# Pragmatic Organization Dynamic Display (PODD) Communication Books: A Promising Practice for Individuals With Autism Spectrum Disorders

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## *Abstract*

*Individuals with autism spectrum disorders (ASD) are severely challenged by their difficulties with language and communication. Some research suggests that augmented language input, whereby a speaking communication partner adopts and uses an augmentative or alternative communication (AAC) system for both expressive and receptive language, can be effective with these individuals. The Pragmatic Organization Dynamic Display (PODD) system is both a method and tool for developing and utilizing augmented language input. As a promising practice, PODD provides strategies to support the design, production, and implementation of communication systems that enable genuine communication for a variety of functions in all daily environments. PODD includes strategies to minimize some of the common difficulties associated with the use of multi- level communication books. Specifically, PODD: (a) supports the individual who relies on AAC and his/her communication partners to move efficiently between pages to locate required vocabulary, (b) reduces the time required to access vocabulary to produce multi- symbol messages, (c) provides a strategy for quick access to predictable messages, and (d) enables access to a broad range of vocabulary for spontaneous, unpredicted messages. This article explores the use of the PODD system for individuals with ASD, with emphasis on features that address the unique communication challenges faced by these individuals.*

Language and communication are the core challenges faced by individuals with autism spectrum disorder (ASD). It is documented that between 30 and 50% of individuals in the autism spectrum will never have spoken language that is adequate to meet their most simple daily needs (National Research Council, 2001). Although the use of AAC for facilitating language and communication for individuals with ASD is now an accepted practice, there is little research available to guide practitioners to match AAC devices or strategies with individual needs. In the end, the design and implementation of AAC systems must support the generation of functional spontaneous communication, a key objective in all programs for individuals with ASD (National Research Council). Functional spontaneous communication presumes the following long-term outcomes:



- Communication autonomy-individuals are able to express themselves according to their own intentions (Von Tetzchner & Grove, 2003);
- Communication accessibility-both familiar and unfamiliar people in the social environment understand and support the individual's learning and use of the AAC form (Von Tetzchner & Grove); and

- Communication competence–the individual is able to demonstrate sufficient linguistic, operational, social, and strategic knowledge, judgment, and skill (Light, 1989, 2003).

## *Augmented Input*

The term "augmented input" has been used to refer to a set of practices whereby a speaking communication partner (e.g., a teacher or parent) adopts and uses an augmentative or alternative communication (AAC) system both as expressive and receptive language, simultaneously communicating with an individual who relies on AAC and modelling the language. The effectiveness of various approaches that utilize aided symbols for augmented input has been demonstrated both qualitatively and quantitatively with individuals with ASD (Acheson, 2006; Cafiero, 1995, 2001; Dexter, 1998; Drager et al., 2006; Romski et al., 2009).

In order to provide augmented input, sufficient aided symbol vocabulary must be provided to express the wide range of communication intents, messages, and topics that naturally occur during interactions in a range of contexts. In their ground-breaking research, Hart and Risley (1995) found that typically developing children in working class families hear approximately 1,250 words per hour, accumulating a total listening vocabulary of 6 million words by the time they reach age 3. Based on this information, Mirenda (2008) suggested that we should be aiming to provide children with ASD who use AAC with at least hundreds of models of symbol use in the form of augmented input throughout the day—a tall order, indeed! Complicating the task is the need for graphic symbols to be presented spatially on communication displays that naturally limit the number of items that can be displayed at one time.

Systematic strategies are required to organize aided symbol vocabulary in ways that provide individuals with ASD and their communication partners with easy access to the broad range of words that will enable them to say what they want to say, when they want to say it. A number of solutions to this challenge have been suggested over the years, including the use of engineered environments that incorporate multiple activity and topic displays, core vocabulary communication boards, flip-charts, multi-level/dynamic display communication books and speech generating devices (SGDs), and message encoding techniques (Goossens', Crain & Elder, 1992; Porter & Cameron, 2007; Van Tatenhove, 2009). However, these solutions often limit the ability of both communication partners and individuals who rely on AAC to generate spontaneous communication across a wide range of pragmatic functions. Some of the limitations include:

