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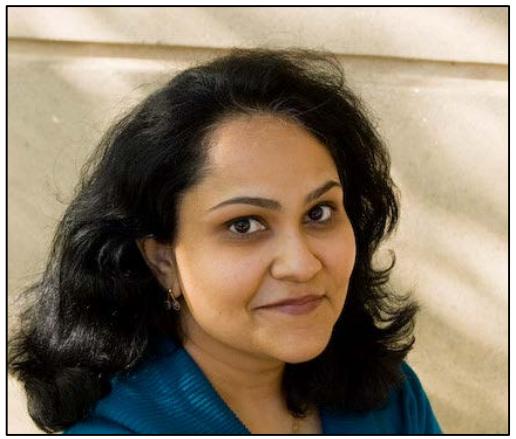
Does naming therapy make ordering in a restaurant easier? Impairment vs. Function in Aphasia

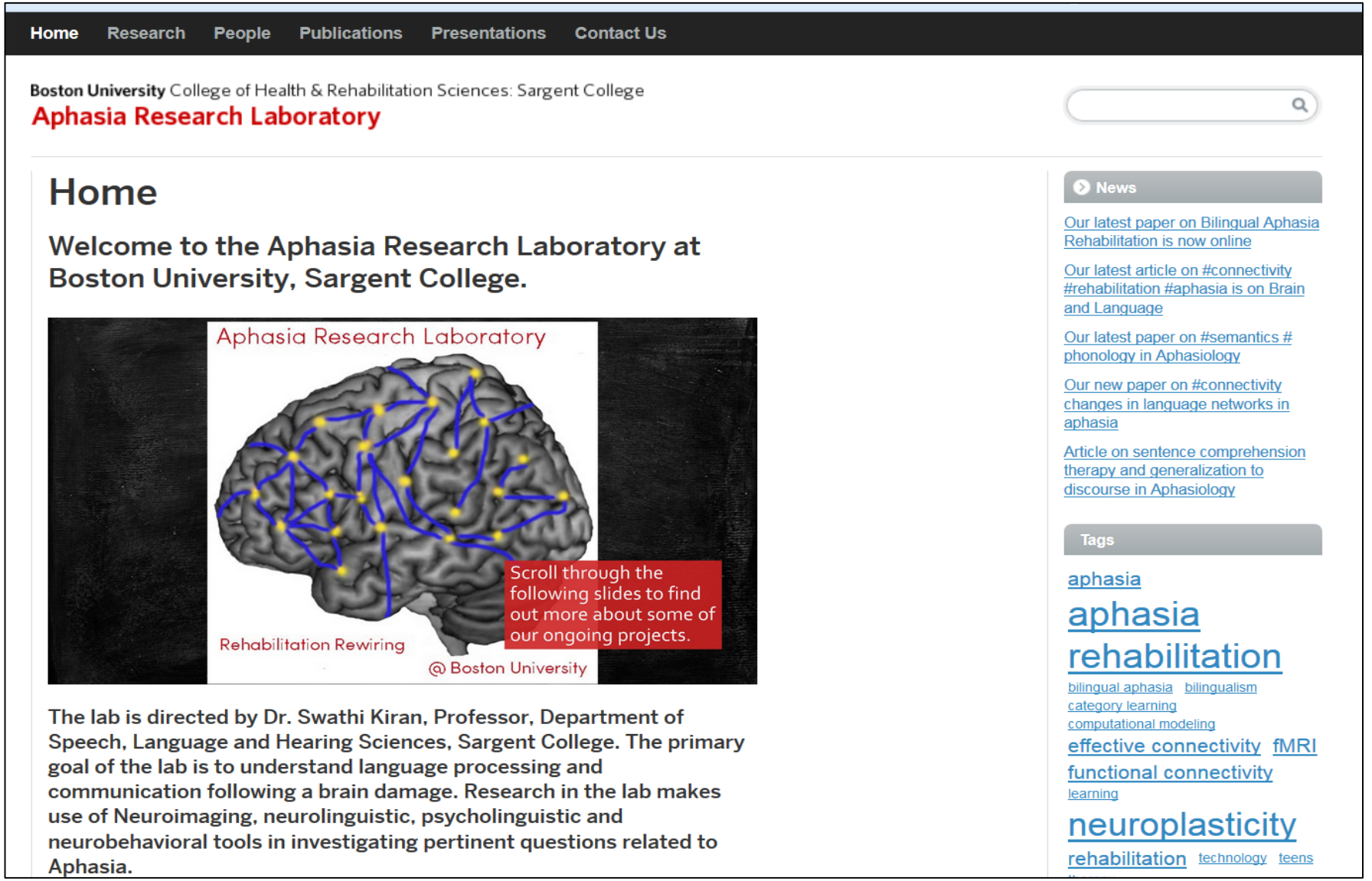
Erin Meier, M.S., CCC-SLP, Jeffrey P. Johnson, M.S., CCC-SLP, Sarah Villard, M.S., CF-SLP, and Swathi Kiran, PhD, CCC-SLP

Boston University Aphasia Research Laboratory



Swathi Kiran

Sarah Villard



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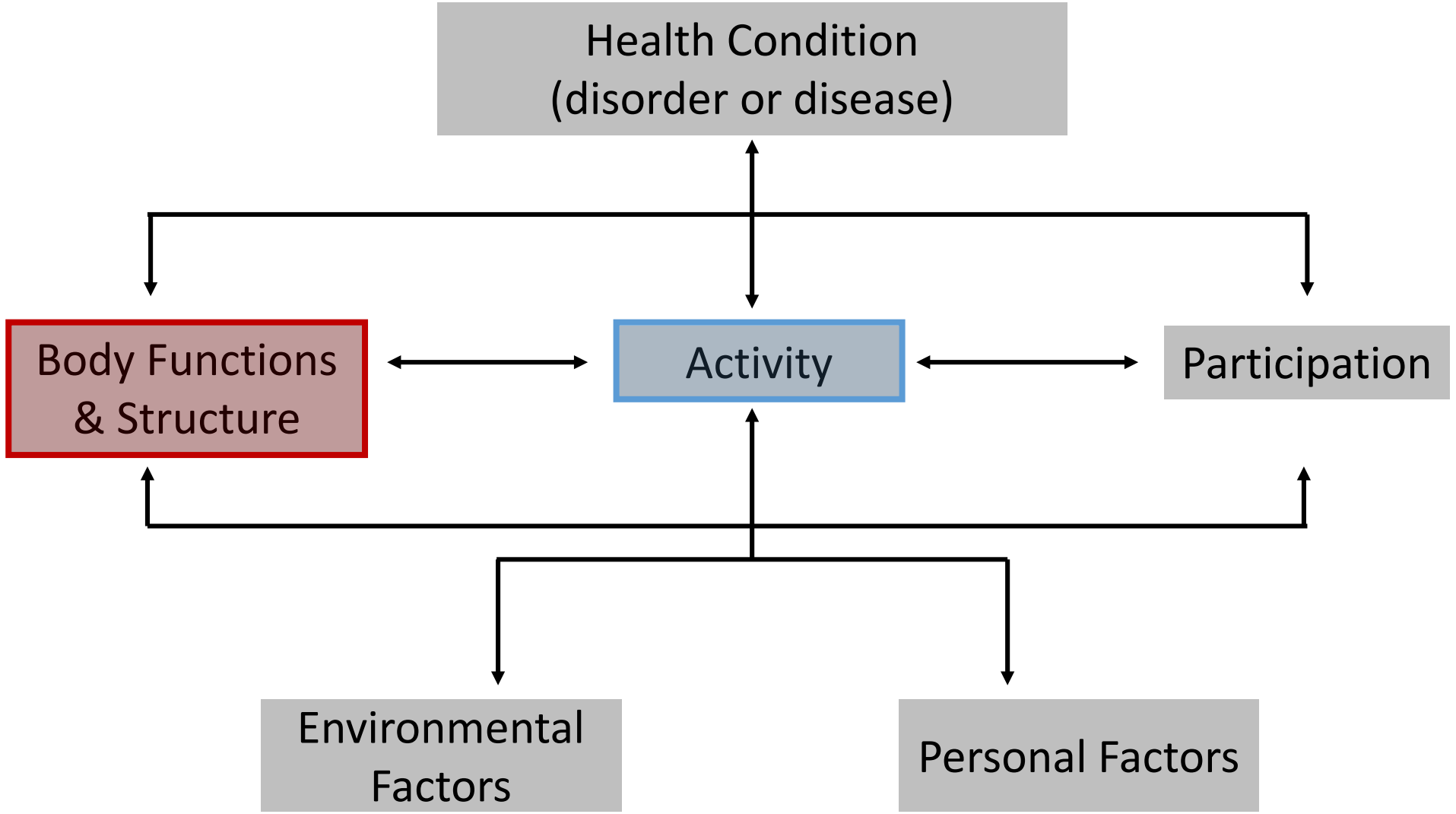
Financial Disclosures

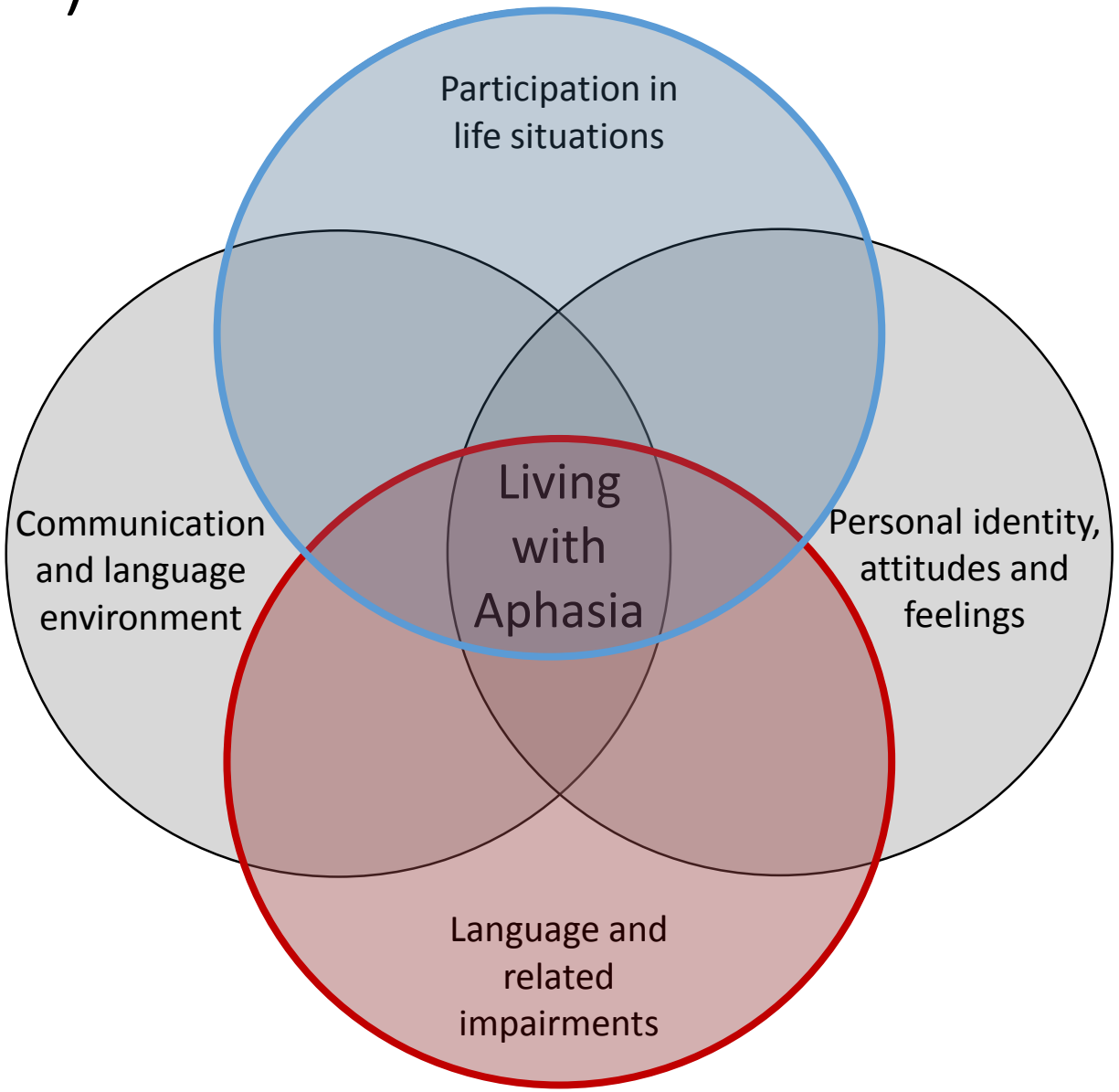
- Swathi Kiran is the co-founder and Scientific Advisor of Constant Therapy and owns stock equity in Constant Therapy, the software platform through which some therapy referred to in this study was delivered
- Boston University owns a portion of stock equity in Constant Therapy

International Classification of Functioning, Disability, and Health (ICF) Framework



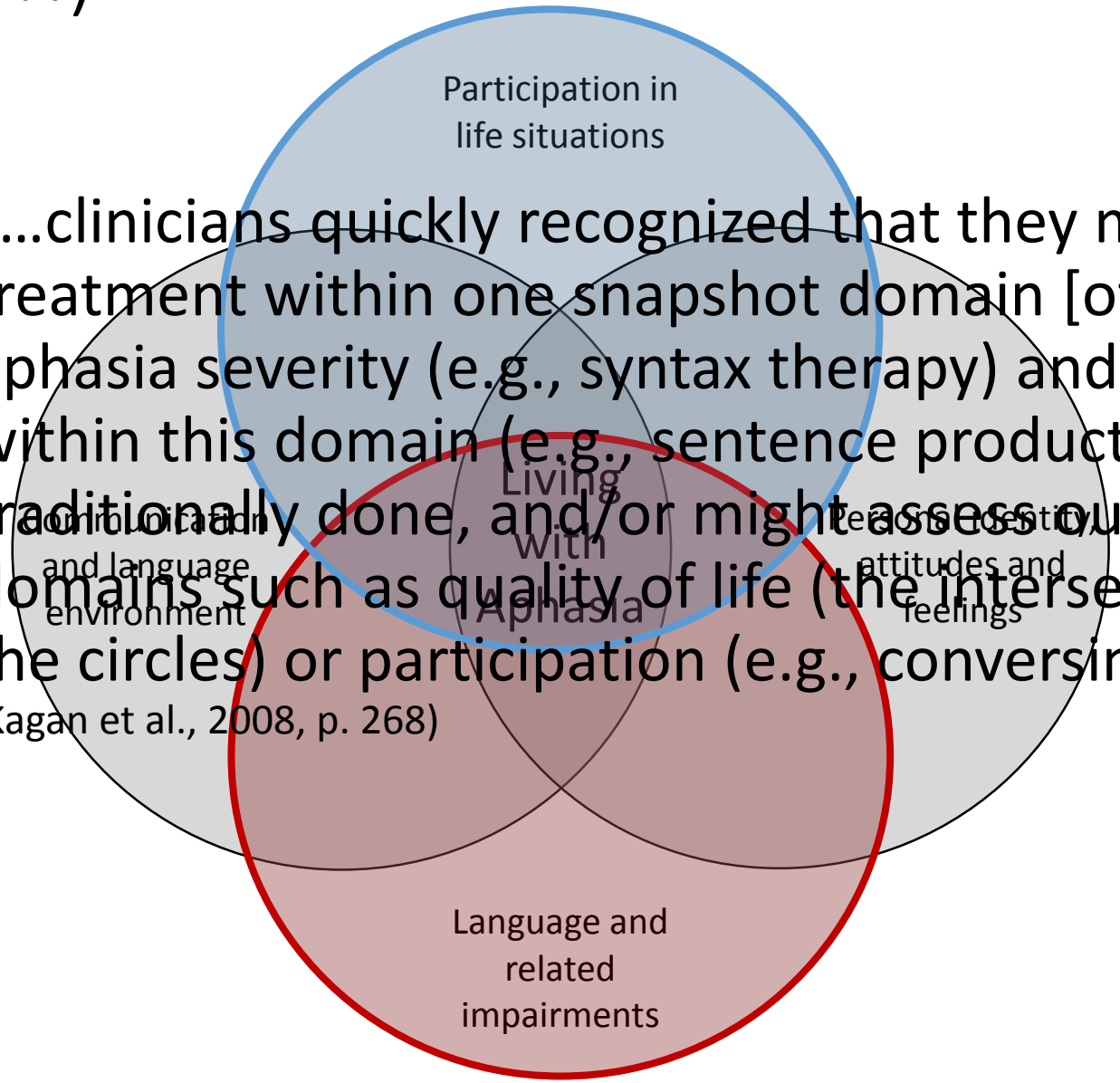
World Health Organization (WHO), 2001

Aphasia: Framework for Outcome Measurement (A-FROM)



Kagan et al., 2008

Aphasia: Framework for Outcome Measurement (A-FROM)



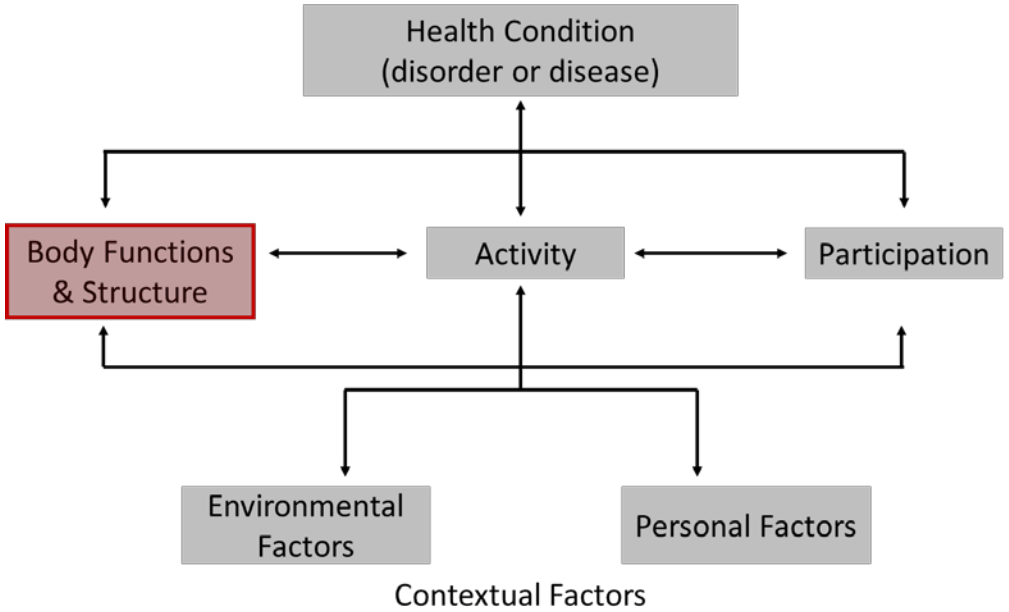
- "…clinicians quickly recognized that they might focus treatment within one snapshot domain [of A-FROM] such as aphasia severity (e.g., syntax therapy) and assess outcomes within this domain (e.g., sentence production) as is traditionally done, and/or might assess outcomes in other domains such as quality of life (the intersect in the middle of the circles) or participation (e.g., conversing with friends)."
(Kagan et al., 2008, p. 268)

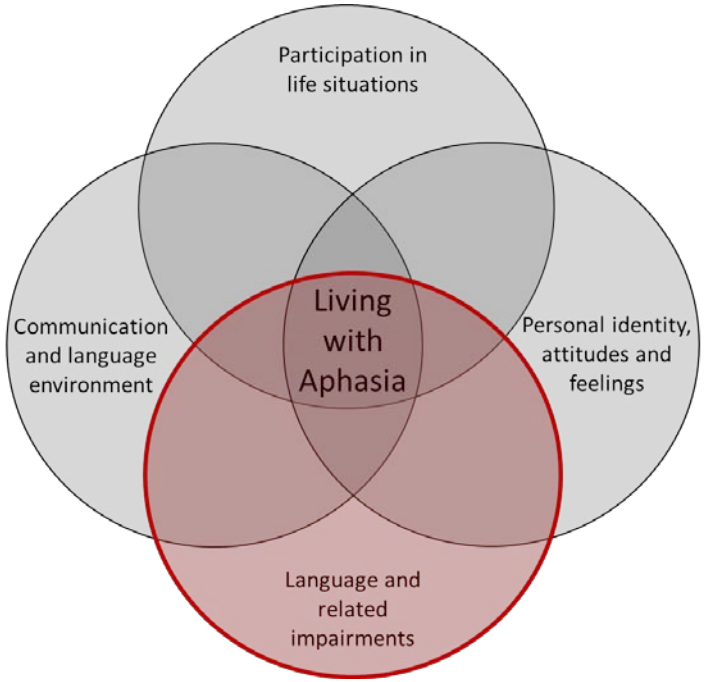
Kagan et al., 2008

How are cognitive-linguistic and functional communication abilities *defined*?

