# Research Insights Into LAMP

## (Language Acquisition through Motor Planning)

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AAC & Autism

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# Research Background

- Many individuals with autism do not produce natural speech that is adequate to meet their daily needs (Weitz, Dexter, & Moore, 1997).
- The level of competence in communication has been found to be a predictor for positive outcomes for individuals with autism (Lord & Paul, 1997).
- Schlosser, et al., (2007) observes that support for these communication deficits has often been sought from AAC systems, especially those which provide an auditory component, or speech-generating devices (SGDs).

# Research Background

- Prizant & Wetherby (1993) found that nonverbal systems may actually facilitate speech acquisition in children with disabilities.
- Therapy employing SGDs can promote the production of speech (Frost & Bondy, 2002; Blischak, Lombardino, & Dyson, 2003).

# Research Background

Using AAC with ASD clients does NOT inhibit speech development:

- Millar, Light, & Schlosser (2006)
- Schlosser & Wendt (2008)
- Romski, et.al. (2010)

# Research Background

- The main thrust of interventions that employ AAC is to enhance the client's communication ability by means of the multi-modal capabilities inherent in AAC systems themselves:
  - tactile interaction
  - visual symbols/devices
  - auditory feedback

(Light, Beukelman, & Reichle, 2003).

# Research Background

- The introduction and acquisition of an AAC system is one aspect of the intervention.
- Another aspect relates to *how* the SGD is used with the client: therapy approach.
- Most studies did not distinguish approach (diverse strategies).

# Texas Study

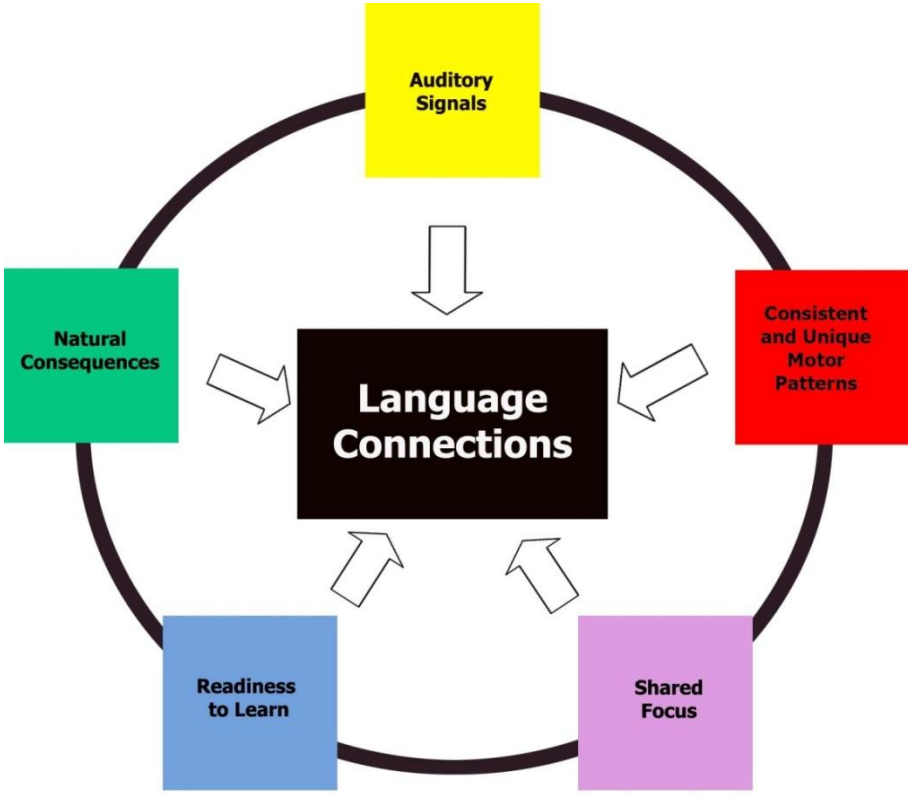
- This study examined the Language Acquisition through Motor Planning (LAMP) approach to implementing an AAC device as an intervention.
- Small group (Case study/Single Subject Research Design)

# Participants

- Study took place from 2009-2012
- Seven clients in a private practice setting
- Four boys, three girls
- Ages 3 to 7
- Each with diagnosis of ASD or PDD-NOS
- Nonverbal
- Disruptive, some self-injurious behaviors
- Short attention spans
- All seven were found to have expressive-receptive language disorder.

