

# Adapting LAMP Words for Life for Individuals with Visual Impairment

For five-year-old Ani, communication was a struggle from the beginning.

Ani lost her vision shortly after birth, spending the first years of her life in a Bulgarian orphanage where she experienced severe neglect. When the Miller family met her at the age of two, they knew she was meant to be a part of their family. With love and excitement, Ani was adopted and brought home to Kansas City, where it just so happens her mom is a teacher of the visually impaired and an orientation and mobility specialist at the Children's Center for the Visually Impaired. Initially, Ani demonstrated a lot of negative behaviors and attachment issues which were the primary concern of teachers and therapists. In terms of formal language systems, Ani was essentially nonverbal. She used a few word approximations when highly motivated but verbal speech was not her preference. She also used a handful of tactile signs as well as eight abstract tactile symbols. Tactile sign was a struggle for her as it required great fine motor and body/space awareness, two things that she is working on. Her team could see her potential. They understood she would benefit from having several communication strategies, and for her to communicate more than her basic wants they needed to give her a vocabulary that would offer room to grow and give her a path to robust independent communication.

Fortunately for Ani and her dedicated team, Gretchen

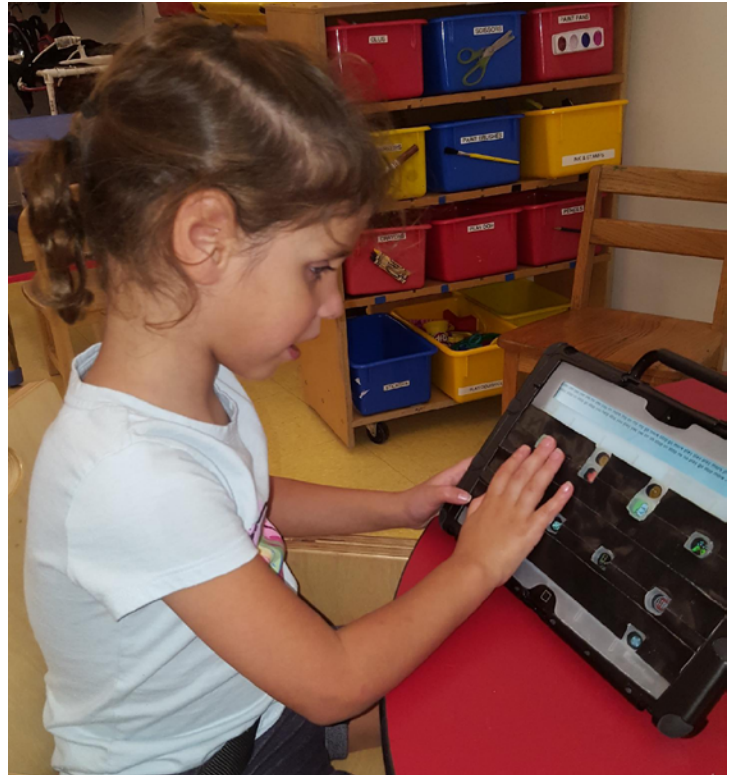


Image 1: Ani Learning First Words



**CINDY HALLORAN** - an occupational therapist, is the Director of The Center for AAC & Autism and co-author of the Language Acquisition through Motor Planning approach. She has over 30 years' experience working exclusively in the field of pediatrics, receiving additional training in the area of sensory integration and neurodevelopmental treatment. She has worked in school, residential, home health and private clinic settings; was co-owner of Integrated Therapy for Kids, a private clinic in North Little Rock, Arkansas; and has served as the therapy department head for Arkansas Easter Seals and Riverdale Academy.



**JEREMY LEGASPI** - Jeremy earned his Bachelor's Degree in Speech and Hearing Science at Arizona State University in 2003. He completed his Master's Degree in Clinical Speech-Language Pathology at Northern Arizona University in 2005, and his Graduate Certificate in Assistive Technology in 2013. Prior to joining PRC in November of 2014, Jeremy was assistant director at Foundations Developmental House (a speech therapy clinic) in Gilbert, AZ. There he completed speech and language evaluations, independent education evaluations, provided ongoing therapy, supervised speech-language pathologist assistants, wrote and implemented individualized education plans, and presented nationally on the topics of AAC and Apraxia. Jeremy also has two years of experience in the public school system and five years of experience at a non-profit school for special needs. Jeremy holds the Certificate of Clinical Competence in Speech-Language Pathology from the American Speech-Language-Hearing Association (ASHA), a state license in Speech-Language Pathology from the State of Arizona, is a member of the Arizona Speech-Language-Hearing Association (ArSHA), and is a member of ASHA's Special Interest Division 12 (AAC Division).



