



Nau mai ki te whakaputanga tuatoru o te paanui NZSIGN. I te waanganga matatini kaatahi anoo ka oti, he maharatanga anoo maa maatou, he whenua ahurea takitini a Aotearoa. He haepapatanga noo maatou te hunga rata hinengaro, rata whanonga raanei kia whanake oo maaatou maatauranga ake, Kia tika ai te aromatawai o te hunga tuuroro. Kia whiwhi hoki ia i te wheako pai, kaua ko te wheako kino.

Welcome to the third edition of the NZSIGN Newsletter. Our recent workshop on multi-cultural issues provided a reminder to us that there is a rich diversity of culture and views within our New Zealand population. As clinicians we have a responsibility to therefore not only continue to update our knowledge of neuropsychology and validity within assessment but also how we can ensure the client experience is a positive rather than negative one.

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RECENTLY HELD NZ-SIGN WORKSHOP - MULTI-CULTURAL PERSPECTIVES AND NEUROPSYCHOLOGY

A very successful two day workshop was completed in October with a range of excellent presenters on Maori, Indian, Asian and Pacific Island perspectives and issues related to neuropsychology. Every presentation provided considerable value to our understanding and respect of cultural differences and ways in which we can be aware of these within our clinical practices.

It is well known by neuropsychologists that English based neuropsychological tests have cultural bias and may underestimate and misinterpret individual's abilities and behaviours when they are from another country/culture. Consequently the workshop did not focus strongly on the tests per se. Instead it very usefully concentrated on providing a psychological understanding of cultures as a means of considering the client's journey from the point of referral through the assessment process.

On Day 1 of the workshop (held at the Waipapa Marae, University of Auckland) participants were welcomed with a wonderful Powhiri and a focus on whakawhanaungatanga, thus providing a warm collegial atmosphere. Professor Denise Wilson spoke of Inequity and Maori Health and the factors which produce and maintain this inequality. This provided a basis for understanding the negative effects this has on access to specialist health services for Maori. Dr Erana Cooper provided an overview of Maori concepts and constructs which further added to understanding where health care is insufficient for Maori.

Dr Margaret Dudley presented a summary of her research on the experience of Maori that have gone through neuropsychological assessments. Recommendations for improvement of such services were also provided thus assisting neuropsychologists to consider not only what was wrong but how we could work towards improving our services to Maori. Dr Valerie McGinn spoke of Tamariki, neuropsychology and Foetal Alcohol Spectrum and Garry McFarlane-Nathan gave a practical look at assessment and neuro-rehabilitation considerations when working with Maori.

Day 2 of the workshop was held on the AUT campus with three presenters. Dr Prasadarao's first presentation was on "Culture and Neuropsychology" which focused on the cultural factors influencing assessments and the strategies in managing cultural issues while conducting assessments.

Dr Prasadarao's second presentation was of causal explanations of health and illness and implications for practising clinical neuropsychology. He provided a very interesting outline of beliefs, rituals, and cultural expectations that, when not understood, are likely to lead to considerable misunderstanding of clients' presentations.

In the presentation on Asian culture by Esther Yong Anderson- "What's in the Heart and Mind of the Dragon? - the Collectivism world view was outlined and, as with the other presentations, an excellent description was provided of some of the factors that can lead to cultural misinterpretation. Esther also introduced some of the research that has been done on how there can be cultural differences in terms of some cognitive processes (e.g. attentional bias).

Chrztine Sina Gemmell's presentation introduced and explored content and process issues when undertaking neuropsychological assessments with Tagata Pasifika. Chrztine's outline of some of the core values/beliefs for Pacific Island people included the Pacific world view of being part of the cosmos rather than as the focus on the individual; as well as of spirituality, correctness, respect, and humility. Chrztine also provided a narrative that brought home how challenging, and potentially demeaning, it can be for clients being tested on information that is completely alien to their learning and culture.

Several strong themes came through the presentations. These included causal explanations of health and illness being unique to each culture. Understanding these provided a more culturally appropriate consideration of the client's (and their families) interpretation, reaction and engagement within the assessment (and intervention). Cultural considerations included acknowledgement that there is both heterogeneity and homogeneity within cultural groups. The world view of each culture (and cultural subgroup) in regards to identity of the self versus the collective and the significant role of family/whanau in the health and well-being of the client, was evident within each presentation.

Discussion was also around acculturation and the effects this had on the individual as they attempted to integrate their cultural heritage within a new country or within a more dominant culture. Generation effects, as it relates to acculturation, was another factor psychologists and neuropsychologists needed to be cognisant of.



AUDITORY PROCESSING: OVERVIEW AND CLINICAL ASSESSMENT AND MANAGEMENT

RICHARD BISHOP AU.D, MNZAS

There is a growing awareness of auditory processing disorders, especially in children with learning difficulties, and the survivors of varying degrees of traumatic brain injury. In this article I want to give you the various presenting symptoms of auditory processing disorder, without going into too much theory, so that you can learn to recognise when your clients' auditory function may be impaired, who present with *auditory inefficiency*. I also want to indicate when effective treatment is available and encourage you to refer these clients to an audiologist who specialises in this area.

As an orientation, remember that the normal auditory process has a very high degree of automaticity. Any impediment to that automaticity will necessitate some degree of cognitive compensation. You will notice that there is some overlap of symptoms, given below, with other diagnostic categories. Some of the symptoms, namely those associated with auditory inattention, have been confused with the symptoms of attention deficit disorder. Others, such as noise distress and reduced social function, have been confused with autistic spectrum disorder.

I have structured this article by grouping symptoms that are associated with the major factors which make up the auditory process. As you assess your clients, both young and old, consider the possibility of some degree of auditory dysfunction in their symptom make up. In survivors of traumatic brain injury, any change from pre-injury status will be an obvious clue. Bear in mind, though, that your client may have had some pre-existing auditory dysfunction, possibly unrecognised, but which may interfere with their rehabilitation.

I. Insufficient Auditory Information

Information in this sense refers to that quality of a sound that allows it to be discriminated from other sounds. Our perception of the soundscape, and our ability to understand what other people are saying, is built up from the auditory system's ability to *discriminate* between different sounds. This is a very low-level of auditory function following the ability to *detect* that a sound is present. The failure to easily identify complex sounds is the most common problem presenting clinically. People with this complaint are very sensitive to the clarity of a sound. They will often recognise that *acoustic* noise makes it more difficult for them to understand what is being said, for instance, but a more common reason for their difficulty is due to a reduction in the clarity of the signal. Acoustic noise has the effect of masking, or obliterating, information which is carried on weaker parts of the signal.

Table I: Symptoms commonly associated with Insufficient Auditory Information

- Difficulty for other people to get the individual's attention auditorily
- Difficulty maintaining listening over a prolonged period - auditory inattention (commonly confused with attention deficit disorder)
- A child who is not interested in listening to stories
- Listens to TV at louder levels than the rest of the family prefers.
- Has difficulty following television and radio dialogue
- Speaks inappropriately loudly or interrupting other conversations inappropriately
- Requires frequent repetitions and clarification
- Difficulty remembering spoken information
- Slow auditory comprehension
- Reduced socialisation
- Listening fatigue
- Stress



2. Selective Listening Difficulty

“Selective hearing” gets a lot of bad press because it is frequently confused with “domestic deafness”, an altogether more complex complaint that may lie more in your domain as psychologists than in mine, as an audiologist. Our ability to selectively attend to a particular sound is a higher level of auditory function that depends on our ability to integrate the input from our two ears. An important concept here is that of “signal” and “noise”. Signal, in this sense, refers to what we are interested in at any particular moment; noise refers to any other coherent activity that may interfere with our ability to attend to the signal. This is particularly important regarding our ability to selectively attend to a particular speaker in the presence of other competing speakers. The particular speaker we are interested in is the signal, the competing speakers are the noise. In a social context, for instance, signal and noise change unpredictably; what may be signal at one moment can be noise at the next.

Coping with informational noise appears to be linked with our ability to make sense out of complex environments, and difficulties with selective listening are often associated with difficulty establishing expectations in new complex situations. This difficulty can be distressing for some people, especially young children and those who have recently acquired this difficulty. People showing this difficulty will not be able to utilise both ears, either because of a unilateral, or otherwise asymmetrical, deafness, or a dichotic deficit. A dichotic deficit arises through a failure of the brain to coordinate information arriving from each ear separately.

Table 2. Presents some of the common symptoms associated with selective listening difficulty:

-
- Distress from or intolerance of Noise (acoustic and/or informational)
 - Increased distractibility
 - Uncertainty about what to do in unstructured situations
 - Confused participation in team sports
 - Difficulty learning rules of new games, especially ad hoc games
 - May “dominate” social interactions
 - Children who have a preference for playing with either younger or older children
-

3. Auditory Integration

A more subtle, but still fairly prevalent, problem is difficulty integrating auditory function with other brain systems. This is most frequently noticed in school-aged children because it is associated with obvious difficulties with reading and spelling. Because these skills are less critical in adults, difficulties are frequently overlooked, but are also associated with spelling and reading difficulties. In adults, reading difficulties associated with this cause show up as deriving little pleasure from reading fiction. Auditory sensory integration is a particularly important component in our ability to utilise the cues of prosody, the stresses, pauses and intonations that distinguish spoken from written language. These cues are also important in identifying the emotional state of someone who is speaking to us.

The ability to recreate appropriate prosody when we are reading is strongly linked to reading comprehension. So although a person with this difficulty may read competently and have gained a high academic qualification, reading may not be one of their most favourite past-times.

Table 3. Symptoms commonly associated with reduced auditory integration.

-
- Difficulty with spelling
 - Difficulty reading, especially fiction
 - Reduced musicality
-



4. Impact of auditory inefficiency

Because our ability to interact socially is, for most of us, heavily dependent on our ability to understand what is being said to us, the impact of any reduction in our auditory efficiency will depend on the level of demand being placed on it. This can vary with stage of life. Infants have a high level of demand on their auditory function as they learn speech and language. School children have a high level of demand by having to listen in the classroom. It has been estimated that children spend up to 70% of their day listening

The demand on adults' auditory function also depends on their degree of social activity. Demand is much higher for an adult living in a family and whose work depends on accurate communication than it would be for a person living by themselves whose work has a low communication component. In order to maintain adequate social function, people with auditory inefficiency have to compensate cognitively for the difficulty. We all do this from time to time when we find ourselves in a difficult listening environment, such as a noisy café, but people with auditory inefficiency have to expend that level of cognitive effort continually in order to function socially. This degree of effort is tiring and stressful in itself. It also reduces a person's social resilience, leaving them more open to the negative social consequences of failed communication. As a result, people with reduced auditory efficiency often find it easier to withdraw socially than to continually suffer the negative effects of failed communication in the social setting. You will be aware of the psychological dangers of social withdrawal and isolation.