# Intervention

- Each obtained a Vantage-Lite speech generating device (SGD)
- Each received Language Acquisition through Motor Planning (LAMP) therapeutic intervention.



# Methodology

- Each child was given an AAC evaluation and trialed multiple devices for extended periods (two to six months).
- The SLP recommended a device for each child.
- Funding was obtained for each device based upon each child's eligibility for Medicaid and private insurance or grant funding.

# Implementation

- LAMP therapy with the SGD involved one to three sessions per week with private practice SLP, depending upon the subjects' family schedules.
- Training was provided to families in the LAMP approach with the expectation that the family would support the LAMP approach at home as well.

# Data Collection

- The primary measure of gains in communication for this study was mean length of utterance (MLU).
- The Systematic Analysis of Language Transcripts (*SALT*) was applied to language samples taken from subjects at various intervals.
- Data collected was matched to Brown's Stages to provide a frame of reference for therapy and to help identify progress.

# Data Collection

- In addition, instruments such as the Preschool Language Scale, Fourth Edition (PLS-4) (Zimmerman, Steiner, & Pond, 2002) were used where possible to measure aspects of expressive and receptive language.
- Type-token ratio (TTR) was used in selected cases as a measure of vocabulary diversity within a child's speech.
- The therapist in this study sought to collect informal data on behavior as well as upon attention and focus.
- Anecdotal data was collected on each subject. Data was supplemented from parent reports and informal measures.

# Data Collection

- Data was collected at various intervals to assess progress.
- Testing revolved around each child's health issues, and family and practitioner schedules.
- Progress was compared to baseline performance and previous test data.

# Results

- It was clear from therapy observation, notes, and from parent reports that all seven participants demonstrated communication progress.
- To the degree that performance could be measured, it was apparent that each child made gains in both expressive and receptive language.
- However, each demonstrated different levels of progress.

# Results

- Among those who made the most progress, vocabulary expanded and represented broad lexical variation.
- The most telling results were evident when mean length of utterance (MLU) was assessed by applying the SALT to language Samples.

