

Qualitative Analysis on the SSW Test

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Disclaimers

- ▶ **Dr. Lucker** has no financial interests in making this presentation. However, he does have a private practice, and participants might make referrals to his private practice. He is also a researcher, and much of his work is based on his evidence based research and publications.



Overview

- ▶ The SSW Test has two “groups” of analyses
- ▶ One is the Quantitative “group” which involves analyzing the number of errors made under the four conditions as well as the total number of errors made
- ▶ Quantitative = RNC, RC, LC, LNC, Total Errors
- ▶ There are norms for each of these five measures for each age level
- ▶ But, there is also the qualitative “group”
- ▶ These involve analyses not of errors specifically but the by types of error patterns. For example, a person may repeat all four test items but in an incorrect sequence (Reversals) or the person may take longer than expected to respond (Delay and Extreme (Double) Delay)

Qualitative Responses

- ▶ The qualitative responses on the SSW include the following
- ▶ *Response Biases (RBs):*
- ▶ Ear Effect, Order Effect, Type A, Reversals
- ▶ *Qualitative Responses:*
- ▶ AYR/Yes, Quick, Delay, Extreme (Double) Delay, Smush, Tongue Twister

Why Use the Qualitative Errors?

- ▶ The Quantitative error analyses provides a great deal of information about the person's abilities to process what was heard on the SSW and indicate specific problems that the person has in real-world listening situations
- ▶ However, Qualitative errors also provide a great deal of information, but look at different things
- ▶ There are specific types of APD problems related to specific types of errors
- ▶ The Buffalo Model includes these qualitative errors as part of the analyses of the different types of APD problems presented
- ▶ For further info on the Buffalo Model read:
<https://www.audiologyonline.com/articles/apd-evaluation-to-therapy-buffalo-945>
- ▶ Also read: <http://www.edaud.org/journal/2005/5-article-05.pdf>

The Response Biases: Ear Effect

- ▶ There are four specific Response Biases or RBs from the SSW Test that fit into the Buffalo Model and other diagnoses of APD problems
- ▶ The first is called *Ear Effect*
- ▶ The Ear effect compares performance between the odd numbered items versus the even numbered items of the 40 items on the SSW
- ▶ Odd items start with the right ear (RNC) and end with the left ear (LNC) - thus, the words are presented as RNC - RC/LC - LNC
- ▶ Even items start with the left ear (LNC) and end with the right ear (RNC) - thus, the words are presented as LNC - LC/RC - RNC
- ▶ Some people perform better with the RE starting (Right Ear First or REF) and others perform better with the LE starting (Left Ear First or LEF)

Calculating the Ear Effect

- ▶ When you score the SSW, the first thing you get are the eight cardinal numbers or 8CN = RNC - RC - LC - LNC LNC-LC-RC-LNC
- ▶ The number of errors for the RNC-RC-LC_LNC (REF) are summed and so are the number of errors for the LNC=LC-RC-RNC (LEF)
- ▶ The Difference between REF sum - LEF sum is the Ear Effect
- ▶ Example: 8CN = 1 - 3 - 6 - 0 1 - 8 - 4 - 1
- ▶ The REF sum = 10 while the LEF sum = 14; Thus, REF-LEF = 10-14 = -4
- ▶ Since the sum of the first four is lower than the sum of the second four, we say the errors for the first four (REF) are lower (L) than the higher (H) number of errors for the second four (LEF) so that the Ear Effect is L/H
- ▶ Thus, the Ear EFFECT is L/H -4. The norms show L/H and H/L values.

Sample EAR EFFECTS

- ▶ Look at these three children's 8CN. Do they have significant Ear Effects. If so, which type (LH or HL)
- ▶ Child#1. 6yo: 8CN = 1 - 9 - 10 - 3 5 - 16 - 4 - 2
 - ▶ Norm (-2SD) for child L/H = 10 H/L = 6
- ▶ Child #2 9yo: 8CN = 0 - 3 - 12 - 2 1 - 12 - 6 - 0
 - ▶ Norm (-2SD) for child L/H = 6 H/L = 4
- ▶ Child #3 16yo: 8CN = 0 - 1 - 3 - 0 0 - 4 - 1 - 0
 - ▶ Norm (-2SD) for adolescent L/H = 3 H/L = 2
- ▶ Do these people have significant Ear Effects?

