

# Gender Differences in Language Samples of Individuals who use Augmentative and Alternative Communication (AAC) Users

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# Abstract

- This pilot study compared summary measures based on a picture description task from 5 female and 5 male adults who rely on AAC.
- The genders were matched by experience and AAC system for comparison purposes.
- The results represent tentative descriptive data analysis to test the hypotheses before initiating possible further investigation.



# Research Questions

1. Does a gender difference present in the frequency of use of AAC language representation methods or communication rates in the language samples of matched pairs of individuals who rely on AAC?
2. Does a gender difference present in the topics discussed and the word choices used in the language samples of matched pairs of individuals who use AAC?
3. Do differences exist in lexical richness and utterance length in the language samples of matched pairs of individuals who rely on AAC?



# Participants

- 5 males and 5 females who use AAC were matched by experience and AAC systems.
- Ages ranged from 21 years to 48 years old
  - Female mean age = 27 years
  - Male mean age = 30 years
- 8 Euro-American and 2 African-American
- All of the participants were diagnosed with cerebral palsy and used powered wheelchairs.
- 3 females lived with their parents, the rest lived independently
- Level of education ranged from high school to a master of arts
- 8 participants were employed.



# Matched Criteria of Participants

- All participants used direct selection as the access method to the device.
  - Direct selection includes both unassisted access and optical headpointing techniques.
- The female participants were matched with male participants that had similar experience with their device, used the same devices, and used similar application software programs on their devices.
- Participants were matched as closely as possible in backgrounds (age, ethnic background, use of a wheelchair, living situation, education, and/or employment).
- The amount of experience with the language program ranged from 3 weeks to 9 years.



# Instrumentation

- All participants used a high technology voice output hybrid display with 128 locations and a touch screen with a Language Application Program (MAP) that supported the three AAC language representation methods (LRMs):
  - Alphabet-based methods: spelling (SPE), word prediction (WPR),
  - Single meaning pictures (SMP), and
  - Semantic compaction (SEM).
- Universal-Language Activity Monitoring (U-LAM) software was used to view the generation of events on the monitor of a computer; in addition, the internal built-in LAM datalogger was activated.
- The AAC device was connected to a laptop computer through a serial/USB adaptor cable.



# Procedure

The picture description task based on the Cookie Theft picture was administered to each participant following the instructions in the manual.



# Data Analysis

- Performance Report Tool 1.0 (PeRT) was used to support data analysis.
- Descriptive statistics were used to report:
  - The total number of words used
  - The total number of different root words used
  - The frequency of vocabulary use
  - The MLU
  - The frequency of the language representation mode use
- Additional analyses:
  - Using the scoring procedures for the Boston Diagnostic Aphasia Examination
  - 6 of 8 methods for assessing lexical richness used in Singh (1997, 2001) and in Holmes and Singh (1996)



# Reliability

- Interrater reliability
  - For word-by-word agreement was 100%
  - For utterance segmentation was 93%
- Interjudge reliability
  - For word-by-word agreement averaged 95%
  - For utterance segmentation averaged 96%



# Descriptive Results:

	Total Number of Words Used	Total Number of Different Words Used	Frequency of Representation Mode	Average Communication Rate (words/min)	MLU
Female 1	128	73	SEM 68% WPR 28.9% SMP 3.1%	6.45	9.85
Male 1	209	127	SEM 73.7% WPR 13.4% SPE 10.0% SMP 2.9%	10.19	19.00
Female 2	130	78	SEM 81.5% WPR 14.6% SPE 3.8%	5.60	21.67
Male 2	139	72	SEM 77% SPE 23%	10.09	13.90
Female 3	95	55	SEM 81.1% WPR 12.6% SPE 6.3%	7.82	7.92
Male 3	127	84	SEM 96.1% SPE 3.1% WPR .8%	9.67	10.58
Female 4	81	52	SEM 81.5% SPE 18.5%	5.45	9.00
Male 4	132	78	SEM 96.2% WPR 3.0% SPE .8%	9.14	10.15
Female 5	246	120	SEM 90.7% SPE 9.3%	19.71	8.79
Male 5	167	103	SEM 92.8% SPE 7.2%	9.69	9.28



	Total Utterances	Empty Utterances	Subclausal Utterances	Single Clause Utterances	Multi-Clause Utterances	Agrammatic Deletions	Complexity Index
Female 1	100%	7.69%	0%	30.77%	61.54%	0%	1.5833
Male 1	100%	9.09%	0%	18.18%	72.73%	36.36%	3.1
Female 2	100%	0%	0%	14.29%	85.71%	14.29%	3.2857
Male 2	100%	0%	0%	10%	90%	0%	2.6
Female 3	100%	9.09%	0%	9.09%	81.82%	0%	2
Male 3	100%	0%	0%	25%	75%	0%	2.1667
Female 4	100%	0%	0%	44.44%	55.56%	22.22%	1.8889
Male 4	100%	0%	15.38%	38.46%	46.15%	0%	2.0769
Female 5	100%	14.81%	3.70%	25.93%	55.56%	0%	1.8696
Male 5	100%	0%	11.11%	38.89%	50%	0%	1.6667



## Scores on the Boston Diagnostic Aphasia Examination

## Results for Measures of Lexical Richness used in Singh (1997, 2001) and in Holmes and Singh (1996)

- Honoré Statistics (R; Honoré, 1979)
  - Female average: 1021.45
  - Male average: 1045.49
- The table to the right shows the frequency of the different parts of speech used in the language samples.

	Noun	Pronoun	Adjective	Verb
Female 1	16	9	3	13
Male 1	21	4	4	14
Female 2	18	6	4	14
Male 2	18	4	0	17
Female 3	18	5	2	18
Male 3	14	6	2	23
Female 4	15	7	5	16
Male 4	15	10	2	17
Female 5	17	7	3	16
Male 5	20	5	4	16



# Initial Implications of Research Results

- Initial descriptive analysis points to potential differences in outcomes achieved between females and males who use AAC assistive technology. The differences observed in this pilot project show the value of further testing and experimentation.
- Initial conclusions of the data analysis showed:
  - Males outperform and achieve better outcomes related to lexical richness, lexical diversity, and system performance. Males used more nouns and verbs than females, however females used more pronouns and adjectives. Females were also found to use more empty utterances, while males used more subclausal and single clause utterances.
  - Although some of these gender patterns may be consistent with those observed in speakers using natural speech, performance differences related to system training and use may be related to clinical intervention.
  - This data suggests that females using AAC may required intervention strategies designed specifically to build communication competence in domains related to strategic and operational skills rather than social skills.



# Thank you!

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