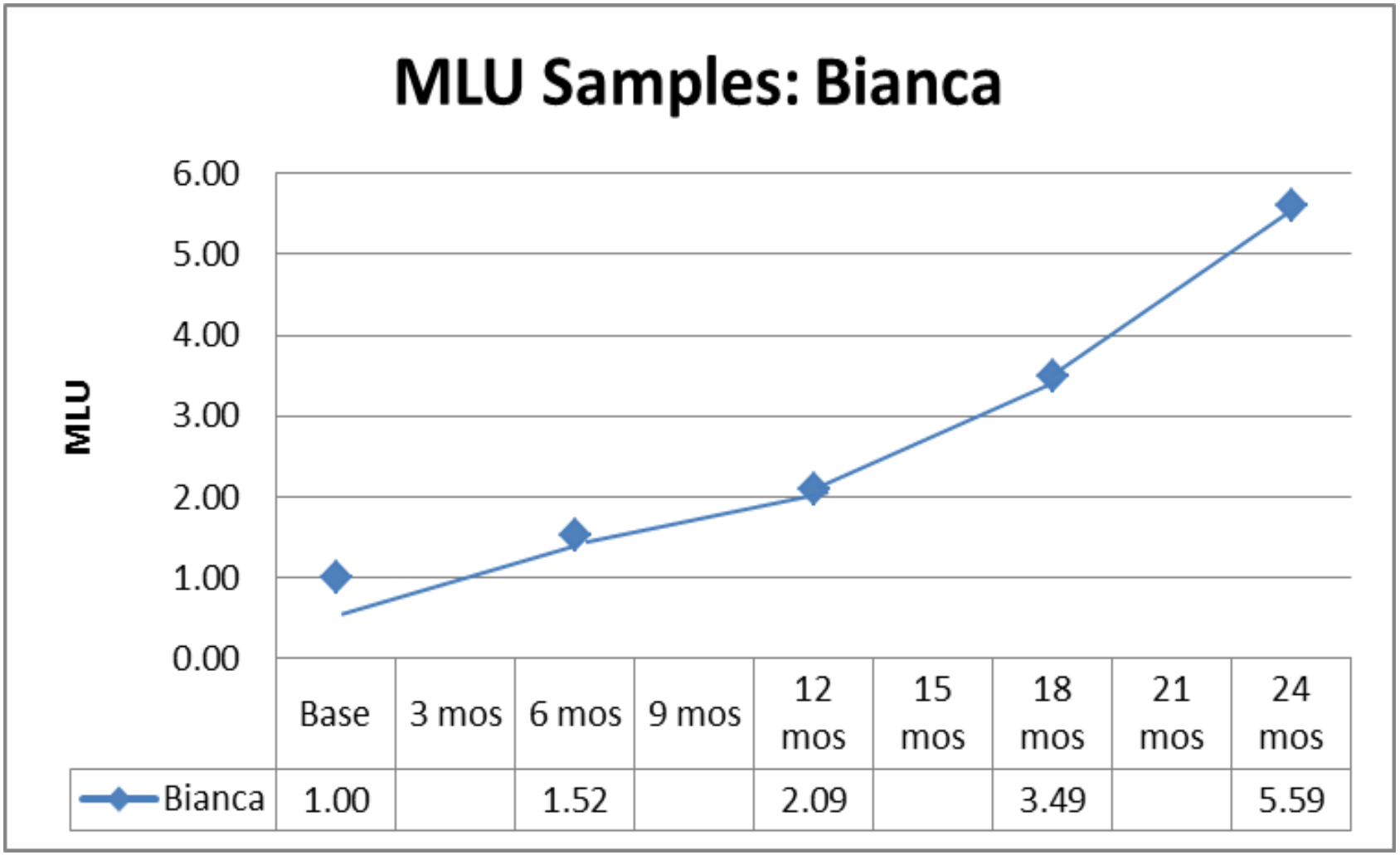
# Results

- The size of the vocabulary used by each subject increased.
- Six of the seven used the SGD to spontaneously generate communication.
- All seven used the AAC device to respond to questions and to make choices.
- Four subjects have demonstrated some level of natural vocalization in addition to using the SGD for communication.
- Two of the four had very limited vocalization at baseline, and their vocalization increased notably while using their AAC devices.