Cognitive-linguistic abilities

- Word Retrieval
- Syntax Production
- Reading Single Words
- Visuospatial Skills

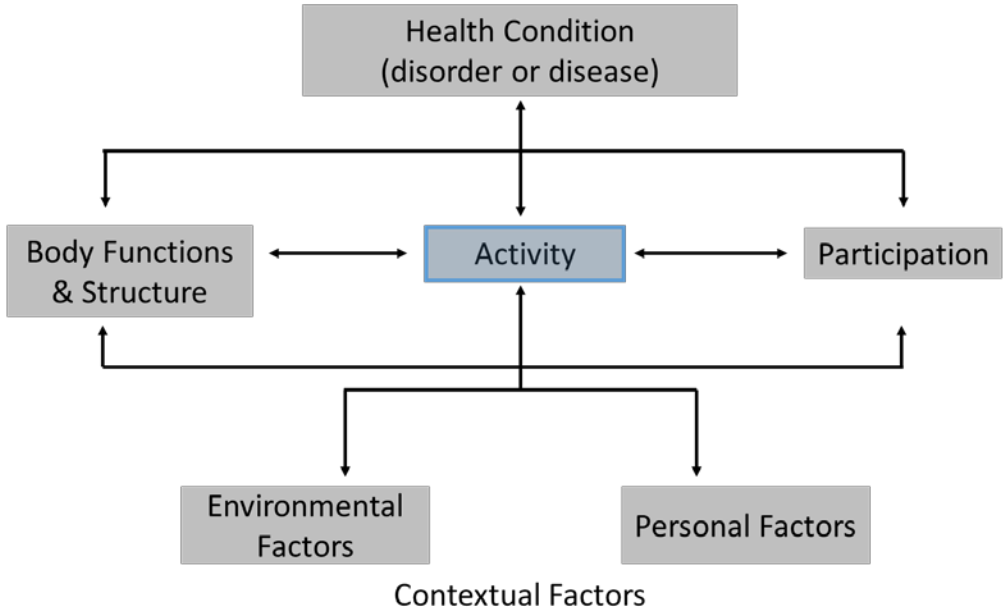


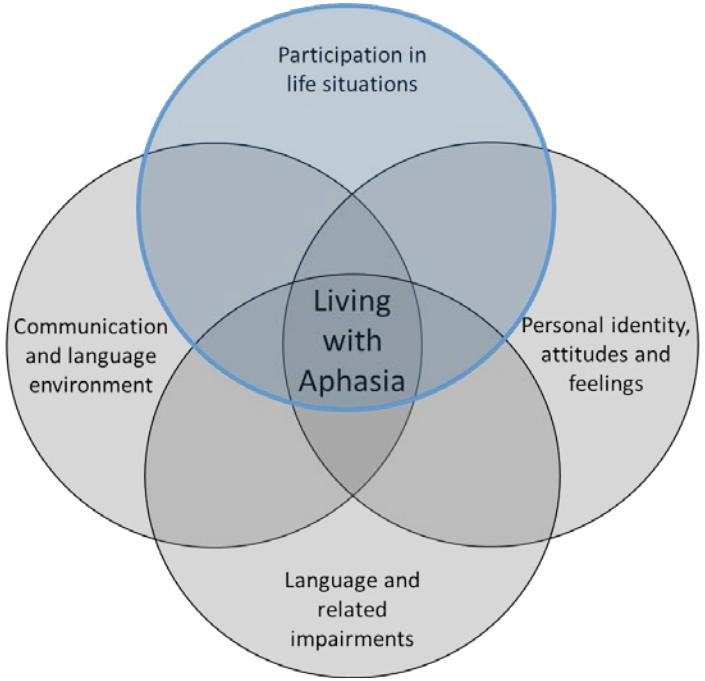


How are cognitive-linguistic and functional communication abilities *defined*?

Functional communication abilities

- Introducing a New Topic
- Requesting Information
- Reading a Menu
- Ordering in a Restaurant





How are cognitive-linguistic and functional communication abilities *measured*?

Impairment-Based Instruments

- Western Aphasia Battery-Revised, WAB-R (Kertesz, 2007)
- Comprehensive Aphasia Test, CAT (Swinburn, Porter, & Howard, 2005)
- Boston Diagnostic Aphasia Examination, BDAE (Goodglass, Kaplan, Barresi, 2000)
- Cognitive-Linguistic Quick Test, CLQT (Helm-Estabrooks, 2001)
- Boston Naming Test, BNT (Kaplan, Goodglass, & Weintraub, 2001)
- Pyramids and Palm Trees, PAPT (Howard & Patterson, 1992)
- Psycholinguistic Assessments of Language Processing, PALPA (Kay, Lesser, & Coltheart, 1992)
- And others…

Functional Communication Instruments

- ASHA Functional Assessment of Communication Skills for Adults, ASHA FACS (Frattali, Thompson, Holland, Wohl, & Frederic, 1995)
- Communication Effectiveness Index, CETI (Lomas et al., 1989)
- Communication Outcome after Stroke, COAST (Long, Hesketh, Paszek, Booth, & Bowen, 2008)
- Aphasia Communication Outcome Measure, ACOM (Hula et al., 2015)
- Assessment for Living with Aphasia, ALA (Kagan et al., 2013)
- Communication Activities of Daily Living, CADL-2 (Holland, Frattali, & Fromm, 1999)
- And others…

How are cognitive-linguistic and functional communication abilities *related*?

How are cognitive-linguistic and functional communication abilities *related*?

1. Significant relationship seen between measures of cognitive-linguistic skills and functional communication at a single time point (e.g., Frattali et al., 1995; Hula et al., 2015; Lomas et al., 1989)

Measures of cognitive-linguistic skills

Measures of functional communication

at Time X

How are cognitive-linguistic and functional communication abilities *related*?

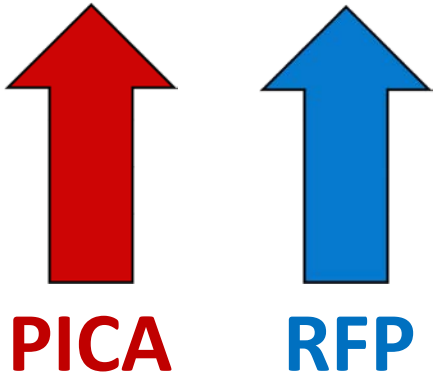
2. Persons with aphasia (PWA) can improve in both cognitive-linguistic and functional communication skills with therapy

- Bakheit, Carrington, Griffiths, & Searle (2005) **WAB** ✓ **CETI** ✓
- Irwin, Wertz, & Avent (2002) **PICA** ✓ **RFP** ✓
- Aftonomos, Appelbaum, & Steele (1999) **WAB** ✓ **CETI** ✓
- Elman & Bernstein-Ellis (1999) **WAB** ✓ **CADL** ✓

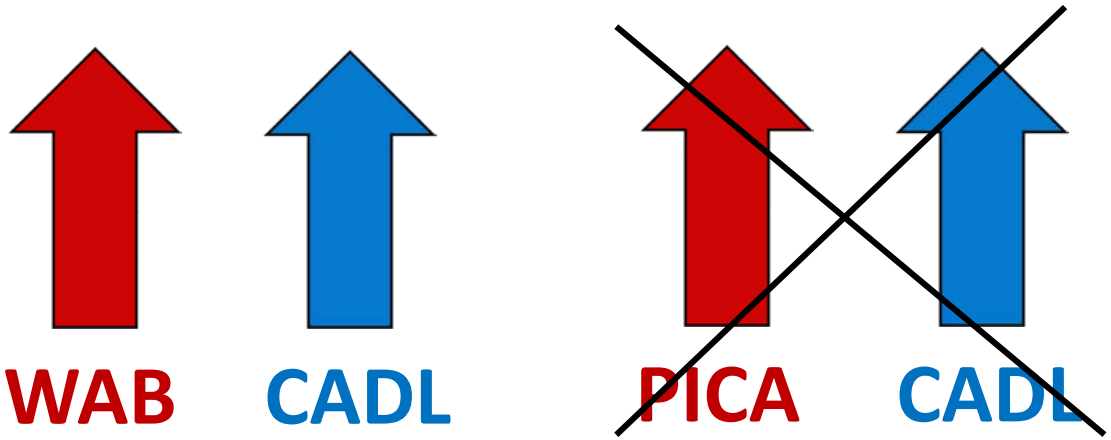
How are cognitive-linguistic and functional communication abilities *related*?

3. Co-occurring changes can be related but may depend on time of administration and specific instruments utilized

- Irwin, Wertz, & Avent (2002)



- Ross & Wertz (1999)



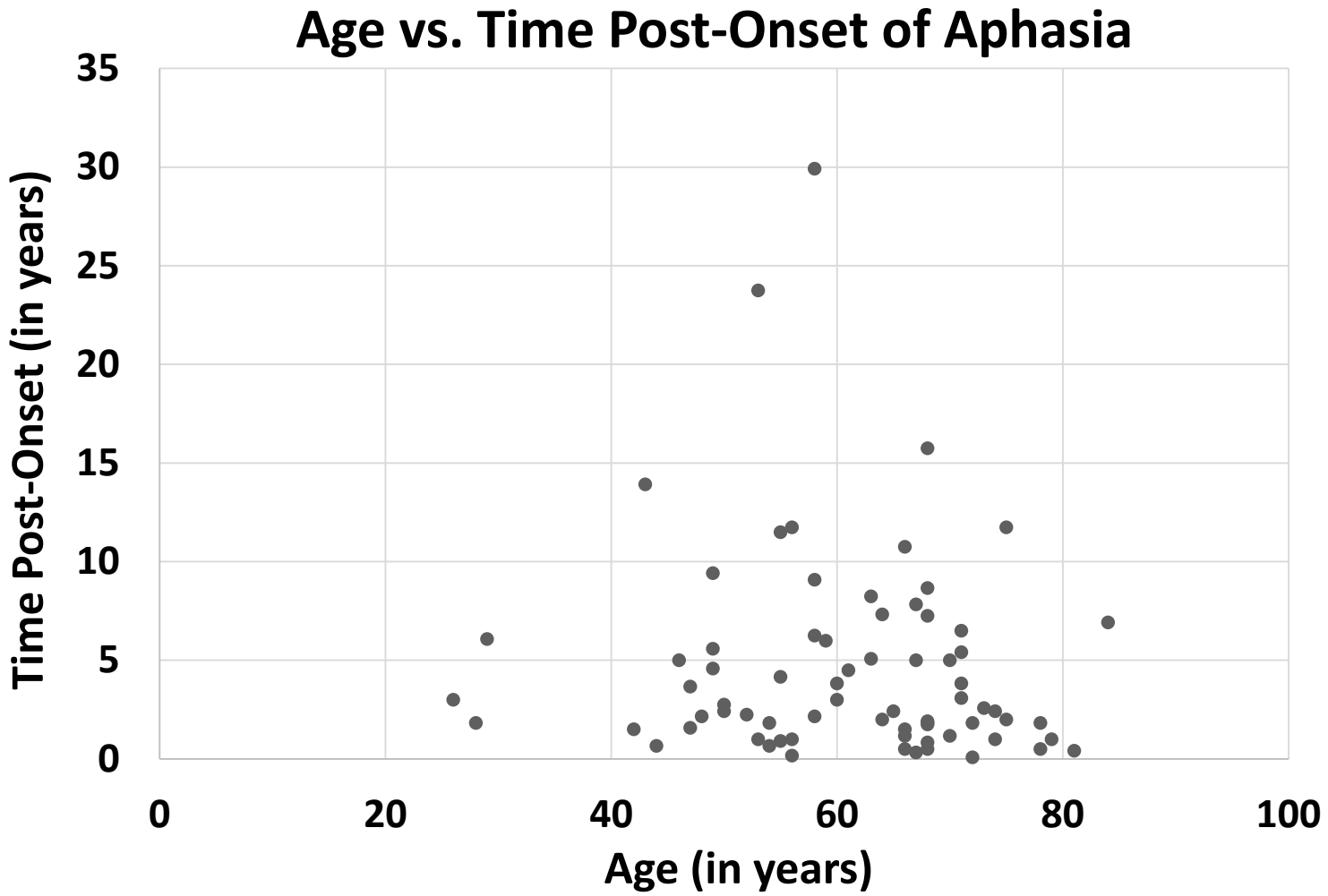
Current Study

Study Aims:

1. Examine relationship between scores on measures of language impairment and functional communication at a single time point
2. Examine the relationship in treatment-induced change scores on the same instruments

Experiment 1: Participants

Experiment 1
Participants:
n = 72
Mean age: 60.9 yrs
Mean time post-onset: 4.7 yrs



Experiment 1: Instruments and Scores

Impairment Measures	Mean ± SD	Range
WAB-R		
Aphasia Quotient (AQ)	65.7 ± 26.5	11.5 – 99.9
Language Quotient (LQ)	66.3 ± 24.2	15.5 – 99.1
Cortical Quotient (CQ)	69.5 ± 21.2	20.3 – 98.0

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CLQT		
Attention (%)	66.9 ± 28.9	1.9 – 97.2
Memory (%)	59.9 ± 22.9	14.1 – 94.6
Executive Functions (%)	50.9 ± 20.6	2.5 – 80.0
Language (%)	50.0 ± 28.0	0.00 – 86.5
Visuospatial (%)	69.2 ± 25.3	3.8 – 96.2
Composite (%)	68.0 ± 21.9	25.0 – 100.0
Clock Drawing (%)	68.2 ± 31.6	0.0 – 100.0

Lowest Scores **Highest Scores**

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Functional Measure	Mean ± SD	Range
FACS: Communication Independence (CI) (1-7)		
Social Communication	5.6 ± 1.1	1.6 – 6.9
Basic Needs	6.5 ± 0.7	4.0 – 7.0
Reading, Writing, Numbers	5.3 ± 1.6	1.1 – 7.0
Daily Planning	5.0 ± 1.8	1.0 – 7.0
Overall CI	5.6 ± 1.1	2.3 – 7.0

Lowest Scores → **Highest Scores**

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Overall CI	5.6 ± 1.1	2.3 – 7.0
FACS: Qualitative Dimensions of Communication (QDC) (1-5)		
Adequacy	3.7 ± 0.8	2.0 – 5.0
Appropriateness	4.3 ± 0.8	2.0 – 5.0
Promptness	3.5 ± 0.9	1.5 – 5.0
Communication Sharing	3.6 ± 1.1	1.0 – 5.0
Overall QDC	3.8 ± 0.7	2.2 – 4.9

Lowest Scores → **Highest Scores**

Experiment 1: Results

Correlations between ASHA FACS Communication Independence scores and measures of cognitive-linguistic ability

n = 72	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.789***	.525***	.787***	.740***	.829***
WAB-CQ	.802***	.518***	.773***	.742***	.822***
WAB-AQ	.782***	.393**	.688***	.650***	.736***
CLQT: Attention	.351**	.239 (p = .054)	.575***	.612***	.576***
CLQT: Memory	.743***	.464***	.721***	.693***	.780***
CLQT: Executive Functions	.379**	.326**	.615***	.646***	.617***
CLQT: Language	.758***	.441***	.722***	.704***	.786***
CLQT: Visuospatial	.243 (p = .050)	.211 (p = .089)	.484***	.537***	.480***
CLQT: Composite	.621***	.387**	.782***	.775***	.797***
CLQT: Clock Drawing	.560***	.437***	.646***	.655***	.692***
BNT	.679***	.367**	.651***	.681***	.726***
PAPT	.543***	.415***	.605***	.640***	.659***
* = p significant at < .05		** = p significant at < .01		*** = p significant at < .001	
Correlation Strength:	Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)				

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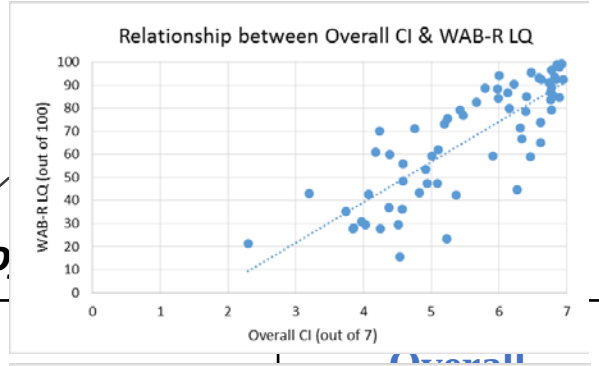

