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Using a Clinical Approach To Answer “What Communication Apps Should We Use?”

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Abstract

It would be impossible (and not the intent of this paper) to conduct a comprehensive review of every communication application (app) that exists as of this writing. Rather, a clinical framework for comparing and selecting apps will be offered to assist speech-language pathologists in answering the popular question “What communication apps should we use?” While this platform and certain apps may indeed represent a reasonable match to the strengths and needs of some individuals, it is important that the needs of an individual be considered on a case-by-case basis using a thorough and clinically based approach. To this end, the clinical application of a chart detailing features believed to represent critical and fundamental considerations for a broad profile of people evidencing complex communication needs will be discussed and highlighted through case examples.

Because of the zeitgeist surrounding the iDevices (Apple’s iPhones, iPods, and iPads) and their applications (apps), speech-language pathologists (SLPs) now are being confronted by families asking “What apps do we use?” or directed to “make this work.” Although the interest in the potential of apps and iDevices can assist in bringing non-professionals on board with augmentative communication supports, this approach runs the risk that well-meaning parents and professionals will make decisions without sufficient experience or clinical judgment and knowledge (including awareness of language abilities or needs, other assistive communication device options, the differentiating features of apps, etc.). Surely, the greatest harm of a faulty clinical decision is the time wasted learning or attempting to learn to use an inappropriate communication technology. To this end, parents and many clinicians are part of the hype, making purchases of mobile technology and apps without clinical evaluations or trials. The app hype is infused in mainstream media outlets with headline-grabbing statements like “App gives special needs users a voice” (Perets, 2010), “iDevices are life changers” (Bascaramurty, 2010), and “iPhone App opens world” (Nojiri, 2010). Gravitytank Researchers (2009) summarize the enormous impact of mobile technology on the world in general and the effect such technologies are having on the AAC/AT world specifically

Apps are poised to have a dramatic impact in a wide range of fields, from education to health care to retail and financial services....[Apps] represent something large and important: the advent of a mobile technology paradigm that may just be as significant as the birth of the web...[Apps] are just the beginning of a social and technological transformation that will have major implications for years to come.

Feature Matching

The opportunities offered by this new wave of technology and its significance on mainstream applications are stunning. At the same time, the unparalleled popularity of the platform coupled with the impressive speed with which apps (including those specifically designed to augment communication) are being produced has resulted in many practitioners forgoing, or at least temporarily suspending, established clinical assessment strategies. We submit that selecting the most appropriate AAC system (including hardware, software, and intervention strategies) is the result of a systematic process by which a person's strengths, abilities, and needs (current and future) are matched to available tools and strategies, a process often referred to as feature matching (Shane & Costello, 1994). Nearly two decades ago, these clinical researchers provided a framework for clinical decision making based on a set of rules and pertinent questions for selecting AAC tools and strategies rather than guesswork, media coverage, public testimonials, or recommendations from well-meaning friends and family. If the feature match process supports consideration or acceptance of the iDevice platform, the decision would result from a careful consideration of the individual's strengths and needs matched to the feature set offered by the iDevice and its supporting apps. As part of this process, two primary questions always should be asked, "were the iDevice platform and accompanying apps determined through a thorough clinical feature matching process?" and "are we fitting the person to the iDevice and communication app or are we fitting the person systematically to the iDevice?"

Being Current

In order to properly select or rule out apps for a potential user, the prescribing clinician must be aware of the available technology and think critically about making a clinical match that aligns with the needs of the AAC candidate. Navigating the ever-growing maze of mass-market applications poses new clinical challenges and responsibilities. As of January 22, 2011, the 10 billionth app was downloaded from Apple App Store. Further, Tables 1 and 2 (compiled from www.apple.com) illustrate a dramatic yearly increase since January 2009 in the number of available apps and the number of downloads.