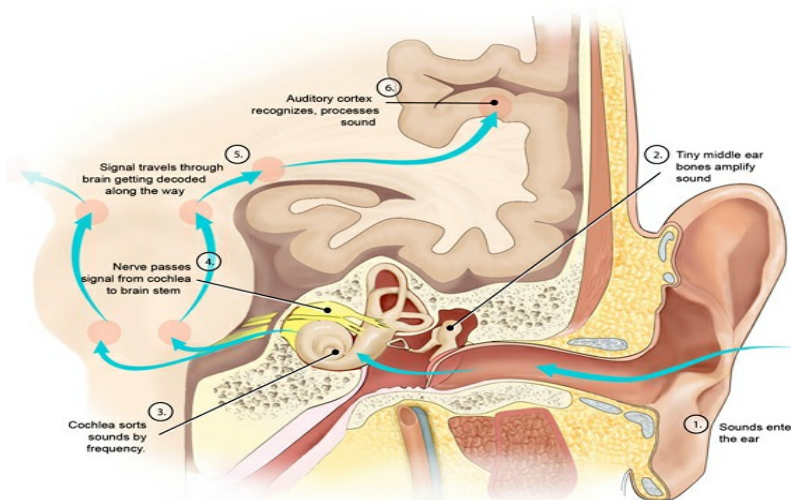
These difficulties can present particular problems for people with traumatic brain injury in the post-recovery stage. Social difficulties which become apparent at this stage may be wrongly attributed to personality or cognitive changes from the brain injury. Recognising the auditory basis of these difficulties can lead to appropriate intervention that will significantly assist their rehabilitation.

5. Bringing it all together

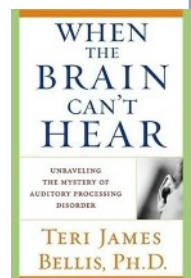
You might like to routinely include one or two questions and your assessment that could highlight the possibility of some auditory involvement. You might ask, for instance "Have you found it more difficult to listen and understand since the injury?", or "Do you find that noise is more distressing for you since the injury?". Once the audiological diagnosis is confirmed, it is possible to plan a remedial programme for your client that can successfully address the different areas of difficulty identified. Through the use of appropriate technology, auditory training, and psychological counselling, it is possible to demonstrate marked improvements in individual's receptive communication function and their social function, resulting in concomitant improvement of their self-esteem and social confidence.

At the moment, there are several audiologists working in this area throughout the country and these can be contact through the New Zealand Audiological Society (mail@audiology.org.nz) to find local audiologists who can provide the service. Richard has indicated he is happy to be contacted directly if you have any questions richard.bishop@macroaudiology.co.nz

Neuroanatomy of auditory system source <http://brainmind.com/images/AuditoryPathways1432.jpg>



A book that may be of interest to readers is "When the brain can't hear" Bellis (2002) - published by Pocket Books: New York. Professor Bellis is Chair of Communication Sciences and Disorders at University of South Dakota, and considered to be an expert on the topic of (C)APD. Her book is written initially in a first person narrative, with Professor Bellis describing her own personal experiences of having (C)APD after a traumatic brain injury. Case studies are provided and different effects of (C)APD are outlined throughout the age span. (K. Cunningham)





Developmental Dyslexia: An Overview for the Practitioner

by Associate Professor Claire M. Fletcher-Flinn, University of Otago, New Zealand

Due to the cultural value placed upon literacy in our society, developmental dyslexia and its remediation are important issues. Developmental dyslexia is a specific learning disorder (SLD), and depending on the definition and criteria used, it affects between 3 to 10 percent of children, with symptoms varying from mild to severe (Snowling, 2013). These children may form a significant proportion of the caseload for some New Zealand practitioners. In this brief review, a summary of the characteristics, theories and difficulties associated with establishing aetiology are provided. The need for consideration of the New Zealand text-centred reading approach for assessment and intervention programs is discussed, and some recommendations are suggested.

Definitions

The terms “reading disability” or “specific reading disability” are often used interchangeably with developmental dyslexia (Vellutino, Fletcher, Snowling, & Scanlon, 2004). Prior to 2013, dyslexia was defined by ‘exclusionary’ criteria (American Psychiatric Association, 2000, Diagnostic and Statistical Manual of Mental Disorders, 4th ed., text revision). This was to differentiate it from poor reading achievement that could be accounted for by other factors, such as low IQ, inadequate educational opportunities, and sensory disorders. The difficulties that dyslexic children experienced in learning to read were seen as “unexpected”, as they were not due to these factors.

Although controversial, the revised DSM-V (2013) has eliminated the “IQ-achievement discrepancy” criterion, and dyslexia is now a category of specific learning disorder with impairment in reading. (The other SLD categories are writing and mathematics.) Dyslexia is considered a neurodevelopmental disorder of biological origin, with onset during the school years and achievement markedly below age level and lasting for at least 6 months, despite the provision of specific intervention to target reading. Symptoms include inaccurate or slow and effortful reading that significantly interferes with academic achievement or activities of daily living. As in the DSM-IV, specific disorders such as uncorrected auditory or visual sensory problems, mental and neurological disorders (e.g., autism spectrum

disorder, intellectual disability), and adverse conditions, including inadequate instruction and lack of proficiency in the language of instruction must be excluded before a diagnosis of dyslexia can be made. Definitions of dyslexia vary, and the current New Zealand Ministry of Education (MoE, 2010) working definition is broader than the DSM-V. It was drawn from the British Psychology Society and British Dyslexia Society definitions, as well as the Ministry’s own review (MoE, 2006).

Aetiology

There are many different cognitive theories as to the causes of developmental dyslexia (for reviews, see MoE, 2006; Ramus & Ahissar, 2012). Dyslexia was first viewed as ‘congenital word blindness’ (Hinshelwood, 1900; Morgan, 1896), and visual-perceptual hypotheses dominated until the 1970s, when the phonological deficit theory emerged and gained prominence. Currently, both visual-perceptual disorder and phonological theories continue to receive support, as well as new theories deriving from them, as new deficits are found through continued research. At a biological level there has been some evidence of genetic and chromosomal links as well as reduced neural activation (Hoefl, et al., 2006; Nopola-Hemmi, 2001; Olson, Keenan, Byrne, & Samuelsson, 2014). This supports earlier work on the heritability of reading problems (e.g., Vogler, DeFries, & Decker, 1985). There is also evidence of reduced capabilities in processing speed and working memory (de Jong, 1998).

The difficulty in finding a single theoretical explanation for developmental dyslexia is that the cognitive deficits reported are frequently comorbid with other conditions, such as developmental coordination disorder (Rochelle & Talcott, 2006), or attention deficit disorder (Germanò, Gagliano, & Curatolo, 2010). In addition, dyslexia is considered heterogeneous and includes subtypes, so that sample characteristics may determine the theoretical interpretation used by the researcher (Ramus & Ahissar, 2012). Reading itself is a complex task involving multiple levels of representation, as are the cognitive tasks used by researchers to test for deficits. Confusion occurs because of under-specification of the characteristics of the task stimuli (Hasselman, 2014), making it unclear at what level the processing is problematic.



At a broader level, variance in task performance and how it relates to reading, and to general theories of perception, attention, working and long-term memory is vague, and in need of integration (Ramus & Ahiissar, 2012). Adding to the difficulty in establishing causality, experimental studies are unable to be undertaken because groups (dyslexic vs non-dyslexic) are pre-specified. Comparisons are correlational, and therefore, potentially bi-directional in the determination of causality, and third variables that affect outcome measures, must be considered, (e.g., aural vocabulary). The emotional impact of cumulative reading failure on general motivation and task performance is a secondary effect that is difficult to ascertain.

The New Zealand context

Despite the difficulties in attributing poor reading performance to a specific aetiology, the phonological deficit theory has made an impact in New Zealand and the MoE (2010) working definition makes direct reference to it. The phonological deficit theory, simply stated, is that children with dyslexia have difficulties with explicit phonological processing, that is, being able to segment spoken words into identified component sounds (phoneme awareness). Poor phonemic awareness (PA) is then claimed to be 'causally' related to difficulty in associating speech sounds to letters for explicit phonological recoding (e.g., *bah- aa- gah*, for *bag*), as taught in explicit phonics approaches to reading instruction. As mentioned, there is considerable research about these claims, but there are also large inconsistencies between studies (Ramus & Ahiissar, 2012), and interpretations are disputed (Valtin, 2012).

Nonetheless, many researchers, clinicians, and teachers in New Zealand subscribe to the view that children with dyslexia are poor at using the explicit skills of PA, and knowledge of letter-sounds. The important point here is that if clinicians and teachers believe that lack of these skills are the problem, remediation will be based on this belief. However, because it is only correlated with reading, it is just as likely that it is through reading that PA or letter-sound knowledge develop, and not the other way round. Important intervention opportunities could be lost.

The educational context of the text-centred approach to reading in our primary schools must also be considered. A common test of phonological recoding skill for attempting

unfamiliar words is a nonword reading task. Children in New Zealand with normal-range progress in reading perform more poorly on these tasks than children in countries where explicit phonics instruction is the main teaching approach (Thompson & Johnston, 2000; Thompson, McKay, Fletcher-Flinn, Connelly, Kaa, & Ewing, 2008). These results show that lower performance on nonword reading is not indicative of a deficit as overseas results would indicate. Moreover, despite their "underdevelopment" in knowing the letter-sounds, several samples of New Zealand 5½ -year-olds, 11-year-olds, and university students, were reading at age-appropriate levels (Thompson, Connelly, Fletcher-Flinn, & Hodson, 2009; Thompson & Fletcher-Flinn, 2012).

The rate of text-reading speed has often been neglected in reading assessments (McKay, Fletcher-Flinn, & Thompson, 2004). Thompson, et al. (2008) showed that low progress 6- to 7-year-old children in New Zealand read text faster than samples of children matched on word reading level who received explicit phonics instruction. The New Zealand children did not receive the phonics, and achieved the same level of text comprehension, but had a faster reading rate. This was attributed to the greater classroom time available for text reading, resulting in more practice with print words and their contexts. Also, faster reading, with equal accuracy and comprehension, provides opportunity to experience more words per unit of time.

Conceptually, reading is a receptive language skill, and as such is dependent on oral language. For example, if the child does not understand a spoken word, then learning to pronounce it from the written form will not result in reading, only in a meaningless pronunciation response. Reading vocabulary usually entails aural receptive vocabulary. If relative to normal peers, 5% are disabled in aural receptive vocabulary, they are also reading disabled. This is important to consider in the New Zealand context as shown in a study by Evans (2002). Of 66 children, 7 to 9 years of age, identified by their teachers from schools in Auckland as having difficulty with reading, 11 had severe impairment of reading but only one met the (pre-2013) exclusionary criteria of dyslexia. The other 10 had a British Picture Vocabulary Scale (BPVS) with a standard score below 80. Similarly, Andrewes (2008) found (from 120 tested) that only 13 of his sample of 26 children with severe reading impairment met exclusionary criteria. The other 13 had a BPVS standard score below 85. (BPVS scores indicate the child's level of aural receptive vocabulary.)



