

SSW Reports

- What About Integration Type of APD?
 - Two Questionnaires
 - Words of Wisdom

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What About Integration?

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There is no APD category that has been discussed in SSW Reports more than Integration (INT). This is because it is more complex and can be a very severe form of APD. This article deals with a change in the INT designation to accommodate the recent increase in focus on therapy for APD.

Type-A and Dyslexia

The INT category came about, back in the 60s when two teenage girls were tested. They were the first patients who were referred to me as having “Dyslexia”. And both of them had the strangest SSW patterns that I had ever seen.

The 8-Cardinal Numbers (8-CN) for *Patsy* were 0 0 0 0 0 14 0 0. I could hardly believe that pattern and had no anatomical explanation based on what I thought I knew about the brain. The only interpretation that I could come up with was that her left-ear pathway was slower than the right. So for REF items the left-ear spondee fell back (so it was less competing with the RC word). Therefore, her REF score improved. But for LEF items the left-ear spondee was pushed back toward the right ear spondee. This in some ways increased the LC challenge. So with REF items with reduced dichotic errors and the LC words with increased jeopardy we get the characteristic Type-A pattern.

About 6-months after *Patsy*, I tested *Linda*. Her 8-CN were 0 7 0 0 0 0 0 0. When I played with the data I realized that the same explanation would hold if her right-ear pathway was slower than her left. Thirteen years later when I was reviewing their folders yet again, I noticed that *Patsy* was right handed and *Linda* was left!

Soon after I tested *Patsy* and *Linda* I learned about the Angular Gyrus that is the auditory-visual integration center and the region that neurologists associated with Dyslexia. Sure enough both *Patsy* and *Linda* had abnormal EEGs in that region. Neurologists also referred to Dyslexia as a ‘disconnection syndrome’ so that the Angular Gyrus could be intact but weak if the connection between the hemispheres was interrupted. Thus, the visual information from the right hemisphere could not combine with the language-based information from the left hemisphere.

Dichotic listening is much like double simultaneous stimulation that neurologists perform tactilely (patient’s eyes closed they touch both arms simultaneously and ask where the touch was felt). With certain neurological problems the person only feels the touch to one side). Kimura (1961) diagrammed dichotic listening. You could see that with a corpus callosum lesion the left competing word would be lost. Indeed one-third of the cases that I saw with corpus callosum tumors had Type-A patterns.

Characteristics of Integration

INT is generally associated with problems with the Angular Gyrus and/or corpus callosum functions. However, other disconnection disorders also could be considered INT.

In a study reported in SSW Reports we found that INT cases were the most severely impaired academically (reading and spelling) of the various categories. However, when we looked deeper into the problem we found that those with primarily DEC as well as INT (i.e., the Type-A pattern) they had the most academic difficulty and Type-A cases with TFM having somewhat less difficulty, but still more severe than those with no Type-A (i.e., DEC, TFM or ORG).

INT-1 vs. INT-2 and Then...

In 1991, Katz & Smith wrote an article dealing with the SSW test. We suggested that INT be divided into two groups: INT-1 would represent INT plus DEC and INT-2 would be INT plus TFM. Later on it got more complicated as we realized the importance of ORG and that frequently there were three and sometimes four categories of APD in a single person. The category system became more and more complex.

For this reason we are gradually steering away from sub-categorizing INT problems. That is, we have moved away from making INT special. This became more and more important as we began to focus on APD therapy as each category should be addressed. In fact, we are less concerned about INT, at least initially in therapy because we believe that the most basic auditory functions should be improved first before we ask the CNS to do more complex tasks.

To all of you who may have put in effort to learn the various sub-categories, I apologize,

but it is time to move on as conditions change.

I have always felt that the Buffalo Model has changed little over the 25 years. Perhaps it's because we used the site-of-lesion information to establish the categories initially. Also, the tests were not quite as sensitive as they are today so it was simpler to identify which problems were related to each.

Summary & Conclusions

Integration (INT) is the most complex category because it can involve several regions of the brain. Because it is generally a severe form of APD we tended to focus on this category (e.g., labels INT-1/2 or INT-8). However, because we also concern ourselves with rehabilitation it seems preferable to treat each category equally. Therefore, a person who has DEC, TFM and INT problems would be listed as such. This makes the most sense as in therapy where we address the least complex and most basic problems first. Therefore, DEC, memory and speech-in-noise would be the first ones and INT and ORG only after there has been good progress in the basic issues.