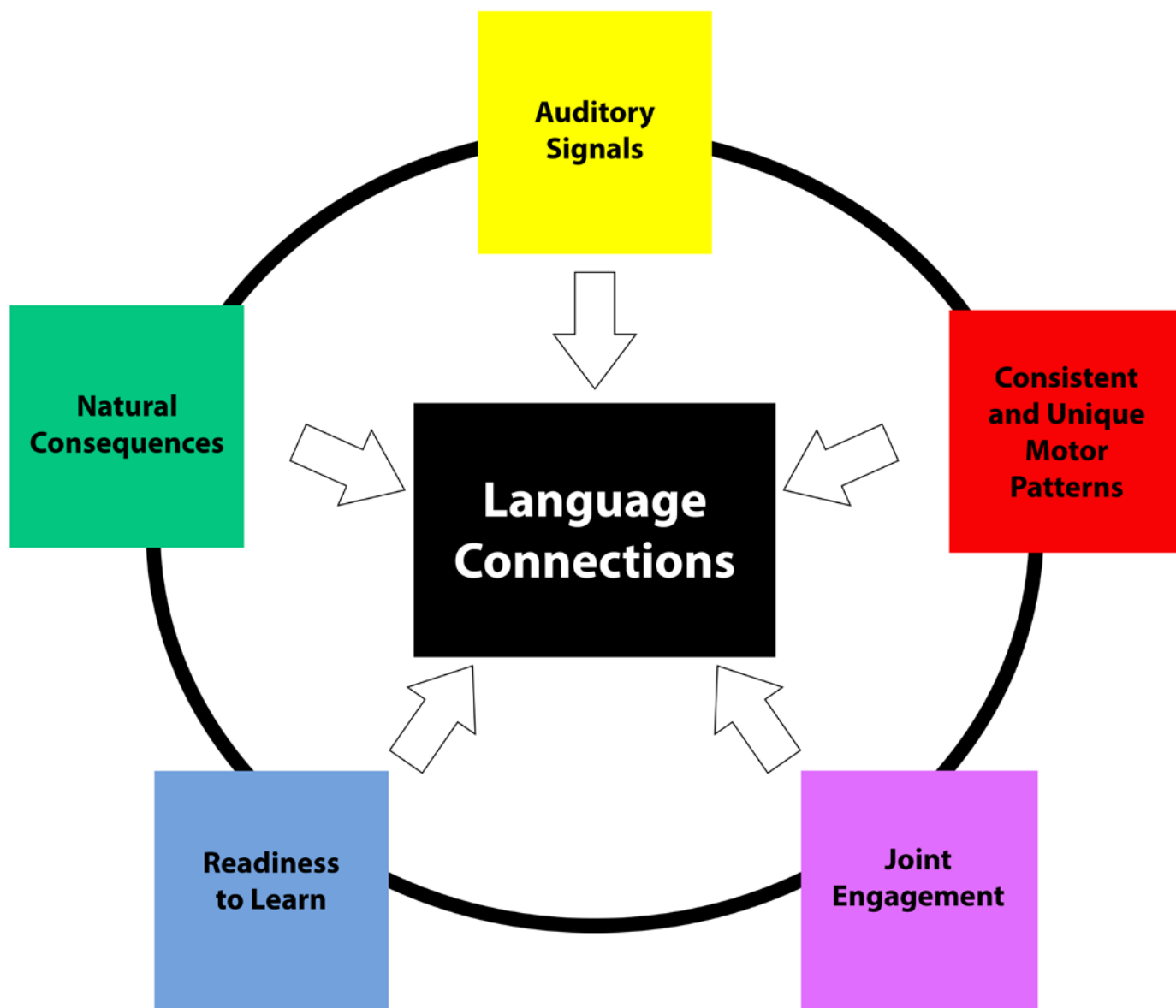


Image 2: The Components of the LAMP Approach.