Table 1. Apps Available in App Store

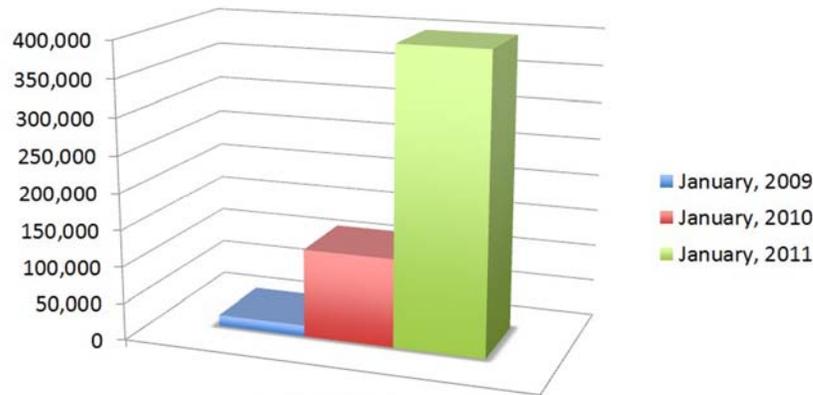
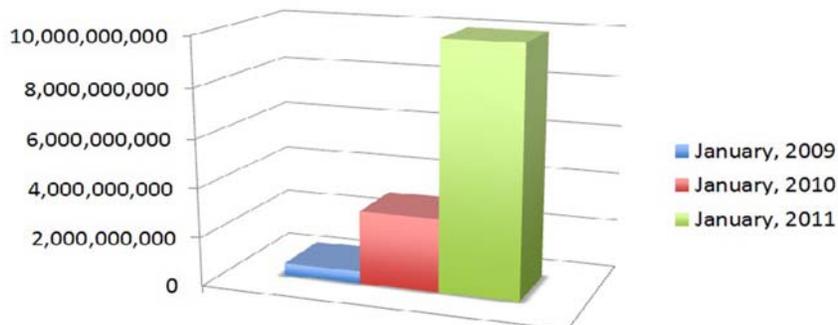
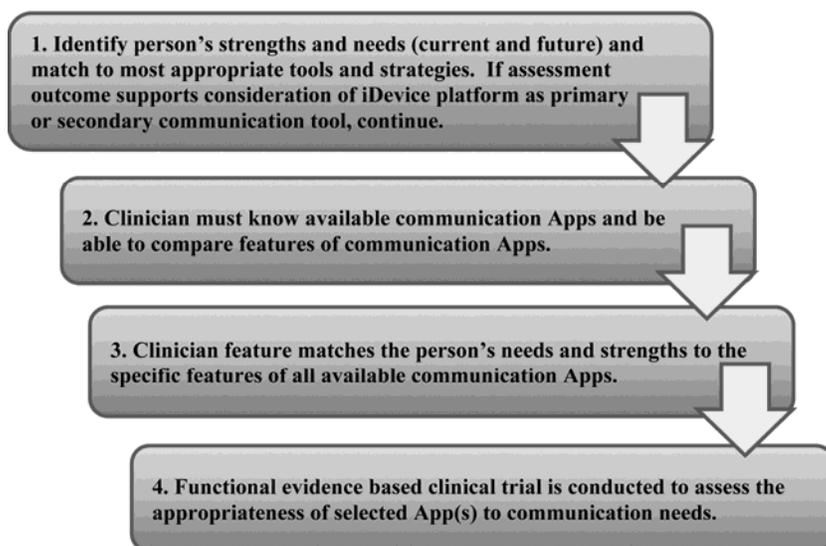