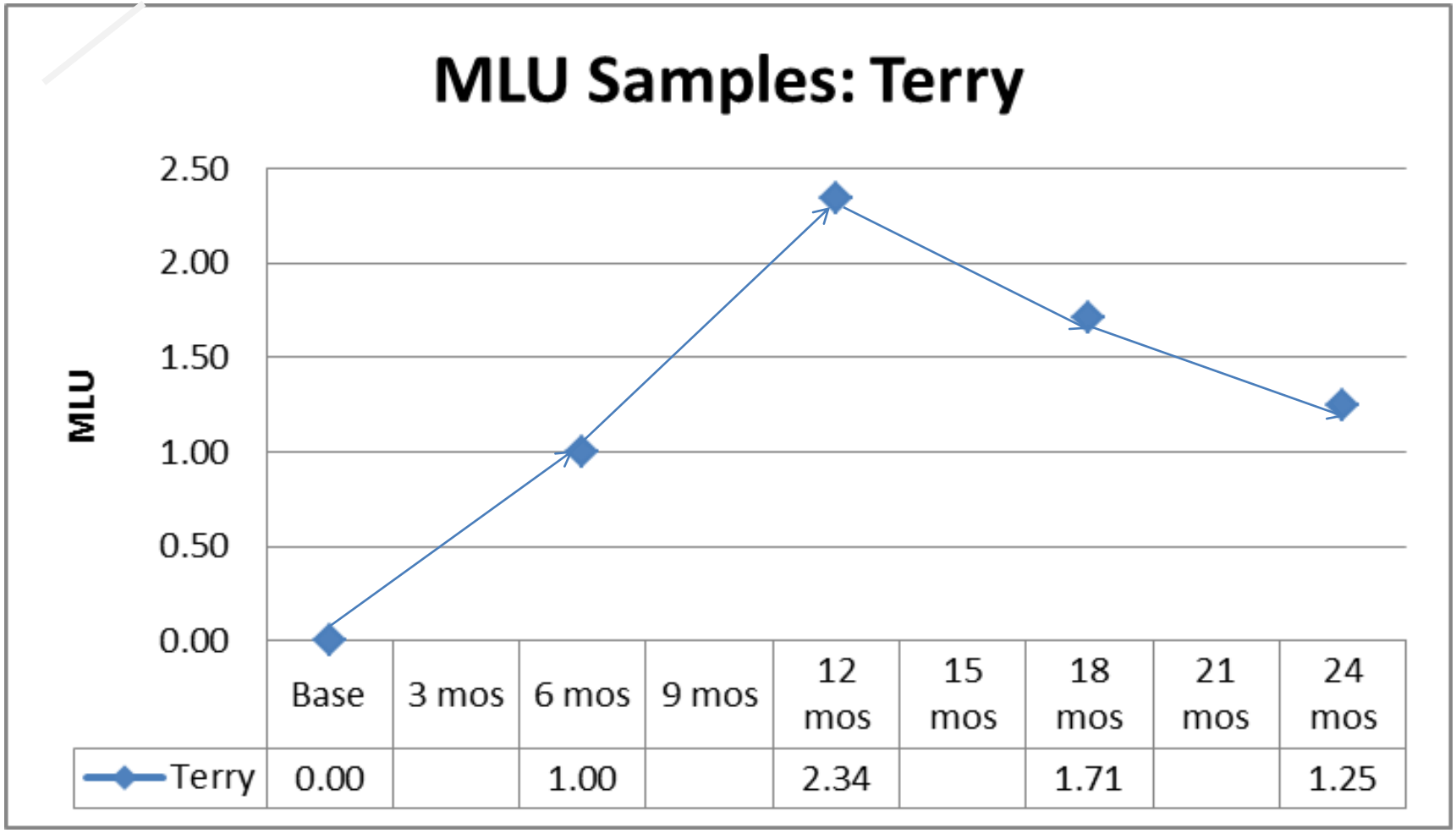
# Behavior, Attention and Focus

- All participants demonstrated gains in shared engagement and attention and a reduction in problem behavior was observed.