Lack of motivation to read (Olson et al., 2014), or an emphasis on explicit skills which results in less classroom time for text reading (Thompson, et al., 2008) interferes with affordances gained from text reading, such as the storage of print word representations (orthographic lexicon). According to Knowledge Sources theory, it is from these representations that induced sublexical relationships (ISRs) are formed (Fletcher-Flinn & Thompson, 2004; Thompson, 2014; Thompson, Cottrell, & Fletcher-Flinn, 1996; Thompson & Fletcher-Flinn, 2006, 2012). ISRs are patterns of letter(s)-sound relations that the child's brain forms as print word representations are stored. They are formed mainly implicitly and as such can represent patterns of relationships more complex and more relevant to the child's emerging reading vocabulary than explicitly taught letter-sounds. These ISRs are supported by context within the words of the child's reading vocabulary. The ISRs facilitate the reading of unfamiliar words through a process of *lexicalised* phonological recoding. This expands the child's reading vocabulary, which in turn, in a recursive process, provides the basis for more advanced ISRs.

Beside theoretical value, Knowledge Sources theory has implications for assessment by drawing a distinction between explicit and lexicalised (mainly implicit) phonological recoding. It has been applied to understanding otherwise inexplicable research results of children with developmental dyslexia (McKay, et al., 2004), and was used to provide an explanation for proficient reading acquisition in two clinical cases, despite significant impairments in their explicit procedures of the visual-spatial and phonological systems (Fletcher-Flinn & Thompson, 2007).

Recommendations for assessment and remediation

For clinical assessment, the usual medical, developmental, family history, educational, and academic test scores should be collected. The history of the initial and subsequent development of receptive and productive language, and any support and obstacles to this development is also important to document. As aural language is the foundation for reading acquisition, the administration of the British Picture Vocabulary (BPVS III; Dunn, Dunn, Styles, & Sewell, 2009) to examine aural receptive vocabulary, an intelligence test (e.g., WISC-IV) to examine general cognitive functioning and productive language are essential. Those children who are reading-disabled due to poor receptive vocabulary but do not fit the exclusionary criteria of dyslexia have learning needs foremost for improvement in

understanding spoken vocabulary rather than reading. A history of the types of initial and subsequent teaching (by family or schools) of reading, and any educational intervention and the outcomes of such should be noted. Reading assessment should consist of a word reading test, and an individually administered oral text reading test, such as the Neale Analysis of Reading Ability, 3rd Edition (Neale, 1999), which has Australian norms for reading accuracy, comprehension, and rate. Specification of which aspects of reading are impaired can guide intervention. McKay et al. (2004, pp. 6–7) provided some practical suggestions for applying Knowledge Sources theory to teaching dyslexic readers, and highlighted the need for text reading practice.

In summary, theoretical views regarding the aetiology of developmental dyslexia remain contentious, and interpretations of poor performance lack resolution because of the inherent correlational aspect of the research designs, task complexity, and integration into broader cognitive models. Some aspects of the New Zealand educational system and current research should be considered when performing assessments and considering remediation. These include the importance of using appropriate assessments, and the inclusion of considerable text reading practice in any intervention. Some children have the symptomatology of dyslexia but they are excluded from this diagnosis due to poor receptive aural vocabulary. These children have learning needs that require spoken language interventions.

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Fletcher-Flinn, C.M. & Haberman, G.M. (2006). *Cognition and Language: Perspectives from New Zealand*. Australian Academic Press: Brisbane. Review by K. Cunningham

Edited by Dr Claire Fletcher-Flinn and Dr Gus Haberman, both highly respected researchers in their own right, this book has an impressive range of contributors. This volume is a collection of reports from New Zealand research projects in cognitive psychology and covers a range of topics with researchers from across New Zealand, as well as several international authors. Four primary areas are focused upon - Part 1: Perceiving and cognising: information processing and neural substrate; Part 2: Cognition, language and communication; Part 3: Cognition in Development; and Part 4: Theoretical insights and future challenges. The value of this book, along with providing an overview of current cognitive research, is the specific consideration given to the Australasian context therefore affording particular relevance.





GIFTEDNESS FROM A NEUROPSYCHOLOGICAL PERSPECTIVE

BY BILL DRUMMOND (VICTORIA UNIVERSITY, WELLINGTON).

What is giftedness?

Despite the definition of giftedness changing over time, a uniformed conception of giftedness is yet to be decided. Furthermore, the inception of giftedness research varies from culture to culture which makes it more difficult to quantify (Stoeger, 2009). Giftedness in the past has been identified through the use of intelligence testing and quantified by a cut-off intelligence quotient (IQ) score. However, a phenomenon called the Flynn effect (Flynn, 1998) demonstrated that the average (tested) intelligence has increased over generations which has influenced the cut-off IQ for giftedness to evolve. One of the fundamental characteristics of gifted children is that they are thought to possess significantly higher cognitive intelligence than their same-aged peers (Bar-On & Maree, 2009).

In recent times, the cut-off score on cognitive intelligence tests such as the Wechsler Intelligence Scale for Children (WISC) has typically been set at two standard deviations above the mean which is equivalent to an IQ of 130 and represents approximately 2% of the population (Bar-On & Maree, 2009). There has been some contention that IQ scores alone define one as being gifted, as a person with an IQ of 130 may not substantially differ from a person with an IQ of 120 (Dai, 2009). Although intelligence still plays an important role in most current conceptions of giftedness, multi-dimensional concepts of giftedness which consider personality traits such as motivation, creativity, and wisdom in addition to intelligence are now most widely accepted (Stoeger, 2009).

Neuropsychological characteristics of giftedness

Many brain structures and functions contribute to all acts of intelligence. Some of these include the lateral prefrontal cortex which supports executive behavioural control; the orbitofrontal cortex which enables decision making; the limbic system which primarily supports emotional processing and motivation; the hippocampus and entorhinal cortex which enables long-term memory storage; and the cerebellum which enables physical and mental coordination during performance (Geake, 2009).

There is now substantive evidence that gifted individuals have atypical brains and atypical brain functioning (Mrazik & Dombrowski, 2010). Cognitive characteristics associated with giftedness include an ability for rapid information processing; a preference for top-down understanding; and intellectual precocity which is typically demonstrated through performance on above-age academic testing (Geake, 2009).

Predictions can be made about the collective differences in the neurology of gifted children based on these cognitive characteristics which may include denser focal cortical grey matter enabling a greater storage of knowledge; denser intra-cortical white matter enabling quicker information processing; greater prefrontal efficacy enabling higher levels of creative thinking and abstract reasoning; and earlier maturation of frontal cortices enabling above-age IQ scores (Geake, 2009).

Shaw et al. (2006) conducted a longitudinal magnetic resonance imaging (MRI) study of intellectual ability and cortical development in 300 children and adolescents. Data gathered over six years showed that the thickness of the cortex was thinner in the high-IQ group when these children were young, but rapidly grew so that their cerebral cortices were significantly thicker than average, especially in the prefrontal cortex by the time these gifted children were teenagers. Studies comparing the neural functioning of gifted children with age-matched typical children consistently indicate that gifted children display enhanced frontal cortical activation and inter-hemispheric functional connectivity (Geake, 2009).

Furthermore, studies comparing the neural function and structure of adults with high-IQ and average IQ consistently indicate that high-IQ adults had relatively enhanced inferior lateral prefrontal cortical activation and relatively enhanced activations in a network of other cortical regions including the inferior parietal cortex (Geake, 2009). These studies may explain why gifted children often display enhanced executive capability and a more efficacious working memory. It is also argued that the extraordinary achievements of gifted children is the result of domain-specific high attentional control which is learnt from the beginning of infancy and is constantly



modulated between the prefrontal cortex and the cognitive-modelling functions of the cerebellum (Vandervert, 2009). This high attentional control may accelerate the production of high intellectual processes through spontaneous and deliberate practice of skills.

Aetiology of giftedness

Natural abilities are viewed as 'potential' with regards to the developmental trajectory of giftedness (Gagné, 2009). Different explanations about the aetiology of giftedness have resulted in controversy over recent years. Some theories propose that giftedness is the result of extended practice and skill acquisition whilst other models argue that giftedness is based on natural or genetically endowed abilities that are transformed into exceptional achievement through nurture (Davidson, 2009). Evidence shows there is a strong genetic influence on intellectual potential, but also that children's development is largely affected by their goals, values, environmental characteristics and family lifestyle (Reichenberg & Landau, 2009). Contemporary theories tend to view giftedness as dynamic as both the individual and their environment interact in ways that produce high levels of achievement (Davidson, 2009).

Families of gifted children

There are a number of factors that aid the development of giftedness for children. From birth, curiosity and interests manifests itself in exploratory behaviour which can become increasingly elaborate during cognitive development (Perleth & Wilde, 2009). Research shows that giftedness can be aided by certain motivational and personality characteristics during the child's development, and research has indicated that throughout pre, primary, middle, and high school, gifted children show higher intrinsic motivation (Gottfried & Gottfried, 2009).

Given that curiosity and exploratory behaviours are important for giftedness development, their social environment should seek to accommodate and support the child's needs. Meta-cognitive strategies aid children's exploration and mastery, and research shows that meta-cognitive strategies are acquired through both verbal and non-verbal interactions from significant others (Perleth & Wilde, 2009). Mothers of gifted children have been found to promote the development of these strategies by pointing out the important relations between problem aspects ("a piece of the jigsaw is missing here and it has a smooth edge"), as

compared to mothers of less-gifted children who tend to give more direct advice ("that piece goes here") to their children in order to solve a problem (Perleth & Wilde, 2009). The concept of multiplier effects (Gottlieb, 1997) aids the development of giftedness in which earlier developmental trends can be supported and amplified. Parents who notice their infant's fondness for books may support and encourage their child's literacy skills which can have long term effects in this area of competency. If the parent does not notice their infant's interest in books or is too busy to care, this does not entail that their innate potential is lost but it does change the probability of their child excelling which is what multiplier effects can do (Gallagher, 2008).

Within families of gifted children, certain characteristics can often be seen including families that are happy and intact, as well as an educational style that encourages motivation whilst maintaining a balance between freedom and pressure (Perleth & Wilde, 2009). In supporting talent development, parents need to set high expectations for their children if high levels of talent are present, whilst ensuring they communicate that their support is not contingent on their child's success (Olszewski-Kubilius, 2008). Families guide their child's development but they also define the opportunities in which their children can exercise their abilities. Parents of children with intellectual disabilities have limited choice with regards to educational opportunities their child can receive. In comparison, parents of gifted children have the option to provide their child with a variety of educational opportunities including gifted programs which can further test the exceptional talents of gifted children (Reichenberg & Landau, 2009).

Ways to encourage and enrich the education of their gifted child is a common concern among parents. Parental encouragement and the availability of a range of learning experiences and materials are essential, as well as shared interactions which can stimulate and foster their child's intellectual growth (Reichenberg & Landau, 2009). It is often important to assure parents that there is evidence that intelligence is heritable and that despite their fears, they are likely to be close in ability and to have the inner resources to raise their gifted child (Silverman & Golon, 2008).