Diagnostic Significance of the EAR EFFECT

- ▶ The Ear Effects fit into the Buffalo Model's categories as follows:
- ▶ Ear Effect H/L = fits the DECODING category
- ▶ The Ear Effect L/H = fits the TFM Category
- ▶ Not everyone follows the Buffalo Model
- ▶ In Lucker's MultiSystem Integrative Approach or LMSIA, Lucker identifies Ear Effect as a function of problems in normal, established neurological processing (no significant ear effect) versus slow processing (significant ear effect) with the L/H indicating that the dominant pathway is doing well in processing, while the non-dominant pathway is weaker so there may be a significant REA (right ear advantage) which could be related to an integration problem. The H/L indicates the non-dominant pathway is doing better than the dominant with would be an LEA which could mean immature development and, thus, connections, in the central auditory nervous system

Response Bias: ORDER EFFECT

- ▶ The Order Effect involves which items had the fewest number of errors = the first word (upstairs) or the second word (downtown)
- ▶ From the 8CNs, you add up the first two for the REF and LEF conditions and then the second two items in each condition
- ▶ 8CN RNC - RC - *LC* - *LNC* LNC - LC - RC - *LNC*
- ▶ The regular printed items = **FIRST** and the italicized = **SECOND**
- ▶ Example: 8CN = 1 - 3 - 6 - 0 1 - 8 - 4 - 1
- ▶ Order first = $1+3+1+8 = 13$ Order second = $6+0+4+1 = 11$
- ▶ Thus, this child's Order Effect is 13/11 which is an Order H/L

Sample ORDER EFFECTS

- ▶ Using the same three clients as before, calculate their Order Effects and tell if they are significant.
- ▶ Child#1. 6yo: 8CN = 1 - 9 - 10 - 3 5 - 16 - 4 - 2
 - ▶ Norm (-2SD) for child L/H = 7 H/L = 12
- ▶ Child #2 9yo: 8CN = 0 - 3 - 12 - 2 1 - 12 - 6 - 0
 - ▶ Norm (-2SD) for child L/H = 4 H/L = 5
- ▶ Child #3 16yo: 8CN = 0 - 1 - 3 - 0 0 - 4 - 1 - 0
 - ▶ Norm (-2SD) for adolescent L/H = 2 H/L = 3
- ▶ Do these people have significant Order Effects?

Diagnostic Significance of the ORDER EFFECT

- ▶ The Order Effects fit into the Buffalo Model's categories as follows:
- ▶ Order Effect L/H = fits the DECODING category
- ▶ The Order Effect H/L = fits the TFM Category
- ▶ Not everyone follows the Buffalo Model

Diagnostic Significance of the ORDER EFFECT (LMSIA)

- ▶ In Lucker's MultiSystem Integrative Approach or LMSIA, Lucker identifies that Order Effect relates to what was described early in the SSW Newsletter (before the SSW Reports). The Order Effects were identified related to memory issues.
- ▶ Order L/H (LH) is related to a low number of errors on the REF versus greater (high) number of errors on the LEF
- ▶ Order H/L (HL) is the reverse

The Response Biases: TYPE A

- ▶ The Type A pattern is a special pattern of errors specifically related to the 8CNs.
- ▶ To calculate Type A, look at the 8CN and see if the second word in the LEF is a difference more than the normal allowable difference compared with every other condition. (In a few cases, you may find that the second word in REF meets this criterion, and two cases are presented to show this.
- ▶ 8CN: REF 1(A) - 2(B) - 3(C) - 4(D) LEF 5(E) - 6(F) - 7(G) - 8(H)
- ▶ Katz uses the letters and identifies Type A by letter and not number.
- ▶ Type A is identified if #6(F) is more than twice greater than all other conditions

