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Evidence-Based Practice: Leading to Evolution of New Treatment Approaches for Aphasia

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Moderated by:
Amy Hansen, MA, CCC-SLP, Managing Editor, SpeechPathology.com



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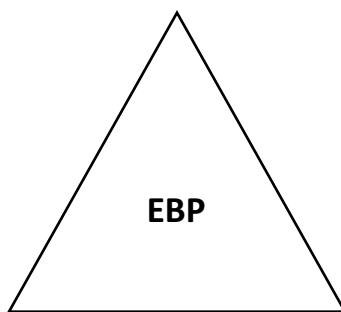
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Evidence-Based Practice:

Leading to Evolution of New Treatment Approaches for
Aphasia

Current Best Evidence



Clinical Expertise

Client Values

Adapted from National Center for Evidence-Based Practice in Communication Disorders

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Disclosures

▪ Financial Disclosures

- Employed by VA Pittsburgh Healthcare System
- SpeechPathology.com will be making a donation to the Veterans Research Foundation of Pittsburgh (VRFP), a 501c3 private, non-profit research corporation that is independent of the Veterans Health Administration (VHA). This donation is requested in lieu of presenter honoraria

▪ Non-financial Disclosures

- Member of American Speech-Language-Hearing Association
 - Member of Special Interest Group 2 (Neurogenic Communication Disorders) and 13 (Swallowing and Swallowing Disorders)

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- Dr. Patrick Doyle
- PIRATE Staff

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Lecture Series Overview: Part 1

- Review Evidence-Based Practice and provide an overview of relevant theory for the development of a new treatment approach
 - Review client profiles
 - Review underlying theory
 - Review current best evidence
 - Review existing treatment protocol
 - Introduce the impetus for SPICES
 - Briefly introduce SPICES treatment

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Lecture Series Overview: Part 2

- Further introduce a step-by-step training for a newly proposed treatment approach, SPICES: Semantic Priming to Improve Comprehension and Expression of Sentences
- Present a case study of a client who participated in SPICES

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Learning Objectives

- Participant will be able to:
 - Identify the three principles underlying Evidence-Based Practice (EBP).
 - Describe Spreading Activation Theory and Verb as Core as the theoretical basis for Verb Network Strengthening Treatment (VNeST).
 - Explain key principles that underlie the development and implementation of SPICES treatment.

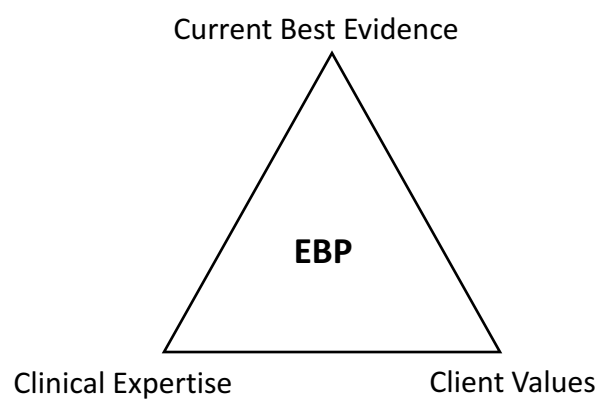
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Terms and key words

- Agent: The subject of a sentence
 - e.g. The boy throws the ball.
 - Agent=subject (boy)
- Patient: The object of a sentence
 - e.g. The boy throws the ball.
 - Patient=object (ball)
- Client: The person receiving services from the clinician

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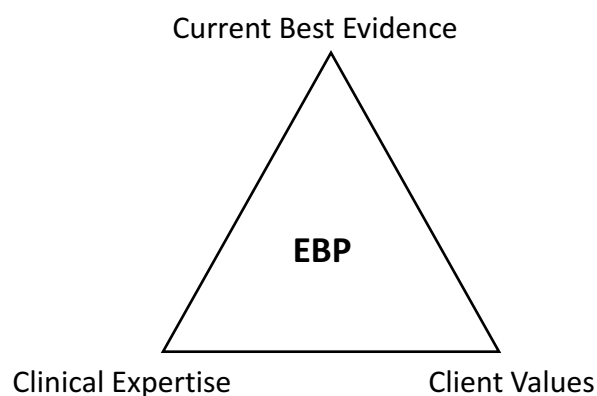
Evidence-Based Practice