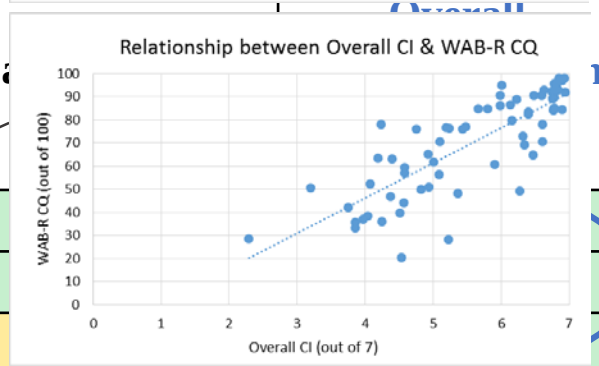

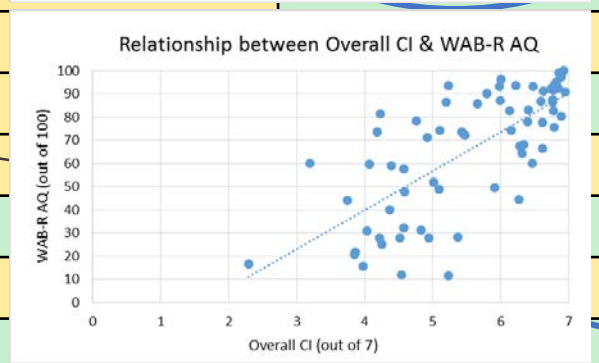

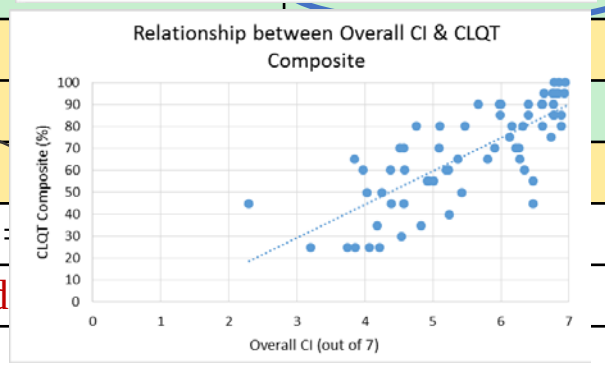

Experiment 1: Results

Correlations between ASHA FACS Qualitative Dimensions scores and measures of cognitive-linguistic ability

n = 70†	Adequacy	Appropriateness	Promptness	Communication Sharing	Overall Qualitative Dimensions
WAB-LQ	.800***	.488***	.530***	.700***	.792***
WAB-CQ	.787***	.501***	.532***	.717***	.796***
WAB-AQ	.767***	.438***	.534***	.756***	.780***
CLQT: Attention	.445***	.566***	.429***	.284*	.497***
CLQT: Memory	.756***	.526***	.478***	.688***	.752***
CLQT: Executive Functions	.484***	.610***	.447***	.335**	.543***
CLQT: Language	.744***	.449***	.437***	.678***	.718***
CLQT: Visuospatial	.364**	.544***	.401**	.206 (n.s.)	.424***
CLQT: Composite	.705***	.614***	.537***	.513***	.710***
CLQT: Clock Drawing	.544***	.576***	.434***	.451***	.602***
BNT	.679***	.412**	.371**	.585***	.638***
PAPT	.565***	.476***	.315**	.407***	.546***

* = p significant at < .05 ** = p significant at < .01 *** = p significant at < .001

Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)

† QDC scores not available for two PWA within the sample

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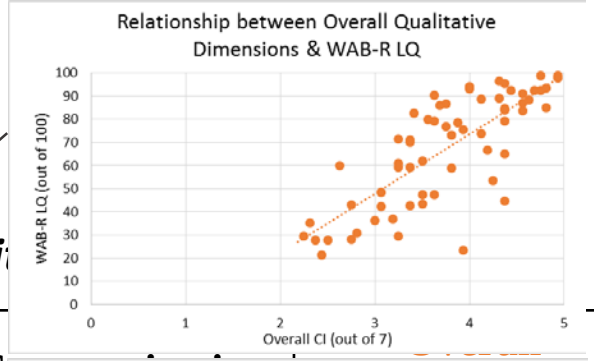
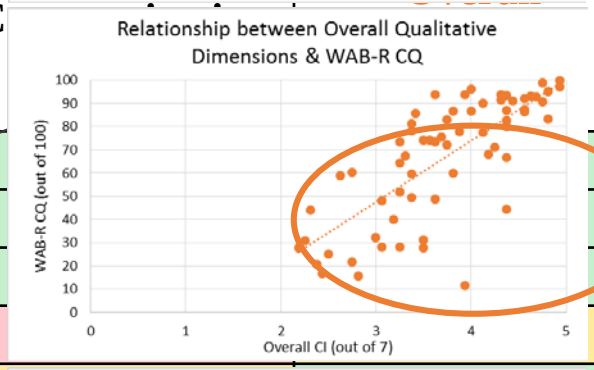
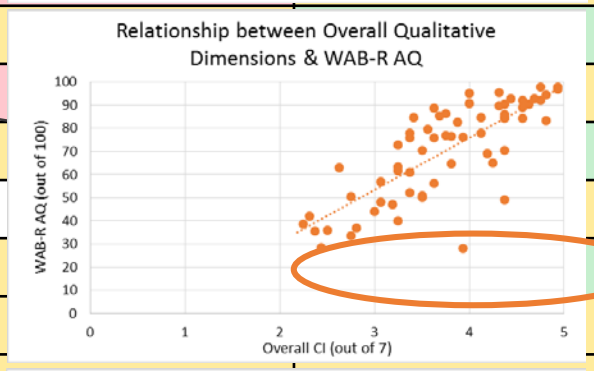
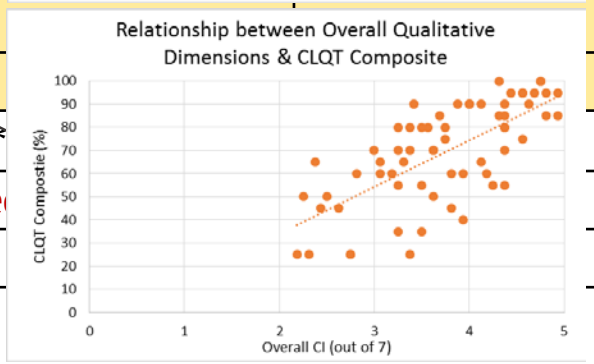


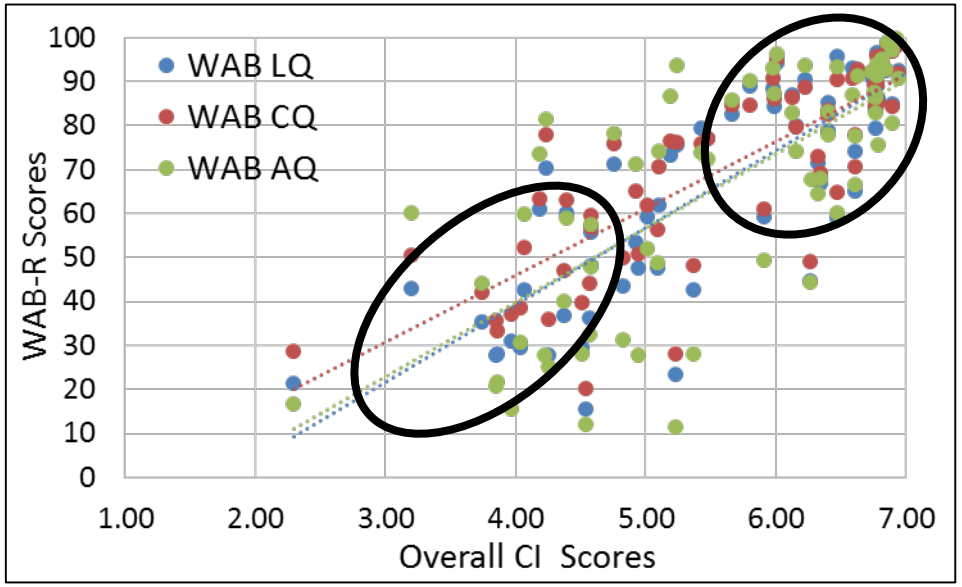


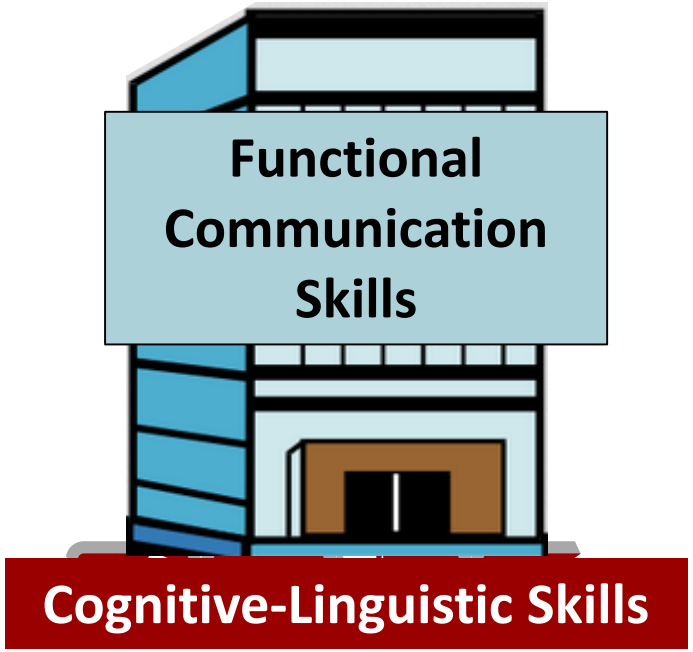


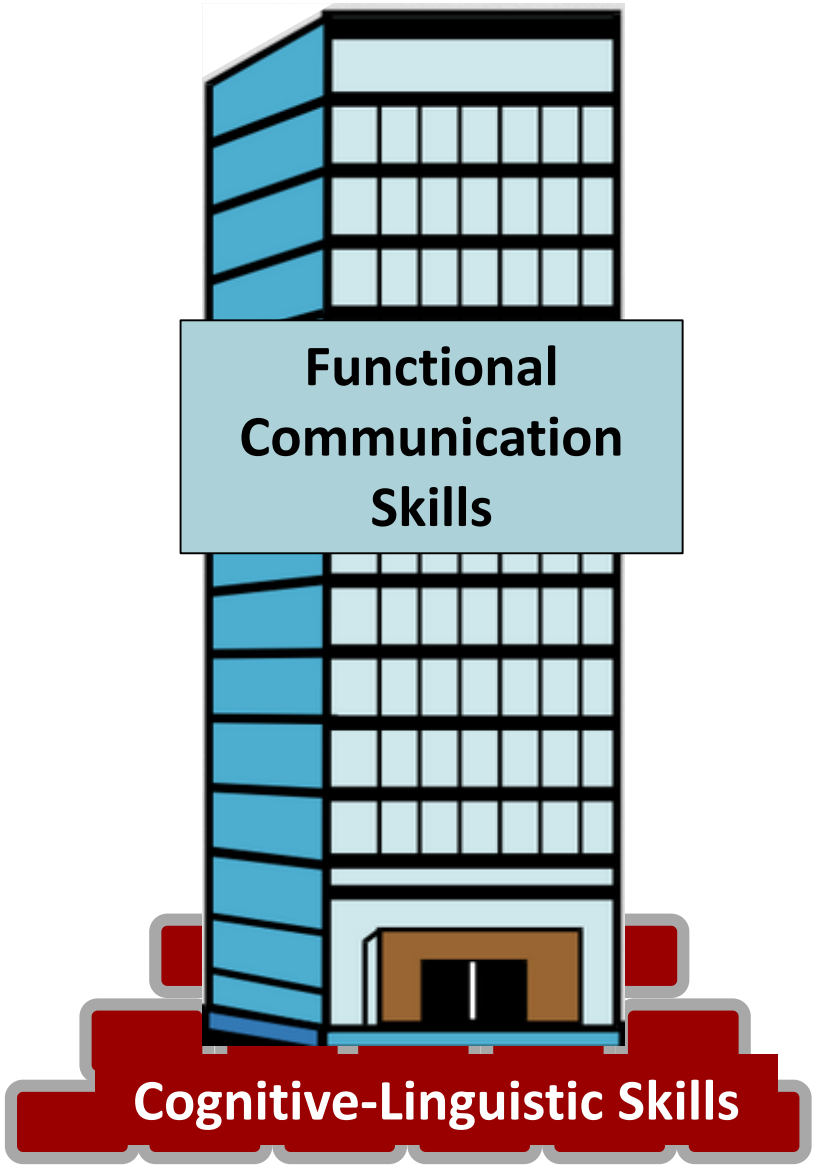


Experiment 1: Summary

All but four correlations between measures of impairment and functional communication were significant and more than 90% were moderate or strong



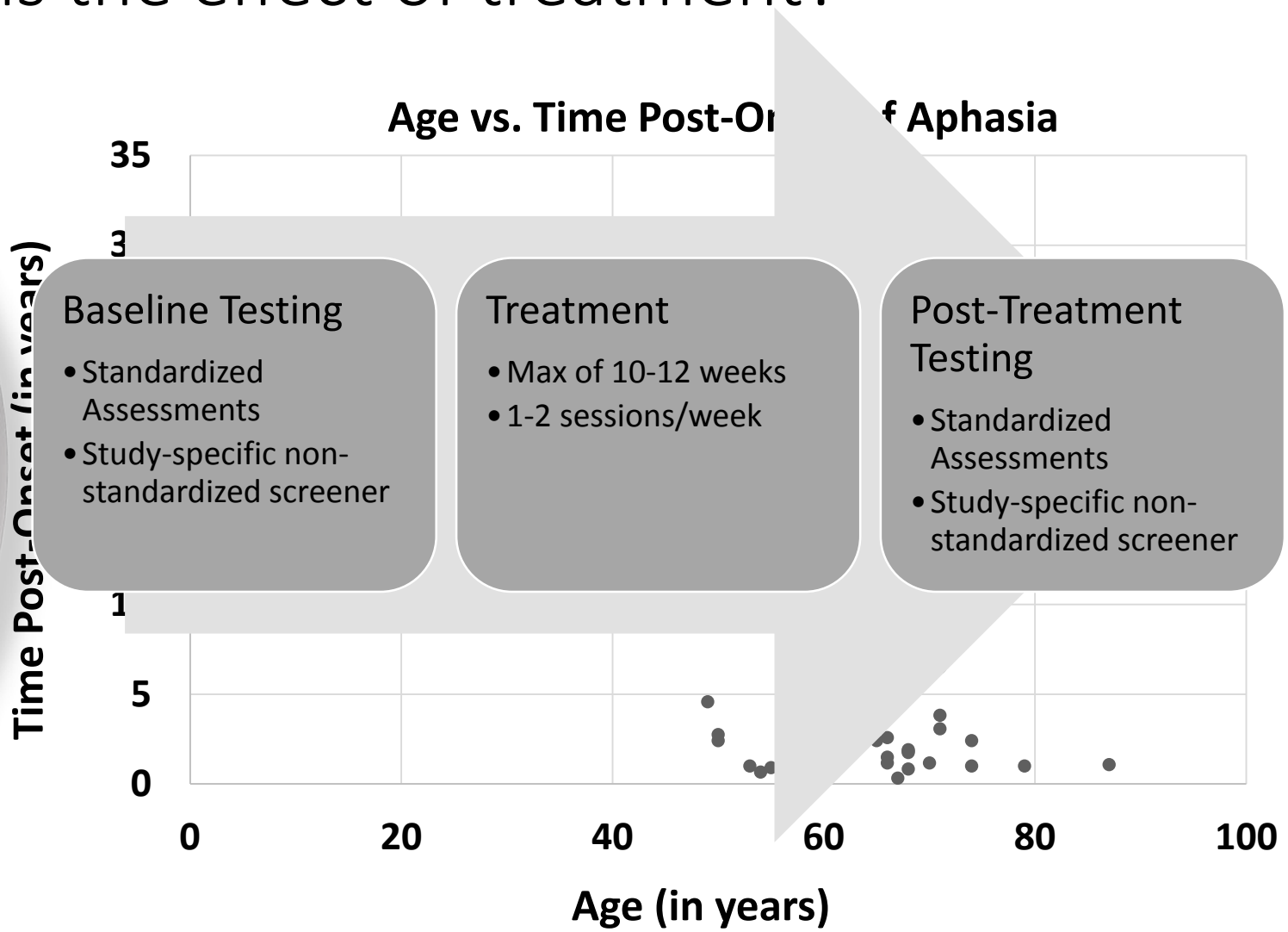




Experiment 2: General Overview

What is the effect of treatment?

Experiment 2
Participants:
n = 39
Mean age: 60.9 yrs
Mean time post-onset: 5.7 yrs



Experiment 2: Correlation results

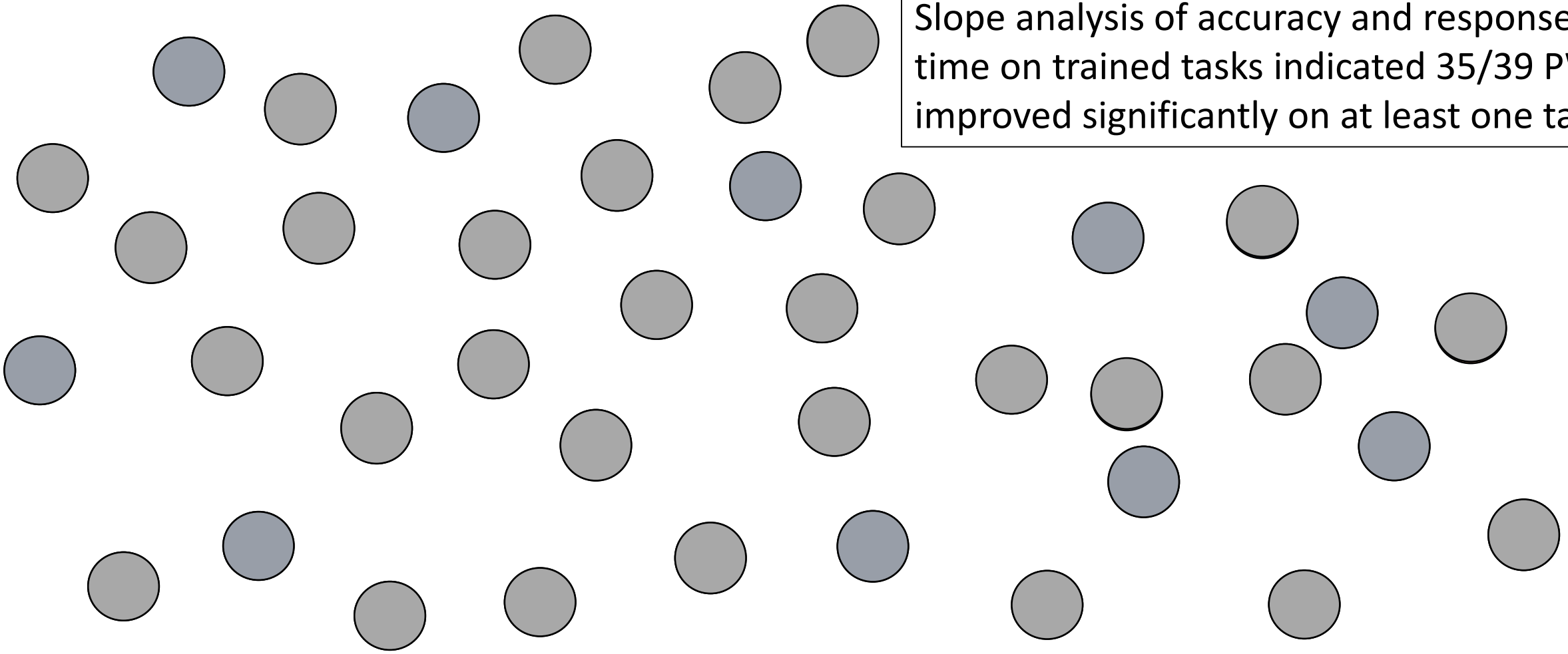
n = 37†	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.906***	.595***	.871***	.807***	.893***
WAB-CQ	.920***	.598***	.853***	.825***	.891***
WAB-AQ	.904***	.484**	.799***	.760***	.834***
CLQT: Attention	.495**	.591***	.625***	.630***	.644***
CLQT: Memory	.849***	.542**	.774***	.754***	.819***
CLQT: Executive Functions	.558***	.719***	.687***	.698***	.727***
CLQT: Language	.850***	.502**	.737***	.743***	.797***
CLQT: Visuospatial	.421*	.603***	.561***	.585***	.590***
CLQT: Composite	.765***	.666***	.825***	.811***	.846***
CLQT: Clock Drawing	.623***	.604***	.648***	.711***	.715***
BNT	.803***	.518**	.692***	.773***	.779***
PAPT	.614***	.737***	.664***	.681***	.747***
* = p significant at < .05		** = p significant at < .01			*** = p significant at < .001
Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)					
† Data not available for two PWA within the sample					