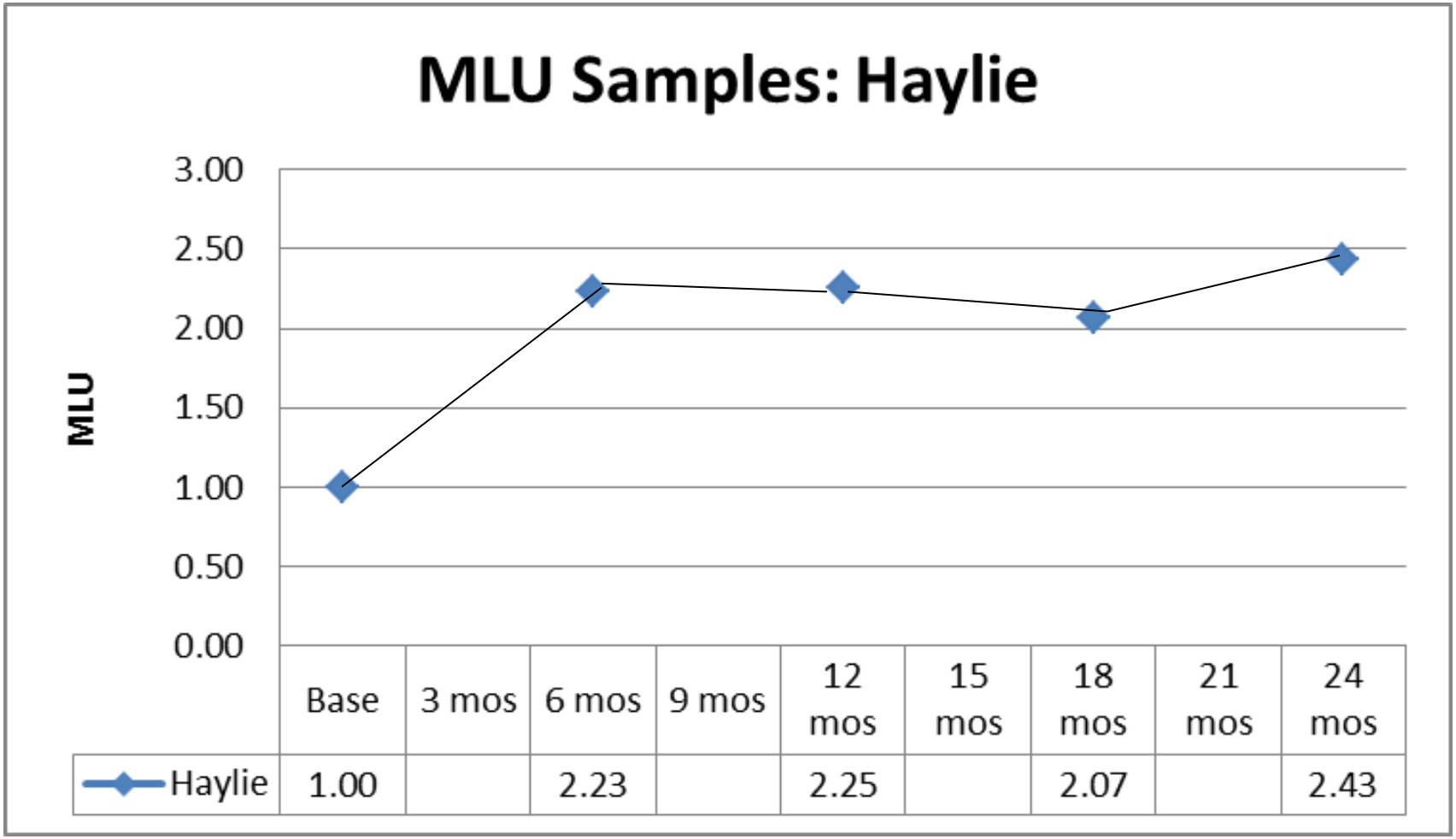
# Results


MLU Samples: Bianca
MLU
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
21 mos
24 mos
Bianca
1.00
1.52
2.09
3.49
5.59