Adapted from National Center for Evidence-Based Practice in Communication Disorders

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Evidence-Based Practice



Adapted from National Center for Evidence-Based Practice in Communication Disorders

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Client Values

- Goal Discussions
 - Identify attainable, specific, functional goals
 - Identify primary communication partners
 - Identify primary communication environments
 - Identify topics of interest

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Client Values

- Goal Discussions: Supported Communication

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Lecture Overview

- 1. Review client profiles**
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Client 1 Profile

- Client goal: “Learn to speak in sentences”
- Primary communication partner: Wife
- Primary communication environments: At home
- Interests: News, politics, sports (Baltimore Ravens, college football, Baltimore Orioles)

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Client 1: Assessment

- Comprehensive Aphasia Test (CAT)
 - Naming Objects: Accurately named 19/24 items
 - Naming Actions: Accurately named 2/5 actions
 - Spoken Picture Description:
 - “Flower uh cat and um fish, fish... mm- knocked out kn-knocked it out. Sleeping uh book, book. Sleeping um cup, fl-flowers. Um...t- t- Tune, tune, tune, tune, tune. [pointing to radio]. Cat [pointing to boy], um boy, girl is uh sleeping, uh Boy is getting cat. Cat, cat. Fo-sofa, sofa, sofa, sofa.”
- “...notable for use of fillers and the sample primarily consisted of nouns. Whole word repetitions were noted. [Client] used 2 verb phrases.”

(Swinburn, K., Porter, G., & Howard, D., 2004)

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Client 1 Profile

- Diagnosis: Moderate Aphasia
 - Characterized by moderate comprehension impairments and verbal expression impairments with moderate-severe writing impairments
 - Deficits stemming from primarily semantic and syntactic deficits
- Speech was characterized by occasional production of appropriate nouns with frequent use of fillers and several automatic/perseverative phrases.

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Client 2 Profile

- Client goal: “Talk on the phone”
- Primary communication partner: Significant other
- Primary communication environments: At home
- Interests: Did not provide topics of interest for conversation

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Client 2: Assessment

- Comprehensive Aphasia Test (CAT)
 - Naming Objects: Accurately named 0/24 items
 - Naming Actions: Accurately named 0/5 actions
 - Spoken Picture Description:
 - “Uh dewy dewy dewy dewy and ah- de dewy dewy de dewy dewy and de dewy dewy dewy (made snoring sound) dewy dewy and dewy dewy dewy “Sh” dewy dewy...de dewy dewy”
- “ [Client] did not produce any appropriate content units. Verbal productions did not demonstrate syntactic structure or grammaticality”.

(Swinburn, K., Porter, G., & Howard, D., 2004) 23

Client 2 Profile

- Diagnosis: Moderate-Severe Aphasia
 - Characterized by moderate impairments in comprehension of written and spoken language and severe impairments in verbal output, repetition, oral reading and writing.
- Verbal production was characterized by frequent repetition and client stereotypic “dewy” and occasional verbalization of “um” or “well”.

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Client 3 Profile

- Client goal: “Increase verbal expression”
- Primary communication partner: Wife
- Primary communication environments: At home, within aphasia group
- Interests: Hanging out with his granddaughter, boxing, Pittsburgh sports

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Client 3: Assessment

- Comprehensive Aphasia Test (CAT)
 - Naming Objects: Accurately named 5/24 items
 - Naming Actions: Accurately named 0/5 actions
 - Spoken Picture Description:
 - “Sleeping. Uh, kid playing. A cat was [neologism]. Moosic uh music. Clocks, coths, cloths. And this, uh [neologism]. Bowl uh him dess, dress. That's it.”
- “[Client's] verbal output continues to be nonfluent with frequent phonological paraphasias and neologisms...Output tends to be single content words with occasional use of 2 word phrases and frequent audible pauses.”

