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## USING TABLETS AND ASSISTIVE TECHNOLOGY TO SUPPORT CHILDREN AND ADOLESCENTS WITH ASPERGER'S SYNDROME: A LITERATURE REVIEW

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Summary of Report. The following report represents a literature review of how tablets (namely iPads) as well as assistive technology help to support children and adolescents with Asperger's Syndrome. Results of this literature review suggest that several professionals as well as mothers believe that there are both advantages and disadvantages to having children and adolescents with Asperger's Syndrome use iPads. The extant empirical literature also suggests that assistive technology is an effective method of improving the emotional recognition of children with Asperger's Syndrome. Limitations and implications of this literature are explored. This report concludes with future considerations.



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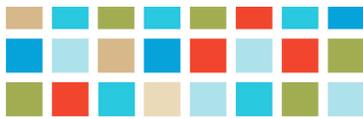
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## INTRODUCTION

### RESEARCH GOALS

To examine 1) the role of tablets (namely iPads) in the lives of children and adolescents with Asperger's Syndrome and  
2) how assistive technology is an effective technique for teaching emotional recognition skills in children with Asperger's Syndrome.

### BACKGROUND

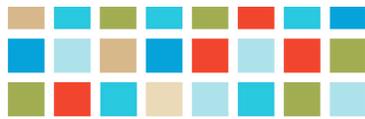
Presently, Asperger's Syndrome is included as disorder in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV-TR; American Psychiatric Association, 2000). Asperger's Syndrome is named after an Austrian pediatrician, Hans Asperger. In 1944, Dr. Asperger reported on four cases of children he observed in summer camp who displayed normal intelligence and language, but preferred to play alone and avoid social interaction (Lee & Park, 2007). As such, a deficiency in social interaction is one of the core features of Asperger's Syndrome (American Psychiatric Association, 2000). Included in this is a difficulty with social-emotional reciprocity as well as nonverbal communication such as facial expression, gestures, and eye contact.

Many professionals recommend that interventions be carried out in order to teach children and adolescents with Asperger's Syndrome social skills. One type of intervention that both professionals and parents have recently explored is the use of iPads in an effort to help improve these children's and adolescent's social skills. A second type of intervention that researchers have empirically tested is using assistive technology to teach children with Asperger's Syndrome specific social skills, such as emotion recognition abilities.

The purpose of this report is to conduct a literature review to explore how tablets (namely iPads) and assistive technology help support children and adolescents with Asperger's Syndrome.

Define Key Terms:

- **Asperger's Syndrome** Characterized by significant difficulties in social interaction, alongside restricted and repetitive patterns of behaviour and interests. Asperger's Syndrome is diagnosed using the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000). The DSM-IV criteria for Asperger's Syndrome is as follows:



A. Qualitative impairment in social interaction, as manifested by at least two of the following:

(1) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

(2) failure to develop peer relationships appropriate to developmental level

(3) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)

(4) lack of social or emotional reciprocity

B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

(1) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus

(2) apparently inflexible adherence to specific, nonfunctional routines or rituals

(3) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)

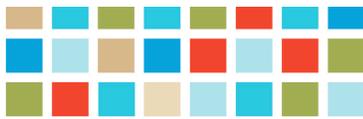
(4) persistent preoccupation with parts of objects

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood.

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia.



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- **Tablet** A portable computer that is smaller and weighs less than a typical laptop. Some tablets include fold out keyboards, while others, such as the Apple iPad have a touchscreen (Christensson, 2011).
- **iPad** A tablet computer manufactured by Apple. It is smaller than a typical laptop, but larger in size than the average smartphone. The iPad does not include a keyboard or a trackpad, but instead has a touchscreen interface, which is used to control the device (Christensson, 2011).
- **Assistive Technology** Specialized software and/or hardware that are used by people with exceptionalities to adapt how specific tasks can be performed (Christensson, 2001).

## METHODS

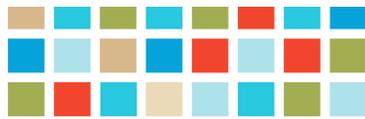
### SOURCES

To achieve the first research goal of this report, sources were obtained using two methods. First, a computerized search for empirical research was conducted of the PsycINFO database using combinations of the following keywords: "Asperger's Syndrome" "iPads" and/or "tablets." This search did not result in any relevant sources. Second, a Google search was performed using the same previously identified keywords. This search yielded 13 relevant resources. Eight of these sources were written by various professionals (i.e., speech-language pathologist, retired special education teacher) who either currently work or have worked with children and adolescents with Asperger's Syndrome. Five of the sources are from the perspective of mothers who have a child or adolescent with Asperger's Syndrome.