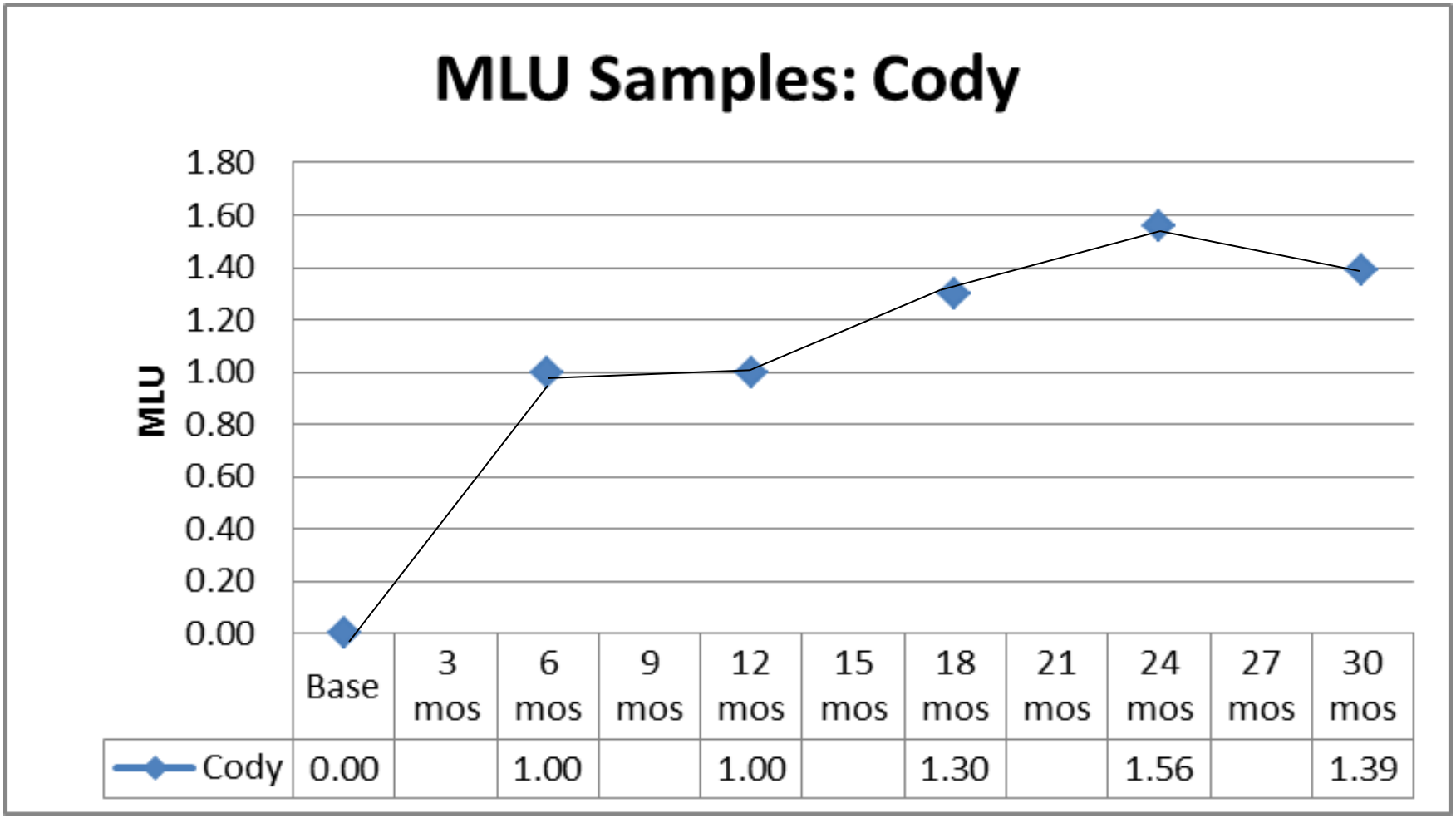
# Results


MLU Samples: Terry
MLU
2.50
2.00
1.50
1.00
0.50
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
21 mos
24 mos
Terry
0.00
1.00
2.34
1.71
1.25

