention
Difficulties with visual perception
MASTERS RESEARCH FOCUS:

Teachers and teacher aides perspectives of the relationship between classroom clutter and the learning experiences and behaviour of students with cerebral visual impairment
Fisher et al. (2014) reported that maintaining focused attention in classroom environments that contain extraneous visual displays can be particularly challenging for young children, due to their still developing visual attention skills.
How much difference does it actually make?

The overall percentage of instructional time spent off task was significantly greater when children were in the decorated classroom.

Around 40% compared with 28%
But how does that relate to children with CVI?

On top of difficulties with visual attention that all children have, a number of the CVIs cause significant visual perceptual difficulties, especially when in cluttered environments.
DORSAL STREAM DYSFUNCTION

Simultanagnosia

Severely reduced visual attention, presenting as only being able to attend to one or two things at once and significant challenges finding things or people in a busy or cluttered environment.
Simultanagnosia

Simultanagnosia is not about size or colour or contrast, it's about what is important and interesting to that individual person, at that moment in time.

Simultanagnosia explains how a person can see something reasonably small, but at the same time miss something enormous.
DORSAL STREAM DYSFUNCTION

Optic ataxia

Visual guidance of movement

Consistent inaccurate guidance of reach, regularly knocking things over or bumping into things
Apraxia of gaze

Apraxia of gaze is when someone's eyes move in correct harmony together, but they can't look from one thing to another in the normal way.
Reduced visual search

This diagram is from a test carried out by neuropsychologist Josef Zihl, which considered the differences in how long it takes children with and without dorsal stream dysfunction to find the diamond.
CLUTTERED CLASSROOM RESEARCH

Research questions

What are the teaching team’s perspectives on the relationship between classroom clutter and learning experiences for students with CVI?

How can we improve classroom layouts to better support learning for children with CVI?
CLUTTERED CLASSROOM RESEARCH

CVI categories

Children with profound visual impairment due to CVI (many of whom have additional disabilities)

Children with CVI who have functionally useful vision and cognitive challenges

Children with CVI who have functional useful vision and normal or near normal cognitive abilities  
(Lueck and Dutton, 2015)
Specific behaviour
Has it changed? If so, has it deteriorated? Or has it got better?

Fatigue levels

Physical
Mental
Posture

Exploration
Accuracy of movement

Visual Awareness
Fixation
Scanning

Visual

Sociability

Willingness
Functioning
Duration of focus
Awareness

Emotional
De-cluttering the classrooms

Reduce visual clutter
Provide spaces that are free from distraction
Creating areas with black background
Creating areas with white background
Awareness that competing sensory information can cause distraction
Consider positioning of children within the classroom environment
<table>
<thead>
<tr>
<th>Internal and external factors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiredness</td>
<td>Lighting</td>
</tr>
<tr>
<td>Hunger</td>
<td>Glare</td>
</tr>
<tr>
<td>Illness /medication changes</td>
<td>Behaviour of others</td>
</tr>
<tr>
<td>Anxiety and stress</td>
<td>Noise</td>
</tr>
<tr>
<td>Frustration</td>
<td>Clothing of teacher team</td>
</tr>
</tbody>
</table>
Impact on students learning and behaviour

Students noticed the changes immediately - while the rooms were being de-cluttered

Students were more aware of their surroundings

Improvements when working in the area surrounding the black paper

Increased attention span and student engagement

Greater degree of focus

Less information to process, less sensory overload, reduction in frustration levels

Increase in visual awareness, visual attention and general attention

Better concentration, less distraction

Students more relaxed and less tension in the room

Improvement in visually guided movement when in motion
RESEARCH FINDINGS

Impact on adults

De-cluttered environment had a calming effect
Created a more peaceful classroom for them
They were able to see better
Had better focus
Were less distracted throughout the day
“When I first walked into the classrooms and I hadn’t seen how it was with all the de-cluttering, I went in and it wasn’t a thought, I didn’t think about it, I just felt oh, this is so calm and peaceful. That was my first initial response to the whole thing and I thought, I like this”
RESEARCH FINDINGS

Remaining challenges

Noise had a significant impact on the students learning outcomes and behaviour

Students were distracted by sounds coming from other classrooms

Impact of constant movement of people causing distraction
CLUTTERED CLASSROOM RESEARCH

Research implications

• The de-cluttering had an immediate impact on students
• The whole classroom may not need to be completely de-cluttered
• Specific learning areas can be created within the classroom environment:
  • Semi de-cluttered environment for less focused activities
  • Creating a ‘black hub’ for concentrated, focused work
  • Equipment storage areas
CLUTTERED CLASSROOM RESEARCH

Recommendations

• Reduce amount of information displayed on walls and windows
• Avoid handing items from the ceiling
• Cover open shelving
• Keep classroom furniture to a minimum
• Improve sound insulation
• Rules around movement of visitors to the classroom
CURRENT RESEARCH FOCUS

Developing an effective framework for supporting children with cerebral visual impairment.
The three main areas of focus

1. Developing individual CVI profiles for each child

2. Based on the child’s CVI profile, develop an individualised education/therapy plan

3. Empower parents to take the lead in supporting their child

CURRENT RESEARCH

Papers almost ready to publish…..

• Validation of the Austin Assessment in Children: A Tool to Detect Visual Perceptual Difficulties Related to Clutter (currently under peer review with Disability and Rehabilitation).

• The role of attainment of cerebral visual impairment (CVI) specific knowledge in empowering parents (Almost ready to submit to Disability and Society).
Individual case studies on one child from each of the three categories of children with CVI (Lueck and Dutton, 2015). Case studies involve:

- Detailed CVI specific FVA’s (included interviews with each child’s families and education and therapy teams).
- Development of individualised programmes that include CVI education for all people working with the child.
- Implementation of the different strategies in the child’s home, school and community.