# Critical Review:
# Is the integration of mobile device apps' into speech and language therapy effective clinical practice?

Julie Sidock
M.Cl.Sc. SLP Candidate
University of Western Ontario: School of Communication Sciences and Disorders

This critical review examines literature currently available on the implications of integrating specific applications (Apps') for mobile devices (namely for the iOS platform used with the iPad/iPod/iPhone) into speech and language therapy, home programming and as an augmentative or alternative communication (AAC) device. As this area of practice is in its infancy, the predominant level of evidence found in the available literature was expert opinion. Results of the literature reviewed provide some encouraging information as well as potential cautions for integrating this type of technology into the practice of speech-language pathology.

## *Introduction*

Portable electronic devices, such as the iPad (or any iDevice using the iOS platform), have altered the way in which we interact with the world in general (e.g. with work and social interactions). It was inevitable that this culture shift would start to seep into the world of speech and language therapy.

More and more clinicians are reporting the use of iPads in speech and language therapy (Wakefield & Schaber, 2011). The iPad's enormous success in therapy is partly due to the nature of our work (in speech-language pathology): play based learning (DeCurtis and Ferrerr, 2011). This environmentally friendly and engaging therapy tool would lend itself well to therapy with a child that is hard to engage or motivate while working on a variety of therapy goals.

Alas, with the booming increase in accessibility and affordability of the iOS platform, a concern has arisen that many clinicians, educators and other potential consumers of AAC and speech-language therapy will begin using Apps as a quick and easy fix (Gosnell, 2011). Many Speech-Language Pathologists (SLPs) and other professionals who are using mobile Apps in therapy report that their selection process is typically driven by word of mouth, online consumer reviews, and the cost, or lack there of, of an App, rather than an evidence-based approach (Gosnell, Costello & Shane, 2011). This brings focus to the fear that clinicians may start fitting clients to specific Apps and/or devices rather than fitting an App and/or device to the client.
Wakefield and Schaber (2011) identify four types of Apps for therapy (1) specifically designed for intervention skills, (2) repurposed-used for intervention but not original intent of the App, (3) motivation or incentive, and (4) tracking data.

In the area of AAC specifically, mobile devices provide diverse opportunities that extend beyond the capacity of current AAC devices and at a significantly lower cost. As the iDevices are well known and common place, their use can also reduce the stigma of using a communication device (AAC-RERC, 2011). Also, as the general public is becoming more aware of AAC, people may be quicker to consider this welcomed innovation in a more familiar and accessible platform (MCG, 2011). AAC professionals feel concerned about their ability to keep up with technology and the rapid proliferation of communication Apps, as well as perhaps a "premature" movement away from more familiar dedicated AAC devices (AAC-RERC, 2011). Some concerns with the use of communication Apps are: the potential loss of technical support, lack of quality control, less customization, costs in monthly service agreements and abandonment if devices do not live up to expectations. (MCG, 2011)

The concept of using mobile devices in therapy is still in its infancy but is rapidly growing as an area of interest to SLPs and the general public. Although there is a plethora of blogs and googledocs available with information on Apps (AAC-RERC, 2011), this is an area that has created an urgent, unmet need for quality research and development. There is limited evidence that demonstrates the efficacy of mobile technologies in speech and language therapy and AAC Apps. As SLPs, we are in uncharted waters and need to respond by providing guidance to our clients and their families, and by identifying a new framework for our roles in this new world of easily accessible technology (AAC-RERC, 2011).

### *Objective*

The objective of this paper was to critically evaluate existing literature on the effectiveness of integrating mobile applications, specifically on the iOS platform, into speech-language therapy and using them as a form of AAC.

### *Methods*

Search Strategy

Computerized databases including, Google Scholar, PubMed, and PSYCinfo were searched using the following search terms: (iPad) AND (speech language therapy) OR (communication therapy) OR (augmentative communication) OR (language therapy); (mobile Apps) AND (speech language therapy). Reference lists of articles found were manually searched for further studies relevant to this critical review.

As this topic is in its infancy, several professionals were e-mailed in order to acquire difficult to access information. As such, power point presentations and online professional courses were included to represent expert opinion evidence.

Selection Criteria

Articles selected for inclusion in this critical review were required to address the use of specific applications for mobile devices in terms of a speech-language therapy supplement or as an AAC device alternative. Contributing research was also included, i.e., research that does not have a speech-language therapy focus but could be applied to the general area of using iDevices for educational purposes.

Data Collection

Results of this literature search yielded the following reports: one online professional course and supporting research studies (six expert opinion pieces and two qualitative research designs).