Table 2. Apps Downloaded to Date



Over 110 communication applications (Farrall) are now available from the iTunes App store, a dramatic increase when compared to only three communication apps available in April 2009. As new apps enter the market, we want consumers to become more knowledgeable as to what options exist and then provide ways to help them make informed purchase decisions that best support communication (RERC white paper). Websites, blogs, and Google documents seem to be a common source of compiled apps (Spectricsinoz), and often can be used as a first step to acquiring information about available apps. Yet informed purchase and proper decision making requires multiple components and not just making a selection after learning that a number of people use a particular app. Figure 1 presents a flowchart (Gosnell, 2011), detailing the clinical process SLPs might consider employing to make an informed communication app purchase based on the application of the feature matching process from Shane & Costello (1994). The clinical process begins by identifying a person's strengths and needs during the assessment. If the outcome of that process points to the iDevice platform as a clinical match, then the feature matching process continues forward to the selection of appropriate communication applications. When selecting the proper communication application, the clinician needs to be aware of available apps and be able to compare and analyze a set of features that make up that application. In a very real sense it is a process of considering the essential features of one app compared to another. The process advances to the feature matching phase, where the needs of the individual (e.g., increased typing efficiency) are compared to the specific rate enhancement features of available communication apps (e.g., word prediction). Lastly, the app should be observed in real-world settings to ensure the individual is able to use the app to achieve functional communication. This step should precede any actual purchase.

Figure 1. Process to Making an Informed iDevice/App Purchase



Clinical Features

It would be impossible to conduct a comprehensive review of all of the communication apps that exist as of this writing or all of the extensive iDevice features that might have relevance as a communication application. Rather, a clinical framework for comparing and selecting apps will be offered. Table 3 is a chart that details features believed to represent critical and fundamental considerations for a broad profile of people evidencing complex communication needs. Along the horizontal axis, features are broken down into 11 main categories. An additional “customization” column indicates when customization options affect components of the features (such as the capability to import personal photographs as a customization component of the “representation” category). The 11 categories include

1. Purpose of Use: Was the App created for the purpose of expressive, receptive, and/or organization?
2. Output: The type of speech (or no speech) produced when using the communication application.
3. Speech Settings and Customization of Speech Settings: These include volume, pitch, rate, and options for when the device speaks out loud. Examples include speak after word vs. speak after message selection.
4. Representation and Customization of Representation: This includes icon/symbol options within the App (e.g., Symbolstix, photographs, PCS). Customization of the representation is the ability to import and modify your icons.
5. Display and Customization of Display Settings: Display features include layouts (e.g., choice boards vs. scene-based displays) and if the app includes dynamic vs. static features. Customization options include changing sizes of symbols, the font, color, and borders.
6. Feedback Features and Customization of Feedback Features: Feedback features are add input when an icon is presented (e.g., highlight/zoom/enlargement of an icon, auditory review) or when an icon is selected (e.g., tactile /vibration feedback). Customization options include the ability to turn them on or off.
7. Rate Enhancement and Customization of Rate Enhancement: Rate enhancement features are strategies to increase the rate of communication output to increase

efficiency (e.g., word prediction, abbreviation expansion, recently used lists, grammar prediction). Customization options include the ability to turn them on or off.

8. Access and Customization of Access: Access is how the user interacts with the device (e.g., direct selection, pointer, scanning). Customization options include includes assistance with access (e.g., dwell).
9. Required Motor Competencies: The user must possess certain motor abilities in order to interact with the app (e.g., pinch and/or swipe).
10. Support: Support covers resources that help users and those who support them learn about the app and resolve technical issues.
11. Miscellaneous and Customization of Miscellaneous: Options relate to e-mailing, texting, Web-based editing.

It should be noted that features listed may not exist currently in apps. This reality highlights the importance of matching a person’s needs to the right tools and trying not to fit a person to a specific platform or app. This chart is dynamic, changing both with apps and features as new clinical solutions continue to be available and as technology and innovation further develop and change. Several contemporary communication applications are listed along the vertical axis, including Proloquo2go, Grace, Assistive Chat, Sounding Board, and Speak It.

Table 3. Chart detailing selection features with example of app comparisons. Note: For formatting purposes, a portion of the chart is represented in this article. The entire chart (including all of the features and definitions of the features) will be downloadable at the Children’s Hospital Boston’s website www.childrenshospital.org/acp after October 3, 2011.

