COMPARISON OF 3 LOW TECH, EYE MOVEMENT-ACCESSIBLE COMMUNICATION METHODS

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Background

- Estimates range from between 80% (Sitver & Kraat, 1982) to 96% (Ball, Beukelman, & Pattee, 2004) of people with ALS (pALS) require augmentative alternative communication (AAC) at some point prior to their death.

- Frequently volitional eye movement is preserved in end stage pALS who are paralyzed and unable to speak.

Background

- Therefore, eye movement provides the one remaining method for interacting for months or years for many pALS.

- A variety of high tech and low tech eye movement communication methods exist that allow paralyzed pALS to spell novel messages instead of being restricted to responding to yes/no questions.

Background

- Low tech AAC is often preferred by pALS over high tech systems especially in end stage ALS. (Doyle & Phillips, 2001)

- High tech systems may be unavailable to individuals in facilities or on hospice.

- Unlike high tech, low tech AAC is inexpensive, quickly attainable, doesn't malfunction and is not a liability issue for facilities.

Background

- There is no evidence guiding our recommendations for low tech AAC methods accessed with eye movement.

- The ALS Practice Parameter published in Neurology 2009 states there are no controlled studies comparing communication treatments for pALS.
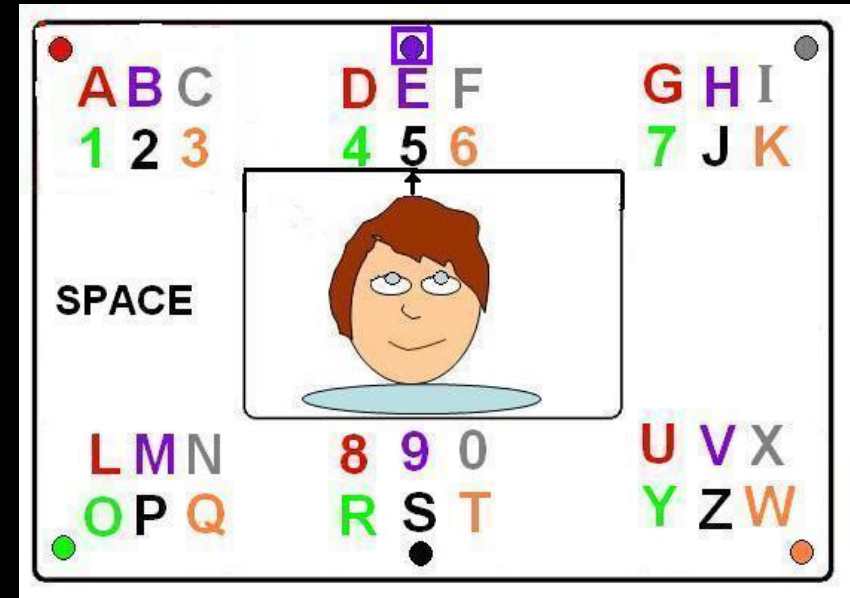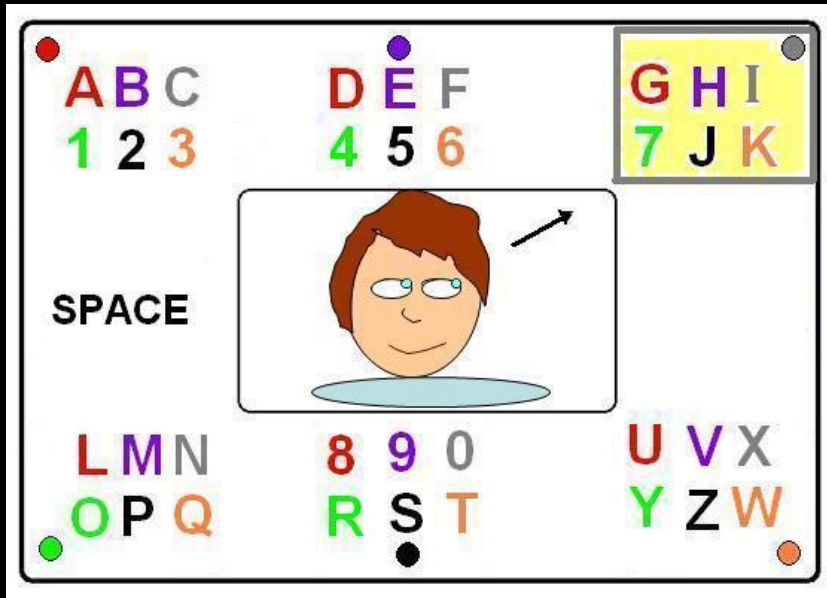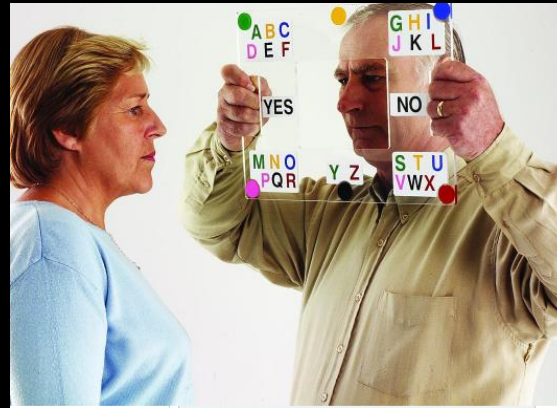
The 3 Methods Compared