### *Results*

Expert Opinion Articles

Gosnell, Costello and Shane (2011) acknowledge that it would be impossible to conduct a comprehensive review of all the communication Apps' that are currently available. Therefore, they proposed a clinical approach for selecting mobile communication Apps' which is based on a framework proposed by the authors/clinical researchers in 1994 for selecting AAC tools and strategies and has been adapted to the selection of Apps. The four-step process proposed was as follows:

*1) Identify person's strengths and needs (current and future) and match to most appropriate tools and strategies. If assessment outcome supports consideration of iDevice platform as primary or secondary communication tool, continue.*
*2) Clinician must have knowledge of available communication Apps and be able to compare features of communication Apps.*
*3) Clinician feature matches the person's needs and strengths to the specific features of all available communication Apps. The article defines 11 categories of features to consider when comparing and selecting Apps.*
*4) Functional evidence based clinical trial is conducted to further assess the appropriateness of selected App(s).*

In addition to reviewing the framework, the application of the framework to several cases is presented. The framework is reviewed in sufficient detail, is logical, and clinically applicable. However, it does lack an empirical evidence base, which is reasonable given the current stage of research in this area. One strength is the application of the framework to several typical cases.

Although the guidelines are clear and rational, questions remain if this would be realistic in a typical clinical setting (i.e., while dealing with time restraints and large caseloads etc.). This concern is primarily focused on steps 2 and 4. Staying current with all Apps available is a daunting task for anyone - including busy professionals - and is not helped by the fact that the iTunes store does not have any organization to speak of when searching speech and language related Apps. As for step 4, the authors suggest that the SLP go out into the real world to trial all Apps', which may be difficult for the average clinician to fit into their busy caseloads.

Gosnell (2011) provides a discussion of the issues related to the use of Apps in therapy. She draws on her own clinical experience to raise related issues. In particular, Gosnell raises professional issues related to the selection and clinical use of Apps and outlines many specific speech and language goals that can be addressed with various Apps. She cautions SLPs to not abandon their traditional methods of goal selection by suiting the client to a specific App, rather than finding an app that suits the client. Gosnell also encourages others to not only use dedicated applications for therapy but to also creatively adapt well designed Apps that offer motivating and fun learning opportunities and provides examples of such adaptations.

As Gosnell's discussion is based on her work in an Augmentative Communication Program, this article is considered expert opinion. Its content can be considered suggestive and could be used as a resource for clinicians

when developing therapy activities for specific client goals.

DeCurtis and Ferrerr (2011) collectively released articles discussing the use of mobile Apps' with preschool children with communication delays. Also, using mobile technology as a conduit for learning interactions was discussed with an emphasis on technology remaining secondary to the interactive learning process with an adult. Within both of these articles the authors provide "The 7 P's of Using Mobile Technology in Therapy" to consider while trying to maximize using a device with young children in therapy. These were developed from DeCurtis and Ferrerr's "anecdotal experience" of what factors have contributed to positive treatment outcomes.

These principles are as follows:
*1) **Preparation:** What is the rationale for integrating a mobile device with a child versus traditional toys alone?*
*2) **Participants**: What is the child's age and developmental level and should this device be used individually or in a group?*
*3) **Parameters**: How much time will be spent integrating the device and which environments will yield the best results?*
*4) **Purpose**: What is the advertised purpose of the App and how can it meet your client's individual goals?*
*5) **Positioning**: What are the effects of sitting side-by-side versus face-to-face and would the child prefer to be at the table or on the floor or on a lap?*
*6) **Playtime:** How will you incorporate the child's preferred style of play with the device and how will you experience shared enjoyment?*
*7) **Potential:** How will you extend and expand the learning gained from using an App to real-life experiences? Where will you and the family anchor the knowledge gained from the App to what the child already knows?*

These articles also provide beneficial strategies for SLPs and parents to use when integrating mobile technology, which they identified after a year of integrating a tablet into their own therapy practices with young children and their families. Several of which are listed below:

- Before introducing the visual stimulation of the device, gain the child's auditory attention (i.e., facing the device away from the child and have them listen).
- Hold the device by your face to gain the child's attention. The similar size of the tablet allows for easy switching of attention between the adult and the device.
- When demonstrating an App, ensure the child is not touching the device so that they can truly focus on observing and processing the adult's actions.
- Look for ways to extend interactions by a variety of means (e.g., adding another direction from the App that it didn't offer, such as story retelling).