Types of giftedness

The developmental process of giftedness draws on the individuals natural abilities to excel in any area through maturation and daily use (Gagné, 2009). Depending on the



individual's environment, there is a great degree of variability in which occupational field their giftedness is demonstrated. It is generally viewed that gifted children are endowed with intellectual skills and aptitudes as well as possessing a greater level of motivation which gives them an edge in pursuing creative activities (Saunders Wickes & Ward, 2009). Giftedness is often attributed to those that are awarded a Nobel Prize in science for exceptional intellectually creative achievements (Shavinina, 2009b). The developmental foundation of intellectually creative giftedness can be bolstered during sensitive periods of development by stimulating the child's interests. This has implications for special education programs through enrichment and acceleration of the child's cognitive experiences and extra cognitive abilities (Shavinina, 2009b).

Gifted readers and writers will display their talents through the use of words (Schnur & Marmor, 2009). Glass (2004) identifies precocious language development as an indicator of giftedness, and asserts that many gifted children have extensive vocabularies and are able to use complex sentence structures by the age of two or three. Gifted readers are often those who are able to read books that are at least two or three years above their level and are able to recall details and understand difficult concepts about the stories (Schnur & Marmor, 2009).

A number of labels are used to identify those who are musically talented including musical aptitude, musical capacity, and musical intelligence. Due to the variety of labels, there is both contention and confusion with regards to what musical giftedness should be considered as (Persson, 2009). Musical talents may involve physical, vocal, or literacy talents. As with all areas of giftedness, it is argued that there are hereditary elements of musical giftedness, but again this opens up the debate for nature versus nurture (Gagné, 2009).

Identification of giftedness

A Full Scale IQ (FSIQ) score of 130+ obtained on the WISC is commonly considered gifted and has been used as inclusionary criteria for accessing gifted educational programs (Silverman, 2009). Some gifted programmes use a FSIQ of 125+ or two standard deviations about the normative mean (Flanagan & Kaufman, 2009). A validity study using the WISC-III found the average FSIQ of the gifted population was 128.7 (Flanagan & Kaufman, 2009) whilst a validity study of the WISC-IV found the average

to be 123.5 (Silverman, 2009). However, the Flynn effect demonstrates that evaluations of giftedness based on intelligence scores may depend on the national norms that are used to interpret scores and that children may obtain higher scores when older norms are used (Lohman, 2009). Another difficulty with relying solely on psychometric intelligence tests to identify giftedness is that they often include measures of factual or declarative knowledge but not intelligence. The 'Information' and 'Vocabulary' subtests of the WISC-IV are examples of this (Shavinina, 2009a).

The WISC-IV includes four indices (Flanagan & Kaufman, 2009): Verbal Comprehension (measures ability to reason verbally); Perceptual Reasoning (measures non-verbal and fluid reasoning, spatial processing, visual-motor integration, and the ability to learn new information); Working Memory (measures ability to store and retrieve auditory information); and Processing Speed (measures visual perception and organisation, visual scanning, and hand-eye coordination). The Verbal Comprehension Index (VCI) and the Perceptual Reasoning Index (PRI) have been shown in studies to be the best indicators of giftedness (Silverman, 2009).

In particular, the Matrix Reasoning and Picture Concepts subtests challenge the child with relatively novel tasks and are purported to assess mental operations or problem-solving approaches which are thought to be highly relevant to gifted identification (Flanagan & Kaufman, 2009). In all gifted samples that have been reviewed using the WISC-IV, the VCI and PRI means were found to be higher than the Working Memory Index (WMI) which in turn was higher than the Processing Speed Index (PSI). This raises the issue of variability within a child's profile.

Using the cases of two gifted samples, substantial discrepancies were found between WISC-IV indices (i.e., 23 points or greater) in 74 to 79% of cases which suggests that non-typical profiles appear to be the norm for gifted children (Rimm, Gilman, & Silverman, 2008). As gifted individuals rarely have a flat profile of assessment, this variability demonstrates the importance to consider all indices and subtests and not just the FSIQ (Flanagan & Kaufman, 2009). Given this, misdiagnoses of gifted children with learning disabilities can frequently occur when: their scores are averaged which masks both their strengths and their weaknesses; when the magnitude of the disparities between their strengths and weaknesses are not fully taken into account; and when they are compared to the norms for average children (Silverman, 2009).



Twice exceptional

The term twice exceptional refers to children who are gifted and talented as well as being disabled (Lupart & Toy, 2009). There is a great amount of heterogeneity among this group, and these children may require special education services for one or more types of disability as well as one or more areas of giftedness. Disabilities can mask intellectual ability, talent, and creativity (Nielsen & Higgins, 2005) which can make it more difficult to identify children who are twice-exceptional as compared to gifted children without disabilities. Children who are twice-exceptional often resemble their gifted peers in intellectual ability according to Nielsen (2002) and may excel in particular academic areas. However, many gifted students with learning disabilities will display a great degree of variability in other academic areas such as reading or mathematics (Lupart & Toy, 2009). Because of this variability, twice-exceptional children are often found incidentally to have IQs in the gifted range when being assessed for learning disabilities. When these children have perfectionist characteristics they are at particular risk of depression and anxiety as they increase with age (Lupart & Toy, 2009). Because these children are exceptional in particular areas, perfectionists with disabilities may try hard to demonstrate their abilities whilst hiding their disability. Furthermore, these children may withdraw from tasks that move beyond their ability to hide their disability.

Gifted children with ADHD (GADHD) can also present with unique characteristics. Gifted children's abilities are typically asynchronous, and this variability is seen to an even greater extent in GADHD children's social, cognitive, and emotional areas of development, as well as their levels of maturity (Lovecky, 2003). Compared to typical peers, gifted children are able to learn things more rapidly, and this ability is still apparent in children with GADHD (Lupart & Toy, 2009). With regards to concentration which is a typical area of deficit for children with ADHD (American Psychiatric Association, 2013), children with GADHD may have the ability to concentrate for a longer period of time than typical ADHD children, but this ability may be limited to areas in which the child is passionate about (Lupart & Toy, 2009).

Risks of giftedness

Children who are highly gifted are also at risk because they differ so significantly with respect to their cognitive and affective development compared to their same-age peers

(Gross, 2009). Some contributors to this risk include: social environments which are mismatched to the child's language, interests, and personal maturity; the tensions created by their energy, creativity, intensity, and high aspirations which are often far greater than their same-age peers; and at the same time their wish to be like everyone else which can tempt them to minimise their abilities in the service of establishing relationships (Robinson, 2008).

Children spend a major proportion of their years at school, and if the setting is a poor match this can cause major difficulties. Furthermore, within the age-stratified society that we live in, gifted children are almost always out of sync with their peers that they encounter in a number of settings including school. An example of this is literacy which is typically advanced for gifted children from a young age (Glass, 2004). Gifted children often enter school several years ahead in literacy compared to their peers which can cause them to lose interest, particularly given that the first year of school often has a strong focus on emerging literacy.

The lack of individualisation within the school curriculum also makes it difficult to tailor for gifted children (Perleth & Wilde, 2009). Gifted children may deal with their school boredom by daydreaming, becoming impatient or irritable with other students who are struggling with the "obvious" work, or by rebelling against their homework. Gifted children may also insist that they do not need to practice skills such as multiplication or spelling and subsequently they fail to adequately master these skills which leads to more negativity (Robinson, 2008).

The disconnect from peers can cause a number of difficulties for gifted children. The more gifted the child, the more likely they are to report that they have fewer friends than they wish, the more likely they are to seek older friends, and the more likely they are to view their intelligence as interfering with their ability to make new friends (Robinson, 2008). Gifted children who don't fit in due to their interests, concerns, and values may be subject to bullying and social isolation. Gifted children with these difficulties are also at higher risk of suicide (Hyatt & Cross, 2009). These difficulties can also contribute to underachievement which has become a notable psychological defensive pattern used by the gifted, particularly during the primary grades where children are trying "to be like everyone else" (Rimm, 2008; Robinson, 2008). This issue can intensify during the early adolescent



years (Assouline & Colangelo, 2006). Underachievement is often identified by parents and teachers who report disorganisation, missing assignments, carelessly completed homework, uneven skills, blame laid on others, and often the child reports boredom (Rimm, 2008). Teachers will often comment that the child is “not working to their ability” and parents may identify a time in which their child’s grades declined. Fortunately, as these difficulties are not inherent in gifted children, the solution can be to correct the mismatch and one option is to enrol children into gifted educational programs (Robinson, 2008). Furthermore, the anti-intellectual atmosphere of primary and secondary school does not continue into tertiary education where gifted individuals often thrive (Assouline & Colangelo, 2006).

ADHD

ADHD is a prevalent neurodevelopmental disorder (American Psychiatric Association, 2013) which affects 5% to 10% of children (Froehlich et al., 2011). Numerous studies including twin and adoption studies over the past 60 years have found that ADHD is among the most heritable of mental disorders (Nigg, 2012; Rommelse et al., 2008). With heritability estimates of 60% to 80%, environmental factors are thought to influence the development of ADHD which include very low birth weight, parental substance exposure, nutritional factors, and lifestyle/psychosocial factors (Froehlich et al., 2011). ADHD is characterised by a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development and is pervasive in multiple settings (American Psychiatric Association, 2013). The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (American Psychiatric Association, 2013) separates ADHD into three subcategories; Inattentive, Hyperactive-Impulsive, and Combined subtype. ADHD is associated with functional impairments in social functioning as these children often have conflicts with both adults and peers which subsequently leads to frustration and rejection (Nijmeijer et al., 2008). ADHD places children at risk of developing comorbid disorders relating to anxiety, oppositional behaviours, and aggression (Taurines et al., 2010).

The Planning, Attention, Simultaneous, Successive (PASS) theory provides a process-based understanding of the intellectual and neuropsychological processes implicated in ADHD (Goldstein & Naglieri, 2008). Planning is critical for self-monitoring behaviour and impulse control as well

generating, evaluating, and executing problem solving strategies. Attention is a cognitive process that occurs when a person selectively focuses on particular stimuli whilst inhibiting competing stimuli.

This process includes both selective and focused attention, with selective attention being important for inhibiting responses to distracting stimuli and focused attention involving directed attention towards a particular activity. Simultaneous processing is a cognitive process used to integrate stimuli into groups which is why this process has been tested using visual spatial tasks. Successive processing is a cognitive process used when stimuli are arranged in a specific chain-like progression. ADHD disrupts these processes, and this theory has suggested that treating children with an understanding of their PASS cognitive processing profile may have a positive and significant effect of their academic performance (Goldstein & Naglieri, 2008).

Neuropsychology of attention

ADHD has increasingly been defined as a disorder due to impaired behavioural inhibition which leads to executive functioning deficits (Goldstein & Naglieri, 2008). Studies have shown that approximately 70% of children who are diagnosed with ADHD have a beneficial response to stimulant pharmacotherapy which suggests that particular neurotransmitter systems are likely involved in the disorder (Cohen, 2013). Causal models of ADHD have consistently implicated dysfunction in the frontostriatal and frontoparietal networks which support executive functioning (Dickstein, Bannon, Xavier Castellanos, & Milham, 2006). Using MRI analysis, volumetric measurements of the brain provide strong support for the involvement of the frontostriatal networks in ADHD.