- EyeLink
- E-tran
- Partner-Assisted Scanning (PAS)

EyeLink

E-tran

Step 1- Choose Letter's <u>Group</u>   Step 2- Choose Letter's <u>Color</u>

Partner Assisted Scanning

A	B	C	D				Yes
E	F	G	H				No
I	J	K	L	M	N		Don't Care/Know
O	P	Q	R	S	T		Thank You
U	V	W	X	Y	Z		Turn Over
space	New Word		Start Over		Please Guess		Don't Guess

Aims of the Study

- **<u>Aim 1</u>:** Determine SLP's familiarity with and frequency of selection of each of these three eye movement accessible, AAC methods for their severely physically impaired, non-verbal, literate patients.

Aims of the Study

- **<u>Aim 2</u>**: Determine which of these methods is the fastest and easiest to use <u>initially</u>.

Aims of the Study

- **Aim 3**: Determine which of these methods is the fastest and easiest following <u>multiple training and practice sessions</u>.

Aims of the Study

- **<u>Aim 4</u>**: Determine the length of time required to train each of the three methods.

Survey

Our Survey of 343 SLPs and AT Specialists found that they:

- were most likely to have heard of, demonstrate and use PAS

- were least likely to have heard of, demonstrate and use the EyeLink

- believed patients rarely selected and used EyeLink

- E-tran fell in the middle

Part II-Experimental Trials
Methods

- 15 pALS and communication partners were recruited

- Five home visits (1-2 hours)