Apps	Purpose of Use ⁽¹⁾			Output ^(1,2,5)						Speech Settings						CUST. Of S.S.			Representation ^(2,3,4)									
	Expressive	Receptive	Organizational	Digitized	Synthesized	male	female	child	Multiple languages	No Voice Output	Voice Recognition	Voice Recording	Temporary Volume	Pause Speech	Speak after letter	Speak after Word	Speak after Punctuation	Speak upon selection	Speech to symbol dictate	pronunciation	adjust speech rate	customize speak after	PCS	Symbolstx	Photographs	Clipart	Minspeak	Text
Proloquo2go	x	x			x	x	x	x							x					x	x	x		x				x
Grace	x	x							x															x	x			
Assistive Chat	x				x	x	x		x						x		x				x	x						x
Sounding Board	x	x		x							x														x	x		
Speak It!	x				x	x	x		x									x		x								x

Clinical Application of the Chart

After applying the schema to five communication applications (Proloquo2go, Grace, Assistive Chat, Sounding Board, and Speak It!), the applications can be compared using the chart provided in Table 3. During assessment, an SLP will identify the individual’s needs. For example, client A needs a device for expressive purposes, male voice output, and the support of photographs. These needs translate to key features when comparing apps. Was the app created for expressive communication? If the answer is “yes,” the app is not ruled out. All five communication applications in Table 3 are created for expressive communication; therefore, no apps were ruled out. Continuing with client A’s needs, similar questions will be asked and applied. Does the app have voice output and a male voice? Grace does not and Sounding Board

does not unless a male voice is available to record custom messages; thus, these apps are ruled out. Does the app support use of photographs? Assistive Chat and Speak It! do not and, therefore, are ruled out. The answers to specific clinical questions will reduce the field of apps until a final app or apps are identified. In the case of client A, the SLP would have ruled out all the app choices except Proloquo2go. The clinician would then observe client A's use of the app to determine whether to recommend purchase.

Case Examples

Two cases illustrate application of the assessment process summarized in Figure 1 and use of the feature matching process/chart in Table 3. These examples were selected because they highlight several potential app recommendations and different uses of the iDevice platform. The case illustrations then are summarized with pertinent information gathered during the assessment following the logic of Tables 4 and 6. The information gathered during the assessment is identified and applied to key app features—a narrowed selection of features that should be assigned the highest priority as indicated in Table 4 and Table 6. The key features then are broken down and compared to a select number of apps as are indicated in Table 5 and Table 7.

Case 1: Critical Features Pertaining to Ronan, a 3-year-old boy With Perinatal Ischemic Stroke

Table 4. Key needs/features based on assessment outcomes

	Information Gathered During Assessment	Key Features Based on Information Gathered During Assessment
Representation	<ul style="list-style-type: none"> Recognizes and can make choices using familiar photographs Inconsistently using PCS icons 	<ul style="list-style-type: none"> Photographs Ability to import photographs
Display Settings	<ul style="list-style-type: none"> Was not able to navigate dynamic displays Used grid-based topic display in Go-Talk successfully Benefited from symbol spacing 	<ul style="list-style-type: none"> Static displays (basic dynamic component) Edit field and symbol size Edit symbol spacing Hide buttons
Access/Motor	<ul style="list-style-type: none"> Inconsistently producing an isolated point Keyguard reduced unintentional selections 	<ul style="list-style-type: none"> Adjust dwell Edit symbol size and spacing Direct Selection
Purpose of Use	<ul style="list-style-type: none"> Preference indication Aided language stimulation opportunities (expanding beyond requesting and modeling 2 symbol combination) Social engagement (turn-taking, sharing information) 	<ul style="list-style-type: none"> Expressive tool Voice output (digitized or Synthesized) A Go-Talk was recommended. In order for carry-over and consistency of targeted skills, boards should be as similar as possible Boards with the ability to expand beyond choice-making