Bright, consultant for the Prentke Romich Company, was assisting in the development of a robust AAC solution that follows the Language Acquisition through Motor Planning (LAMP) approach with a tactile keyguard for individuals like Ani and presented it to her therapists as an option. Ani was learning pre-Braille, so utilizing tactile cues to locate words on a speech generating device seemed like a good option. (See image 1)

### WHAT IS LAMP?

LAMP is an augmentative alternative communication (AAC) approach designed to give individuals who are nonverbal or have limited verbal abilities a method of independently and spontaneously expressing themselves using a speech-generating device. The key components of the LAMP approach include providing an environment and activity that promotes

readiness to learn, encouraging joint engagement and learning language through a unique and consistent motor plan paired with an auditory signal and a natural consequence. Teaching of vocabulary happens across environments, with multisensory input to enhance meaning, and the child's interests and desires determining the vocabulary to be taught. (See Image 2)

In presuming competence, rather than progressing through different AAC strategies or language systems, one language system that offers the potential for unlimited language growth with the ability to present and teach language at a level commensurate with the learner's current abilities is selected at the outset. If a speech generating device with a complex communication system isn't available initially, it's used as the goal so motor plans for vocabulary can remain consistent.

## UNIQUE AND CONSISTENT MOTOR PATTERNS

- No need for picture discrimination
- No need for understanding that a symbol can represent a thing or concept
- Complex language organization system used initially but motor patterns simplified or vocabulary masked to encourage initial success.
- Consistent motor plans allow for automaticity to develop- allows for decreased cognitive load and increased rate.

There are multiple benefits of a word-based system that pairs a consistent motor pattern with consistent auditory output along with teaching words by providing a fun, natural response. There are no cognitive prerequisites for the implementation of LAMP, as intervention can begin at the cause and effect level and systematically build upon the stages of natural language development while maintaining a consistent motor pattern to access each word. There is no need to discriminate pictures. The visual differences help to direct reach and touch but understanding the meaning of picture or perceiving all the details of the picture are not necessary. Understanding that a symbol can represent a thing or concept is not a prerequisite but can developed naturalistic way by pairing motor auditory natural response, which is a quicker path to communication. For emergent communicators, motor patterns for initial words can be simplified or vocabulary masked to encourage initial success. Having a consistent motor movement per word allows for automaticity to develop which decreases the cognitive load for the communicator and increases rate of communication.

AAC systems typically used for beginning communicators with significant visual impairment focus on accentuating visual and tactile input. These necessary modifications tend to limit the amount of vocabulary available. Real objects may be a good introduction to using symbolic language but there are limitations with representation of core words, quick access to lots of words, and combining words. Progressing from real objects to picture symbols opens the door to more language options, but also requires relearning. Communication boards and single overlay speech generating devices can be modified to assist the learner with visual impairment with high contrast icons and tactile cues but again access to vocabulary and grammar is limited and without auditory output, language isn't consistently reinforced. Braille is the standard tool for written communication for those with significant visual impairment but may not be a practical option for a nonverbal child who is preliterate. In fact, it's designed for transmission of written communication rather than real-time alternative to verbal communication.

Dynamic display speech generating devices have been successfully used to provide a means to develop spontaneous generative complex communication in individuals without visual impairment. Access to thousands of words are made possible by screens that change providing different visual options on each screen. However, the visual and functional change between

screens and the lack of tactile cues on a touchscreen prove to be an obstacle for those with visual impairment. An AAC system that utilizes simple unique and consistent motor patterns for words provides a static display in a dynamic environment and along with a tactile keyguard may eliminate this obstacle.

LAMP Words for Life has been designed with one unique and consistent motor pattern for words and seemed to be a natural fit for some students with visual impairment. It's structured to allow the ability for complex communication but can be adapted to the skill level of the learner while providing a structured path for language development. Motor patterns can be shortened initially to provide immediate auditory output upon touching the buttons but are expanded upon when skills progress to access more vocabulary. A few words can be presented at a time to teach in activities that are relevant and motivating to the learner in a manner that preserves the unique motor patterns for every word.

## MODIFICATIONS TO SUPPORT VISUALLY IMPAIRED LEARNERS

With input from clinicians using LAMP Words for Life with children with visual impairment, modifications were made to address the needs and challenges of these learners. At the same time, we wanted to maintain as much consistency with standard LAMP Words for Life as possible to make it easier for classrooms with multiple AAC communicators to model and support language learning.