In particular, ADHD has been associated with loss of caudate nucleus volume which is shown to be predictive of both inattentive and hyperactive-impulsive symptoms (Cohen, 2013). Children with ADHD tend to have volume reductions in the frontostriatal networks as well as other subcortical and white matter systems. Furthermore, a meta-analysis of neuroimaging studies found a consistent pattern of frontal hypoactivity in patients with ADHD compared to controls (Dickstein et al., 2006) which corresponds with deficits in executive and attentional functioning (Cohen, 2013).



Assessment of ADHD

The significant rise in prevalence of ADHD over recent years is attributable to changes in recognition rather than a true increase of the disorder (Taylor, 2009). When assessing for ADHD, identification of the sources of the child's attentional deficits is important both for accurate diagnosis and effective treatment (Bernstein, 2012). Symptoms of ADHD can be attributed to a number of factors and a thorough assessment is necessary to determine the cause of the symptoms. A multimodal assessment is essential which should include a family interview, school and home observations, parent and teacher psychometric reports, child report if they are of appropriate age, and psychometric testing of the child (Palumbo & Diehl, 2007).

The Test of Everyday Attention for Children (TEA-Ch) is used to measure children's ability to selectively attend, sustain their attention, divide their attention between two tasks, switch attention from one thing to another, and to withhold (inhibit) verbal and motor responses (Manly, Robertson, Anderson, & Nimmo-Smith, 1999). The TEA-Ch is able to identify the patterns of attentional problems the child may have which can inform both treatment and management of symptoms.

There are also a number of subtests from other psychometrics which can assess for aspects of attention. The Symbol search subtest on the WISC-IV assesses accuracy, and because it is timed, the speed at which the child can selectively attend is determined. The Trail Making subtests on the Delis-Keplin Executive Function System allows the examiner to compare the child's performance on each task to determine the effects of additional demands by switching between numbers and letters which requires greater attentional focus than simply connecting numbers in sequence.

The Stroop Color-Word Interference Test is the most widely used test to assess one's ability to inhibit the competing stimulus feature which can identify deficits in attention and executive functioning.

Continuous performance tests are an effective means to assess sustained attention. The Conners 3 (Conners, 2011) is a broadband paper-and-pencil psychometric test which assesses key areas of peer relations, attention, hyperactivity/impulsivity, learning problems, executive functioning and aggression for children aged 6-18 years old.

These tests in conjunction with observations (for example, fatigue or decline in performance over time) are an effective method for assessing attention (Cohen, 2013).

ADHD and giftedness

Many gifted children exhibit behaviours that are associated with Attention Deficit Hyperactivity Disorder (ADHD) making it difficult to distinguish between these two conditions (Lupart & Toy, 2009). Some of these behaviours include high activity levels, difficulty persisting on certain tasks, acting without forethought, and both groups often experience significant social difficulties and academic underachievement. Due to this ambiguity, many gifted children are misdiagnosed as having ADHD or are not appropriately identified (Antshel, Hendricks, Faraone, & Gordon, 2011). Diagnosticians who heavily rely on behaviour checklists to assess ADHD increase the possibility of confusing ADHD with giftedness, as behaviour checklists address only the expression of behaviour but not its cause (Hartnett, Nelson, & Rinn, 2004).

Children with ADHD tend to exhibit their problem behaviours in all settings compared to gifted children whose problem behaviours are usually situation specific due to boredom for example. Gifted children may have attentional problems at school but not at home. In comparison, with the possible exception of television and computer games, children with ADHD have short attention spans in all settings (Lupart & Toy, 2009). Both groups tend to exhibit heightened levels of activity, but gifted children's activity tends to be focused and directed compared to ADHD which is often random and not goal directed. Impulsivity is another characteristic which is often shared, but gifted children generally tend to answer correctly to answers they impulsively respond to as compared to ADHD whose answer may be irrelevant and due to an inability to wait (Hartnett et al., 2004).

These points highlight the need to thoroughly assess ADHD symptomology to determine the processes that are occurring and their function.

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Relevant articles (NZ culture and context) (K. Cunningham)

Bevan-Brown, J. (2005). Providing a culturally responsive environment for gifted Maori learners. *International Education Journal*, Vol: 6 (2), 150-155.

Bevan-Brown, J. (2013). Identifying and providing for gifted and talented Māori students. *Apex: The New Zealand Journal of Gifted Education*, Vol: 15 (1).

Blackett, R. & Webb, J.T. (2011). The social-emotional dimension of giftedness: The SENG support model. *The Australasian Journal of Gifted Education*, 20 (1), 5-13.

Mahuika, R. (2007). Maori Gifted and Talented Education: a review of the literature. *MAI Review 1, Intern Research Report 5*.

Moltzen, R. & MacFarlane, H.A. (2006). New Zealand: gifted and talented Maori Learners, in Wallace, B. (Ed.). *Diversity in Gifted Education: International Perspectives on Global Issues*. Routledge: Abingdon, Oxon.

Reid, N.A. (2006). The detection and nurture of the culturally different gifted and talented in Aotearoa/New Zealand, pp. 86-105, in Wallace, B. (Ed.). *Diversity in Gifted Education: International Perspectives on Global Issues*. Routledge: Abingdon, Oxon.

Additional articles

Arffa, S. (2007). The relationship of intelligence to executive function and non-executive function measures in a sample of average, above average, and gifted youth. *Archives of Clinical Neuropsychology*. Vol: 22 (8), 969-978.

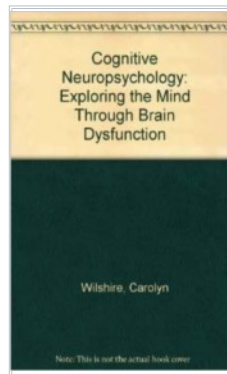
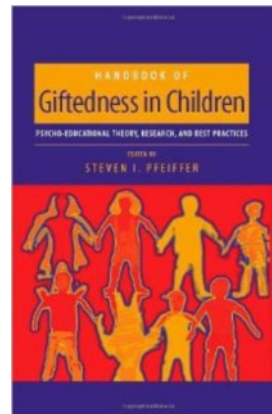
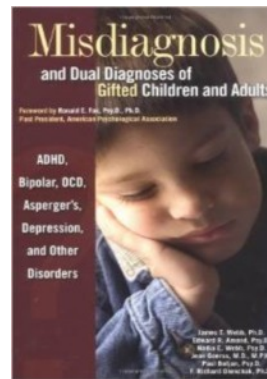
Budding, D. & Chidekel, D. (2012). ADHD and Giftedness: A Neurocognitive Consideration of Twice Exceptionality. *Applied Neuropsychology: Child* Vol 1 (2). Special Issue: Neuropsychology of Attention Deficit Hyperactivity Disorder.

Hernández Finch, M.E. et. al (2014). The Relationship of Cognitive and Executive Functioning with achievement in gifted kindergarten children. *Gifted Child Quarterly*, Vol. 58 (3), 167-182.

Additional book references

Webb, J.T. et. al (2005). *Misdiagnosis And Dual Diagnoses Of Gifted Children And Adults: ADHD Bipolar, OCD, Asperger's, Depression, And Other Disorders*. Great Potential Press: Scottsdale: AZ..

Pfeiffer, S. (2008) (Ed.) *Handbook of Giftedness in Children: Psychoeducational Theory, Research, and Best Practices*. Springer.

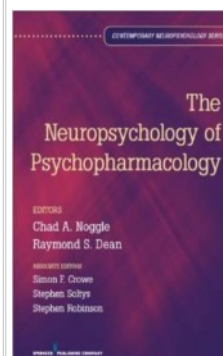


Book alerts for 2014

Dr Wilshire is a Senior Lecturer at School of Psychology, Victoria University, Wellington with research focuses on cognition, language and language disorders. Her book *Cognitive Neuropsychology: Exploring the mind through brain dysfunction* is published by Psychology Press and due for release in December 2014.

Book alerts for 2015

Edited by Noggle, C.A. & Dean, R.S. and sub-edited by Crowe, S.F., Soltys, M.D. & Robinson, S.W., *The Neuropsychology of Psychopharmacology* is published by Springer and due for release in Sept 2015.



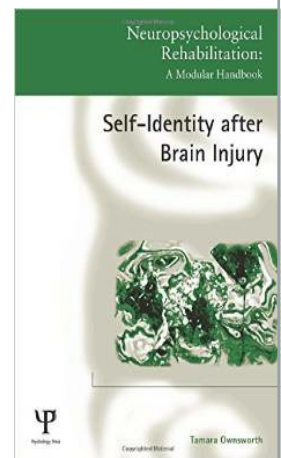


SELF-IDENTITY AFTER BRAIN INJURY - EFFECTS, ASSESSMENT AND INTERVENTIONS

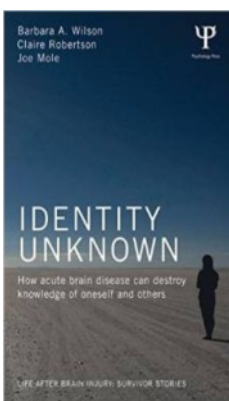
Self-identity after brain injury involves a transition from the identity the individual once knew to a re-formulation of a new identity, and in some situations social status. This involves psychological adjustment and integration of what is often a loss of ability and/or a change in the way in which life tasks and roles can be managed. Grief is commonly part of the process of redefining a new identity as accommodation is made to a 'new normal' for the individual and those within their significant relationships in life. Redefining a new sense of identity may include within occupational and educational roles, with a return to these potentially occurring at a lower level or adjustment to an inability to no longer undertake these activities. The following book and reference articles provides the reader with some of the relevant literature in this very important area of neuro-rehabilitation. While self-identity within cultural groups has been researched this appears to be limited on the effects of how cultural background can have an impact/influence on changes in self-identity when a brain injury occurs. As identified in the recent multi-cultural workshop in October (Auckland) cultural values and beliefs have a significant bearing on how the individual perceives themselves and therefore a cultural understanding is needed. Hopefully in the future this can be an area of further research focus. (K. Cunningham)

Owensworth, T. (2014). Self-Identity after Brain Injury (Neuropsychological Rehabilitation: A Modular Handbook. Psychology Press: London.