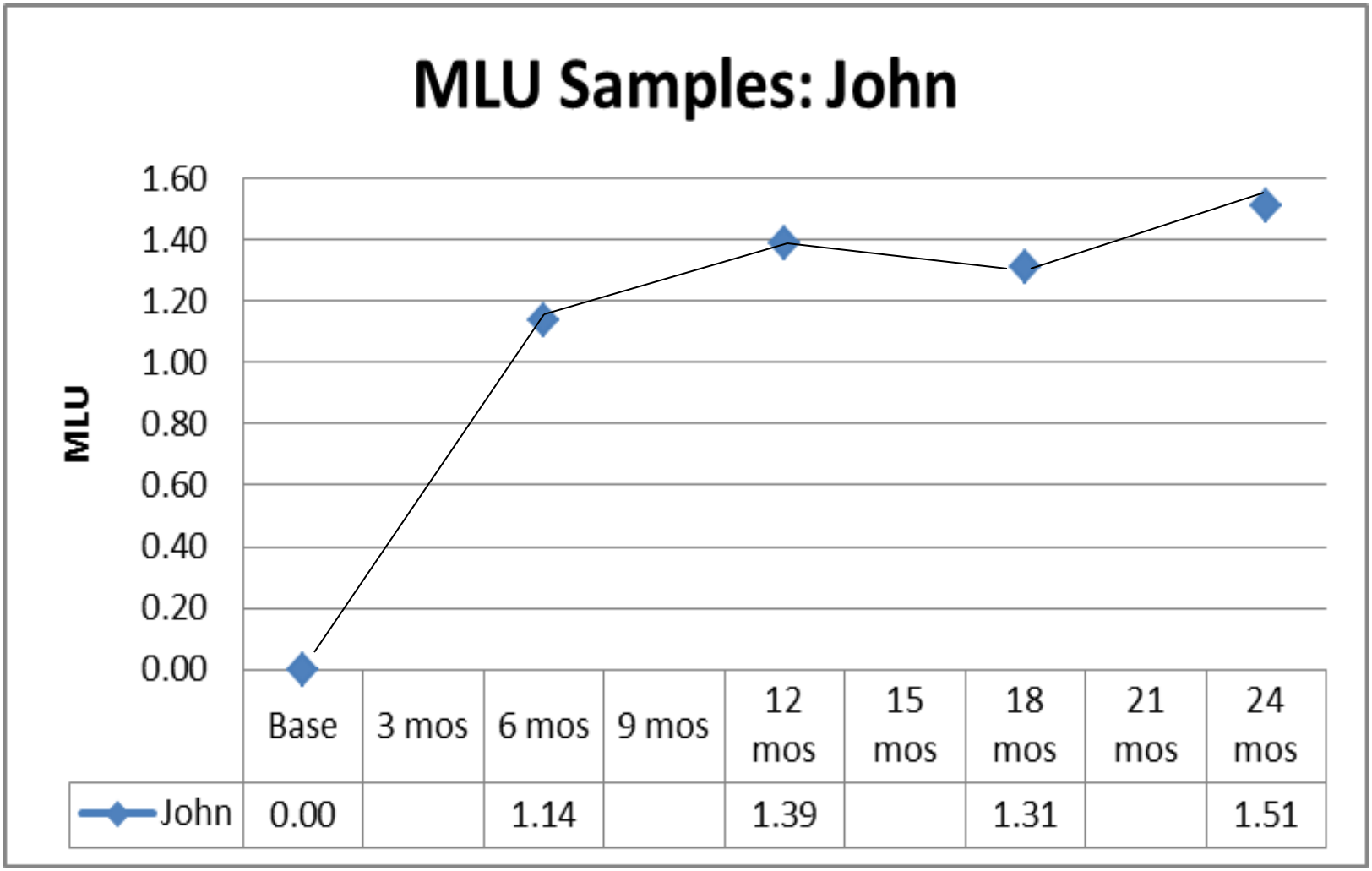
# Results


MLU Samples: Haylie
MLU
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
21 mos
24 mos
Haylie
1.00
2.23
2.25
2.07
2.43