(Swinburn, K., Porter, G., & Howard, D., 2004)

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Client 3 Profile

- **Diagnosis: Moderate-Severe Aphasia**
 - Characterized by moderate-severe deficits in verbal expression and mild-moderate deficits in auditory comprehension.
 - Deficits stemming predominantly from phonological system deficits with impairments in syntactic processing; semantic system appears to be a relative strength.
- Verbal production was characterized by effortful speech comprised of mainly single content words and phonological paraphasias, neologisms, and motor speech errors.

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Client Comparison

	Client 1	Client 2	Client 3
Object Naming	19/24	0/24	5/24
Action Naming	2/5	0/5	0/5
Primary Deficit	Primarily semantic and syntactic deficits	Phonological, semantic and syntactic deficits	Primarily phonological with syntactic deficits; semantics were a relative strength
Candidate for a verb strengthening tx?	YES	NO	YES

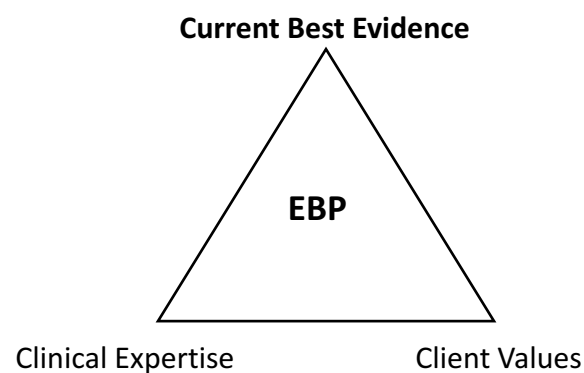
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Evidence-Based Practice



Adapted from National Center for Evidence-Based Practice in Communication Disorders

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Verb Network Strengthening Treatment

- Semantic treatment
- Improve lexical retrieval of subjects, objects and verbs in a sentence context
- Promotes retrieval of verbs and their corresponding semantically related subject and object pairs.

(Edmonds, 2016)

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Verb Network Strengthening Treatment (VNeST): Theoretical Models

- Spreading Activation Theory of Semantic Processing
- Verb as Core

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Collins & Loftus, 1975

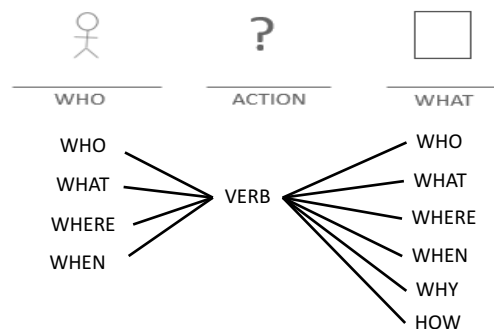
- Spreading-Activation Theory of Semantic Processing
- Spreading activation from concept nodes

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Verb Centered Treatments:

Verb as Core

1. Verbs are central to sentence formulation
2. An increase in verb retrieval will support sentence production



Adapted from Loverso et al, 1986; Edmonds, 2009

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Verb Network Strengthening Treatment

- Theoretical framework for the semantic organization of verbs and their specific thematic roles
- Clients are required to generate subject-object pairs for a given verb
- Comprehension component of the treatment is focused at a sentence level

(Edmonds, 2016)

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Verb Network Strengthening Treatment

(Edmonds et al., 2009 & 2011)

- Phase I and II Treatment Studies
- Phase 1 Results (Edmonds et al., 2009)
 - Generalization to lexical retrieval of content words during probes
 - Improved sentence production
 - Improved noun and verb naming
 - Increase in the number of complete utterances at discourse level

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Verb Network Strengthening Treatment

(Edmonds et al., 2009 & 2011)

- Phase II Results (Edmonds et al., 2011)
 - First participant demonstrated limited generalization
 - Second participant demonstrated generalization on all untrained probe sets
- Discrepancy may be due to the change in protocol for the second participant
 - Verbal and written responses accepted
 - Oral reading of the subject, VERB, and object

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Verb Network Strengthening Treatment

(Edmonds, 2016; Edmonds et al., 2015; Edmonds et al., 2014)

- Participants: 11 persons with aphasia due to stroke ranging from mild to moderate-severe
- Results
 - Improvement and maintenance on sentences containing trained and untrained words
 - Significant increase in noun and verb naming accuracy
 - Increase in percentage of complete utterances
 - Improvement in post-treatment WAB Aphasia Quotients