- Strong and highly significant correlations between cognitive-linguistic and functional communication skills at baseline in the subset of PWA who underwent therapy

n = 35††	Adequacy	Appropriateness	Promptness	Communication Sharing	Overall Qualitative Dimensions
WAB-LQ	.817***	.529**	.606***	.826***	.829***
WAB-CQ	.813***	.526**	.597***	.838***	.829***
WAB-AQ	.799***	.487**	.578***	.843***	.817***
CLQT: Attention	.581***	.560***	.444*	.379*	.570***
CLQT: Memory	.798***	.533**	.473**	.775***	.778***
CLQT: Executive Functions	.659***	.664***	.532***	.519**	.697***
CLQT: Language	.722***	.428*	.442*	.754***	.712***
CLQT: Visuospatial	.528**	.566***	.394*	.374*	.538**
CLQT: Composite	.813***	.644***	.559***	.587***	.772***
CLQT: Clock Drawing	.544**	.662***	.420*	.494**	.613***
BNT	.668***	.395*	.395*	.636***	.639***
PAPT	.560***	.484**	.268 (n.s.)	.434*	.532**
* = p significant at < .05		** = p significant at < .01			*** = p significant at < .001
Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)					
†† Data not available for two additional PWA					

Experiment 2: Intervention and Response

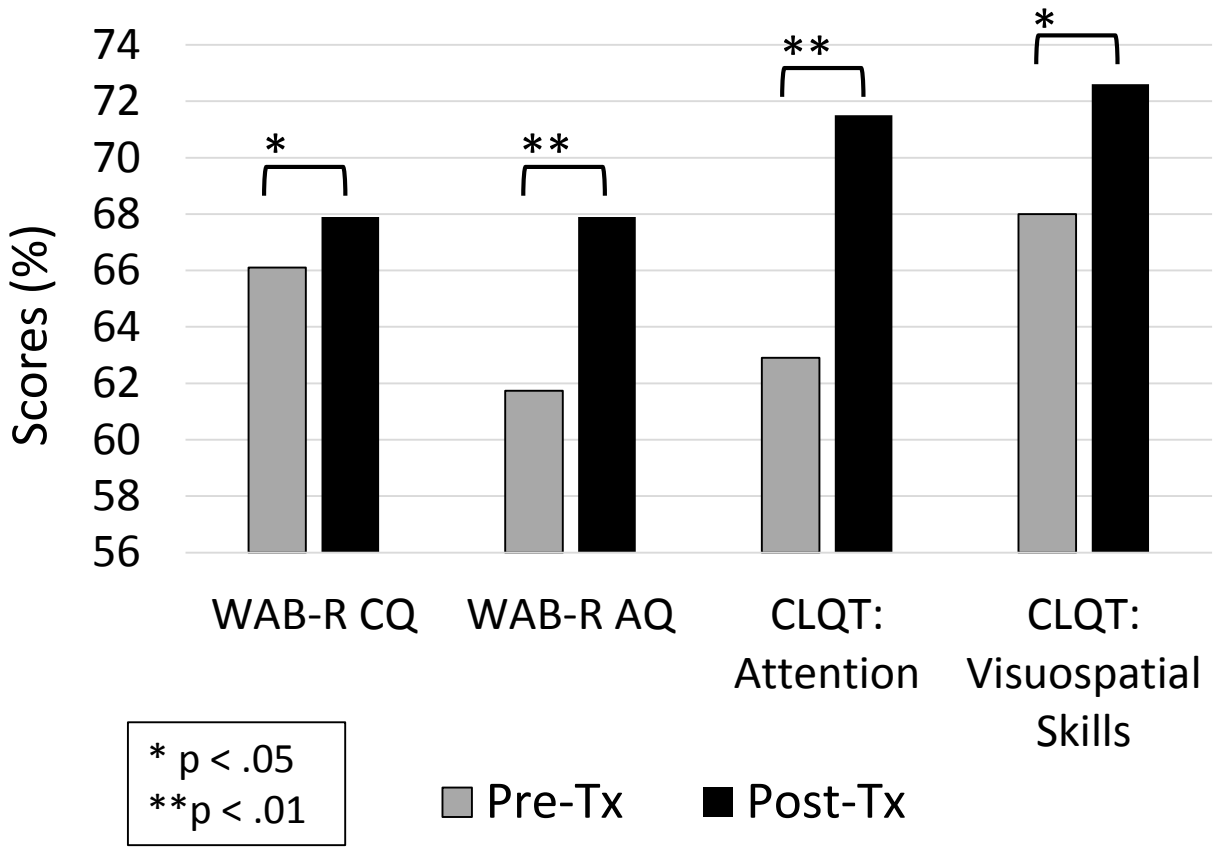
Slope analysis of accuracy and response time on trained tasks indicated 35/39 PWA improved significantly on at least one task



Naming | Reading | Writing | Problem Solving | Memory

Experiment 2: Results in Pre- to Post-Treatment Outcome Measures

- PWA significantly improved from pre- to post-therapy on WAB-R CQ and AQ and CLQT Attention and Visuospatial Skills
- **No** significant changes in ASHA FACS domain or dimension scores were noted following therapy
- Change-score calculation = post-tx score – pre-tx score



Experiment 2: Change Score Correlations

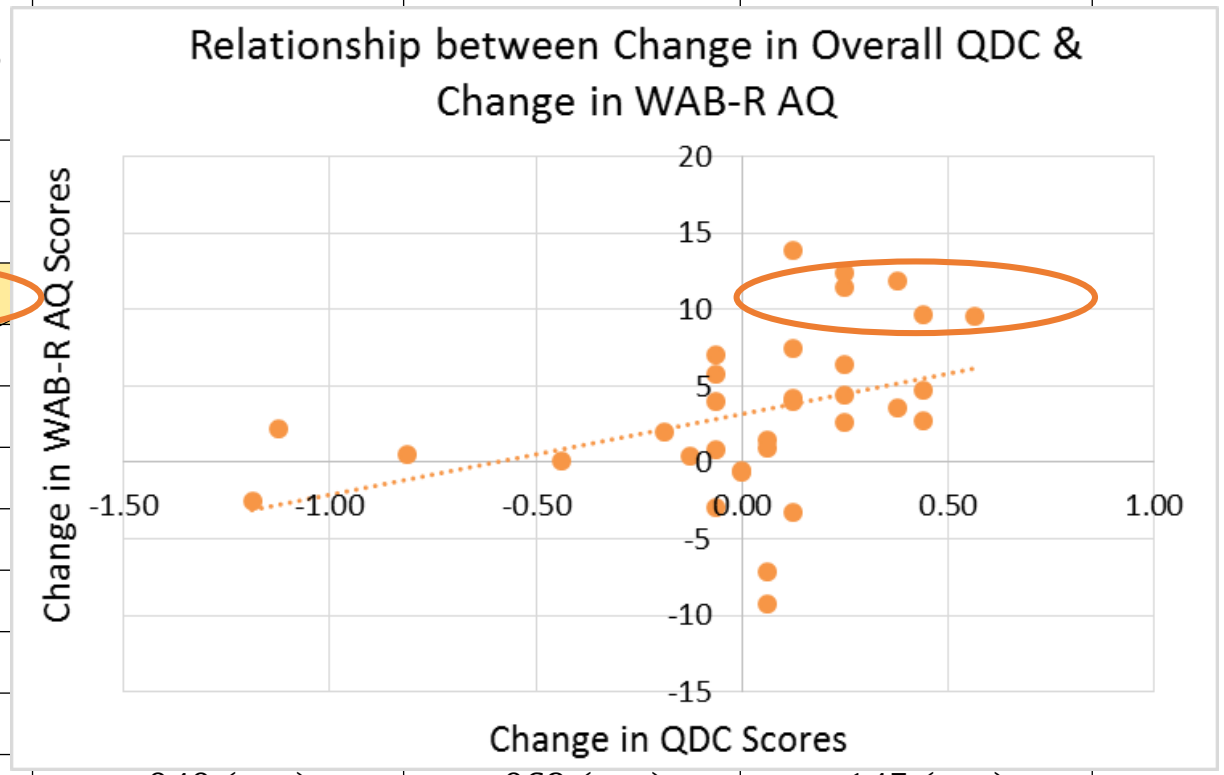
Correlations between ASHA FACS Communication Independence and cognitive-linguistic measure change scores

n = 37†	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.245 (n.s.)	.063 (n.s.)	.261 (n.s.)	.027 (n.s.)	.215 (n.s.)
WAB-CQ	.251 (n.s.)	.132 (n.s.)	.261 (n.s.)	-.030 (n.s.)	.200 (n.s.)
WAB-AQ	.303 (n.s.)	.235 (n.s.)	.256 (n.s.)	.069 (n.s.)	.267 (n.s.)
CLQT: Attention	.076 (n.s.)	.034 (n.s.)	.160 (n.s.)	-.207 (n.s.)	.008 (n.s.)
CLQT: Memory	.181 (n.s.)	.090 (n.s.)	.148 (n.s.)	-.015 (n.s.)	.090 (n.s.)
CLQT: Executive Functions	.103 (n.s.)	.131 (n.s.)	-.005 (n.s.)	-.028 (n.s.)	.077 (n.s.)
CLQT: Language	.164 (n.s.)	-.056 (n.s.)	.181 (n.s.)	.075 (n.s.)	.154 (n.s.)
CLQT: Visuospatial	.067 (n.s.)	.177 (n.s.)	.074 (n.s.)	-.191 (n.s.)	-.001 (n.s.)
CLQT: Composite	.204 (n.s.)	.188 (n.s.)	.219 (n.s.)	-.147 (n.s.)	.054 (n.s.)
CLQT: Clock Drawing	-.218 (n.s.)	-.045 (n.s.)	-.102 (n.s.)	-.040 (n.s.)	-.170 (n.s.)
BNT	.293 (n.s.)	.261 (n.s.)	.280 (n.s.)	.249 (n.s.)	.337 (n.s.)
PAPT	.193 (n.s.)	.061 (n.s.)	.143 (n.s.)	.143 (n.s.)	.181 (n.s.)
* = p significant at < .05		** = p significant at < .01			*** = p significant at < .001
Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)					
† Data not available for two PWA within the sample					

Experiment 2: Change Score Correlations

Correlations between ASHA FACS Qualitative Dimensions and cognitive-linguistic measure change scores

n = 35††	Adequacy	Appropriateness			
WAB-LQ	.086 (n.s.)	.399 (n.s.)			
WAB-CQ	.082 (n.s.)	.446 (n.s.)			
WAB-AQ	.147 (n.s.)	.600*			
CLQT: Attention	-.093 (n.s.)	.330 (n.s.)			
CLQT: Memory	.141 (n.s.)	.175 (n.s.)			
CLQT: Executive Functions	.116 (n.s.)	.313 (n.s.)			
CLQT: Language	.067 (n.s.)	-.032 (n.s.)			
CLQT: Visuospatial	-.025 (n.s.)	.359 (n.s.)			
CLQT: Composite	.065 (n.s.)	.568 (n.s.)			
CLQT: Clock Drawing	-.226 (n.s.)	.035 (n.s.)			
BNT	.201 (n.s.)	.246 (n.s.)	.040 (n.s.)	-.069 (n.s.)	.145 (n.s.)
PAPT	.325 (n.s.)	.247 (n.s.)	-.194 (n.s.)	-.009 (n.s.)	.053 (n.s.)



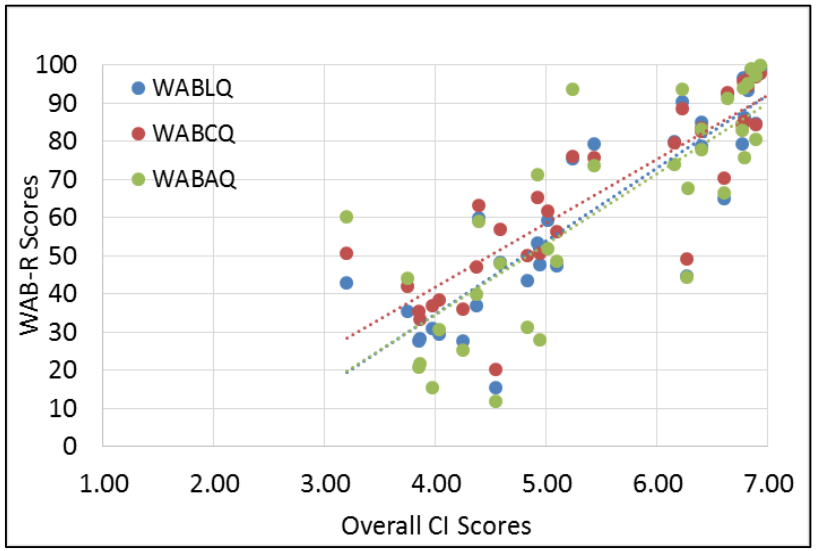
* = p significant at < .05 ** = p significant at < .01 *** = p significant at < .001

Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)

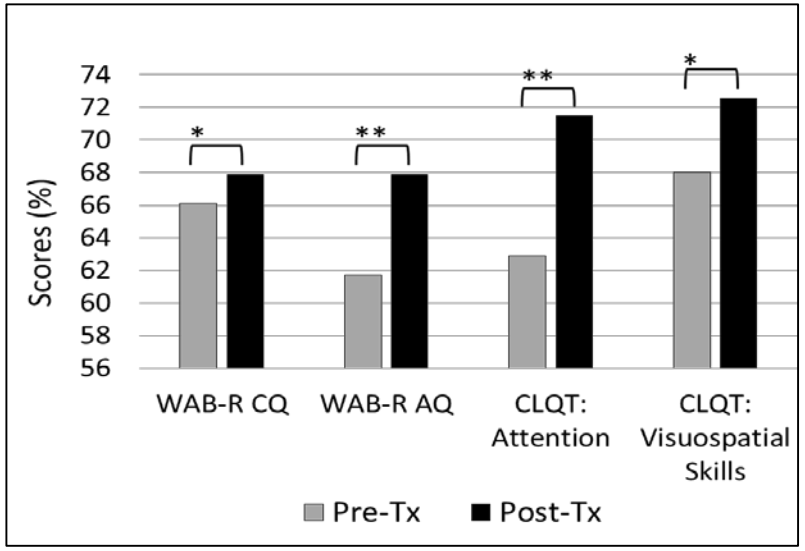
†† Data not available for two additional PWA

Experiment 2: Interim Conclusions

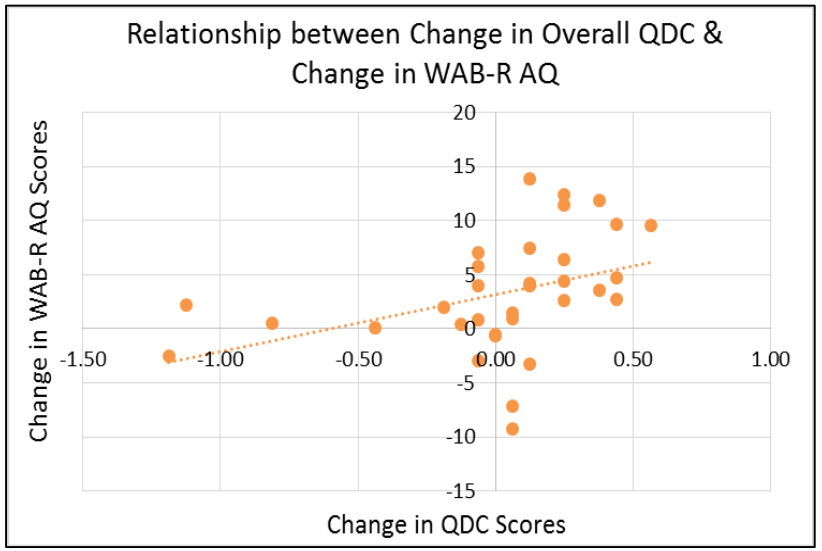
Highly significant, strong positive associations between cognitive-linguistic skills and functional communication **at a single time point**



Following therapy, PWA improved significantly on several tests of cognitive-linguistic skills but not on **any** ASHA FACS domains



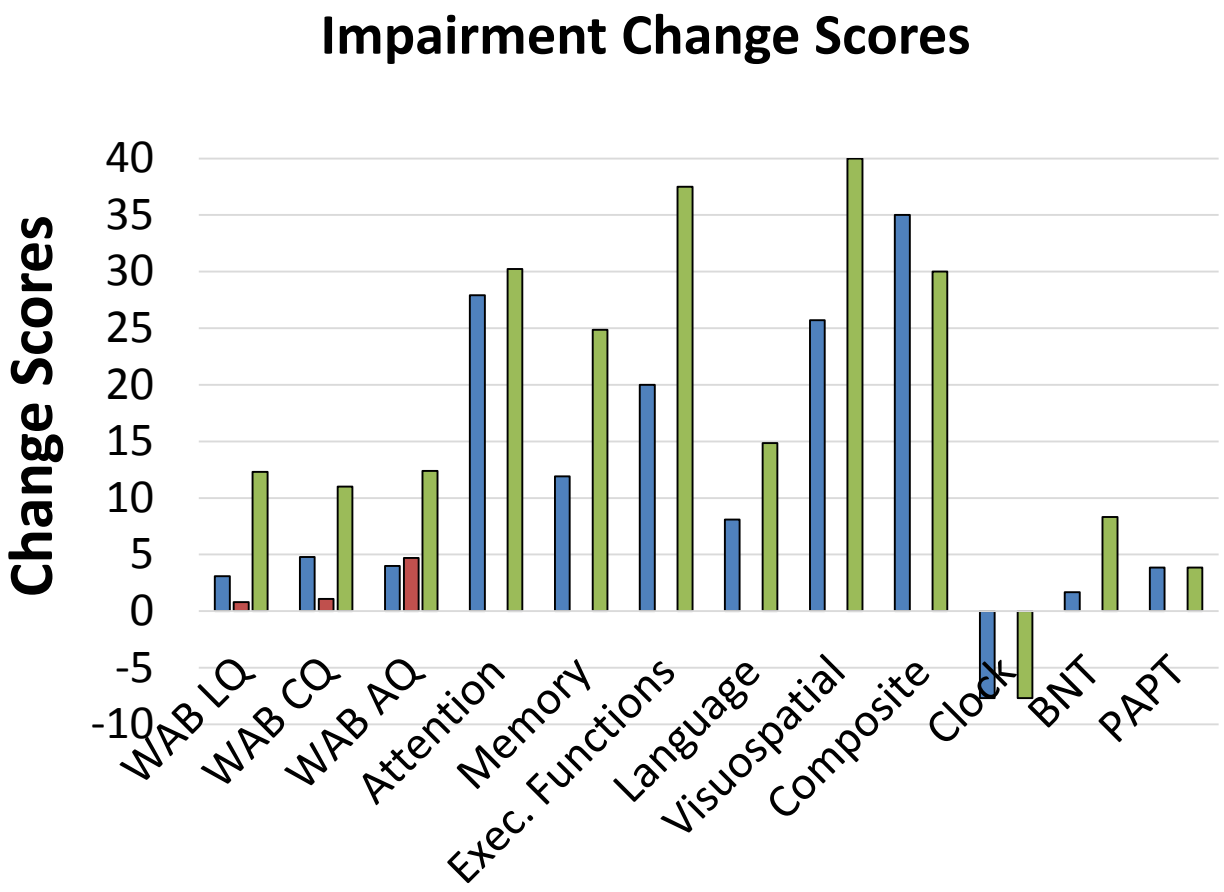
Only **two significant correlations** between **change scores** on measures of cognitive-linguistic skills and change scores on ASHA FACS