For the second research goal, a computerized literature search was conducted of the PsycINFO database using the following keywords: "Asperger's Syndrome" and "assistive technology." This search was limited to English peer-reviewed articles. This search yielded one relevant source.

## RESULTS/FINDINGS

Below is a list of website sources on the topic of Asperger's Syndrome and use of iPads. This list of resources is organized according to type of author. The first eight sources are written by various professionals who work with children or adolescents with Asperger's Syndrome. The



latter five sources are written by mothers who have a child or an adolescent with Asperger's Syndrome. A short summary of each source is provided.

- 1) <http://autismdigest.com/turn-your-ipad-into-a-wepad/>

This article is written by a speech-language pathologist, Kathie Harrington. Kathie discusses the benefits and drawbacks to using iPads with children who have Asperger's Syndrome.

- 2) <http://autismdigest.com/tablet-computers/>

This is an article by Dr. Temple Grandin. In this article, she explores the advantages and disadvantages of using iPads and other tablet computers for children on the Autism/Asperger's Spectrum.

- 3) <http://www.iballz.info/blogs/blog/6630670-ipads-and-autism-my-experience-and-app-recommendations-for-teaching-kids-with-developmental-differences>

This article is written by a retired special education teacher, Nancy Barth. She discusses the benefits of iPad applications for children and adolescents with Asperger's Syndrome.

- 4) <http://www.prweb.com/releases/2011/sosh/prweb8795906.htm>

This is an article about a pediatric psychologist, Dr. Mark Bowers who has released a social skills application, called Sōsh™ to help develop social skills in children and adolescents with Asperger's Syndrome.

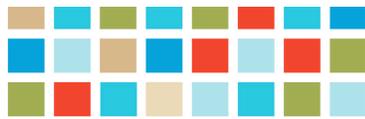
- 5) <http://otswithapps.com/2011/11/14/sosh-app-for-individuals-with-aspergers/>

This is written by an occupational therapist, Carol Leynse Harpold. This professional talks about a specific iPad application for adolescents with Asperger's Syndrome, the Sōsh™ application.

- 6) <http://tips2012.edublogs.org/tag/aspergers-syndrome/>

Dr. Jenny Lane writes about the Sōsh™ application for children who have Asperger's Syndrome.

- 7) <http://www.parentingaspergerscommunity.com/futureofaspergersreport.pdf>



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This document is written by David Angel, who is the founder of "Parenting Asperger's Community." This is a pdf document that identifies specific iPad applications that parents can use to help their children with Asperger's Syndrome.

- 8) <http://www.ipadsforeducation.vic.edu.au/userfiles/files/DEECD%20iPad%20support%20booklet%20for%20special%20education.pdf>

This is a link to a pdf document published by the Department of Education and Early Childhood Development in Melbourne, Australia in 2010. It is a guide to the use of iPads in special education.

- 9) <http://lynnes.wordpress.com/2011/03/01/ipads-for-aspergers/>

This blog is written by a mother who has a child with Asperger's Syndrome. In this entry, she explores the possibility of using an iPad for her child.

- 10) <http://www.bookroomreviews.com/2010/08/16/best-ipad-apps-for-autism-and-aspergers-syndrome/>

This article is written by a mother who has a child with autism. She identifies specific iPad applications that are relevant for helping children with Asperger's Syndrome develop certain skills.

- 11) <http://cardsasgifts.blogspot.ca/2011/09/ipad-applications-for-kids-with.html>

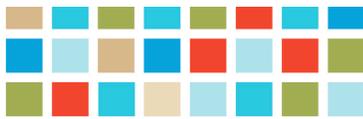
This is written by a mother who has a child with Asperger's Syndrome. In this article, she lists a number of iPad applications for children who have Asperger's Syndrome.

- 12) <http://www.myaspergerschild.com/2012/08/do-ipad-apps-really-help-families.html>

This is a video clip that features a mother who talks about the benefits of the iPad for her child.