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Examples of Semantically Related Verbs

(Edmonds et al., 2009)

Verb List 1

Throw
Chop
Sew
Read
Bake

Verb List 2

Kick
Slice
Knit
Write
Fry

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Generalization

- Spreading activation theory to untrained verbs
- Verbs prime semantically related verbs
 - McRae, Hare, Ferretti, & Elman (2001)
- Prior semantic noun and verb treatments
 - Edmonds, Obermeyer, & Keman (2014)
 - Boyle and Coehlo (1995)

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Generalization of Verb Network Strengthening Treatment

- Generalization was evident across clients regardless of linguistic impairment patterns
- Sentence construction > lexical retrieval abilities corresponded to gains in both simple and complex sentence structures
- Negative impacting factors included pronoun production, light verb usage (e.g. put, give vs. throw), sentence construction difficulties and reduced self-monitoring

(Edmonds et al., 2015)

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Verb Network Strengthening Treatment

- 1) Generation of a single subject/object pair
- 2) Read the triads aloud (e.g., Butcher-Chop-Steak)
- 3) Answer WH- questions about selected subject-object pair
- 4) Semantic judgments
- 5) Generation of target verb
- 6) Generation of subject-object pairs

Edmonds, 2014

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Verb Network Strengthening Treatment

- 1) Generation of a single subject/object pair

Verb Network Strengthening Treatment

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Verb Network Strengthening Treatment

- 1) Generation of a single subject/object pair
- 2) Read the triads aloud
- 3) Answer WH- questions about selected subject-object pair
- 4) Semantic judgments

Verb Network Strengthening Treatment

The t examines the crime scene.

The dentist examines the p.

The witness examines the prosecutor.

The seamstress examines the hem.

Edmonds, 2014

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Verb Network Strengthening Treatment

- 1) Generation of a single subject/object pair
- 2) Read the triads aloud
- 3) Answer WH- questions about selected subject-object pair
- 4) Semantic judgments
- 5) Generation of target verb

Edmonds, 2014

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Verb Network Strengthening Treatment

- 1) Generation of a single subject/object pair
- 2) Read the triads aloud
- 3) Answer WH- questions about selected subject-object pair
- 4) Semantic judgments
- 5) Generation of target verb
- 6) Generation of subject-object pairs

Edmonds, 2014

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Verb Network Strengthening Treatment

- A trial of VNeST is completed for a target verb using step 1.
- No note cards or cues are used here.

Edmonds, 2014

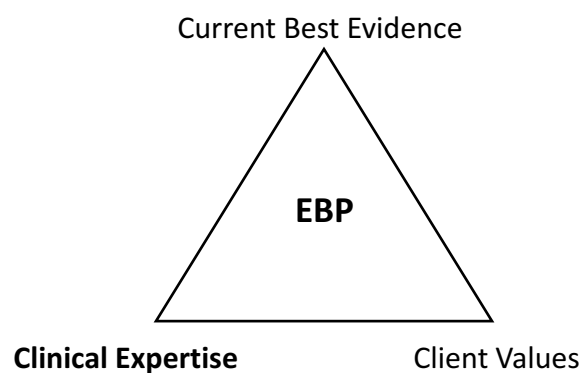
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Evidence-Based Practice



Adapted from National Center for Evidence-Based Practice in Communication Disorders

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SEMANTIC PRIMING TO IMPROVE COMPREHENSION AND EXPRESSION OF SENTENCES

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The impetus for development of SPICES treatment

- VNeST is an efficacious treatment approach for expansion of verbal output from words to sentences (Edmonds et al., 2009; Edmonds & Babb, 2011; see Edmonds, 2016, for review)
- However, many PWA show an inordinate difficulty with verb retrieval (verbs are supplied in VNeST treatment)

(Schumacher et al., 2016, 2017)

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Semantic Priming to Improve Comprehension and Expression of Sentences (SPICES)

- Clinical Observations
 - Many persons with aphasia lack **specific** verbs in verbal output
 - Many persons with aphasia produce mostly single nouns
 - Many persons with aphasia demonstrate more difficulty with generating subjects than objects during VNeST treatment