Assessment findings for Ronan, summarized in Table 4, include the need to use photographs and the ability to customize and import personal photographs; this relates to representation and customization of representation categories of the chart (Table 3). In addition, this child did not demonstrate the ability to use the dynamic features of a device in order to navigate and did best with a reduced field size with symbols spaced apart. This relates

to the display settings category of the chart (Table 3). Regarding motor and access, Ronan was using direct selection. He would benefit from the ability to change/increase dwell due to motor control issues and greater target spacing on the display, findings that relate to display, customization of the display, and access/customization of access categories of the chart (Table 3). Last, the purpose of the app was for expressive communication and social participation; therefore, voice output was needed. Whether the voice choice was digitized or synthesized was not a determining factor.

Ronan’s family had previously purchased an iPad and indicated a strong desire to use it for purposes of communication. The SLP recommended use of a Go-Talk in the pre-school setting and a Step-By-Step in the pre-school setting and to share information between home and school, expanded use of photographs for requesting, and use of basic toy displays to engage Ronan in and model communicative intents such as , directing and commenting. The iPad was recommended for direct instruction and aided language stimulation.

For the purpose of applying the logic of the chart, eight applications were selected (e.g., Sounding Board, Proloquo2go, Assistive Chat) and compared to the app features found to be critical (expressive tool, use of photographs, ability to edit the field size on a horizontal axis). The appropriate column was marked on the chart if the app contained a desired feature. The app ultimately having the greatest number of features was selected for trial. In Ronan’s case, Sounding Board (created by Ablenet) was selected as the most appropriate communication app, because the available features best matched Ronan’s identified needs (see Table 5).

Table 5. Ronan’s key features compared to eight communication apps

	Expressive	Digitized	Synthesized	Photographs	Import own photographs	Static board	Choice Board*	Edit field size	Edit symbol size	Direct selection	Adjust dwell	Hide buttons	Symbols Spaced apart	Rule Out Factors
Assistive Chat	X		X											No photographs
Grace	X			X	X		X			X			X	No voice output and Request based app
iCommunicate	X	X		X	X		X			X			X	Limited ability to edit field size and symbols
My Choice Boards	X	X		X	X	X	X			X			X	Choice focused, limited ability to create topic displays
Proloquo2go	X		X	X	X		X	X	X	X		X	*	Although all Apps have the ability to customize the displays, Ronan does not need an app that is dynamic (therefore the add cost is not worth the money)
Touch Chat	X	X	X	X	X		X	X	X	X		X	X	Same as Proloquo2go
My Talk	X	X	X	X	X	X	X	X	X	X		X	X	Same as Proloquo2go
Sounding Board	X	X		X	X	X	X	X	X	X		X	X	

Table 6. Key needs/features based on assessment outcomes

	Information Gathered During Assessment	Key App Features Based on Information Gathered During Assessment
Representation	<ul style="list-style-type: none"> • Text 	<ul style="list-style-type: none"> • Text
Rate Enhancement	<ul style="list-style-type: none"> • Doesn't want to "write every letter out" 	<ul style="list-style-type: none"> • Word prediction • Abbreviation expansion • Logical letter encoding • Ability to store phrases/retain codes
Display Settings	<ul style="list-style-type: none"> • Was able to navigate dynamic displays • Wants something with "little set up" • Able to use QWERTY keyboard • Increase font size 	<ul style="list-style-type: none"> • QWERTY Keyboard • Increased font size
Access/Motor	<ul style="list-style-type: none"> • Able to type on iPad and other devices • No current motor issues (could potentially have motor issues in the future) 	<ul style="list-style-type: none"> • Adjust dwell • Edit icon size and spacing • Direct selection • Indirect access method (motor issues may be a factor in the future)
Purpose of Use and Patients "requests"	<ul style="list-style-type: none"> • Communication in multiple contexts • Wants voice output and a female's voice 	<ul style="list-style-type: none"> • Synthesized speech (voice output) • Female voice • Adjust rate • Speak after selection