Calculating the TYPE A

- ▶ Let's look at the following two real examples:
- ▶ Example #1: 8CN = 1 - 3 - 3- 0 1 - 8 - 2 - 1
- ▶ Example #2: 8CN = 2 - 10 - 4 - 1 0 - 3 - 2 - 0
- ▶ Notice in the first example, the LC for the LEF is 8 (*italicized*) and the next highest value is 3, $8 - 3 = 5$ which is greater than the allowable difference (at -2SD) which is 3. Thus, this child has a significant Type A Pattern.
- ▶ In the second example, the highest value is the RC in the REF which is 10 and if the norm is also a difference no greater than 3, the next highest item is 4 which is a difference of 6 which is much higher than the norm of 3. Thus, this child also has a significant Type A pattern. (This second child is left handed and has a strong LEA on SSW and SCAN-3).
- ▶ Age norms are used (see SSW Manual for norms)

Sample TYPE A

- ▶ Look at these three children's 8CN. Do they have significant Type A?
- ▶ Child#1. 6yo: 8CN = 1 - 9 - 9 - 3 5 - 18 - 4 - 2
 - ▶ Norm (-2SD) norm is 7
- ▶ Child #2 9yo: 8CN = 0 - 3 - 12 - 2 1 - 12 - 5 - 0
 - ▶ Norm (-2SD) is 3
- ▶ Child #3 16yo: 8CN = 0 - 9 - 4 - 0 0 - 3 - 1 - 0
 - ▶ Norm (-2SD) is 3
- ▶ Do these people have significant Type A patterns?

Diagnostic Significance of TYPE A

- ▶ The Type A fits into the Buffalo Model as one of the Integration (INT) problems
- ▶ But, one of Lucker's earliest research studies revealed that of 100 children with learning disabilities administered the SSW, 23 had Type A patterns and all had reading decoding difficulties. Thus, Lucker identified Type A as a specific type of INT which was and is still called a Sound-Symbol Association Integration (INT) problem
- ▶ Thus, Lucker's S-S Association problem can be
 - ▶ Lexical = forming mental images to comprehend what is heard putting the pieces together to form a mental image whole
 - ▶ Phonological = decoding having problems associating the sounds (phonemes) with their associated orthographic symbols (and vice versa)
- ▶ Although almost all APD cases have DEC issues - the B-M looks at INT and DEC as separate issues for both diagnosis and therapy

The Response Biases: REVERSALS

- ▶ Reversals indicate when a person responds correctly ~~with all~~ for ~~or~~ at least three of the four test items, but in the wrong order.
- ▶ For example: for up-stairs/down-town, the child might respond
 - ▶ Downtown - Upstairs
 - ▶ Downstairs-Uptown
 - ▶ Downup - Stairstown (I have never had this happen)
 - ▶ Downtown - Up
- ▶ Thus, the child is getting all or most of the items correct, but is doing so in some reverse order or sequence
- ▶ You merely count the total number of reversals on the whole test

Response Biases: SIR (Standard Integration Ratio)

- ▶ The SIR compares the ratio between the RC and LC number of errors.
- ▶ SIR norms are in the Manual
- ▶ Significant SIR is indicative of an INT problem

Calculating REVERSALS

- ▶ Consider the following responses, are these reversals
- ▶ Item *response*
- ▶ Up-stairs/Down-town *Downstairs - Uptown*
- ▶ Out-side/In-law *Inside - Outside*
- ▶ Day-light/Lunch-time *Lunchtime - Daytime*
- ▶ Wash-tub/Black-board *Blacktub - Washboard*
- ▶ Corn-bread/Oat-meal *Oatmeal - Cornbread*
- ▶ Bed-spread/Mush-room *Mushroom - Bedroom*
- ▶ If these represented half the number of reversals on the test, would each person have significant REVERSAL problems :
- ▶ 6yo norm = 7 7yo norm = 5 8 through adult norm = 3