Brain injury effects can often require a psychological adjustment with the individual's previous sense of identity becoming affected. This impact not only affects the individual but also upon others, for example on relationship and family identities. Therefore interventions need to consider the individual's social milieu as both needing support and being supportive. A growing body of research has looked at not only the impact of brain injury on self identity but also ways in which this can be addressed. Professor Owensworth notes that people reconstruct a sense of self from personal meaning they derive from their everyday experiences after brain injury. She provides a developmental perspective within a biopsychosocial framework "*which recognises the interactive influence of pre-morbid, neurological, social environmental and psychological factors*". Consideration is given to the impact of sustaining a brain injury early in life and the implications this has for emerging sense of self in childhood and adolescence. Within adulthood, the influence of pre-morbid characteristics and neuropsychological status is discussed. Approaches and measurement of self-perception processes relating to self-identity are described, as are neuro-rehabilitation approaches. An excellent text which provides both theoretical and practical information to assist individuals as they develop, return to, or reformulate their self-identity. Also provides consideration of cultural impact. (Reviewed by K. Cunningham)



Wilson, B., Robertson, C. & Mole, J. (2015). Identity Unknown: how acute brain injury can destroy knowledge of oneself and others. After Brain Injury: Survivor Stories. Psychology Press: New York.



As part of a series of books on different brain injury conditions, this edition focuses on the effects of one survivor and her journey of recovery from Herpes simplex viral encephalitis through a personal narrative. This progresses from the initial impact of a range of cognitive deficits from an intellectual level to self-awareness of the impact on functional ability and participation in everyday life. A comprehensive review of the neurobehavioral and psychosocial ramifications of prosopagnosia is provided. As stated by others: "*Even more compelling is Claire's first-hand account of alterations in her personal memories, sense of self, and her capacity to feel whole. The dialogue between Claire and her therapeutic team sets the stage for well-articulated therapeutic goals suited to her lifestyle as well as her cognitive, perceptual, and emotional needs. The bar is set high and the mantra, established early in her program, is "together we can."* This book is a wonderful guide for the patients, caregivers and clinicians who seek education and guidance regarding optimal adaptation to brain damage - [Margaret O'Connor, Harvard Medical School, USA]". (Reviewed by K. Cunningham)



New Zealand authors (on self-identity after brain injury)

- Manuela, S. & Sibley, C. G. (2012). The Pacific Identity and Wellbeing Scale (PIWBS): A Culturally-Appropriate Self Report Measure for Pacific Peoples in New Zealand. *Social Indicators Research*, 1, 83-103.
- Martin, R., Levack, W.M.M. & Sinnott, K.A. (2014). Life goals and social identity in people with severe acquired brain injury: An interpretative phenomenological analysis. *Disability and rehabilitation Source: PubMed*.
- Levack, W.M., Boland, P., Taylor, W.J., Siegert, R.J., Kayes, N.M., Fadyl, J.K. & McPherson, K.M. (2014). Establishing a person-centred framework of self-identity after traumatic brain injury: a grounded theory study to inform measure development. Vol: 4 (5). *BMJ Open* 1-8.
- Thomas, E., Levack, W.M.M. & Taylor, W.J. (2014). Self-Reflective Meaning Making in Troubled Times: Change in Self-Identity After Traumatic Brain Injury. *Qualitative Health Research*, Vol. 24 (8), 1033-1047.

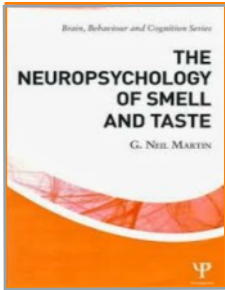
Other articles of interest

- Anderson, S. & Whitfield, K. (2013). Social identity and stroke: 'They don't make me feel like, there's something wrong with me'. *The Authors Scandinavian Journal of Caring Sciences*, Vol 27 (4), 820-830.
- Biderman, D., Daniels-Zide, Reyes, A. & Marks, B. (2006). Ego-identity: Can it be reconstituted after a brain injury? *International Journal of Psychology*, Vol 41(5), 355-361.
- Bryson-Campbell MI, Shaw L, O'Brien J, Holmes J, Magalhaes L. (2013). A scoping review on occupational and self identity after a brain injury. *Work*, 1:44(1), 57-67.
- Cotton, G.S. (2012). Occupational identity disruption after traumatic brain injury: an approach to occupational therapy evaluation and treatment. *Occupational Therapy Health Care*, 26 (4), 270-82.
- Douglas, J.M. (2013). Conceptualizing self and maintaining social connection following severe traumatic brain injury. *Brain Injury*. 27 (1), 60-74.
- Jones, J.M., Halem, S.A., Jetten, J., Williams, W.H., Morris, R., Saroyan, S. That which doesn't kill us can make us stronger (and more satisfied with life): The contribution of personal and social changes to well-being after acquired brain injury. *Psychological Health*, 26 (3), 353-69.
- Landau, J. & Hissett, J. (2008). Mild Traumatic Brain Injury: Impact on identity and ambiguous loss in the family. *Families, Systems & Health*. Vol: 26 (1), 69-85.
- Lorenz, L.S. (2010). Discovering a new identity after brain injury. *Sociology of Health & Illness*, Vol. 32(6), pp. 862-879.
- Medved, M.I. & Brockmeier, J. (2013). Continuity Amid Chaos: Neurotrauma, Loss of Memory, and Sense of Self. *Qualitative Health Research*, Vol: 18 (4), 469-479.
- Muenchberger, H., Kendall, E. & Neal, R. (2008). Identity transition following traumatic brain injury: a dynamic process of contraction, expansion and tentative balance. *Brain Injury*, Vol: 22 (12), 979-992.
- Nochi, M. (2000). Reconstructing self-narratives in coping with traumatic brain injury. *Social Science & Medicine*, Vol: 51, 1795-1804.
- Pallesen, H. (2014). Body, coping and self-identity. A qualitative 5-year follow-up study of stroke. *Disability and Rehabilitation*, 2014, Vol. 36 (3), 232-241.
- Perna, R.B. & Errico, A.E. (2004). Neurological Substrates of Personal Identity: Implications for Neurorehabilitation. *The Journal of Cognitive Rehabilitation*, Vol: 22 (1), 10-12.
- Segal, D. Exploring the Importance of Identity Following Acquired Brain Injury: A Review of the Literature. *International Journal of Child, Youth & Family Studies*, Vol1 (3/4), 293-314.
- Soeker MS. (2012). The development of the Model of Occupational Self Efficacy: an occupational therapy practice model to facilitate returning to work after a brain injury. *Work*, 43 (3), 313-22.
- Stergiou-Kita, M. & Rappolt, S. & Dawson, D. (2012). Towards developing a guideline for vocational evaluation following traumatic brain injury: the qualitative synthesis of clients' perspectives. *Disability Rehabilitation*, Vol: 34 (3), 179-188.



Book reviews

Reviewer: Kay Cunningham

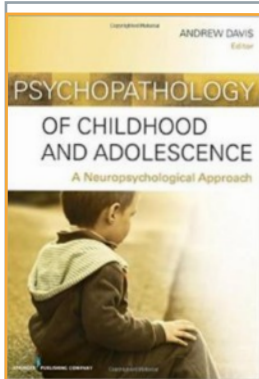
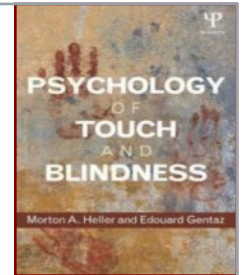


Martin, G.N. (2013). The Neuropsychology of Smell and Taste. Psychology Press: London.

The text provides a very readable outline of anatomy and the function of these senses. Research on the impact on behaviour and relevance to various disorders is outlined. For example, olfactory dysfunction has been identified as a key indicator in disorders such as Parkinson's and Alzheimer's and may be a better marker of risk of degenerative disease. Provides an interesting reference for understanding this particular area.

Heller, M.A. & Gentaz, E. (2014). Psychology of Touch and Blindness. Psychology Press: London.

For any clinician working with clients who are blind, this text provides a comprehensive outline of the neural and neuroscience basis of touch. Haptic perception is the process of recognising objects through touch and how this occurs in the development in young children and also the effects of aging are presented. Research on the touch skills of people who are blind are described, along with research on the use of, for example raised pictures to aid the development of spatial perception.

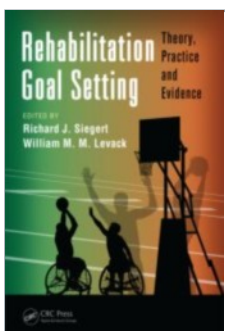
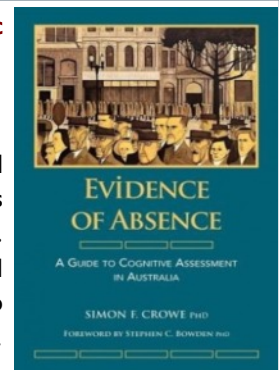


Andrews, S. (2013) (Ed.). Psychopathology of Childhood and Adolescence: a neuropsychological perspective. Springer: New York.

This book covers a wide range of disorders which include topic areas such as developmental and learning disorders, autism, auditory processing, and psychiatric disorders such as ADHD. Additionally topics include issues with attachment, eating, substance abuse, and cognitive disorders, (or example due to foetal alcohol, medical disorders) and sleep disorders. This comprehensive text provides neuropsychologists working with children and adolescents with a chapter of specific disorders followed by a case study which includes recommended interventions. Highly recommended for both students and experienced clinicians as this book provides well written reviews of research and relevant models. The case studies then provide the translation of theoretical background into functional understanding and implementation.

Crowe, S.F. (2010). Evidence of Absence A Guide to Cognitive Assessment in Australia. Australian Academic Press.

Although based within the Australian context, the information provided within this text is equally valuable to New Zealand neuropsychologists. Professor Crowe outlines a guide to clinical interpretation of the adult Wechsler scales and other cognitive tests, in a very easily understood approach. Structure of reports and appropriate tests to use are discussed. Empirical and interpretive analysis is undertaken with case studies representing intellectual disability, traumatic brain injury and in situations where less than genuine effort is noted. A focus on clinical dilemmas is provided along with guidelines for report writing applied to specific referral questions. This text is also very useful for both new grads as well as experienced clinicians, with step by step instructions for analysis and comparison of results, presented in both a statistically and clinically meaningful way.

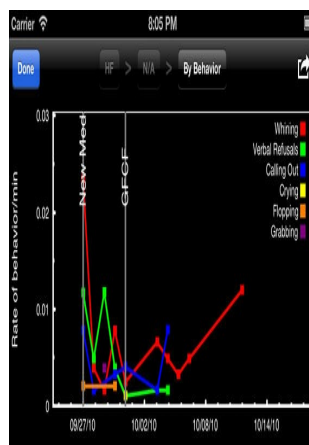
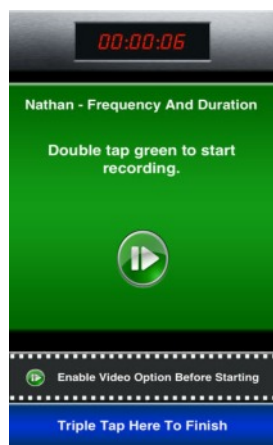
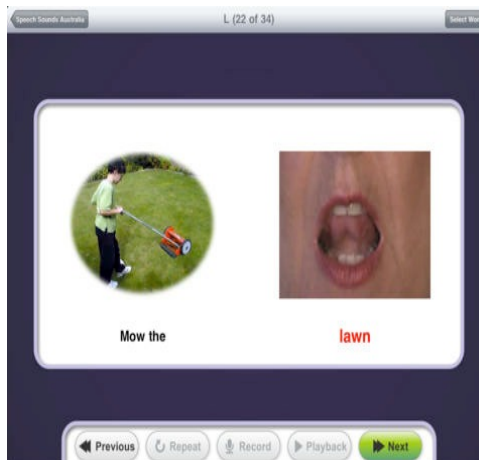


Siegert, R.J. & Levack, W.M.M. (2015) (Eds.). Goal Setting: Theory, Practice and Evidence. CRC Press: Florida.