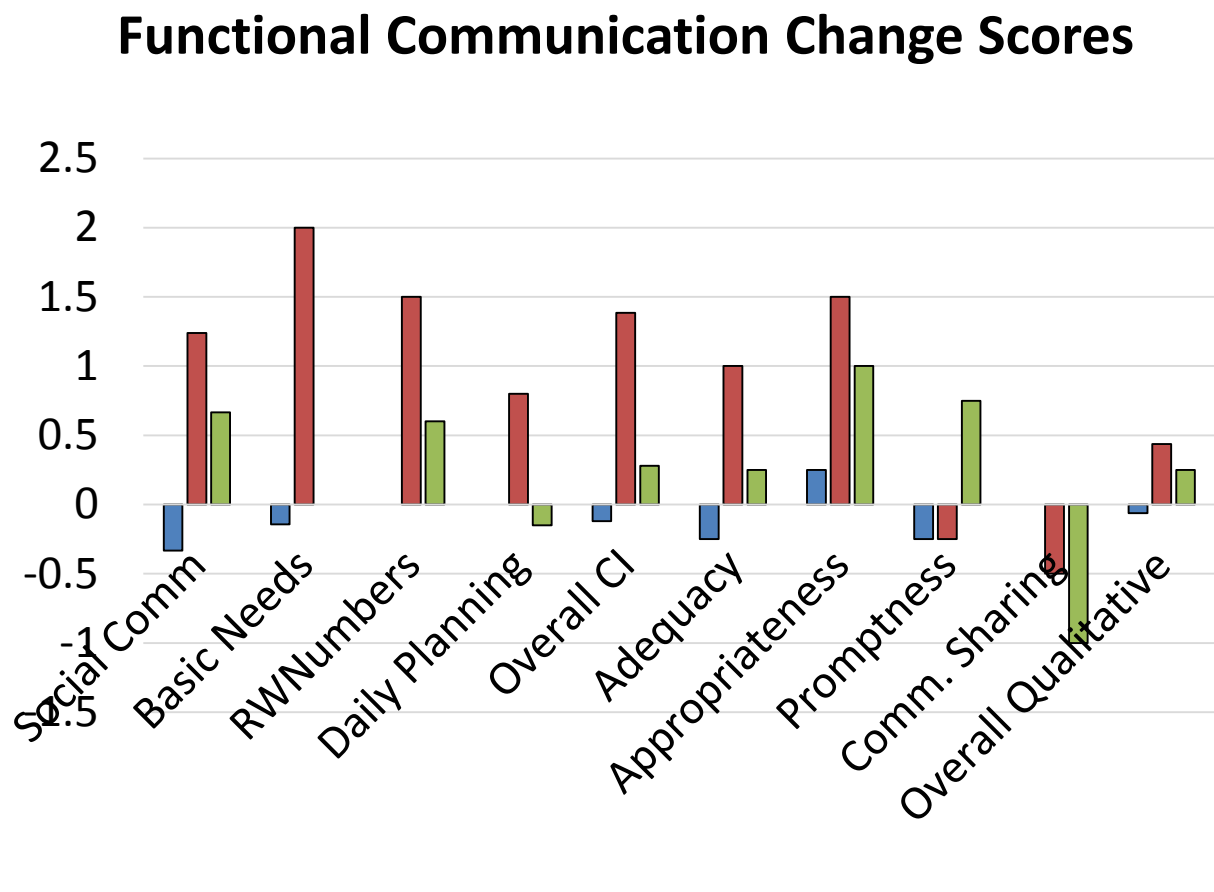


Why is change not related?

- The most obvious possibility…
  - In Experiment #2, scores improved only on cognitive-linguistic measures, NOT on the ASHA FACS
- Did all PWA really not change in functional communication?

Inter-Individual Variability in PWA

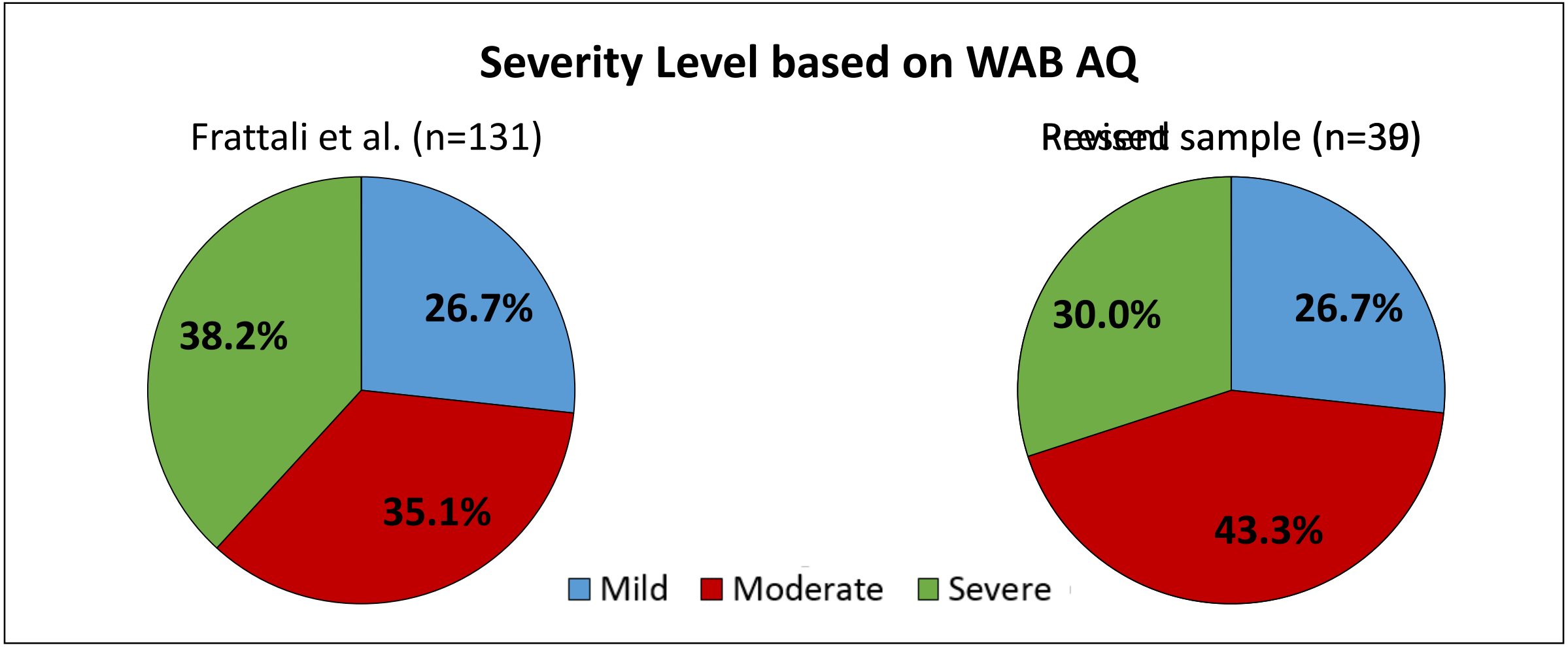




Baseline WAB-R AQ: **PWA 1: 9**3 PWA 1 PWA 2 PWA 3 **e)**; **PWA 3: 31.3 (severe)**

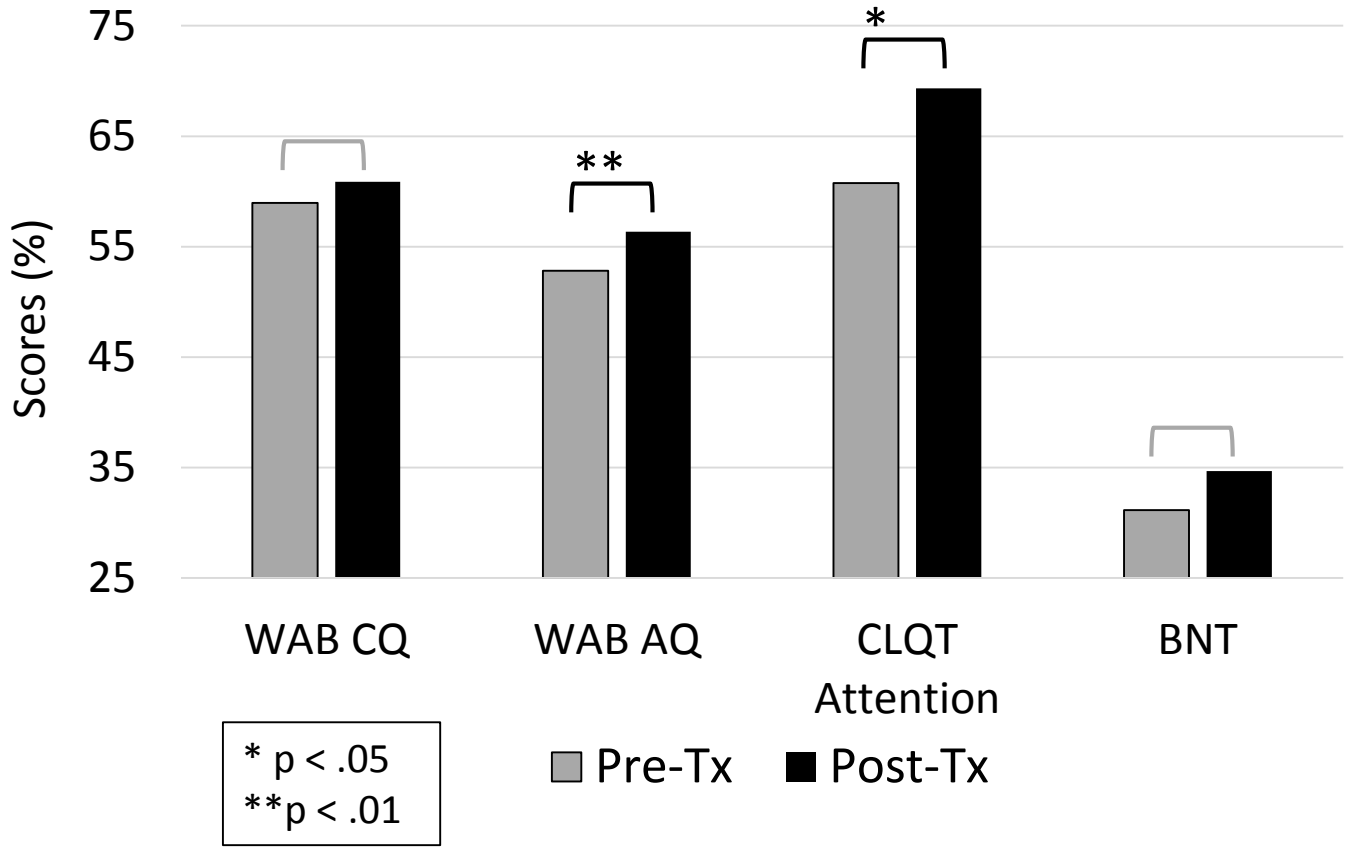
What is the severity of the sample?

- Frattali et al.'s field test included only PWA with WAB AQ <93.8
- Our sample included **9** PWA who were perceptibly aphasic but had WAB AQ >93.8



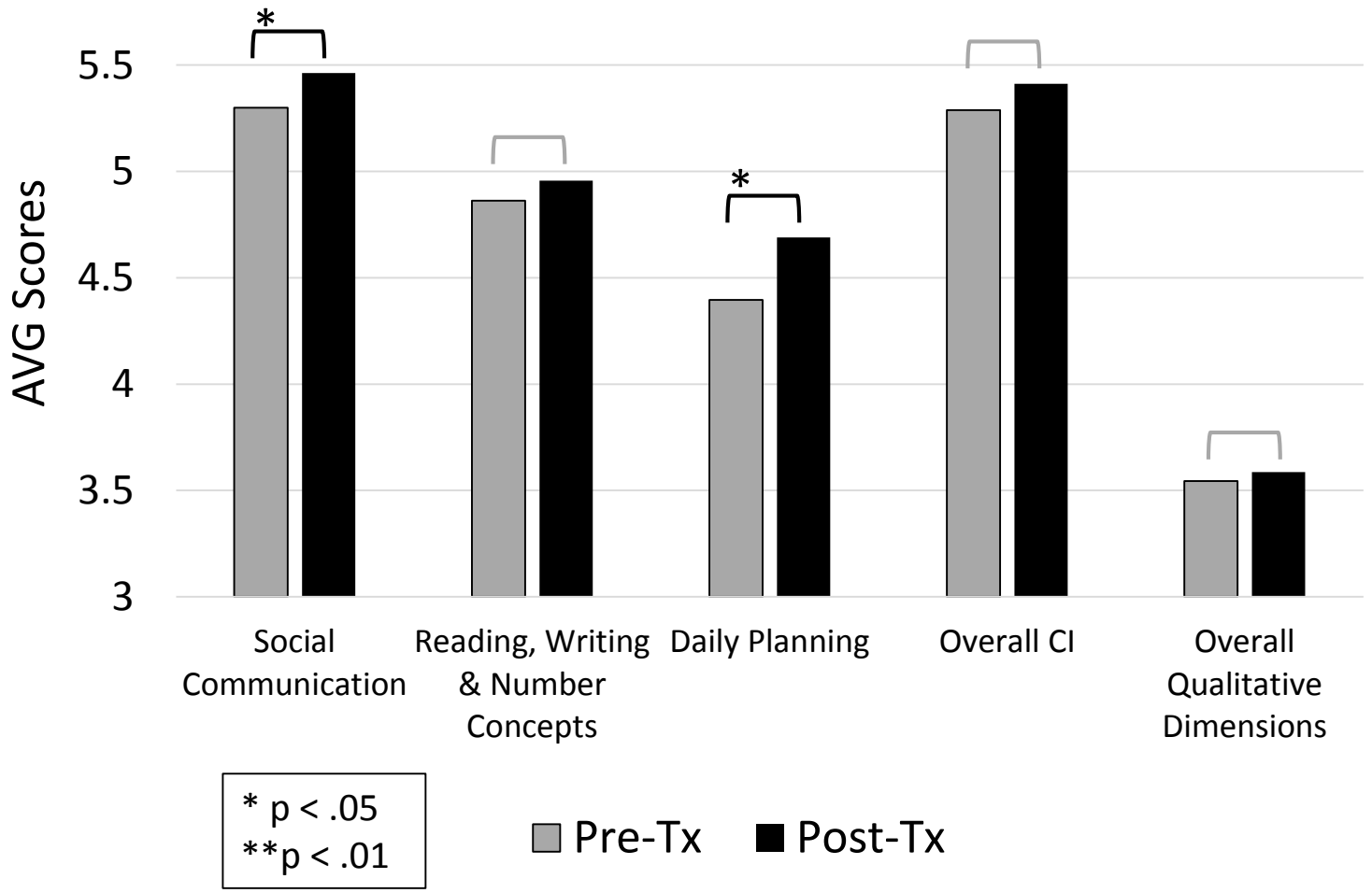
Follow-Up Analysis: Results in Pre- to Post-Treatment Outcome Measures

- PWA significantly improved from pre- to post-therapy on WAB-R AQ and CLQT: Attention
- Improvement approached significance for WAB-R CQ and BNT



Follow-Up Analysis: Results in Pre- to Post-Treatment Outcome Measures

- PWA significantly improved from pre- to post-therapy on Social Communication and Daily Planning
- Improvement approached significance for Reading, Writing & Number Concepts, Overall CI, and Overall Qualitative Dimensions



Follow-Up Analysis: Results in Change Correlations

Correlations between ASHA FACS Communication Independence and cognitive-linguistic measure change scores

n = 28†	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.372 (n.s.)	.050 (n.s.)	.239 (n.s.)	.053 (n.s.)	.295 (n.s.)
WAB-CQ	.349 (n.s.)	.129 (n.s.)	.231 (n.s.)	-.042 (n.s.)	.253 (n.s.)
WAB-AQ	.284 (n.s.)	.186 (n.s.)	.202 (n.s.)	.029 (n.s.)	.230 (n.s.)
CLQT: Attention	.183 (n.s.)	.099 (n.s.)	.206 (n.s.)	-.146 (n.s.)	.096 (n.s.)
CLQT: Memory	.295 (n.s.)	.196 (n.s.)	.263 (n.s.)	.043 (n.s.)	.208 (n.s.)
CLQT: Executive Functions	.231 (n.s.)	.198 (n.s.)	.0370 (n.s.)	-.013 (n.s.)	.134 (n.s.)
CLQT: Language	.338 (n.s.)	.039 (n.s.)	.323 (n.s.)	.132 (n.s.)	.279 (n.s.)
CLQT: Visuospatial	.107 (n.s.)	.271 (n.s.)	.067 (n.s.)	-.217 (n.s.)	.031 (n.s.)
CLQT: Composite	.311 (n.s.)	.269 (n.s.)	.255 (n.s.)	-.133 (n.s.)	.124 (n.s.)
CLQT: Clock Drawing	-.275 (n.s.)	-.134 (n.s.)	-.160 (n.s.)	-.071 (n.s.)	-.220 (n.s.)
BNT	.285 (n.s.)	.143 (n.s.)	.216 (n.s.)	.084 (n.s.)	.278 (n.s.)
PAPT	.193 (n.s.)	.122 (n.s.)	.059 (n.s.)	.335 (n.s.)	.267 (n.s.)
* = p significant at < .05		** = p significant at < .01		*** = p significant at < .001	
Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)					
† Data not available for two PWA within the sample					

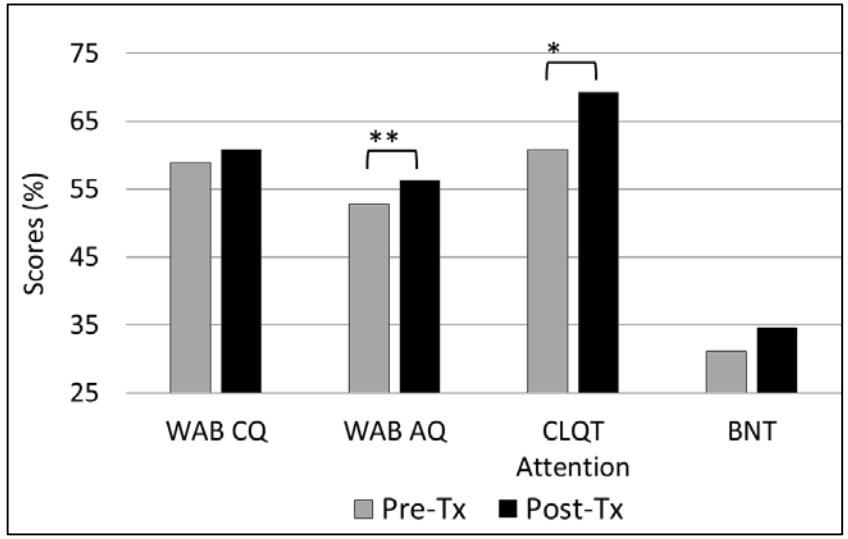
Follow-Up Analysis: Results in Change Correlations

