The cognitive profile of gifted learners with ASD: Pedagogical implications

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Aim of this session

• Provide the personal and professional background to the study
• Describe a section of the conceptual framework relating to memory and learning
• Utilise this to characterise/portray the cognitive profile of ‘Colin’
• Provide opportunity to apply the conceptual framework to illuminate the thinking, memory and learning of an individual with AS known to you (self, family member, students)

Background to the research

• Teacher and professional developer of teachers with regard to the use of computing technology in the classroom, K-12
• Husband diagnosed with Asperger syndrome (AS) in 2005 at the age of 51
• After diagnosis, the Sydney Morning Herald published a story on the researcher’s family, 9 June 2005
• At school, informal consultations with teachers over the learning of their students with AS
• Personal and professional learning journey
The educational problem

‘The idea that people with autism miss out on socially transmitted skills and information, despite apparently intact information processing potential, fits well with Asperger’s (1944; trans. Frith, 1991) original insights into the puzzle of autistic intelligence: [T]here is an inability to learn from adults in conventional ways.’ (Scheuffgen, Happé, Anderson & Frith, 2000, p. 89)


Qualitative Research Design

• PhD educational research study
• Investigating thinking, memory and learning
• In-depth case studies; 5 gifted adults with Asperger syndrome
• Semi-structured interviews; key informant interviews; artefacts
• Data were interpreted utilising Interpretive Phenomenological Analysis (IPA)
• Emergent themes
• Development of a conceptual framework for explanatory purposes

Who is the framework for?

• The intended audience was teachers and educators but relevance for parents and life partners has been uncovered via multiple presentations throughout the research study
• The explanatory framework has also been presented to a group of adults with AS, who reported that they found it a helpful aid to think about memory
• ‘Colin’ reports that he finds it useful as an interpretive tool to understand and accept his thinking and his giftedness

Research Question

How do gifted adults with Asperger syndrome think and learn?
The Research

• When participants were asked about their memories of learning at school, they instead talked about their memories generally.

• The characteristics of their descriptions of memory became a central focus of the research.

Case study: ‘Colin’

• Successful wildlife and fashion photographer in his 60s.

• Found school very difficult, was bullied, left early.

• Feels that he did not learn anything from teachers at school.

• Exception: a history teacher who used a lot of drama and story-telling techniques in his teaching.

• Has multiple publications, books and articles on photography.

• His photographs are widely used in high-quality publications, advertising and the media.

Characteristics of memory in ‘Colin’s’ narrative

• Claims he has never consciously learnt anything.

• Feels like a ‘fraud’ because he is not conscious of putting any mental effort into his photography yet receives acclaim within his industry.

• Speculates that he is ‘psychic’ or being helped by a supernatural power.

• Learning camera, lighting techniques is ‘crap’.

• ‘If I see it, I’ve missed it’: pressing the camera shutter; the ‘zen’ of taking a great photo; mystique.

How can the characteristics of thinking, memory and learning in Colin’s narrative be understood?
Information Processing + Memory = Learning

Information processing (i.e. thinking) in working memory + successful encoding, storage and retrieval in long-term memory = learning (i.e. acquisition of knowledge, understanding & skills)
Episodic Memory vs. Semantic Memory

‘Paris is the capital city of France’

• If I learnt this from a book, the knowledge is stored in semantic memory (factual, without context)

• If I know this by visiting Paris, the memory of my visit is stored in episodic memory (personal experience)

• For someone who learnt about Paris from a book and has visited, both memory systems are employed
There are consistent findings that episodic memory is impaired in autism (Boucher & Mayes, 2012; Bowler, Gardiner & Grice, 2000). Memory in autism is described as being ‘selectively impaired’ (Ben Shalom, 2003; Gardiner, 2001; Zahavi, 2010) because, while episodic memory is impaired, the perceptual (Mottron, et al., 2006) and semantic memory systems are spared or even enhanced (Boucher, 2007), giving rise to a different cognitive profile when compared to typically developing individuals.

**Literature Review Summary**

<table>
<thead>
<tr>
<th>Episodic memory</th>
<th>Semantic memory</th>
<th>Perceptual memory (PRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory for personal experience</td>
<td>memory for facts, general knowledge</td>
<td>records perception</td>
</tr>
<tr>
<td>self-referential processing</td>
<td>externally oriented</td>
<td>holistic</td>
</tr>
<tr>
<td>experiential</td>
<td>symbolic</td>
<td>experiential</td>
</tr>
<tr>
<td>abstract reasoning</td>
<td>concrete/literal thinking</td>
<td>sensory (sensitivities)</td>
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<tr>
<td>mental time travel</td>
<td>familiarity</td>
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</tr>
<tr>
<td>‘I remember this’</td>
<td>‘I know this’</td>
<td>‘without knowing’</td>
</tr>
<tr>
<td>Autonoetic consciousness</td>
<td>Noetic consciousness</td>
<td>Anoetic consciousness</td>
</tr>
</tbody>
</table>

**References**


Boucher, J. & Mayes, A. (2012). Memory in ASD: Have we been barking up the wrong tree? Autism, 16(6), 603-611.


**How can the characteristics of thinking, memory and learning in Colin’s narrative be understood?**

- explanation
How can the characteristics of thinking, memory and learning in Colin’s narrative be understood?

Compared to neurotypical profile

Legend
<table>
<thead>
<tr>
<th>Weaker</th>
<th>Stronger</th>
<th>Stronger</th>
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</table>

<table>
<thead>
<tr>
<th>Colin</th>
<th>Weaker</th>
<th>Strong but Colin is less reliant</th>
<th>Enhanced Colin is more reliant</th>
</tr>
</thead>
</table>

Limitations

• Case study participants were adults; the youngest was 18 and still at school on a half-time load

• Case studies are a ‘snapshot’ of the experience of the individuals and do not generalise to other individuals

• It’s unknown whether the findings based on gifted individuals are applicable to other parts of the autism spectrum

• This study was preliminary; the first of its kind; more research needed

• However, the conceptual framework is based on the research literature, is theoretical, and is generalisable

Pedagogical Implications

- Teaching and learning -
Pedagogical implications

Mental Learning Activity

- Meaning making
- Concept formation
- Prototype formation (summary representations)
- Categorising, grouping, classifying, sorting
- Naming, labelling
- Memorising facts

Learners with AS

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Questions

Discussion

How does the memory and learning framework provide insight into the learning profile of your self/student/family member with ASD?