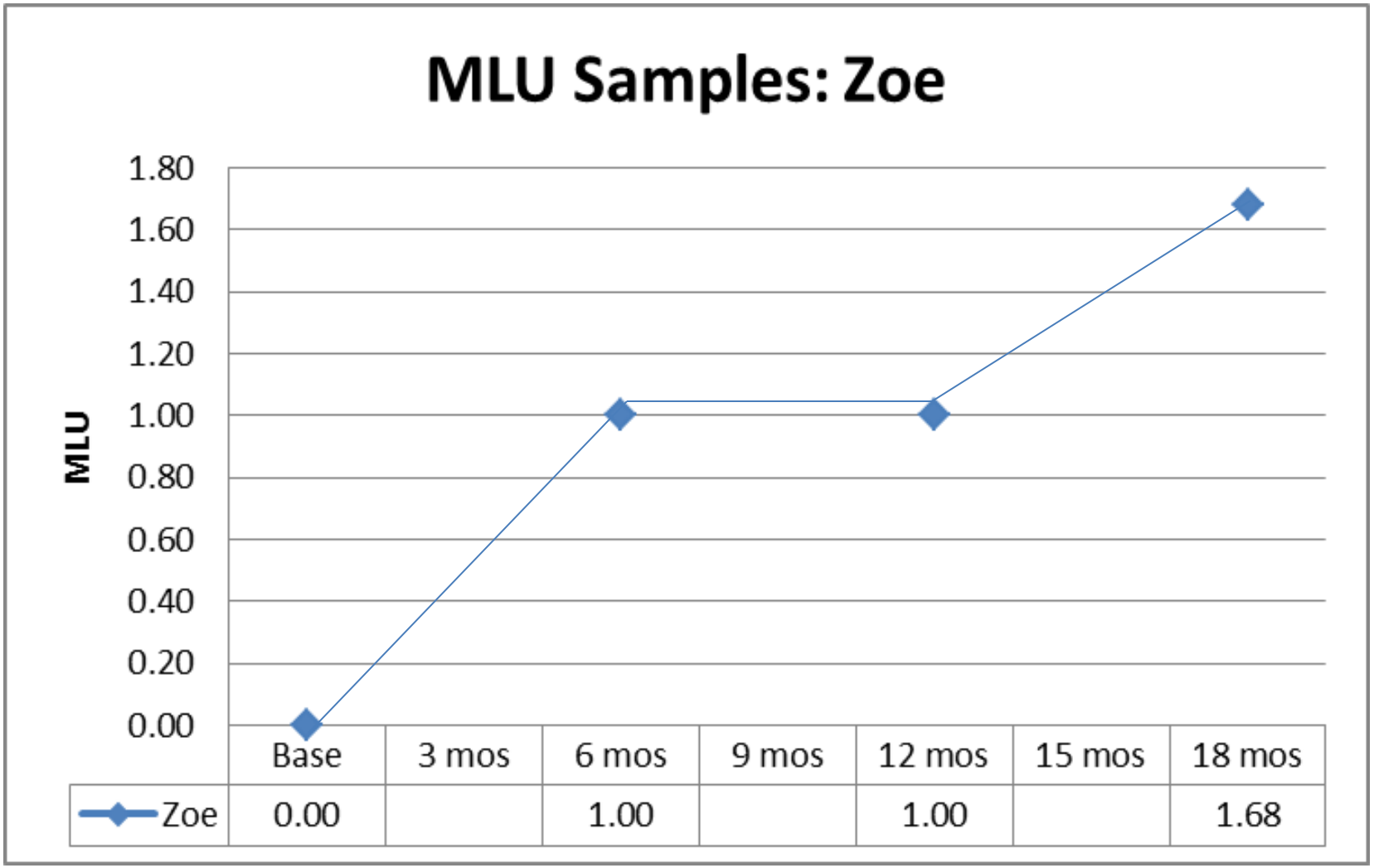
# Results


MLU Samples: Cody
MLU
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
21 mos
24 mos
27 mos
30 mos
Cody
0.00
1.00
1.00
1.30
1.56
1.39

# Results


MLU Samples: John
MLU
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
21 mos
24 mos
John
0.00
1.14
1.39
1.31
1.51

# Results


MLU Samples: Zoe
MLU
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Base
3 mos
6 mos
9 mos
12 mos
15 mos
18 mos
Zoe
0.00
1.00
1.00
1.68

# Conslusions

- *The LAMP therapy approach appears to have been important in each student's communication progress.*
- *The LAMP technique appears to have contributed to the participants' gains in terms of behavior and attention.*
- *The Vantage Lite with "Unity-modified" vocabulary appears to support the LAMP therapy effectively.*

# Questions for Further Study

- *What is the impact of the LAMP therapy on those who exhibited natural vocalization?*
- *Will the children who began to naturally vocalize ultimately transition to natural speech and no longer need an AAC device?*
- *What was the impact of family and school support for LAMP therapy upon client progress?*

# Australian Study

- Case studies of 9 children with ASD
- Ages 4 to12
- 3 locations
- Each had AAC in place, but not using spontaneously
- LAMP Training rovided for family & therapist
- Five weeks of LAMP intervention followed by two weeks of Maintenance

# Australian Study Outcomes

- All participants made progress (differing levels)
- Anecdotal evidence supports statistical data.
- Greatest gains: expressive communication
  - Four out of the eight participants went from being mainly in the pre-intentional/intentional stages of communication, to using intentional and symbolic communication using SGD
  - other four participants who were already using both intentional and symbolic communication, increased their use of symbolic communication across the functions of communication, and as a consistent method of communicating.

# Australian Study Outcomes

- Prior to the research:
  - 87% of participants were using a method of communication to protest;
  - 62% were able to gain attention, greet and farewell or express feelings using some sort of communication or physical behavior (e.g. hugging another person).
  - Only two of the participants (25%) were commenting in some way
- At the post-assessment and maintenance stages,:
  - All the participants were requesting using a symbolic means of communication (device or spoken language)
  - 100% of participants were developing social communication through commenting.
- Other improvements in functional communication were:
  - An increase of 75% of participants developing communication to gain attention and express feelings
  - 87% using communication to greet or bid farewell to others.

# Australian Study Outcomes

- Most Impressive Increases in expressive communication:
  - range of vocabulary
  - length of utterances used by participants.
- Specifically:
  - Fifty per cent of participants had up to 10 words by session five.
  - The other 50% had greater than 30 words being used spontaneously on the device, by session five.
  - Three of these had a vocabulary of between 40 to 65 words at this stage.

# Australian Study Conclusions

- Effective teaching of motor plans, using the LAMP theory, can be seen to:
  - allow for increased storage and retention of symbolic information,
  - resulting with more automatic communication over time,
  - reducing the cognitive demands associated with analyzing and choosing from different symbol sets
- The results of this research add to the evidence regarding the effectiveness of using AAC with people with an ASD

# Questions & Discussion

# Contact Information

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