Correlations between ASHA FACS Qualitative Dimensions and cognitive-linguistic measure change scores

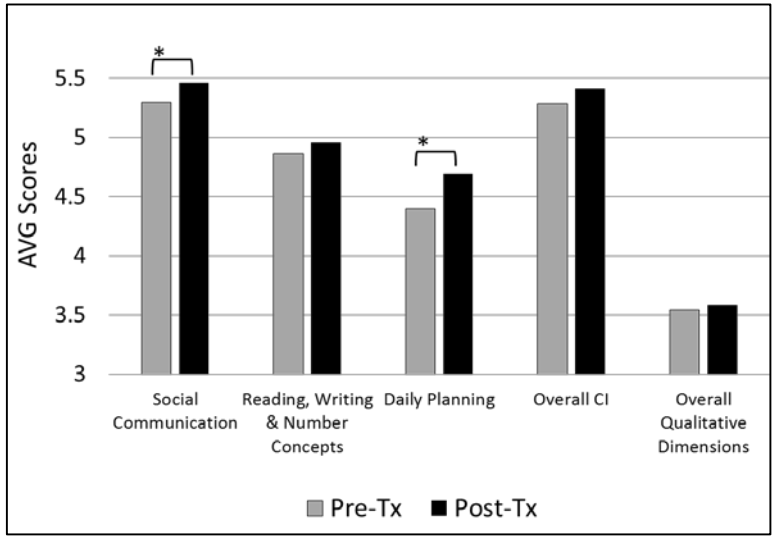
n = 27††	Adequacy	Appropriateness	Promptness	Communication Sharing	Overall Qualitative Dimensions
WAB-LQ	.083 (n.s.)	.443 (n.s.)	.462 (n.s.)	.134 (n.s.)	.572 (p = .094)
WAB-CQ	.042 (n.s.)	.451 (n.s.)	.431 (n.s.)	.205 (n.s.)	.567 (p = .094)
WAB-AQ	.014 (n.s.)	.648*	.366 (n.s.)	.224 (n.s.)	.596 (p = .079)
CLQT: Attention	-.108 (n.s.)	.353 (n.s.)	.312 (n.s.)	.235 (n.s.)	.370 (n.s.)
CLQT: Memory	.205 (n.s.)	.198 (n.s.)	.252 (n.s.)	-.168 (n.s.)	.336 (n.s.)
CLQT: Executive Functions	.209 (n.s.)	.354 (n.s.)	.153 (n.s.)	.078 (n.s.)	.346 (n.s.)
CLQT: Language	.152 (n.s.)	.021 (n.s.)	.117 (n.s.)	-.268 (n.s.)	.103 (n.s.)
CLQT: Visuospatial	-.108 (n.s.)	.335 (n.s.)	.237 (n.s.)	.160 (n.s.)	.286 (n.s.)
CLQT: Composite	.042 (n.s.)	.546 (n.s.)	.185 (n.s.)	.113 (n.s.)	.422 (n.s.)
CLQT: Clock Drawing	-.294 (n.s.)	-.022 (n.s.)	-.386 (n.s.)	-.393 (n.s.)	-.287 (n.s.)
BNT	.110 (n.s.)	.175 (n.s.)	-.029 (n.s.)	-.255 (n.s.)	.077 (n.s.)
PAPT	.307 (n.s.)	.087 (n.s.)	-.178 (n.s.)	-.096 (n.s.)	-.101 (n.s.)
* = p significant at < .05		** = p significant at < .01		*** = p significant at < .001	
Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)					
†† Data not available for one additional PWA					

Follow-Up Analysis Conclusions

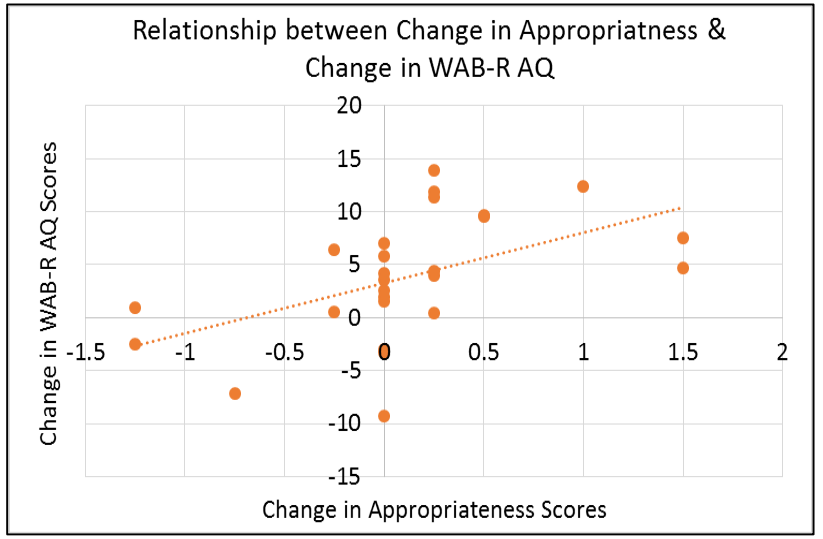
The subsample of PWA with more severe aphasia improved significantly on several tests of cognitive-linguistic skills



Unlike the full treatment group, this more impaired group also improved on domains/dimensions of the ASHA FACS



BUT…there was only ONE significant correlation between change scores on measures of impairment and the ASHA FACS



Discussion: Why is change not related?

Correlations between ASHA FACS Communication Independence scores and measures of cognitive-linguistic ability

Pre-Treatment

n = 28 †	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.847***	.563**	.833***	.717***	.852***
WAB-CQ	.872***	.563**	.805***	.733***	.849***
WAB-AQ	.880***	.463*	.752***	.669***	.[illegible]***
CLQT: Attention	.565**	.578**	.706***	.[illegible]***	.756***
CLQT: Memory	.797***	.476*	.702***	[illegible]	[illegible]
CLQT: Executive Functions	.509**	.645***	.655***	[illegible]	[illegible]
CLQT: Language	.810***	.466*	.677***	[illegible]	[illegible]
CLQT: Visuospatial	.458*	.572**	.617**	.[illegible]***	.683***
CLQT: Composite	.686***	.564**	.781***	.785***	.821***
CLQT: Clock Drawing	.542**	.454*	.557**	.665***	.[illegible]***
BNT	.788***	.550**	.702***	.699***	.784***
PAPT	.473*	.706***	.552**	.578**	.672***

* = p significant at < .05 ** = p significant at < .01 *** = p significant at < .001

Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)

† Data not available for two PWA within the sample

Post-Treatment

n = 28 †	Social Communication	Basic Needs	Reading, Writing & Number Concepts	Daily Planning	Overall Communication Independence
WAB-LQ	.799***	.582**	.807***	.674***	.786***
WAB-CQ	.824***	.603**	.813***	.686***	.802***
WAB-AQ	.870***	.513**	.766***	.639***	.754***
CLQT: Attention	.462*	.528**	.661***	.705***	.742***
CLQT: Memory	.718***	.474*	.734***	.617**	.710***
CLQT: Executive Functions	.[illegible]7 (n.s.)	.542**	.641***	.684***	.713***
CLQT: Language	.764***	.502*	.802***	.647***	.759***
CLQT: Visuospatial	.319 (n.s.)	.520**	.552**	.627**	.648***
CLQT: Composite	.554**	.589**	.783***	.741***	.808***
CLQT: Clock Drawing	.284 (n.s.)	.483*	.706***	.582**	.666***
BNT	.726***	.472*	.761***	.696***	.772***
PAPT	.379 (n.s.)	.505*	.600**	.670***	.682***

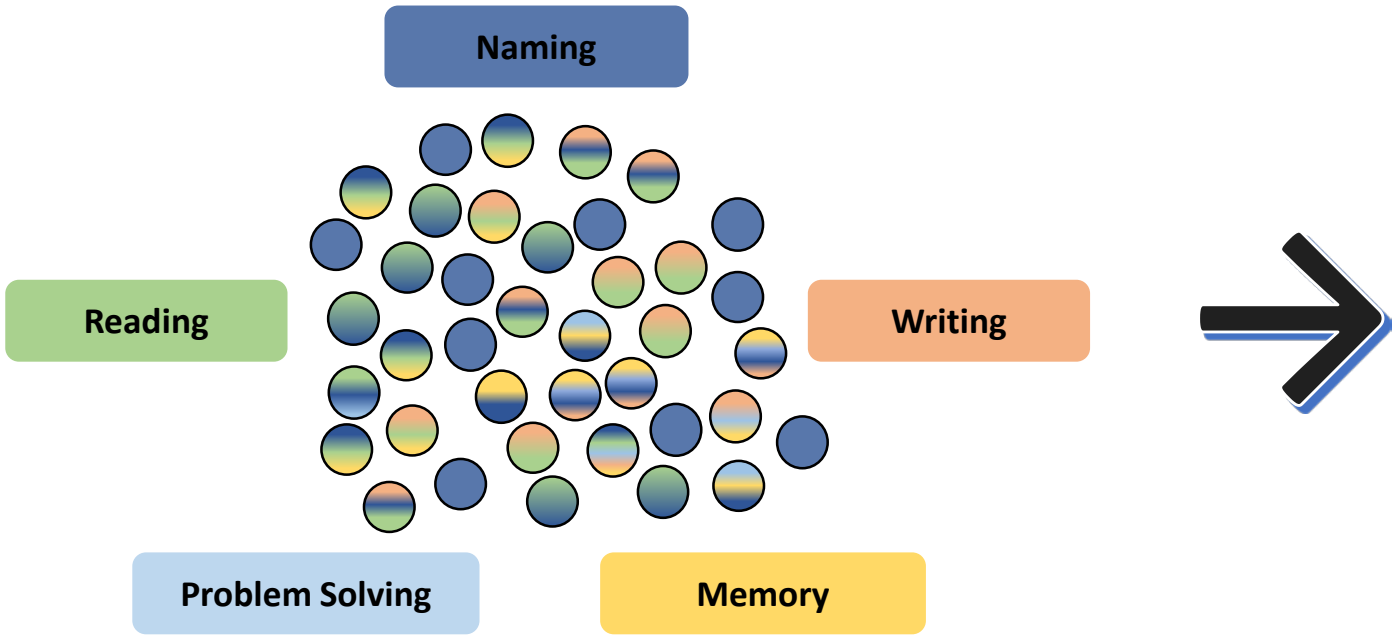
* = p significant at < .05 ** = p significant at < .01 *** = p significant at < .001

Correlation Strength: Green = Strong (1.00 - .700); Yellow = Moderate (.699 - .400); Red = Weak (.399 - .100)

† Data not available for two PWA within the sample

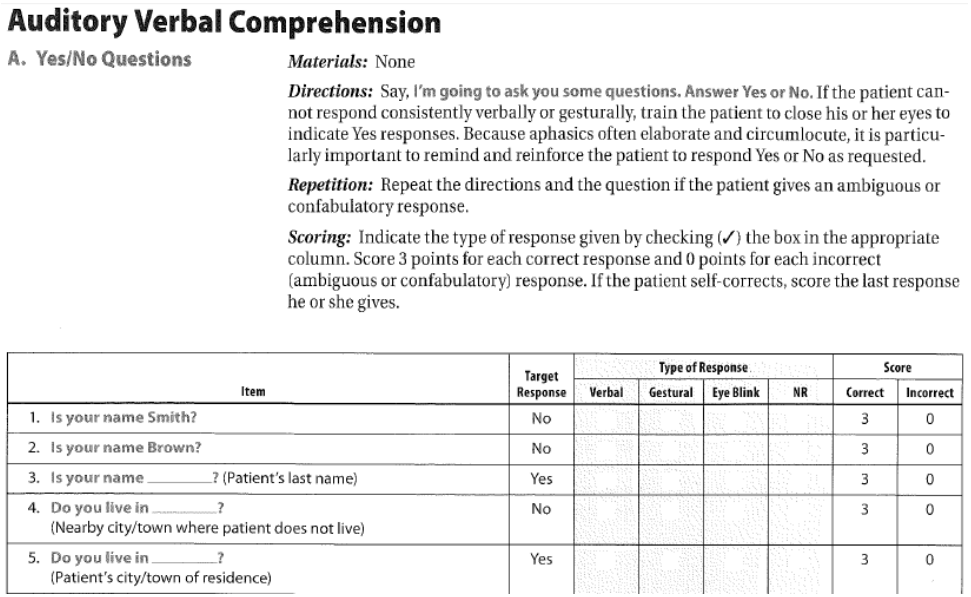
Discussion: Why is change not related?

- What needs to happen for change correlations to be significant?
  - In the same individual, **both** skills need to improve to a certain degree **and** this same pattern of improvement must be observed across **several** PWA



Discussion: Why is change not related?

- **Impairment measures**
  - Objective
  - Performance-based
  - Continuous scales
- **ASHA FACS**
  - Subjective
  - Based on rater's perception with input from family members/caregivers
  - Ordinal scales



Auditory Verbal Comprehension

A. Yes/No Questions

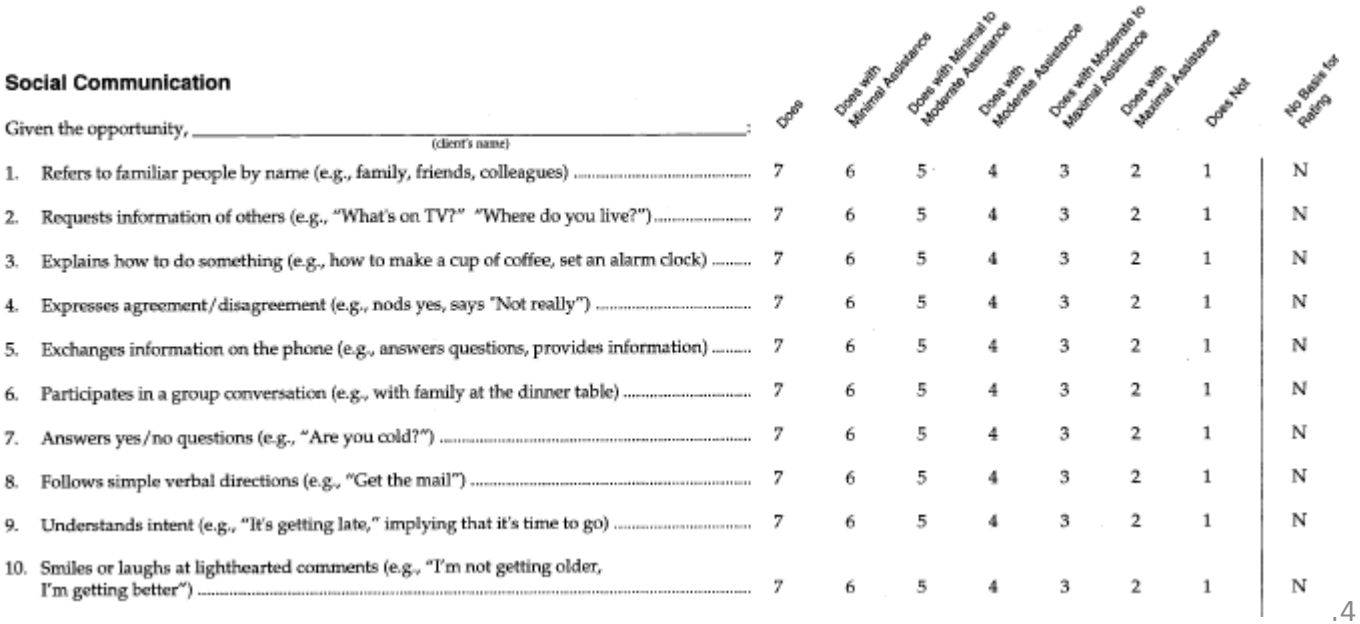
Materials: None

Directions: Say, I'm going to ask you some questions. Answer Yes or No. If the patient cannot respond consistently verbally or gesturally, train the patient to close his or her eyes to indicate Yes responses. Because aphasics often elaborate and circumlocute, it is particularly important to remind and reinforce the patient to respond Yes or No as requested.

Repetition: Repeat the directions and the question if the patient gives an ambiguous or confabulatory response.

Scoring: Indicate the type of response given by checking (✓) the box in the appropriate column. Score 3 points for each correct response and 0 points for each incorrect (ambiguous or confabulatory) response. If the patient self-corrects, score the last response he or she gives.