- At each visit pairs performed all 3 methods (order of presentation was randomized)
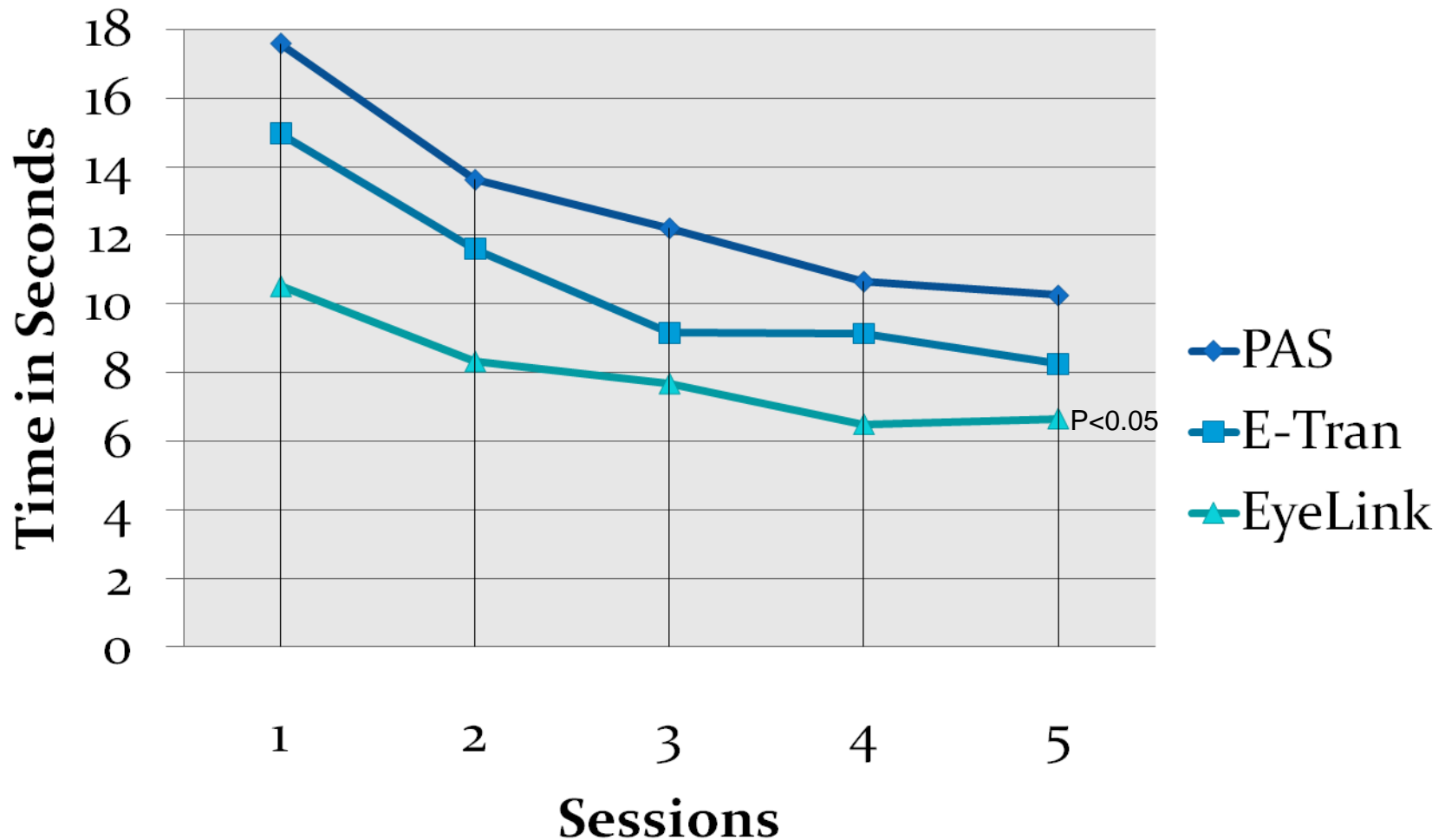
Methods - Schedule

- At Sessions 1 & 2: Three instructional videos (no additional instruction)