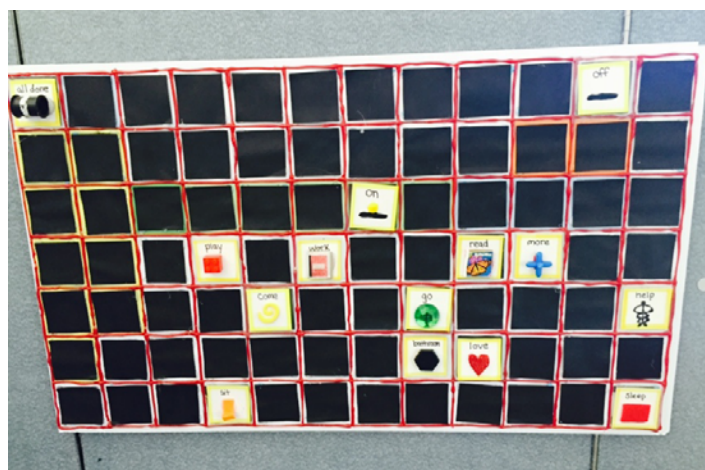
### TACTILE CUES

Having consistent motor patterns for words is key for these learners but visual strategies to teach those motor patterns such as modeling, icon sequence cards, vocabulary masking or pointing to icons aren't effective for this population and tactile cues are needed to assist in finding and discriminating locations. A keyguard provides a physical border for each button and allows for consistent landmarks to find desired button much like the raised areas on a keyboard to mark the home row.

One of the speech pathologists providing input was Michelle Britt-Thompson. She was working with an elementary student with autism and visual impairment who'd had minimal success with real objects and primarily communicated with inappropriate behaviors. Having seen communication growth when implementing the LAMP approach with other students, she gave it a try. This student's fine motor skills were significantly delayed as she didn't have an isolated point and demonstrated sensory defensiveness when presented with an AAC device. Michelle adapted a large communication board replicating the home screen of LAMP Words for Life with only a few words showing, puff paint to create a grid and tactile symbols. It was used to teach core words in the classroom. Eventually the student transitioned to a portable communication board and then to an Accent device. To create a tactile version of Vocabulary Builder,







Michelle covered the keyguard with Gorilla tape and made cut-outs, leaving only a few words visible. This helped the student learn to isolate an index finger to select the desired word as well as using the landmarks on the keyguard to find the desired word. (See Images 3, 4 and 5)

It was decided to create a standard keyguard with build-in tactile cues to accompany the VI version of LAMP Words for Life. Initially, a 3D printed design was developed so clinicians could print it locally. Tactile cues were placed around the edges and eight squares within the middle of the grid were raised so that each button was next to or one location away from a marker. While the layout of vocabulary on the home screen is identical to standard LAMP Words for Life, highly motivating core words can be moved to those raised locations to aid tactile search when teaching first words. While only necessary in initial stages, once swapped, those words need to stay in those locations for motor consistency. The 3D design was a helpful tool initially as changes could be made as feedback was received, but they were not very durable, and the finish was rough to the touch. Using input from clinicians, a flip-up KeyGuide was designed. It rested closer to the screen to make access easier, while still being able to flip up for programming and vocabulary masking and unmasking. A molded touch KeyGuide allowed for a smoother material and rounded edges on tactile cues for better tactile experience. (Image 6)

#### SIMPLIFIED MOTOR PLANS

LAMP Words for Life has three vocabulary files with increasing levels of complexity. At the one-hit level, 82 words can be said by pressing one button allowing for immediate reinforcement. At the full level, 2-3 button pushes are needed to say most words, and there are consistent patterns to say words based on parts of speech. For example, all present tense verbs end in the same location. All adjectives end in a different but consistent loca-



Image 7: High Contrast Icons.

tion. In the VI version of LAMP Words for Life, the words learned at the one-hit level become double hits on the same button to eliminate the need for tactile search and increase rate. Since the corners provide a good reference point, they are left blank to be utilized for customization of favorite people, places, and things.

#### HIGH CONTRAST ICONS

When every word is produced with a unique and consistent motor pattern, visual discrimination is not a requisite skill. However, for those individuals with some visual skills, accentuating the icons to better direct reach is beneficial.

Will, a teenager with cerebral palsy and CVI, started using an Accent 1000 in October of 2017. His speech-language pathologist, Katie Nelson, describes what their team did to help him be successful. She pulled the contrast icons into the Unity 84 sequenced vocabulary Will was already using. "Since there were not high contrast options for most of the row of categorized parts of speech (am, social, determiners, prepositions, etc.) I changed the background color of each symbol because the symbols themselves are mostly black. We gave each one a different color to help Will remember them better. The symbols themselves don't offer a lot of details for someone with VI so I thought distinct colors would help more." Will has a great memory and memorized a lot of vocabulary but is starting to use his limited visual skills to try and scan pages and find new words. Katie says that "His mom has noted a big increase in his production of new multiple word phrases since the switch, so I know what we have done already has been very helpful." (Image 7)

In LAMP Words for Life-VI, the background color of most icons was changed to black to contrast the bright colors in the icons. A small set of high-contrast Minspeak icons were developed for the home screen with less detail and fewer brighter colors. (Image 8) Color coding based on part of speech was maintained outside the home page.