- Vocabulary displays that appear during an activity and are then put away at the discretion of others, so that an individual who uses AAC is unable to retrieve the display or access the vocabulary at other times or in different environments;
- The use of activity-specific vocabulary only, which usually does not enable an individual to introduce or change topics. For example, if a child feels sick when playing with blocks it is unlikely that the word SICK will be included on a "block play" activity display;
- The use of multiple displays with changing formats related to the available vocabulary and location of symbols, requiring the individual to direct valuable cognitive and working memory resources in order to visually scan each display,



discriminate the symbols therein, and determine what they can and cannot say using a particular display. This sophisticated skill set involves planning and coordinating motor movements, shifting attention, and processing multiple cues, all of which are challenges for people in the autism spectrum (Dyck, Piek, Hay, & Hallmayer, 2007; Koegel & Koegel, 2006). The end result is a reduction in the resources available for communication and for the learning process in general;

- A need to move between pages in a communication book to locate the vocabulary needed to construct multi-symbol messages, resulting in reduced speed of communication;
- Inefficient vocabulary organization that fails to support communication of both predictable, contextually based messages and spontaneous, generative, non- contextual messages on a range of topics.

The Pragmatic Organization Dynamic Display (PODD) emerged from clinical problem-solving to address these challenges. PODD is a system guided by a set of principles and design strategies for organizing aided symbol vocabulary to support genuine, autonomous, spontaneous communication for a full range of functional purposes in all daily environments. The PODD approach can be used to create a wide range of communication displays that suit varying communication, language, sensory, and physical access requirements. While the PODD approach can be applied to both communication books and to page sets for dynamic display SGDs, we focus on non-electronic PODD applications in this article. PODD communication book templates can be used to reduce the time and knowledge required to produce a communication book using pragmatic organization (Porter, 2007, 2008; Porter, Tainsh, & Cameron, 2008).

## *Some Unique Features of PODD Communication Books*

A number of factors influence the overall organization and features included in a PODD book, including the individual's current and developmental communication and language requirements; the number of items the individual can manage on a page at one time, given his or her visual, cognitive, and physical skills and challenges; and the access method the person uses to select a symbol (e.g., index finger point, fist point, eye gaze, etc.).

There are three main styles of PODD communication books, as depicted in Figure 1.

*Figure 1. Three main styles of PODD communication books. The Picture Communication Symbols ©1981–2009 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission. Boardmaker® is a trademark of Mayer-Johnson LLC.*

PODD communication books of each style can be constructed with varying number of items on a page to accommodate complexity of language, symbol size, access method, and visual/auditory presentation constraints.

## *Navigation*

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In a conventional communication book, a partner or AAC user typically turns the pages one-by-one looking for specific vocabulary symbols, a time consuming and inefficient process. In addition, individuals with ASD can become frustrated if they cannot find a specific symbol quickly, and/or distracted as they focus on and point to symbols of interest that are not part of the intended message. A number of simple yet effective features are incorporated into the PODD to improve the efficiency of page turns. These features support communication autonomy by enabling the person using the PODD to (learn to) independently direct movement between pages, even though a partner may physically turn them, at least initially. The PODD "navigation" strategies that are depicted in Figure 2 include the following:

- "Go to page (number)" instructions are associated with symbols that function as part of the navigation system to move between levels in the communication book. Using "go to page (number)" rather than "go to page name" allows adults and older children to use their knowledge of the sequence of numbers to find a required page more efficiently.
- Colored page tabs matching the color of the "Go to page (number)" instruction adds another cue to assist with the efficient location of the required page.

- Symbols for specific operational commands such as “TURN THE PAGE,” “GO TO (CATEGORY),” AND “GO BACK TO PAGE (NUMBER)” are included to facilitate the individual’s control of movement between levels. These operational commands also provide both the AAC user and the communication partner with ideas of which page to move to next, in order to continue and expand communication.