- At Every Session
  - Two practice words/method
  - Eight timed target words

    (36 letters & spaces)/method
  - At end of each session, participants ranked methods from most to least preferred
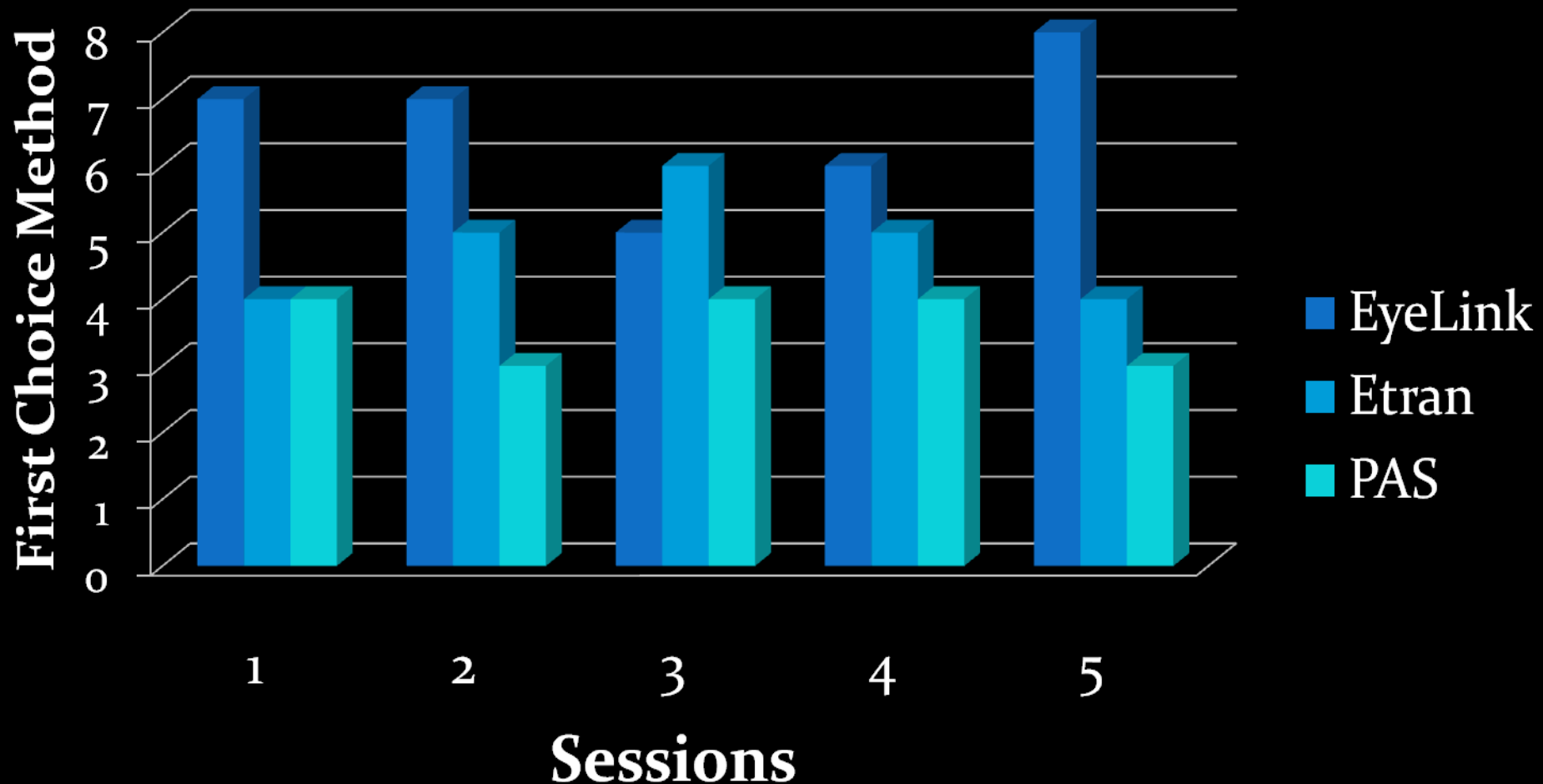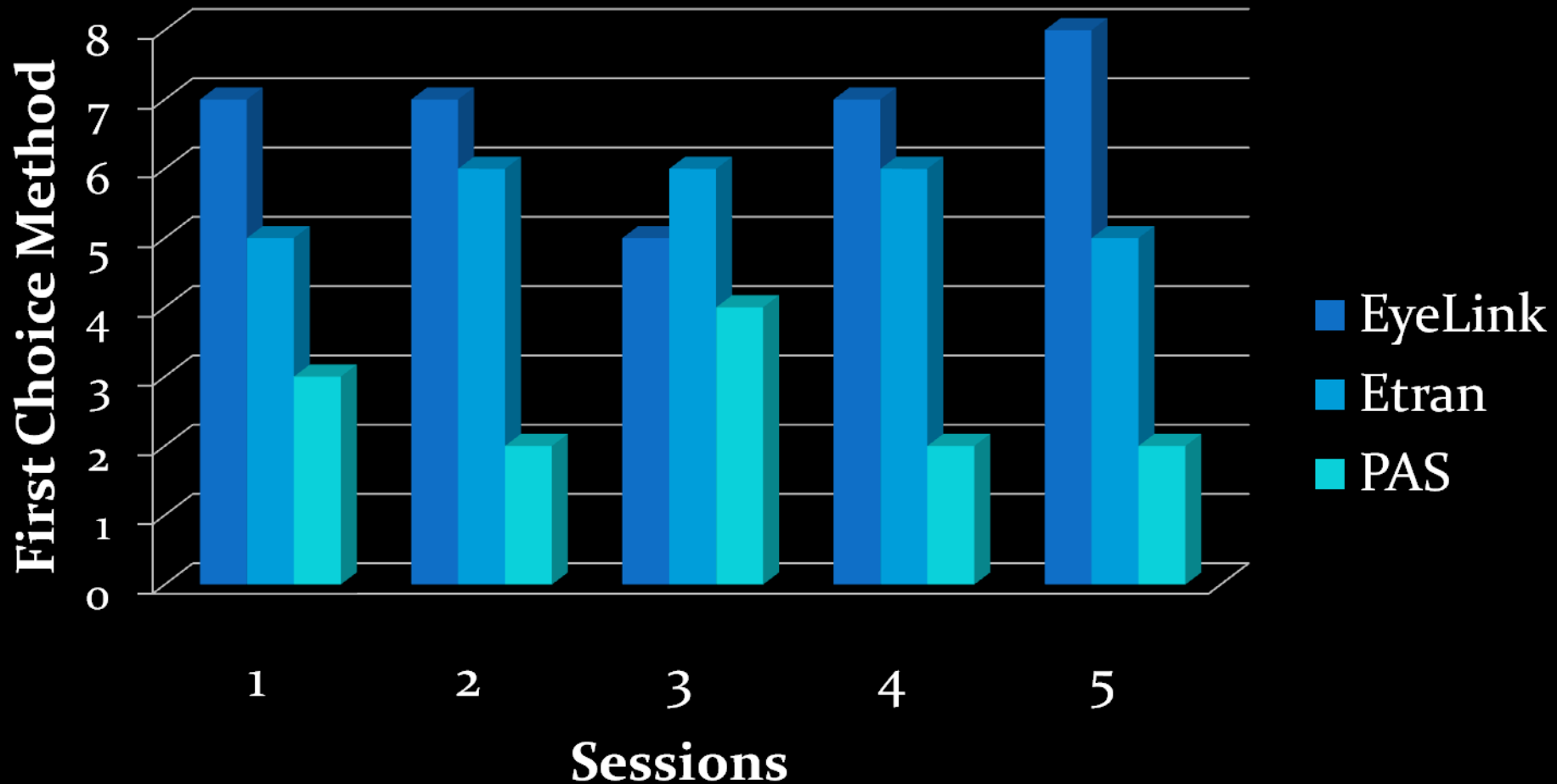
Results
Average Time Per Selection (letter)