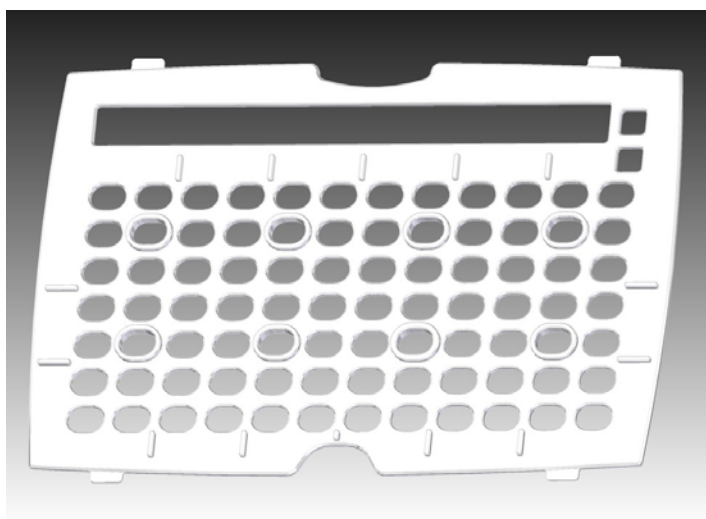


Image 6: Touchguide with Tactile Markers



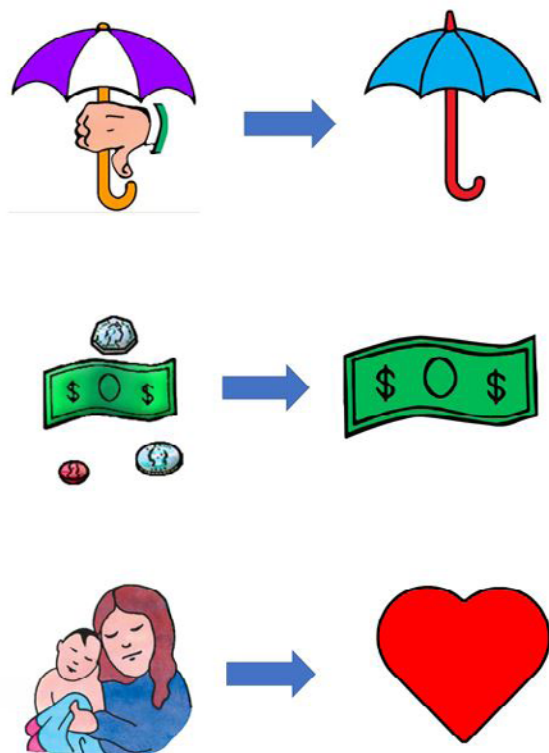


Image 8: Examples of Simplified Icons.

## PROGRESS FOR ANI

It's awesome that a community of therapists could pool their experiences to help shape a product that can benefit others. Once Ani switched to LAMP Words for Life – VI and the Tactile KeyGuard, some of her frustrations went away although she is still learning a systematic scanning pattern to locate words. "Ani is an amazing little girl who has grown so much in all areas of her development," shared her speech pathologist, Erica McCarthy. "Ani continues to show everyone around her what she can do! It's also nice that she can be easily understood by the majority of communicators versus the unconventional language systems like tactile symbols or tactile ASL." LAMP Words for Life - VI gives Ani and her family a much more efficient communication system to expand her language. (Image 9)

Erica stresses that you always want to make sure the family can incorporate the AAC system into their routines and teach them how to incorporate siblings. For example, using the tactile keyguard and static locations in LAMP Words for Life - VI, Ani's older sister who is also visually impaired but verbal can model communication on the device for Ani.

"In the short time that Ani has been using the Tactile KeyGuide, she has increased her intentionality and independence for purposeful communication. She can have more autonomy in her day, participate in activities that previously caused behaviors and - best of all - communicate more effectively with her family and peers. The Tactile KeyGuide is the solution she needed to access AAC. The tactile markers help establish a motor pattern



Image 9: Ani and Dad at the Park.

that is concrete and achievable for her to navigate language on her own. Though she is still learning, she is already using the vocabulary for so many different language functions, and it has been such a joy to see her personality through her language, like her great affection for wind and musical toys but avid dislike of loud noises! There are many obstacles that children with visual impairments face when using AAC, and this KeyGuide and language file address many of them. In working with a population solely comprised of young children with visual impairments this is filling such a large void!" ■