The authors caution that, even though the iPad can be very engaging to a child and can act as a valuable learning tool, this type of technology can also foster a habit of surrendering these devices to children for independent learning. "It is the quality, not the quantity, of time that is powerful" (pg.7) Also, there are going to be clinical cases for which using mobile Apps will not be the most beneficial course of action for a child. Although these articles have ecological validity as they are based on experience with the therapeutic use of Apps, there is no supporting empirical data. Therefore, the content is suggestive and could be viewed as a starting point for future research in this field.

AAC-RERC (2011) white paper was intended to raise issues related to mobile technologies and AAC Apps. The content was developed following interviews with 25 AAC "thought leaders" representing multiple steak holders via phone, e-mail and skype between January and March 2011. The authors addressed this topic from several perspectives, which are: perspectives from the field; consumer issues; service delivery issues, AAC industry issues, development issues, research issues and advocacy issues.

The take home message from this piece is that the goal of AAC has always been about communication and not the device or technology. It is important to keep a holistic perspective of AAC. There is a very real danger of succumbing to the media's obsession with smaller, faster and more powerful devices and ignoring other features that are critical to successful use of AAC, such as customizability, learnability, durability and supports for training.

This article can be considered suggestive as it presents a variety of perspectives with high ecological validity in that all participants are currently engaged, in some way, in the area of AAC. However, the criteria of how one would be included in this group of thought leaders, or of which professional background they are, were not included in this article.

<u>Professional Online Course</u>
Wakefield and Schaber (2011) employed an online course format in an expert opinion presentation aimed at continued education for SLPs. Within this presentation,

the authors apply a five-step evidence based practice approach to the review of Apps. They demonstrated working through this process with a clinically relevant example. In addition, they presented the findings of their pilot survey research, which asked SLPs how they select their Apps for their practice. Results indicated that SLPs rely on recommendations from other SLPs, App reviews, descriptions by developers, and trial and error/ like-dislike.

Wakefield and Schaber provide a basic review of evidence-based practice approaches as they apply to Apps. The application to a typical case has ecological validity but lacks empirical support. The results of the survey are summarized descriptively, however, the demographics or number of clinicians who complete this survey were not included in the presentation. This presentation can provide clinicians with foundational guidelines for investigating the use of Apps in therapy rather than providing specific evidence regarding their effectiveness.

Contributing Research

The Michael Cohen Group (MCG) (2011) conducted a qualitative research study to explore young children's and their caregivers' perception and use of touch iPads and Apps. It was intended to increase understanding of the iPad's potential for use as an educational tool by young children. All of the children in this study were presumably typically developing so the results may not generalize to a population of children with communication disorders. The following are the reported findings:

- The iPad's touch screen provides easy access and allows for sustained engagement;
- Young children explore and learn in ways that are natural to them (touch, repeat, trial and error, making silly things happen);
- Overall, children are enthusiastic about iPads. However, the device alone does not guarantee engagement and learning;
- iPad access and use are relative to the design of the App interface, game experience and the fit between App content and the child's developmental level.

The subjects of this research were 60 children, aged 2-8 years old (29 boys and 31 girls) and their parent(s)/caregiver(s). The data were collected by one-on-one in depth interviews and structured observations with the children. Also, caregiver survey questionnaires were completed and caregiver focus group interviews were conducted. One weakness noted was that the questionnaires were not completed by all of the parents and that only half of the parents participated in the focus group interviews.

The study was conducted in two phases. Phase One was completed with children at a research facility, with equal numbers of experienced and novice touch screen users (determined by a pre-interview survey about family's media and technology ownership and usage, focused on touch screen devices and Apps). Phase Two was conducted with children two-to-eight years old in schools that serve low-income children. The data was obtained and analyzed by MCG research professionals. No statistics were provided in the study and the children were considered one large group despite the gender differences, differing experience with touch technology and varying SES (socioeconomic status).

This study is a much-needed piece of empirical evidence regarding the use of iDevices as learning tools for children. As previously mentioned this study was conducted with (presumably) typically developing children and cannot be readily applied to children with communication disorders. However, it can be used as a foundation for further research, perhaps with a larger and more diverse sample group.

De La Cruz (2011) conducted a small survey study in a special education school district to investigate the impact on the devices' on student performances. Four teachers with prior experience were provided with 3 iDevices for use in the classroom, as well, four non-classroom teachers (an SLP, an intervention specialist, a program supervisor and a vocational coordinator) were provided one iDevice to use in their support services. Staff feedback provided data on when and how the tools were being used (time of day, size of group, goal of task) and on student performance in the areas of behaviour, accuracy, motivation and independence. A total of 136 data sheets were collected between March and June of 2011, 5% of which were from a high school teacher and 36% concerned traditional tools. Descriptive statistics were presented regarding device use with respect to time of day, group size, goal, and impact. Qualitative descriptors were presented thematically. Of particular importance to the present study were findings indicating higher teacher ratings of student performances (particularly in terms of motivation and time on task) when using an iDevice than traditional tools to support instruction.