Results

pALS Preferred Method by Session

Results

Partners' Preferred Method by Session

Conclusion

- EyeLink, the least known and least popular method in our survey of SLPs, was the fastest and preferred method by our pALS and partners.

Discussion

- Further Questions
  - Why is PAS most popular with SLPs?
    - Availability/Easily improvised
    - Can function even when eye movement is impaired (targeting not required)
  - Which method is the best for different subpopulations (executive dysfunction, glasses, reclined, fatigue with poor concentration)

Future Research

Analysis of experienced users to

- Compare communication rates attained by experienced users of each method

- Compile the strategies and shortcuts that experienced method users employ to speed message generation

Recommendations

- Have EyeLink and E-tran boards readily available to demonstrate and provide to patients

- The videos used in this study can be used to learn & train each of these methods (YouTube)

- Conduct more controlled studies on communication methods and strategies for pALS

Resources

- EyeLink boards
  - cini.org/eyelink.html
- E-tran boards
  - mnd.asn.au   (select resources, other items)
  - amazon.co.uk (search: Frenchay E-tran)

- EyeLink Instruction Video
  - youtube.com/watch?v=zdTeVwTXjxI
- E-tran Instruction Video
  - youtube.com/watch?v=lfLuqGAxaz4
- PAS Instruction Video
  - youtube.com/watch?v=nxwooUb9ohw