Item	Target Response	Type of Response				Score	
		Verbal	Gestural	Eye Blink	NR	Correct	Incorrect
1. Is your name Smith?	No					3	0
2. Is your name Brown?	No					3	0
3. Is your name _____? (Patient's last name)	Yes					3	0
4. Do you live in _____? (Nearby city/town where patient does not live)	No					3	0
5. Do you live in _____? (Patient's city/town of residence)	Yes					3	0

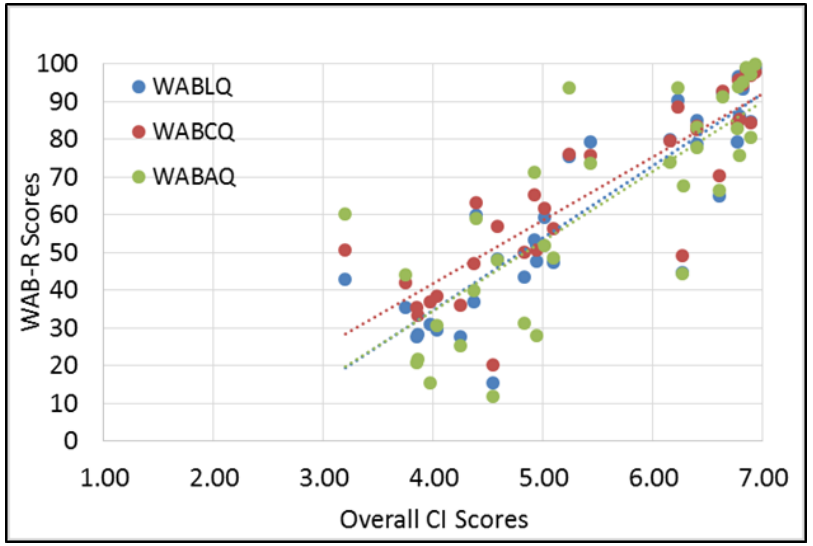


Social Communication

Given the opportunity, _____ (client's name):	Does	Does with Minimal Assistance	Does with Minimal to Moderate Assistance	Does with Moderate Assistance	Does with Moderate to Maximal Assistance	Does with Maximal Assistance	Does Not	No Basis for Rating
1. Refers to familiar people by name (e.g., family, friends, colleagues)	7	6	5	4	3	2	1	N
2. Requests information of others (e.g., "What's on TV?" "Where do you live?")	7	6	5	4	3	2	1	N
3. Explains how to do something (e.g., how to make a cup of coffee, set an alarm clock)	7	6	5	4	3	2	1	N
4. Expresses agreement/disagreement (e.g., nods yes, says "Not really")	7	6	5	4	3	2	1	N
5. Exchanges information on the phone (e.g., answers questions, provides information)	7	6	5	4	3	2	1	N
6. Participates in a group conversation (e.g., with family at the dinner table)	7	6	5	4	3	2	1	N
7. Answers yes/no questions (e.g., "Are you cold?")	7	6	5	4	3	2	1	N
8. Follows simple verbal directions (e.g., "Get the mail")	7	6	5	4	3	2	1	N
9. Understands intent (e.g., "It's getting late," implying that it's time to go)	7	6	5	4	3	2	1	N
10. Smiles or laughs at lighthearted comments (e.g., "I'm not getting older, I'm getting better")	7	6	5	4	3	2	1	N

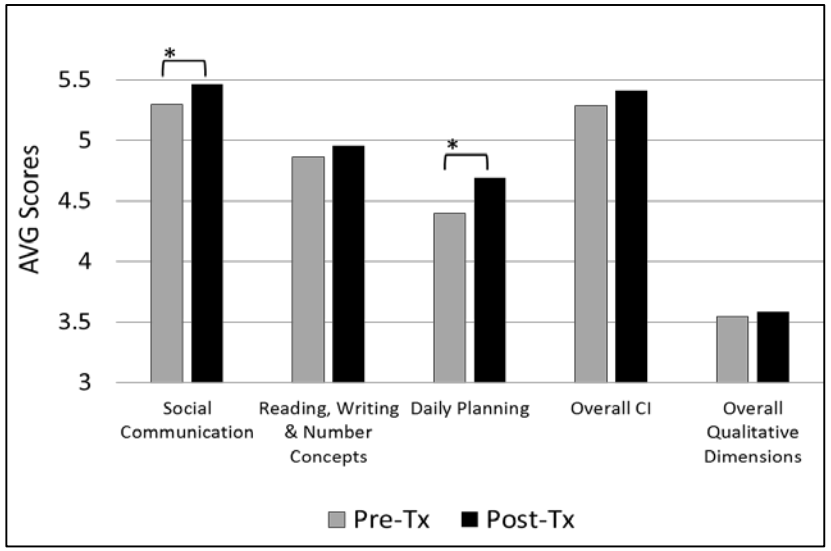
Summary of Study Results

1



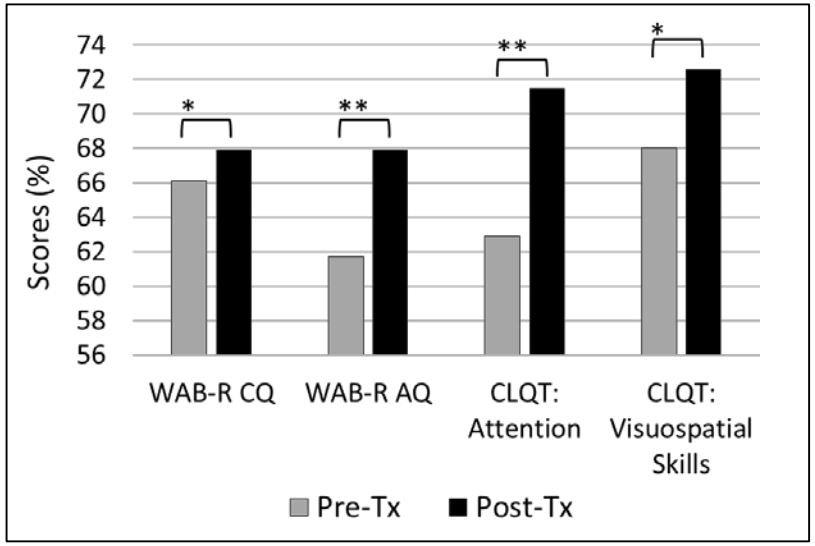
Single Time Point Correlations

3



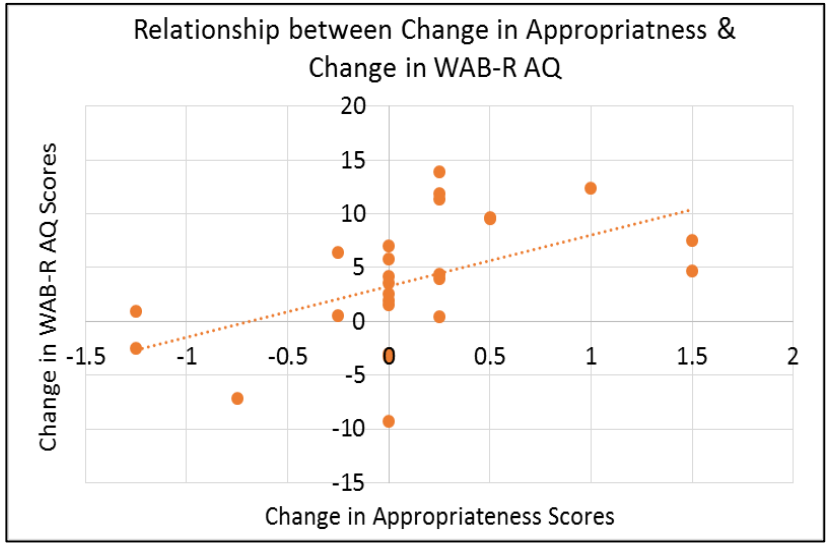
Accounting for Severity: Change in Impairment AND Functional Communication Measures

2



Change on Impairment Measures Only

4



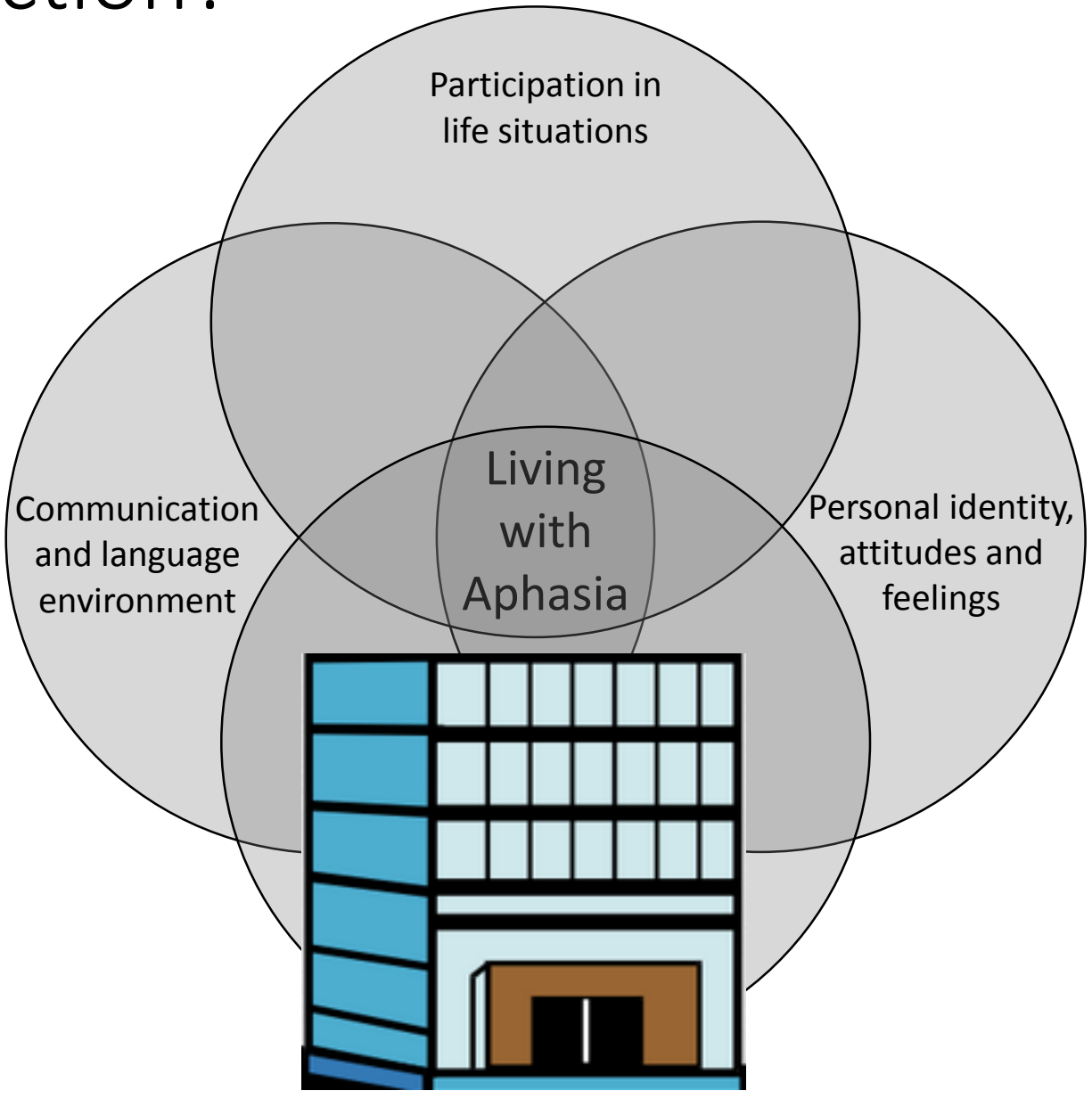
Very Few Change-Score Correlations

Discussion: Interim Take-Homes

- A global assessment of impairment can provide insight into PWA's functional communication skills and vice versa
- Global measures of cognitive-linguistic skills/impairment capture improvement as a function of therapy
- The ASHA FACS appears to be effective at capturing change in PWA with more severe aphasia but may be less well-suited for mild PWA due to ceiling effects
- Because cognitive-linguistic and functional communication appear to be distinct (though related) constructs, it is best to assess both areas separately to definitively capture changes over time (Ross & Wertz, 1999)

What may be the relationship between impairment and function?

- Reading Single Words
- Executive Functions
- Visual Scanning
- Basic Calculations



Reading a Menu

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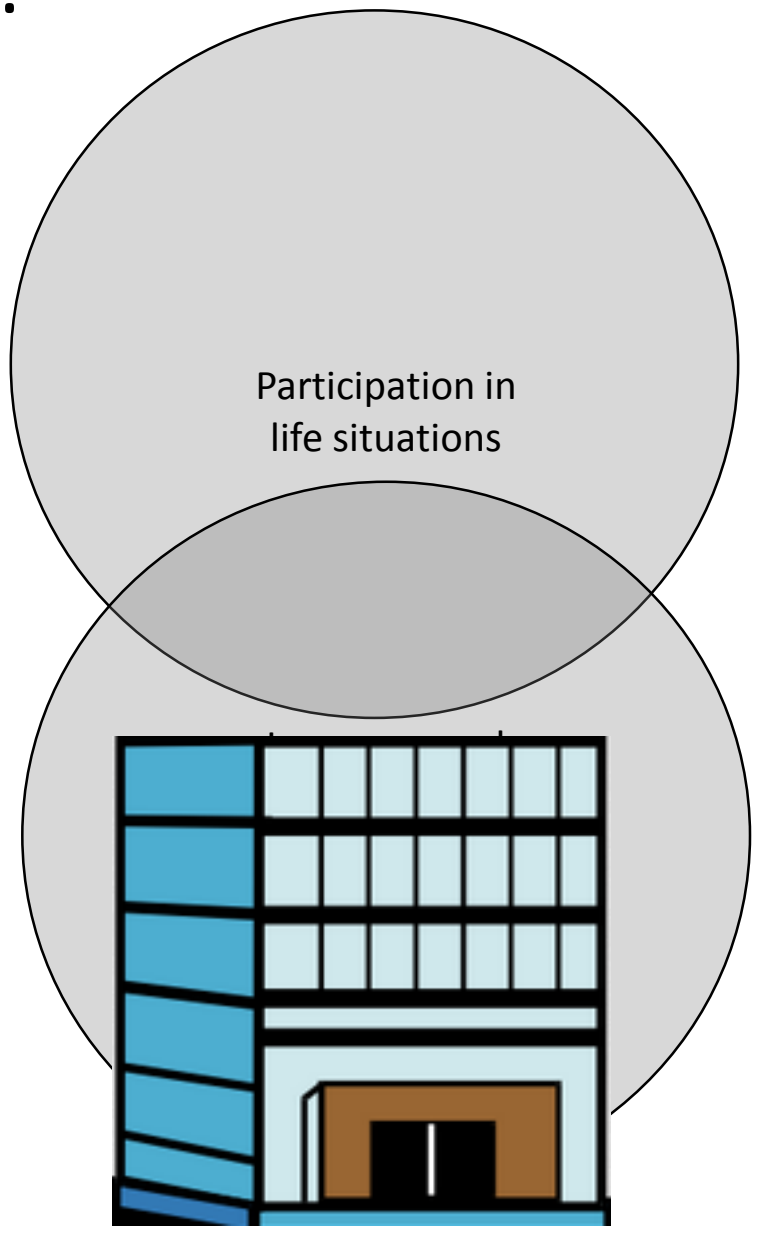


Reading a Menu

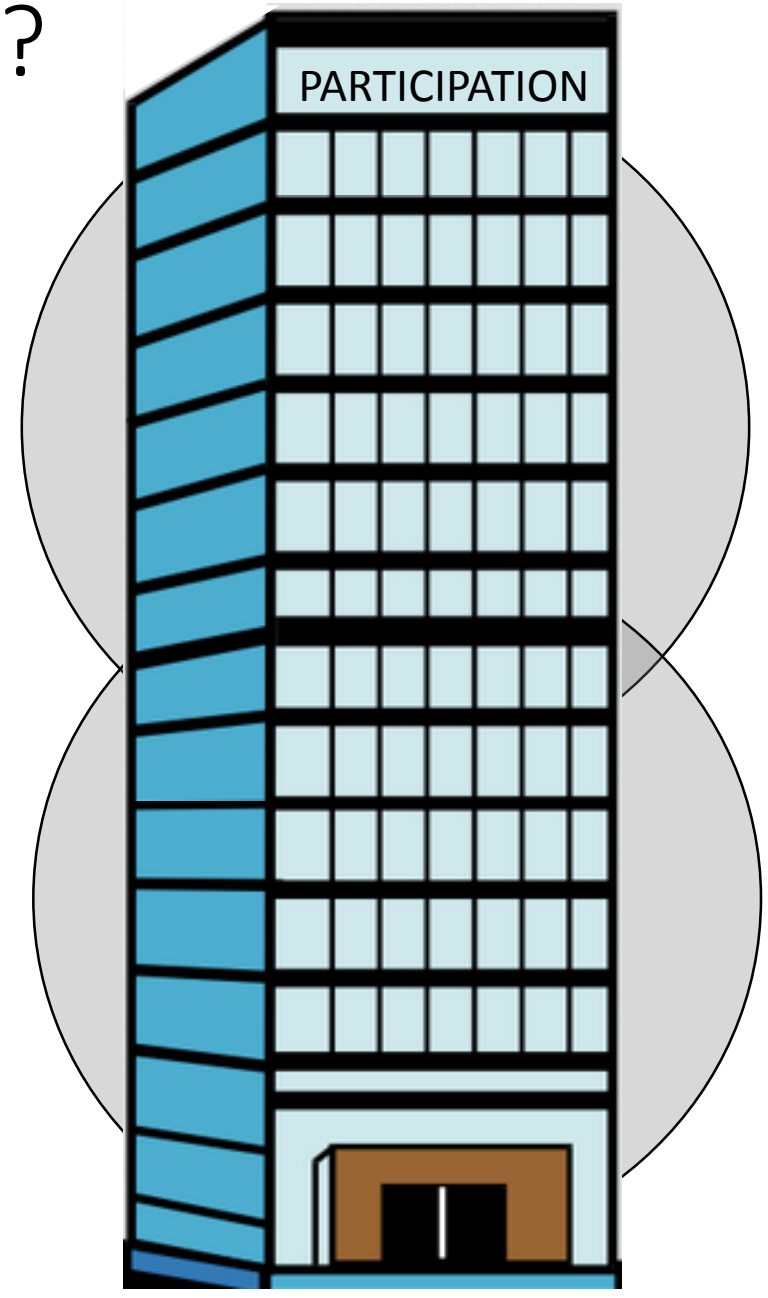
What may be the relationship between impairment and function?

Verb Retrieval

Passive Sentence Comprehension

Selective Attention

Basic Calculations



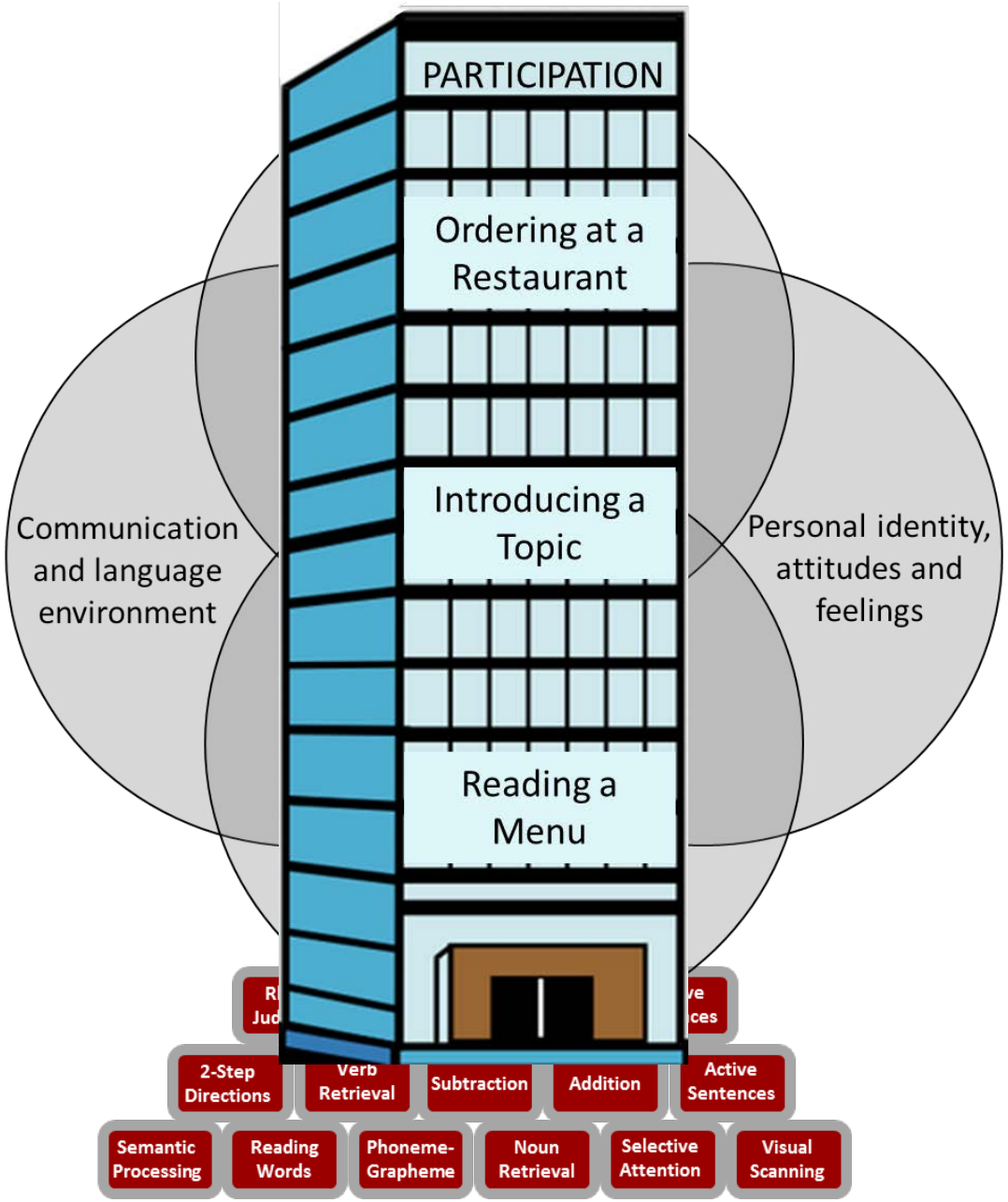
Ordering at a Restaurant

Introducing a Topic

Reading a Menu

Future Directions

- Investigate the relationship in change pre- to post-therapy by targeting…
  - Functional communication specifically
  - Combined impairment- and function-based skills
- Expand the battery of assessments
- Measure additional domains within A-FROM/ICF



Acknowledgments

Thank you to our patients and members of the lab who worked on this project. Special thanks to Carrie Des Roches, Natalie Gilmore, Brett McCardel, Mara Nussbaum, and everyone else for their contributions.