(Schumacher et al., 2016, 2017)

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Semantic Priming to Improve Comprehension and Expression of Sentences (SPICES)

- Clinical Observations
 - "Flower uh cat and um fish, fish... mm- knocked out kn-
knocked it out. Sleeping uh book, book. Sleeping um cup, fl-
flowers. Um...t- t- Tune, tune, tune, tune, tune. [pointing to
radio]. Cat [pointing to boy], um boy, girl is uh sleeping, uh
Boy is getting cat. Cat, cat. Fo-sofa, sofa, sofa, sofa."

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Semantic Priming to Improve Comprehension and Expression of Sentences (SPICES)

▪ Clinical Observations

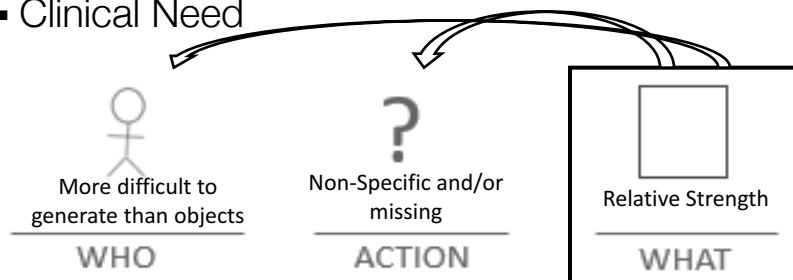
- Many persons with aphasia lack **specific** verbs in verbal output
- Many persons with aphasia produce mostly single nouns
- Many persons with aphasia demonstrate more difficulty with generating subjects than objects during VNeST treatment

(Schumacher et al., 2016, 2017)

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Semantic Priming to Improve Comprehension and Expression of Sentences (SPICES)

▪ Clinical Need



- A novel treatment approach which relies on good noun retrieval to facilitate retrieval of related actions and subjects.

(Schumacher et al., 2016, 2017)

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Spices: An overview

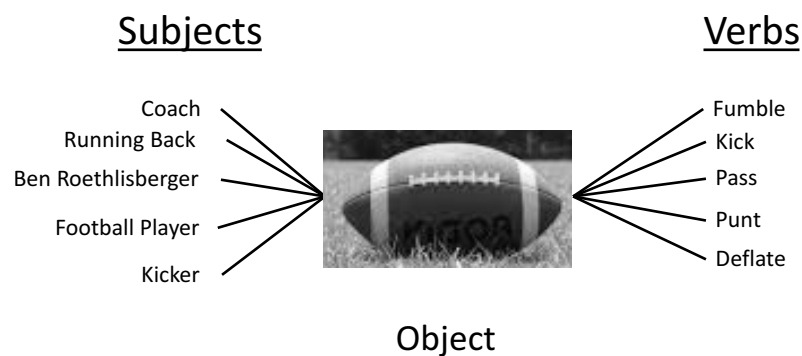
- Novel picture-based treatment
- Uses good noun retrieval to facilitate retrieval of related actions or verbs.



(Schumacher et al., 2016, 2017)

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Spices: An overview



(Schumacher et al., 2016, 2017)

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Spices: An overview

- Novel picture-based treatment
- Uses good noun retrieval to facilitate retrieval of related actions or verbs.

Telemarketer

Receptionist

Strum

Pluck



(Schumacher et al., 2016, 2017)

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SPICES: An Overview

- Novel picture-based treatment
- Rooted in semantic-priming models (Collins & Loftus, 1975)
- Used to facilitate retrieval of verbs and their arguments (subjects and objects)
- PWA were cued to identify and produce semantically-related subjects and actions in response to pictured objects.
- Speed is a focus of treatment activities

(Schumacher et al., 2016, 2017)

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The Impetus for Development of SPICES Treatment

- Research has supported bidirectional semantic priming between verbs and their arguments (Ferretti et al., 2007; Hare et al., 2009; McRae et al., 2005)
- Objects (including pictured objects) may prime related subjects and verbs (Hare, et al., 2009)
- Noun retrieval may be a strength compared to verb retrieval for many PWA, possibly contributing to telegraphic output – see Verb as Core (Loverso, Selinger & Prescott, 1979)
- Both top-down knowledge of commonplace events (e.g., McRae & Matsuki, 2009) and personally-relevant associations often trigger generative responses of related actions and subjects (Hare, et al., 2009)

(Schumacher et al., 2016, 2017)

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The Impetus for Development of SPICES Treatment

- Goal: To explore sentence-level treatment that would maximize number of treatment trials, as well as focus on efficiency of successful subject and verb retrieval.