- 13) <http://www.essentialbaby.com.au/forums/index.php?showtopic=939803>

This is a link to a forum where parents talk about the use of iPads for children with Asperger's Syndrome.



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A search on literature pertaining to Asperger's Syndrome and assistive technologies resulted in one study:

LaCava, P. G., Golan, O., Baron-Cohen, S., & Myles, B. S. (2007). Using assistive technology to teach emotion recognition to students with Asperger Syndrome: A Pilot study. *Remedial and Special Education, 28*, 174-181. doi: 10.1177/07419325070280030601

This study explored the use of assistive technology to teach emotion recognition to eight children with Asperger's Syndrome. Emotion recognition testing was conducted using a computer at pre and post intervention, lasting 10 weeks. Results indicated that after intervention, the sample of children improved on face and voice emotion recognition.

## CONCLUSIONS

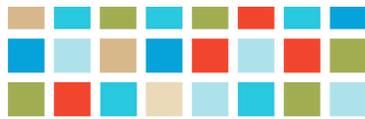
### GENERAL CONCLUSIONS

The findings of this literature review suggest that many professionals and mothers support the use of iPads for children and adolescents with Asperger's Syndrome. For example, professionals and mothers have asserted that the iPad allows children and adolescents with Asperger's Syndrome to practice important social skills that they often lack such as turn taking, greetings, salutations, and eye contact. However, both professionals and mothers have identified some pitfalls of using iPads with children and adolescents who have Asperger's Syndrome. For instance, Dr. Temple Grandin has suggested that the iPad should not be a replacement for real social interactions. Furthermore, mothers have voiced cautiousness in downloading free iPad applications as many of them have advertising banners that include inappropriate content.

The results from a study conducted by LaCava, Golan, Baron-Cohen, and Myles (2007) also suggest that assistive technology is an effective method of teaching emotion recognition to children with Asperger's Syndrome. As such, findings from this literature review imply that iPad and computer assistive technology interventions have the ability to positively support children and adolescents with Asperger's Syndrome.

### LIMITATIONS OF THE REPORT

This report is not meant to be a systematic review of Asperger's Syndrome, nor how tablets and assistive technology support children and adolescents with Asperger's Syndrome. Rather this report represents a preliminary review of the extant literature in this area.

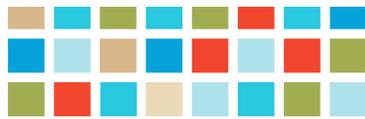


### **IMPLICATIONS OF THE FINDINGS**

The findings of this review may help professionals who work with children or adolescents who have Asperger's Syndrome make a decision about whether or not to implement an intervention findings are also of relevance to parents who have children or adolescents with Asperger's Syndrome as it may help them decide whether or not to purchase an iPad or inform them on how to use an iPad so that their children or adolescents receive the greatest benefits. Furthermore, the results of LaCava et al.'s (2007) empirical research study may help professionals when making recommendations for interventions for children and adolescents with Asperger's Syndrome. In addition, these results may also inform parents' decisions about whether or not they wish to enroll their children or adolescents in similar research studies.

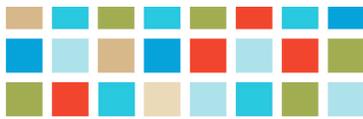
### **FUTURE CONSIDERATIONS**

This report uncovered a lack of empirical research on the use of tablet computers (namely iPads) to support children and adolescents with Asperger's Syndrome. As such, future empirical research in this area is warranted. Furthermore, longitudinal research is necessary in order to uncover the long-term outcomes of using iPads. In addition, although professionals' and mothers' perspectives are plentiful, fathers' and other caregivers' perspectives regarding the use of iPads are needed. Developmental considerations are also required in order to distinguish between the needs of children and adolescents when using iPads. Finally, more empirical research needs to be conducted on the effective of assistive technology on improving the social skills of children and adolescents with Asperger's Syndrome.



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Available online at <http://cardsasgifts.blogspot.ca/2011/09/ipad-applications-for-kids-with.html>

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Lynne (2011). iPads for Aspergers. Available online at

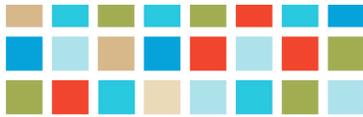
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