Case 2: Critical Features Pertaining to Nancy, a 69-year-old Woman With Bulbar ALS

In Nancy's case, the iPad meets most of her communication needs, serving as her primary communication system. During the AAC consultation, the SLP also recommended use of pen and paper (for written messages) and a low-tech alphabet board. The iPad will be her primary tool, largely due to the voice output, ability to pre-store messages, and word prediction (enhancing the rate of communicative interactions). Assistive Chat was selected as the primary communication app, because it matched the features that Nancy needed most.

Table 7. Nancy’s key features compared to eight communication apps. Note: As noted by the authors, it is very difficult to keep up with changes and at the time of review, the App iMean now has voice output (one female, one male).

	Synthesized	Speak after Selection	Adjust Speech Rate	Text	Keyboard-QWERTY	Adjust Text Size	Word Prediction	Abbreviation Expansion	Logical Letter	Ability to Store Phases	“Recent” Used List	Adjust Dwell	Rule Out Factors
iMean				X	X					X		X	No voice output
ShapeWriter				X	X	X	X			X*			No voice output
TalkAccist	X	X		X	X					X			No efficiency strategies
SayIt	X	X		X	X					X			No efficiency strategies
Speak It!	X	X	X	X	X	X				X	X		A good low cost alternative, but was willing to pay more for efficiency strategies
Proloquo2go	X	X	X	X	X		X			X	X		Comparing word predictions- Nancy said Assistive chat “found her word better”
EasySpeak	X	X	X	X	X		X			X			Ruled out due to voices (accents)
Assistive Chat	X	X	X	X	X		X			X			

In Nancy’s case, both Prolquo2go and Easy Speak had just as many “matched” features to the final app choice. Yet, during the assessment, Nancy voiced a clear preference for Assistive Chat due to quality of voice and what she described as “the best prediction”; thus, underscoring the importance of step 4 in Table 2.

Conclusion

The speed with which apps for the iOS platform have become available has caused many clinicians, educators, and potential consumers of AAC to search for a quick and easy fix. This platform and certain apps may indeed represent a reasonable match to the strengths and needs of some individuals. However, the clinician should always follow a clinically based approach that evaluates client needs and technology options on a case-by-case basis. To this end, once the appropriate iDevice has been chosen, the clinician can apply Table 3 (narrowing down key features for comparison and then matching the user’s needs to the app’s specifications) as part of best practice in a feature matching approach to app selection.

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References

- AAC-RERC. (2011, March). *Mobile devices and communication apps*. Retrieved from <http://aac-merc.psu.edu/index.php/pages/show/id/46>
- Farrall, J. (2011). Apps for AAC. Retrieved from <http://www.spectronicsinoz.com/article/iphoneipad-apps-for-aac>
- Gosnell, J. (2011, January). *AAC applications in 2010: How to conduct a clinical feature matching process*. Session presented at the Eleventh Annual Conference on Augmentative and Alternative Communication Conference, Orlando, FL.
- Gravitytank. (2009). *Apps get real*. Retrieved from <http://www.gravitytank.com/apps/>
- Bascaramurty, D. (2010, April 11). For autistic kids, iDevices are life changers. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com>
- Nojiri, M. (2010, February 9). iPhone app opens world to boy with rare syndrome. *ABC News*. Retrieved from <http://www.abcnews.go.com>
- Perets, A. (2010, August 30). Tapping this app gives special-needs users a voice. *CNET News*. Retrieved from <http://news.cnet.com>
- Shane, H., & Costello, J. (1994, November). *Augmentative communication assessment and the feature matching process*. Mini-seminar presented at the annual convention of the American Speech-Language-Hearing Association, New Orleans, LA.