Edited by two New Zealand researchers, this text outlines research into goal setting within rehabilitation settings. Over recent years in particular there has been an increase in this area with the focus particularly on interdisciplinary teams rather than individual clinicians. One of the challenges with effective goal setting practice has been gaining consensus on how this is practised. As well as describing the primary framework for goal setting, the authors provide a description and interpretation of specific topics such as ethics, and within a range of clinical areas and conditions. A practical guide which is valuable as a team text for all disciplines within the rehab setting.

Phone/Tablet Apps for Neuro-Rehabilitation (identified but not reviewed)

Speech Sounds on Cue for iPad (Australian English) - created by a Speech Pathologist. As described *"the application shows how to produce speech sounds and words and encourages speech, even in people with severe speech difficulties. This easy to use iPad application contains over 500 videos, sound clips and colour photos designed to help adults and children to produce the consonant speech sounds in isolation, in words and in sentences. Now includes recording, playback, rhyming words and randomisation"*. Can be accessed on <https://itunes.apple.com/nz/app/speech-sounds-on-cue-for-ipad/id478653632?mt=8>

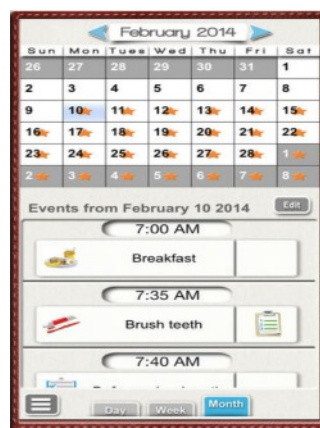
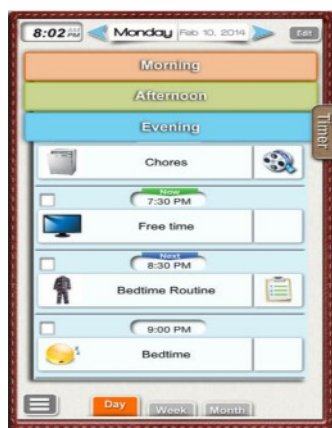


Behaviour Tracker Pro - This app provides a means for behavioural therapists, teachers and any others to keep track of specific behaviours (e.g., ABC data, such as frequency, duration and so forth). Once data is recorded and graphs are then generated. Another function is the video recording of target behaviours for later review.

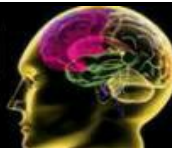
<https://itunes.apple.com/us/app/behavior-tracker-pro/id319708933?mt=8>

Visual Schedule Planner - designed to give an individual an audio/visual representation of the "events in their day". In addition, events that require more support can be linked to an "activity schedule" or "video clip" to help model the task even further.

<https://itunes.apple.com/us/app/visual-schedule-planner/id488646282?mt=8>



USE OF MOBILE TOUCH-SCREEN TECHNOLOGY IN STROKE REHAB - go to <http://strokerecoverybc.ca/wp-content/uploads/2012/12/StrokeRecoveryiPadPresentation.pdf>



NZSIGN Mandate

To provide the following opportunities for group members to:

- Meet others with an interest /expertise in neuropsychology and to increase knowledge and support via discussion of cases, topic areas, and issues relevant to the practice of neuropsychology in Aotearoa/New Zealand;
- Share ideas and information;
- Share information regarding upcoming training events relevant to neuropsychology;
- Provide workshops and other events related to neuropsychology to contribute to the continuing professional development of group members;
- Align with international standard of practice as a long term aim through continuous improvement of the practice of neuropsychology in New Zealand.

If you want to know more about NZSIGN, email Dr Nic Ward (Coordinator of NZSIGN) Nic@insightteam.co.nz. NZSIGN has an email list for announcements and discussion. To subscribe, send an email with brief information on your background in neuropsychology to nzsign-subscribe@synapseproject.org

Relevant News Update

- The primary NZSIGN committee (Dr Nic Ward, Dr Jamie Macniven, and Kay Cunningham) recently met with the New Zealand Psychologists' Board to discuss the potential for formalise clinical neuropsychology as a specialty and to establish clinical competencies in this area. The Board indicated an interest in further discussions which is a positive move towards potential establishment of guidelines and/or a scope of practice.
- Professor Simon Crowe and Peggy Bain (Australian Psychological Society Clinical College of Neuropsychologists) have expressed an interest in making links with NZSIGN and discussions as to how to achieve this are currently ongoing.
- Similarly we have had contact from Shelley Peery at the National Academy of Neuropsychology in the USA. They are interested in identifying projects which we may be able to collaborate on for the general improvement of the field of Neuropsychology and the services we offer our patients/clients. They offer a number of webinars and other internet-based collaborations in addition to reduced rates on in-person conference attendance. See their website at www.NANOnline.org. And do mention NZSIGN if you have any communications with them. They run various online training courses that may be of interest.

Thanks to Dr Margaret Dudley (AUT) for Maori translation of introduction, and to article contributors Richard Bishop, Associate Professor Claire Fletcher-Flinn and Bill Drummond.



References from article by Associate Professor Claire Fletcher-Flinn - Developmental Dyslexia

- Andrewes, S. (2008). *Lexicalised phonological recoding and reading disability: A comparison of implicit learning in reading acquisition of typically developing and reading disabled children* (Unpublished master's thesis). University of Auckland, Auckland, New Zealand.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- de Jong, P. F. (1998). Memory deficits of reading disabled children. *Journal of Child Psychology*, 70, 75–96.
- Dunn, L. M., Dunn, D. M., Styles, B., & Sewell, J. (2009). *The British Picture Vocabulary Scale III*—3rd Edition. London: GL Assessment.
- Evans, E. L. (2002). *Induced sublexical relations: A comparative study between 5-year-old normal readers and an 8-year-old poor reader* (Unpublished master's thesis). University of Auckland, Auckland, New Zealand.
- Fletcher-Flinn, C. M., & Thompson, G. B. (2004). A mechanism of implicit lexicalized phonological recoding used concurrently with underdeveloped explicit letter-sound skills in both precocious and normal reading development. *Cognition*, 90, 303–335.
- Fletcher-Flinn, C. M., & Thompson, G. B. (2007). Dissociation between deficits in explicit procedures and implicit processes in the visual-spatial and the phonological systems during reading acquisition. *Cognitive Neuropsychology*, 24, 471–484.
- Germanò, E., Gagliano, A. & Curatolo, P. (2010). Comorbidity of ADHD and Dyslexia, *Developmental Neuropsychology*, 35, 475–493, DOI:10.1080/87565641.2010.494748.
- Hasselman, F. (2014). Classifying acoustic signals into phoneme categories: Average and dyslexic readers make use of complex dynamical patterns. *PeerJ PrePrints*, 1, 2:e341. <http://dx.doi.org/10.7287/peerj.preprints.241v1>
- Hinshelwood, J. (1900). Congenital word blindness. *Lancet*, 1506–1508.
- Hoeft, F., Hernandez, A., McMillon, G., Taylor-Hill, H., Martindale, J. L., Meyler, A., ... Widén, E. (2006). Neural basis of dyslexia: A comparison between dyslexic and nondyslexic children equated for reading ability. *The Journal of Neuroscience*, 26, 10700–10708.
- McKay, M. F., Fletcher-Flinn, C. M., & Thompson, G. B. (2004). New theory for understanding reading and reading disability. *Australian Journal of Learning Disabilities*, 9(2), 3–7.
- Ministry of Education (2006). Literature review: An international perspective on dyslexia. http://www.google.co.nz/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCEQFjAA&url=http%3A%2F%2Fliteracyonline.tki.org.nz%2Fcontent%2Fdownload%2F4401%2F24402%2Ffile%2FLiterature%2BReview%2B%25E2%2580%2593%2BAn%2BInternational%2BPerspective%2Bon%2BDyslexia%2B%28PDF%29.pdf&ei=_uK5U8g3ioiTBanUgegB&usq=AFQjCNEuXJvq_rbz7RCtTnNgpQuUr3scLg
- Ministry of Education (2010). Defining Dyslexia. <http://literacyonline.tki.org.nz/Literacy-Online/Student-needs/Learners-with-special-education-needs/Dyslexia/Defining-dyslexia>
- Morgan, W. P. (1896). A case of congenital word blindness. *British Medical Journal*, 2, 1378.
- Neale, M. D. (1999). *Neale Analysis of Reading Ability* (3rd ed.). Melbourne: Australian Council for Educational Research.
- Nopola-Hemmi, J., Myllyluoma, B., Haltia, T., Taipale, M., Ollikainen, V., Ahonen, T., Gabrieli, J. D. E. (2001). A dominant gene for developmental dyslexia on chromosome 3. *Journal of Medical Genetics*, 38, 658–664.
- Olson, R. K., Keenan, J. M., Byrne, B., & Samuelsson, S. (2014). Why do children differ in their development of reading and related skills? *Scientific Studies of Reading*, 18, 38–54. DOI: 10.1080/10888438.2013.800521
- Ramus, F., & Ahissar, M. (2012). Developmental dyslexia: The difficulties of interpreting poor performance, and the importance of normal performance. *Cognitive Neuropsychology*, 29, 104–122.
- Rochelle, K.S.H., & Talcott, J. (2006). Impaired balance in developmental dyslexia: A meta-analysis of the contending evidence. *Journal of Child Psychology and Psychiatry*, 77, 1159–1166.
- Snowling, M. J. (2013). Early identification and interventions for dyslexia: A contemporary view. *Journal of Research in Special Educational Needs*, 13, 7–14. DOI: 10.1111/j.1471-3802.2012.01262.x



- Thompson, G. B. (2014). Discovering and accounting for limitations in applications of theories of word reading acquisition. *Frontiers in Psychology*, 5, 579. DOI:10.3389/fpsyg.2014.00579.
- Thompson, G. B., Cottrell, D. S., & Fletcher-Flinn, C. M. (1996). Sublexical Orthographic phonological relations early in the acquisition of reading: The Knowledge Sources account. *Journal of Experimental Child Psychology*, 62, 190–222.
- Thompson, G.B., & Fletcher-Flinn, C. M. (2006). Lexicalised implicit learning in reading acquisition: The Knowledge Sources theory. In C. M. Fletcher-Flinn and G. M. Haberman (Eds.), *Cognition and language: Perspectives from New Zealand* (pp. 141–156). Brisbane: Australian Academic Press.
- Thompson, G. B., & Fletcher-Flinn, C. M. (2012). Toward better teaching: Revising the fundamentals of learning to read. In S. Suggate & E. Reese (Eds.), *Contemporary debates in childhood education and development* (pp. 250–260). London, UK: Routledge.
- Thompson, G. B., & Johnston, R. S. (2000). Are nonword and other phonological deficits indicative of a failed reading process? *Reading and Writing*, 12, 63–97.
- Thompson, G. B., McKay, M. F., Fletcher-Flinn, C. M., Connelly, V., Kaa, R. T., & Ewing, J. (2008). Do children who acquire word reading without explicit phonics employ compensatory learning? Issues of phonological recoding, lexical orthography, and fluency. *Reading and Writing*, 21, 505–537.
- Valtin, R. (2012). Increasing awareness of phonological awareness – helpful or misleading? In S. Suggate & E. Reese (Eds.), *Contemporary debates in childhood education and development* (pp. 227–237). London, UK: Routledge, Taylor & Francis.
- Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): what have we learned in the past four decades? *Journal of Child Psychology and Psychiatry*, 45, 2–40.
- Vogler, G. P., DeFries, J. C., & Decker, S. N. (1985). Family history as an indicator of risk for reading disability. *Journal of Learning Disabilities*, 18, 419–421.