Diagnostic Significance of REVERSALS

- ▶ Reversals fit the Buffalo Model's categories as a specific problem called Organization.
- ▶ The Buffalo Model looks at organization problems as problems maintaining the sequence of the incoming auditory stimuli when processing what is heard.
- ▶ In Lucker's LMSIA model, he agrees with this, and it should be noted that it was Lucker's early research that identified the Organization and Sequencing category.
- ▶ But, Lucker views organization problems as going beyond merely understanding the sequence of incoming auditory messages. Organization problems may also be related to mental organization in thinking as well as understanding the organization or sequence implied in linguistic messages such as "Your bed is a mess, go to your room and fix it, then come down for dinner." First go to room - second make bed - third come down for dinner!

The QUALIFIERS (the other measures)

- ▶ In addition to the RBs are *qualifiers*
- ▶ AYR/Yes, Quick, Delay/Extreme (Double) Delay, Smush, Tongue Twister, Perseveration, Quiet Rehearsal, Smush-2, Back-to-Back, and Intrusive Word
- ▶ They relate more to some other problems which also include factors NOT associated with APD (LMSIA model especially sees them this way.
- ▶ Let's take a look at these seven Qualifiers and how to score them.

AYR/Yes

- ▶ Each of the items on the SSW begins with the “carrier phrase” “Are you ready?”
- ▶ The listener is told NOT to repeat that, but only the words that follow.
- ▶ Example: Are you ready? Air-plane/wet-paint. Response should be only Airplane - Wetpaint.
- ▶ Some children cannot suppress responding to “Are you ready? Either repeating that phrase (AYR) or responding “Yes” as if saying “Yes I am ready.
- ▶ Each time the person provides the AYR or Yes response, you count that. For almost all ages, the norm is zero AYR/Yes responses.
- ▶ At the 4 and 5 year old norms, you do NOT count any of the RBs or Qualifiers.

Diagnostic Significance of AYR/Yes

- ▶ The AYR/Yes response is a impulse control problem. Children with impulse control problems do not have APD issues causing the impulse control difficulties, but have self-regulation problems which may be related to ADHD, attention difficulties, and/or executive functioning deficits.
- ▶ We do not dx the attention or executive functioning problems - but significant AYR/Yes responses would lead to referral to a psychologist to rule out ADHD, attention problems, executive functioning difficulties.
- ▶ In the LMSIA model, I state that these responses are typically seen in children with attention and executive functioning difficulties, to the child should see a clinical psychologist to rule out such deficits and appropriate interventions would be recommended by that psychologist.
- ▶ We can provide input to help with self-regulation problems however.

QUICK Responses and Their Significance

- ▶ The way the SSW is presented, the child is instructed to “Wait until you hear all the words before responding,” and is instructed for each of the four practice items if the child does not wait.
- ▶ Some children continue to respond before all the words are presented. Again, the norm for most ages for QUICK responses is zero. Only for 6yo and 7yo the the norm = 1.
- ▶ Example: Test Item (Response in italics)
- ▶ Up-stairs/down (*Upstairs*) - town (*Downtown*)
- ▶ Quick responses are, again, indications of impulsivity which goes along with the AYR/Yes responses regarding their meaning and what is to be done when a child has a lot of Quick responses. However, it could also be due to negative emotional reactions (anxiety, fear of forgetting).

DELAYS and Extreme (DOUBLE) DELAYS

- ▶ Another qualifier response is a delay which may be of a normal length (delay) or double length or more delays (Extreme (Double) Delays).
- ▶ The way the test goes, the item is presented with the AYR carrier phrase, and the person is given a period of silence in the recording in which time the person has to respond. People usually begin their response after hearing the last word.
- ▶ Some people respond after a delay of time but before the next test item begins. This is a DELAY response.
- ▶ Some people do not respond until the beginning of the next AYR - EXTREME (DOUBLE) DELAY.
- ▶ The problem could be very slow processing.
- ▶ The problem could also be emotional, insecurity in responding and needing to triple check before responding.