  *Figure 2. PODD navigation strategies. The Picture Communication Symbols ©1981– 2009 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission. Boardmaker® is a trademark of Mayer-Johnson LLC.*

## *Vocabulary Organization*

The efficiency of communication is the overriding factor determining the selection, organization, and placement of vocabulary on PODDs. Vocabulary is organized with consideration of both communicative function and typical patterns of conversational discourse. Different types of branches and vocabulary organization strategies may be used to support communication for different functions; for example, activity displays are used for predictable activities, while categories are used for less predictable, generative messages.

The first pages of a PODD communication book generally include words and phrases to express messages that are contingent on an ongoing activity, need to be interpreted in relation to the partner’s previous utterance, or need to be said quickly. For individuals on the autism



spectrum, the first pages are likely to include words and phrases to support behavioral and environmental regulation.

PODD page sets also include predictably associated vocabulary in all sections/categories of a communication book, to increase the efficiency of communication to combine words. This is in contrast with the more traditional practice of organizing vocabulary by semantic or grammatical category (e.g., people, places, vehicles, places, action words, emotions, descriptive words, etc.) in a multi-level communication book and including only the words directly associated with that category. This practice often results in frequent page turns in order to produce a sentence, as the words required are each on different pages and combining words usually requires multiple page turns back to and forward from the main category index. Using the concept of predictably associated vocabulary, PODD communication books include the vocabulary that is predictably used in association with the main content words in each category/section.

*Figure 3. Predictably associated vocabulary in the PODD. The Picture Communication Symbols ©1981–2009 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission. Boardmaker® is a trademark of Mayer-Johnson LLC.*

Thus, vocabulary may be repeated in multiple locations throughout the communication book, with an aim to increase the efficiency of communication by reducing the number of page turns required to produce a sentence. The use of predictably associated vocabulary has been observed to increase the partner’s use of aided language stimulation with models and expansion of more complete sentences to extend a child’s learning (Porter, 2007).

## *Pragmatic Starters*

Pragmatic branch starters perform two different functions within the PODD system. First, they provide faster predictive links to pages of vocabulary that are commonly required to express a particular communicative function. For example, a symbol representing SOMETHING’S WRONG leads to pages of symbols that enable an individual to complain or relate a difficulty. Second,

pragmatic branch starters compensate for the reduced use of environmental supports, gestures, and vocal intonations that are generally used to establish the communication intent of 1-2 word utterances. In spoken language development, a single word such as store may express different meanings, depending on the vocal intonation, facial expressions, and actions accompanying the spoken word. For example:

- *Store* + rising intonation and questioning facial expression = "Can we go to the store?"
- *Store* + pointing to oneself with a telling facial expression = "I went to the store."
- *Store* + holding up a toy cash register = "Let's play going to the store."



When aided symbols are used for communication, there is no inherent equivalent to intonation. In addition, individuals with ASD who use aided symbols may have limited ability to coordinate body language and symbol use to support accurate interpretation of telegraphic (i.e., 1-2 word) sentences. Thus, their communication partners must interpret the meaning of telegraphic symbol sentences from a combination of the context and their knowledge of the individual. Because there is considerable variability in the natural abilities of partners to consider the range of messages an individual may communicate using aided symbols, communication breakdowns often occur.

Pragmatic starters are phrased to provide the communication partner with contextual information related to the communicative message. They use symbols representing conversational speech (e.g., I WANT SOMETHING; I WANT TO GO SOMEWHERE; I'M ASKING A QUESTION) to promote the communication interaction. This helps the focus remain on the interaction, as the pragmatic starters are an integral part of the message.

*Figure 4. PODD page with pragmatic starters. The Picture Communication Symbols ©1981–2009 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission. Boardmaker® is a trademark of Mayer-Johnson LLC.*

The use of pragmatic starters also may support individuals with ASD who experience difficulty interpreting the communicative meanings of vocal intonations, facial expressions, and gestures to understand the intent of other people's messages. For example, a child with auditory processing and receptive language challenges is likely to be better able to follow a direction if it is preceded by the pragmatic starter IT'S TIME TO… versus I'M ASKING A QUESTION…

## *Predictive Links*

In PODD, predictive links go to the next page most likely required to communicate a predictable message. This both supports the communication partner's ability to provide more consistent aided language input and assists the AAC user to produce sentences that follow conventional English word order. Paired with pragmatic branches, the use of predictive links supports individuals at early stages of language development to locate vocabulary efficiently in the communication book.