This study has high ecological validity in that all participants were currently engaged in student teaching in some way. As well, individual participants were able to select Apps to match their job functions. Nevertheless, the study involved few participants, the diagnoses and teaching needs of the students involved were not described, and the results are largely based on impressions rather than direct measures of student

performance. Overall, this study provides suggestive evidence that the use of iDevices in the classroom is an effective teaching tool.

### *Discussion & Conclusion*

Apps represent something large and important: the advent of a mobile technology paradigm that may just be as significant as the birth of the worldwide web (Gosnell, 2011).Apps are just the beginning of a social and technological transformation that will have major impacts for years to come. SLPs and other health professionals will be affected more and more by the growing popularity of Apps and by the ease of which clients and their families can access information on Apps. Families are going to have questions and it is the professional's responsibility to be educated on what technology is available and on the benefits and draw backs of their use(s).

It seems as though Apps have the potential to contribute to efforts by SLPs to assist their clients, particularly in terms of engagement and motivation to participate in therapy. However, the question remains, will these improvements in behaviour and motive continue to be observed or will the effects of the iDevice wane with additional exposure. Although it seems inevitable that empirical research will be conducted in the future to provide insight into the efficacy of using mobile Apps in therapy and as communication devices, there is still no strong evidence that suggests it is equal or superior to traditional tools and devices. Therefore, any application of the above information should be done with much caution and with the best clinical judgment of individual clinicians.

That being said, mobile Apps hold a world of potential for SLPs as the only constraint in their development is their designer's imagination. Apps can be used as a key tool in the SLPs' intervention arsenal, but cannot take the place of a clinical professional or a parent/caregiver.

### *Clinical Implications*

The following is a collection of suggestions for SLPs that were presented in this paper for using Apps as a therapy supplement in the area of speech-language pathology:

- iDevices are motivating and engaging for young children compared to traditional tools.
- It is the professional's responsibility to stay current with what Apps are available, to follow evidence-based guidelines when selecting and comparing Apps, to abide by traditional goal selection methods, and to fit the App to the child rather than fitting the child to the App.
- When using Apps, always consider the rationale for using an App opposed to traditional tools, the purpose of the App and how you will extend and expand the learning gain from an App to real life experiences, how long you will present the device and how (i.e., positioning.
- Clinicians should consider creatively adapting Apps to help meet their therapeutic goals.
- iDevices and Apps can not replace the clinical professional or the parent/caregiver, rather they can act as conduits for learning interactions. iDevices are not ideal for independent learning, as the device alone does not guarantee engagement and learning.
- In terms of AAC, it's important to focus on the client's strengths and needs to judge if an iDevice is appropriate and when considering the features of potential communication Apps. Try not to be blinded by the relatively inexpensiveness and wide availability when selecting an iDevice for your practice.

### *References*


AAC-RERC. (2011, March). *Mobile devices and communication apps*. Retrieved from http://aac-rerc.psu.edu/index.php/pages/show/id/46

DeCurtis, L. L. and Ferrer, D. (2011). Maximizing Mobile Technology with Toddlers and Preschoolers. Retrieved from http://pampclub.org/site/2011/07/01/maximizing-mobile-technology-with-toddlers-preschoolers/

DeCurtis, L. L. and Ferrer, D. (2011). Toddlers and Technology: Teaching the Techniques. The ASHA Leader.

De La Cruz, C., F. (2011). iTechnology Pilot Study Outcomes. Northern Suburban Special Education District. Retrieved from http://www.delicious.com/tonyvincent/research+ipodtouch

Gosnell, J. (2011). Apps: An Emerging Tools for SLPs: A plethora of apps can be used to develop expressive, receptive, and other language skills. *The ASHA Leader.* 16 (12), 10-13.

Gosnell, J., Costello, J., and Shane, H. (2011). Using a Clinical Approach To Answer "What Communication Apps Should We Use?". *Perspectives on Augmentative and Alternative Communication.* 20(3), 87-96.

Michael Cohen Group LLC (2011). Young children, apps and iPad.

Wakefield, L., and Schaber, T. (2011). Selecting apps for therapy. Speechpathology.com