(Schumacher et al., 2016, 2017)

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VNeST vs. SPICES

VNeST*	SPICES
Supplied verb (printed word) serves as the semantic primer	Supplied object (a pictured object) serves as the semantic primer
Comprehension component focuses on plausibility of subject-object pairs at the sentence level	Comprehension component focuses on subject-object pairs and verb-object pairs at the single word level , though therapist models sentence-length constructions
Verb is supplied ; Subjects and Objects are generated .	Object is supplied ; Subjects and Verbs are generated .

*Edmonds et al. (2009, 2011)

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Lecture Overview

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continued™

Set-up

- Client is presented with a field of 10 pictured objects. SVO sentence structure is visible for reference.



- Training is completed using **block trials** of 10 stimuli for the following groups:
 - Comprehension of Subjects
 - Comprehension of Verbs
 - Production of Subjects
 - Production of Verbs

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continued™

Clinician: "Quarterback"



Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

70

continued™

continued™

“Right; The QUARTERBACK
THROWS the FOOTBALL”

Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

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continued™

Clinician: “Fumble”



Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

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continued™

continued™

“Right; The RUNNING BACK
FUMBLES the FOOTBALL”

Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

73

continued™

Clinician points to a pictured object and requests
verbal generation of a semantically related subject



Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

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continued™

continued™

Client: "MUSICIAN"

Clinician: "Right; Please use it in a sentence."

Client: "The MUSICIAN plays the GUITAR."



Comprehension
of Agents

Comprehension
of Verbs

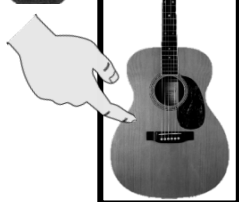
Production
of Agents

Production
of Verbs

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continued™

Clinician points to a pictured object and requests verbal generation of a semantically related verb



Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

76

continued™

continued™

Client: “Strum”

Clinician: “Right; Please use it in a sentence.”

Client: “The music teacher STRUMS the GUITAR.”



WHO



ACTION



WHAT

Comprehension
of Agents

Comprehension
of Verbs

Production
of Agents

Production
of Verbs

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continued™

VNeST vs. SPICES

VNeST*	SPICES
Supplied verb (printed word) serves as the semantic primer	Supplied object (a pictured object) serves as the semantic primer
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*Edmonds et al. (2009, 2011, 2016)

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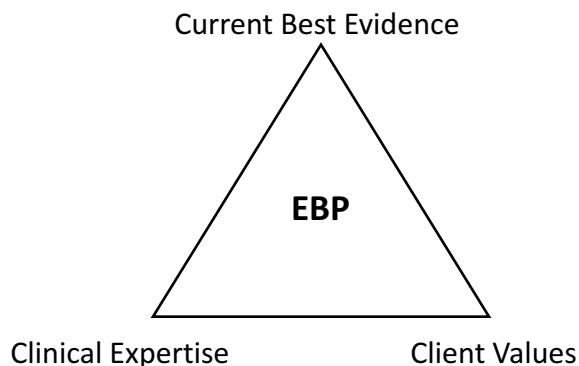
SPICES

- Improved retrieval of actions and subjects was hypothesized to improve both SVO sentence generation and processing speed.
- Pre-Phase I investigation provided SPICES as an adjuvant to VNeST to (2) PWA and later as a stand-alone treatment to (2) PWA.

(Schumacher et al., 2016, 2017)

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Review



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What's next?

- Further explore a step-by-step training for a newly proposed treatment approach, SPICES: Semantic Priming to Improve Comprehension and Expression of Sentences.
- Present a case study of a client who participated in SPICES.

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Questions?

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