The first page of pragmatic starters presents the individual with options such as I WANT SOMETHING, I LIKE THIS, and SOMETHING'S WRONG. At least initially, the



communication partner uses aided language input to present the symbols to the AAC user. When he or she selects SOMETHING'S WRONG, the partner then navigates to the predictable link (page 5, as indicated on the symbol), which includes vocabulary to express various things that might be wrong. Again, the partner uses aided language input to inform the user of the available options; and, when the user selects HURT, SORE, PAIN, navigates to a second predictable link (page 6) that contains body part symbols. Using these symbols, the AAC user is then able to communicate where he/she is sore.

*Figure. 5. Predictive links in the PODD. The Picture Communication Symbols ©1981–2009 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission. Boardmaker® is a trademark of Mayer-Johnson LLC.*

## Conversational Repairs and Requests for Clarification

For individuals with ASD, supports for communication repairs on PODD are essential, given the difficulties they experience in coordinating body language, gestures, and listening. PODD communication books include the symbol for I DON'T KNOW on the front page, and may include additional vocabulary to provide more specific feedback as well, such as symbols for I DON'T UNDERSTAND, PLEASE EXPLAIN THIS TO ME, and THAT'S NOT WHAT I'M SAYING. A symbol for OOPS is also included on all pages in communication books designed for individuals at the early stage of communication and language development. This allows them to indicate that something is wrong or that a mistake has been made, although they will still require partner assistance to identify and fix the problem.

## Lists

List spaces that allow the communication partner to draw in extra symbols and/or write in additional words are included in every category/section of a PODD communication book. Lists enable the inclusion of fringe vocabulary without substantially increasing the size and weight of the communication book. Lists enable the addition of new vocabulary "on the spot" so that unique messages can be added to the communication book whenever the need arises.

## Use of PODDS to Address Behavioral Distress

Lilly is a 5-year-old child who achieved a score of 44 (moderate-severe autism) on Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1992). Lilly exhibits tantrums



several times weekly, and an average of two episodes of self-injurious behavior per school day. Lilly has had previous training using the Picture Exchange Communication System (PECS; Bondy & Frost, 2002) in her school program and American Sign Language at home. Lilly's parents report that she can comprehend over 35 signs and has an expressive vocabulary of 5 signs to request preferred foods or objects. Currently, Lilly attends a communication-focused intensive autism program housed in her neighborhood school.

Lilly's school team kept track of her behavioral episodes and determined that they occur primarily during transitions and group instruction. Previous interventions consisted of planned ignoring, redirecting, and token boards, but no interventions focused on functional communication training with aided AAC. Lilly did not respond to manual signs for, "What do you want?" nor was she able to generate signs to mediate her difficulties during these difficult episodes.

During group instruction, the PODD was introduced when Lilly began the precursor behavior to her meltdowns (i.e., leaving her chair; whimpering softly). On the first page, six symbol options were presented by Lilly's communication partner using augmented input, "I want," "It's time", "Something's wrong," "Quick word," "I think," and "I want to tell you something." The first time the PODD was presented, Lilly stopped crying, focused on each symbol and pointed to "Something's wrong." Her communication partner navigated immediately to the linked page and used augmented input to present a symbol menu consisting of "I feel sick," "I'm tired," "I'm hungry," "I'm thirsty," "I'm not ready," I'm angry," "Something's changed," and "I don't know." Lilly selected "I don't know." Although this did not give her communication partner specific information, Lilly's distress immediately stopped and she resumed her participation in group instruction. This anecdote suggests that the use of PODD to augment speech may be an effective mode of communication with individuals with ASD who are unable to retrieve or generate adequate language to mediate the distress.

## Conclusion

It is critically important to design strategies that enable communication partners to provide aided language input and that enable aided language expression in natural environments to individuals with ASD who rely on AAC. The PODD system was designed to provide these opportunities by including a range of strategies that support aided language use based on sound AAC principles and that address a wide range of communication requirements. PODD is a promising, field-tested practice that demands rigorous scientific study for individuals with ASD.

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