SMUSH Responses

- ▶ This response was originally identify by one specific test item:
- ▶ Bed-spread/mush-room.
- ▶ Some people responded by blending together the “s” of “spread” with the “mush” responding: Bed-smushroom.
- ▶ SMUSH responses may indicate problems for the child segmenting words which can affect phonological decoding and reading.

TONGUE TWISTERS

- ▶ For some test items, the person has problems correctly repeating items and gets the sounds mixed up forming a “tongue twister”.
- ▶ For example, Sun-day/Shoe-shine, some people may say “Sunday/Shoesign or Sueshine or Suesign (I have heard all three).
- ▶ They mix up the “s” of Sunday with the “SH” of shine.
- ▶ The norms for all age level (except 4 and 5yo when this is not counted) is ZERO.
- ▶ Lucker does not see Tongue Twisters as anything to do with APD - the LMSIA model views Tongue Twisters (TTW) as an output, motor integrative response problem - I believe, however, the Buffalo Model sees it as a motor planning problem that sits in the middle of TFM region and reversal strip.

PERSEVERATION RESPONSES

- ▶ Perseveration is repeating what was said before when not appropriate. Repeating what is said before when it is not appropriate....oh, right, that's not correct, it's a perseverative response.
- ▶ Example: Item 1 = Up-stairs/Down-town Item 2 = Out-side/In-law
- ▶ Response after Item 2 = Outside/downtown or Upstairs/Inlaw.
- ▶ The person is repeating a previously correct item when it is no longer heard.
- ▶ For all age levels, except 4 and 5yo for which it is not counted, the norm is ZERO.
- ▶ The Buffalo Model views Perseveration responses as the opposite of a memory problem in which poor decoders reach out when unsure and pull out from memory what they have retained (from the previous item). Thus, it is viewed as a DEC problem.

Example of Two Cases: Value of Qualitative Analyses

- ▶ Case #1: 16 year old boy who was referred by parents and their educational advocate (lawyer). The school has the child pegged as having attention problems and they are willing to give the child a 504 Plan for accommodations under educational eligibility for Other Health Impaired/ADHD. Child is right handed, very right handed and definitely REA.
- ▶ SSW Results:
- ▶ All condition scores were normal. Qualifiers: *AYR/Yes very significant*
- ▶ RBs: *Ear effect H/L Significant* Quick *VERY SIGNIFICANT*
- ▶ *Order effect H/L Significant* Delay/Double Delay NONE
- ▶ Type A not significant Smush, Tongue Twisters, Perseveration
- ▶ *Reversals very significant* ALL NONE

Example of Second Case: Value of Qualitative Analyses

- ▶ Case #2: 8 year old girl who was referred by parents and their educational advocate (lawyer). The school has the child pegged as having attention problems and they are willing to give the child a 504 Plan for accommodations under educational eligibility for Other Health Impaired/ADHD. Child is right handed, very right handed and definitely REA.
- ▶ SSW Results:
 - ▶ *Condition Significant LC* Qualifiers: AYR/Yes NONE
 - ▶ RBs: *Ear effect L/H Significant* Quick, Tongue Twisters NONE
 - ▶ Order effect not Significant *Delay Significant*
 - ▶ Type A not significant Double Delay NONE
 - ▶ Reversals NONE *SMUSH Significant*

Conclusions

- ▶ In addition to the quantitative responses, there are many significant and important qualitative responses.
- ▶ Some have to do with APD issues.
- ▶ Some have to do with issues that affect processing of what we hear, but are not necessarily specific to APD.
- ▶ However, information from qualitative responses (RBs and Qualifiers) is important for the best understanding of the person's issues and needs.
- ▶ Thus, it is important to look at your SSW Test results and look at not merely the TOTAL score, or not merely the four conditions, and not merely to look at the RBs, but to look at ALL information we obtain from the SSW.
- ▶ For me, the SSW is one of the most comprehensive tests of auditory processing.

Keep In Touch

- ▶ Any Questions?????????????
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