References from article by Bill Drummond - Giftedness and Neuropsychology

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Amer Psychiatric Pub Incorporated.
- Antshel, K. M., Hendricks, K., Faraone, S. V., & Gordon, M. (2011). Disorder versus disability: The challenge of adhd in the context of a high iq. *The ADHD Report*, 19(2), 4–8.
- Assouline, S. G., & Colangelo, N. (2006). Social-emotional development of gifted adolescents. In F. A. Dixon & S. M. Moon (Eds.), *The handbook of secondary gifted education* (pp. 65–85). Waco, TX: Prufrock Press.
- Bar-On, R., & Marea, J. G. (2009). In search of emotional–social giftedness: A potentially viable and valuable concept. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 559–570): Springer Netherlands.
- Bernstein, J. H. (2012). Clinical encounters of the adhd kind: The unique role of neuropsychology. [Review]. *Applied Neuropsychology Child*, 1(2), 105–111.
- Biggs, S. N., Lushington, K., van den Heuvel, C. J., Martin, A. J., & Kennedy, J. D. (2011). Inconsistent sleep schedules and daytime behavioral difficulties in school-aged children. *Sleep Medicine*, 12(8), 780–786.
- Cohen, R. A. (2013). *The neuropsychology of attention* (2 ed.). Dordrecht: Springer.
- Dai, D. Y. (2009). Essential tensions surrounding the concept of giftedness. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 39–80): Springer Netherlands.
- Davidson, J. E. (2009). Contemporary models of giftedness. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 81–97): Springer Netherlands.
- Davis, G. A. (2009). New developments in gifted education. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 1035–1044): Springer Netherlands.
- Dickstein, S. G., Bannon, K., Xavier Castellanos, F., & Milham, M. P. (2006). The neural correlates of attention deficit hyperactivity disorder: An ale meta-analysis. *Journal of Child Psychology and Psychiatry*, 47(10), 1051–1062.
- Flanagan, D. P., & Kaufman, A. S. (2009). *Essentials of WISC V Assessment*. Wiley.
- Flynn, J. R. (1998). IQ gains over time: Toward finding the causes. *The rising curve: Long-term gains in iq and related measures* (pp. 25–66). Washington, DC, US: American Psychological Association.
- Froehlich, T. E., Anixt, J. S., Loe, I. M., Chirdkiatgumchai, V., Kuan, L., & Gilman, R. C. (2011). Update on environmental risk factors for Attention-Deficit/Hyperactivity Disorder. *Current psychiatry reports*, 13(5), 333–344.



- Gagné, F. (2009). Debating giftedness: Pronat vs. Antinat. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 155-204): Springer Netherlands.
- Gallagher, J. J. (2008). Psychology, psychologists, and gifted students. In S. I. Pfeiffer (Ed.), *Handbook of giftedness in children* (pp. 1-11): Springer US.
- Geake, J. G. (2009). Neuropsychological characteristics of academic and creative giftedness. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 261-273): Springer Netherlands.
- Glass, T. F. (2004). What gift?: The reality of the student who is gifted and talented in public school classrooms. *Gifted Child Today*, 27(4), 25-29. doi: 10.4219/gct-2004-152
- Goldstein, S., & Naglieri, J. A. (2008). The school neuropsychology of ADHD: Theory, assessment, and intervention. *Psychology in the Schools*, 45(9), 859-874.
- Gottfried, A. E., & Gottfried, A. W. (2009). Development of gifted motivation: Longitudinal research and applications. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 617-631): Springer Netherlands.
- Gottlieb, G. (1997). *Synthesizing nature-nurture: Prenatal roots of instinctive behavior*: Lawrence Erlbaum Associates.
- Gross, M. U. M. (2009). Highly gifted young people: Development from childhood to adulthood. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 337-351): Springer Netherlands.
- Hartnett, D. N., Nelson, J. M., & Rinn, A. N. (2004). Gifted or adhd? The possibilities of misdiagnosis. *Roeper Review*, 26(2), 73-76.
- Hyatt, L. A., & Cross, T. L. (2009). Understanding suicidal behavior of gifted students: Theory, factors, and cultural expectations. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 537-556): Springer Netherlands.
- Lohman, D. F. (2009). Identifying academically talented students: Some general principles, two specific procedures. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 971-997): Springer Netherlands.
- Lovecky, D. V. (2003). *Different minds: Gifted children with ad/hd, asperger syndrome, and other learning deficits*. Jessica Kingsley Publishers.
- Lupart, J. L., & Toy, R. E. (2009). Twice exceptional: Multiple pathways to success. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 507-525): Springer Netherlands.
- Manly, T., Robertson, I. H., Anderson, V., & Nimmo-Smith, I. (1999). *TEA-Ch: The Test of Everyday Attention for Children Manual*. Bury St. Edmunds, UK: Thames Valley Test Company Limited.
- Mrazik, M., & Dombrowski, S. C. (2010). The neurobiological foundations of giftedness. *Roeper Review: A Journal on Gifted Education*, 32(4), 224-234. doi: 10.1080/02783193.2010.508154
- Nielsen, M. E. (2002). Gifted students with learning disabilities: Recommendations for identification and programming. *Exceptionality*, 10(2), 93-111. doi: 10.1207/s15327035ex1002_4
- Nielsen, M. E., & Higgins, L. D. (2005). The eye of the storm: Services and programs for twice-exceptional learners. *Teaching Exceptional Children*, 38(1), 8-15.
- Nigg, J. T. (2012). Future directions in adhd etiology research. *Journal of Clinical Child & Adolescent Psychology*, 41(4), 524-533. doi: 10.1080/15374416.2012.686870
- Nijmeijer, J. S., Minderaa, R. B., Buitelaar, J. K., Mulligan, A., Hartman, C. A., & Hoekstra, P. J. (2008). Attention-Deficit/Hyperactivity Disorder and social dysfunctioning. *Clinical Psychology Review*, 28(4), 692-708. doi: 10.1016/j.cpr.2007.10.003
- Olszewski-Kubilius, P. (2008). The role of the family in talent development. In S. I. Pfeiffer (Ed.), *Handbook of giftedness in children* (pp. 53-70): Springer US.
- Palumbo, D. R., & Diehl, J. (2007). Managing attentional disorders. In S. J. Hunter & J. Donders (Eds.), *Pediatric neuropsychological intervention*. Cambridge, UK: Cambridge University Press.
- Perleth, C., & Wilde, A. (2009). Developmental trajectories of giftedness in children. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 319-335): Springer Netherlands.
- Persson, R. S. (2009). The elusive muse: Understanding musical giftedness. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 727-749): Springer Netherlands.
- Reichenberg, A., & Landau, E. (2009). Families of gifted children. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 873-883): Springer Netherlands.



- Rimm, S. (2008). Underachievement syndrome: A psychological defensive pattern. In S. I. Pfeiffer (Ed.), *Handbook of giftedness in children* (pp. 139-160): Springer US.
- Rimm, S., Gilman, B. J., & Silverman, L. K. (2008). Non-traditional applications of traditional testing. In J. Van Tassel-Baska (Ed.), *Alternative assessments with gifted and talented students* (pp. 175-202). Waco, TX: Prufrock Press.
- Robinson, N. M. (2008). The social world of gifted children and youth. In S. I. Pfeiffer (Ed.), *Handbook of giftedness in children* (pp. 33-51): Springer US.
- Rommelse, N. N. J., Altink, M. E., Martin, N. C., Buschgens, C. J. M., Buitelaar, J. K., Sergeant, J. A., & Oosterlaan, J. (2008). Neuropsychological measures probably facilitate heritability research of ADHD. *Archives of Clinical Neuropsychology*, 23 (5), 579-591. doi: 10.1016/j.acn.2008.06.002
- Saunders Wickes, K. N., & Ward, T. B. (2009). Creative cognition in gifted youth. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 381-396): Springer Netherlands.
- Schnur, R., & Marmor, S. G. (2009). Reading, writing, and raising the bar: Exploring gifts and talents in literacy. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 713-725): Springer Netherlands.
- Shavinina, L. V. (2009a). A new approach to the identification of intellectually gifted individuals. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 1017-1031): Springer Netherlands.
- Shavinina, L. V. (2009b). Scientific talent: The case of nobel laureates. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 649-669): Springer Netherlands.
- Shaw, P., Greenstein, D., Lerch, J., Clasen, L., Lenroot, R., Gogtay, N., . . . Giedd, J. (2006). Intellectual ability and cortical development in children and adolescents. [Research Support, N.I.H., Intramural]. *Nature*, 440(7084), 676-679. doi: 10.1038/nature04513
- Silverman, L. K. (2009). The measurement of giftedness. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 947-970): Springer Netherlands.
- Silverman, L. K., & Golon, A. S. (2008). Clinical practice with gifted families. In S. I. Pfeiffer (Ed.), *Handbook of giftedness in children* (pp. 199-222): Springer US.
- Stoeger, H. (2009). The history of giftedness research. In L. V. Shavinina (Ed.), *International handbook on giftedness* (pp. 17-38): Springer Netherlands.
- Taurines, R., Schmitt, J., Renner, T., Conner, A., Warnke, A., & Romanos, M. (2010). Developmental comorbidity in attention-deficit/hyperactivity disorder. *ADHD Attention Deficit and Hyperactivity Disorders*, 2 (4), 267-289. doi: 10.1007/s12402-010-0040-0
- Taylor, E. (2009). Developing adhd. *Journal of Child Psychology and Psychiatry*, 50 (1-2), 126-132. doi: 10.1111/j.1469-7610.2008.01999.x
- Vandervert, L. (2009). Working memory, the cognitive functions of the cerebellum and the child prodigy. In L. Shavinina (Ed.), *International handbook on Giftednes*. Springer: Canada.