References available upon request:

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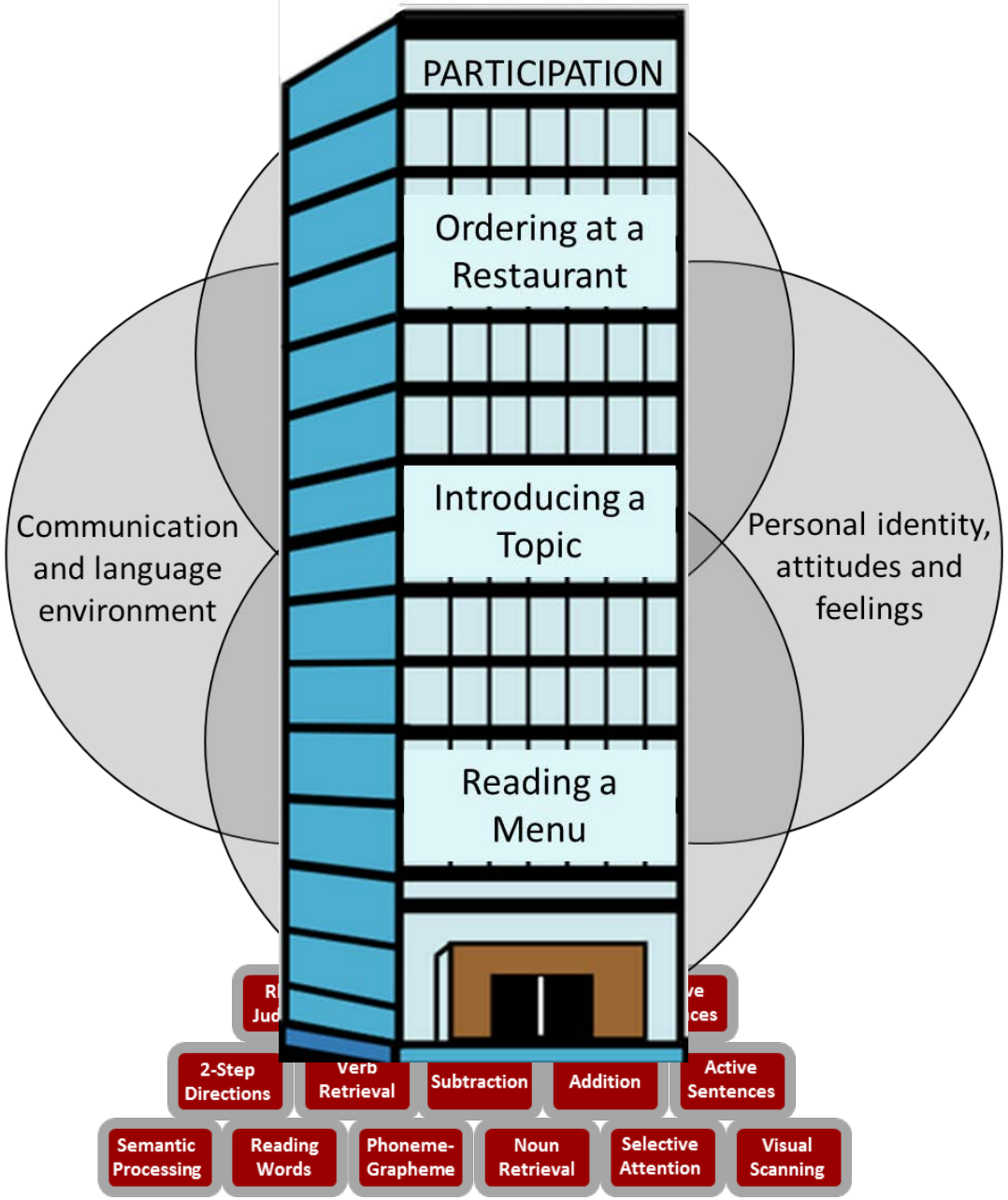
Thank you for your attention.

Comments or questions?



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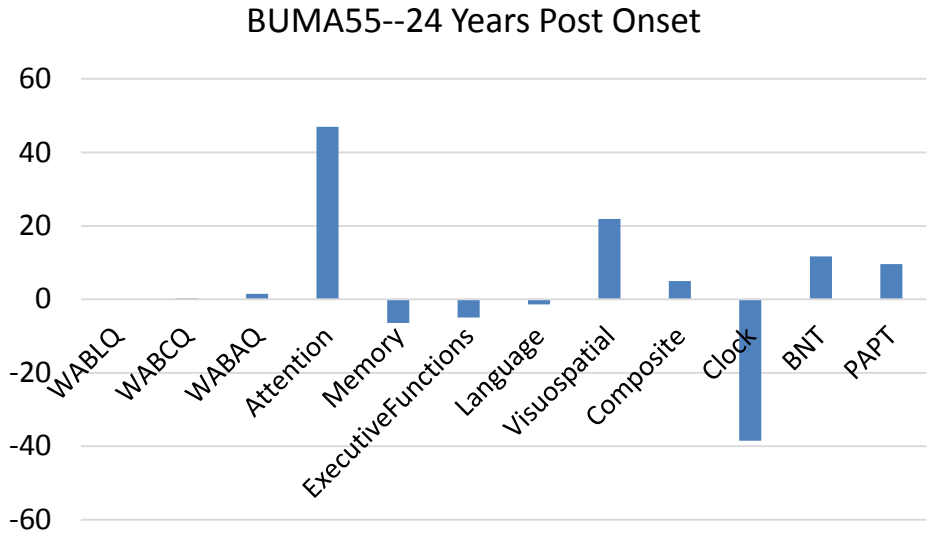
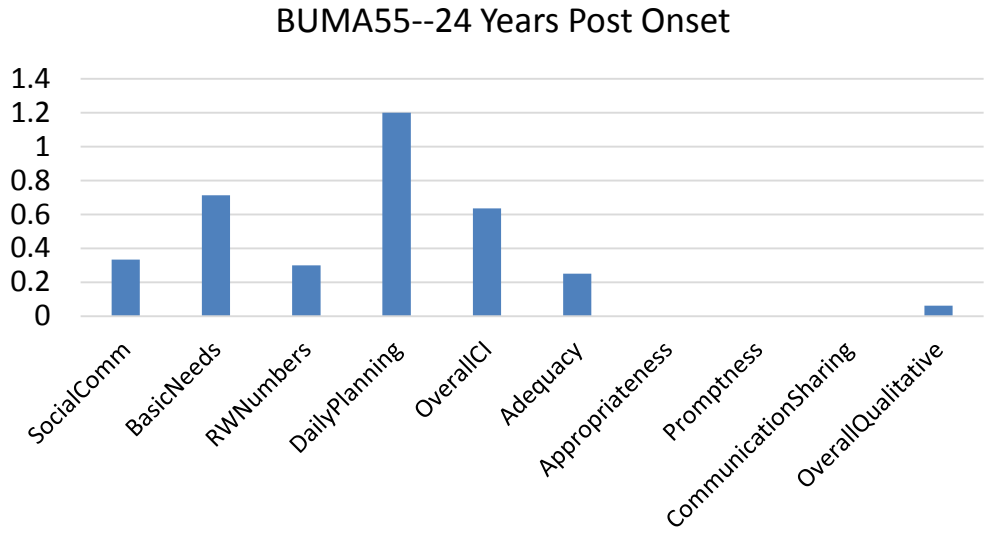
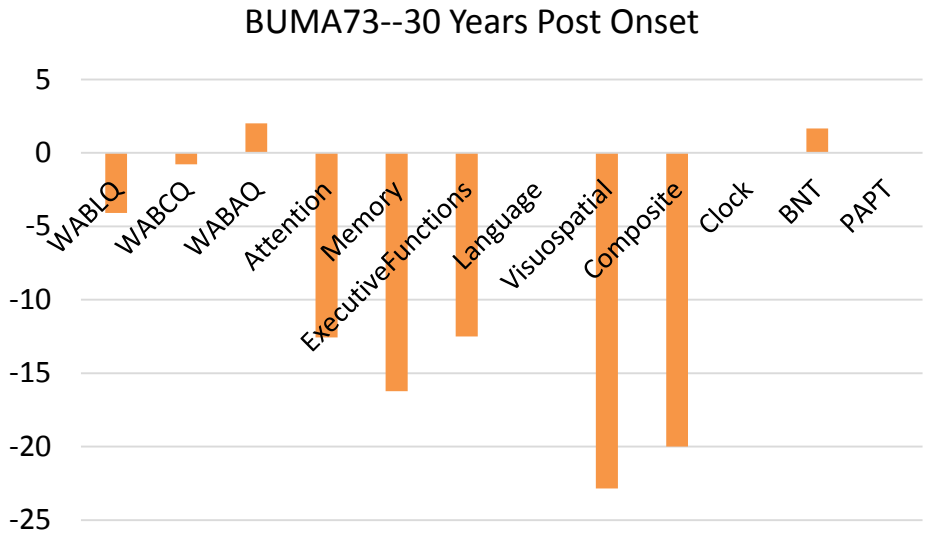
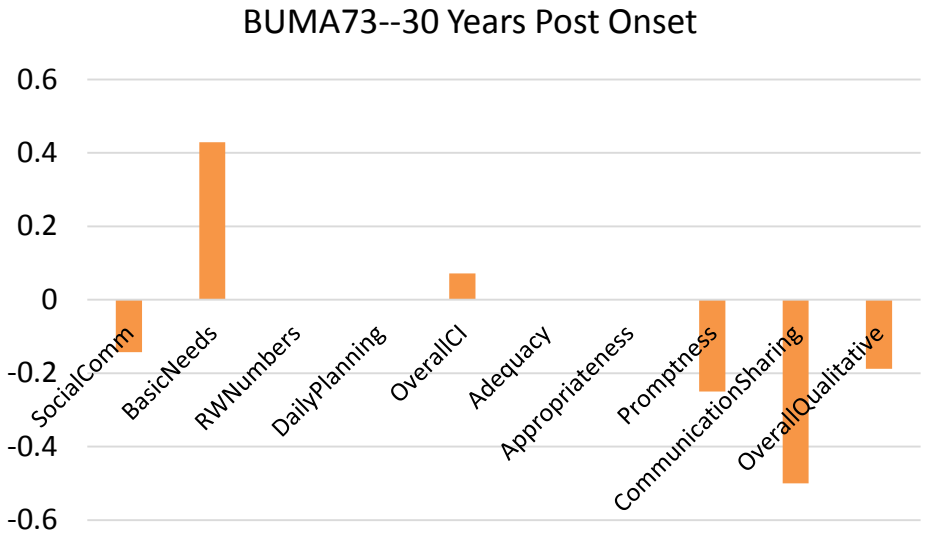
Extra Slides

Did the outliers improve in outcomes?









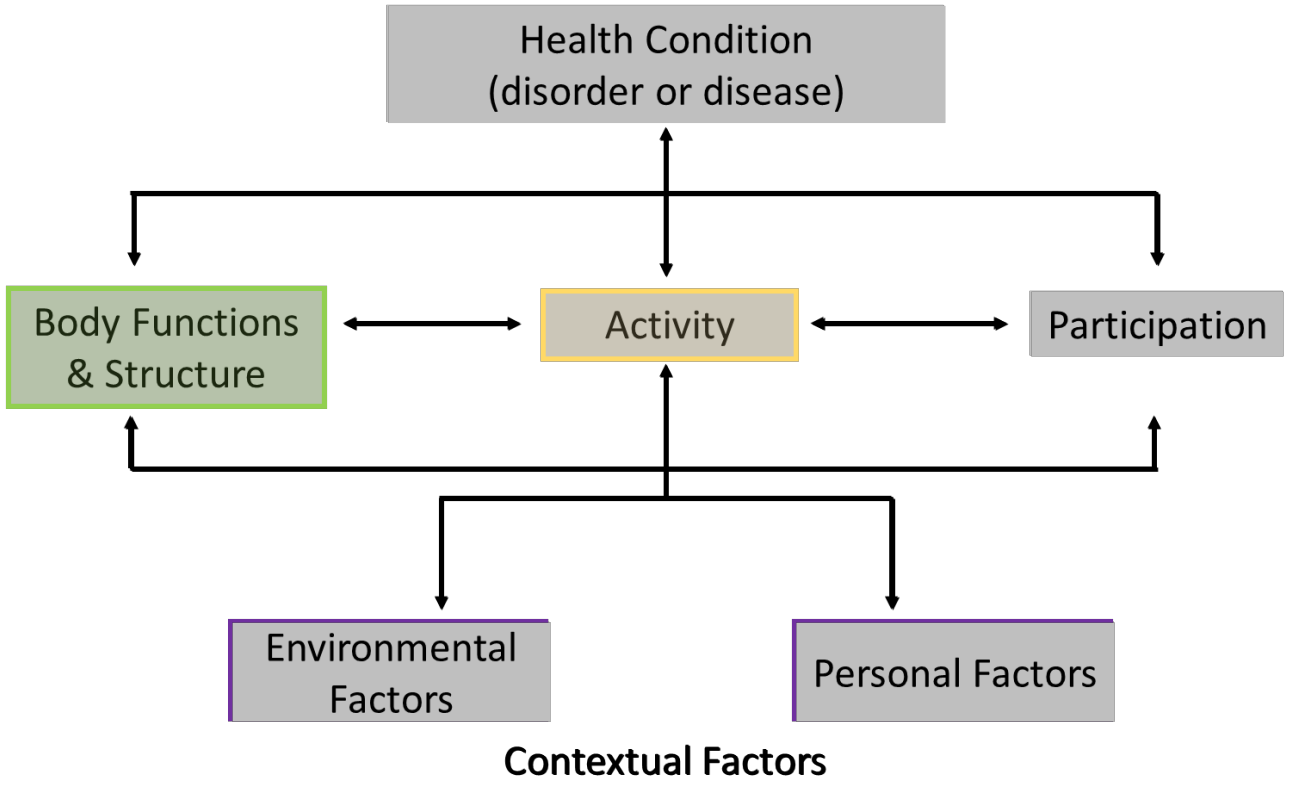
Questions we might get from others

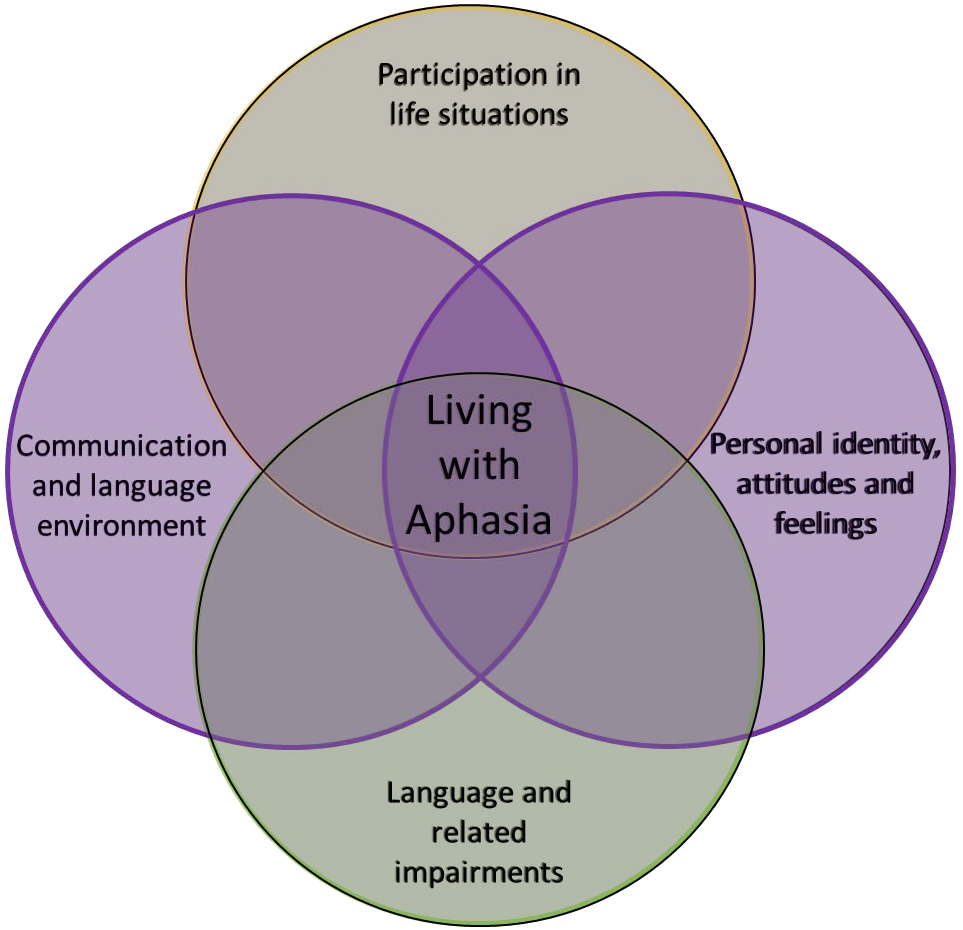
- Proxy measure vs PRO
- Why did we keep in the people who didn’t improve in tx?
- Did Frattali say anything about who the ASHA FACS is most appropriate for in terms of severity
- How did we select the instruments?
- Did the outliers on slide 12 improve if they were in the tx sample?

Review of what FACS dimensions mean

- -Adequacy: frequency with which the PWA understands the gist of a message and gets a point across
- -Appropriateness: frequency with which the PWA's communication is both relevant and done under the right circumstances
- -Promptness: frequency with which the PWA responds without delay and in an efficient manner
- -Communication Sharing: extent to which the PWA's communication poses a burden to the communication partner because the PWA talks excessively or not enough
- -Overall QDC: Composite measure of overall Quality/Effectiveness in expressive and receptive communication in functional situations

Discussion: Other factors





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Extra Slides

For Questions

Activity vs. Participation

- **Kagan and colleagues (2008):** “it is difficult to segregate broad life habits from activities and tasks. Rather, activities and tasks combine to create life habits.”