References

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APD Characteristics of Young Children Jack Katz

You may know that Donna Geffner and Ronald Goldman have a test battery for screening children 3½ to 6 years of age for APD (Auditory Skills Assessment [ASA]). My daughter (a deaf-ed, special-ed specialist) and I helped out with obtaining an APD sample. My colleague, Angela Loucks, uses ASA and finds it very useful! However, this dog is too old to learn new tricks. Nevertheless, I feel that identifying the children as soon as possible is so important in order to take advantage of the brain's natural plasticity.

I suspect that we can all agree that holding off evaluating children for APD is not in the best interest of the children, their families and society. Just as we should not wait for some special number such as 7 years to identify and treat deaf children we should not wait to identify and treat those with APD (see vol. 27 #s 3 and 4, 2005 *SSW Reports*).

Although it is highly desirable to identify and treat children who have APD as soon as possible we don't have a lot of tools like ASA to use. I would like to further discuss questionnaires.

The Reason for ACYC

I think you know how invaluable the Buffalo Model Questionnaire (BMQ) has been for me (and I hope for some of you). But I found that my case history form and BMQ did not provide sufficient information for young children. So much of our understanding of the APD issues for school-age children and adults comes from their academic performance. However, we lose that information with young children.

Back in 2005, in my private practice when I was referred children under 5 years, I had no battery of tests for them. So, rather than turn

children away who likely needed help; I would gather as much information as I could to enable me to suggest if the child likely had APD and if so what categories. This would not properly diagnose the problem, but at least it was possible to develop a *working hypothesis* so appropriate approaches might be used to help these young children. Interestingly, the children ranged from 2 to 5 years of age, but then I had 6-year-olds who also were preschoolers or kindergarteners. So they lacked the scholastic information that was so useful with older children.

Because more information was needed the *APD Characteristics in Young Children* (ACYC) was developed. This brief questionnaire has turned out to be very helpful in filling in information from early childhood and also to offer insights into possible APD.

Developing the ACYC

ACYC is based on characteristics that would give us a) early signs of APD and b) hopefully suggest APD categories. The first two were pretty easy: a family history of APD and a history of otitis media, but neither of them provide specific categorical information. Thus, they are listed as 'c' for 'CAP' in general.

Some of the items are the same/similar to the questions in the BMQ. For example, if the child is messy or disorganized, has poor articulation, or is forgetful. Other questions were specific to young children. For example, did not learn nursery rhymes or finger-play. I assumed that both were dependent on DEC, but finger-play (e.g., eensy weensy spider) also required ORG. These 20 items provide 24 indicators, in part, because some items have 2 choices (e.g., receptive or expressive language) depending on which ones are circled. Also one item deals with localization of sound.

APD Characteristics in Young Children

Name _____ Age _____ Date _____

***Please put an 'X' for each question in the box that applies**
***When 2 parentheses per item (i.e., #s 2, 10 and 20) please circle any that apply**

- | | | | | |
|---|------------------------------|-----------------------------|----------------------------|-----|
| 1. APD or presumed APD in family | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | c |
| 2. History of otitis media (ear fluid/infections) (tubes) | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | c |
| 3. Allergies | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | c |
| 4. Slow to learn to talk | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d |
| 5. Poor articulation | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d |
| 6. Limited vocabulary | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d |
| 7. 'Marches to a different drummer' | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d/o |
| 8. Not learn nursery rhymes | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d |
| 9. Difficulty with finger-play (e.g., itsy bitsy spider) | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d/o |
| 10. Poor language (receptive) or (expressive) (both) | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | d/v |
| 11. Bothered by noise | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | n |
| 12. Makes own sounds (e.g., when ignition is turned on) | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | n |
| 13. May be a noisy child when in noisy conditions | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | n |
| 14. Hyperactive/wild when several children present | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | n |
| 15. Forgetful | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | m |
| 16. Easily distracted by noise | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | n |
| 17. Does not remember simple directions | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | m |
| 18. Messy, disorganized | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | o |
| 19. Difficulty locating source of sounds | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | i |
| 20. Has/had (sensory-integration) or (speech) therapy | <input type="checkbox"/> yes | <input type="checkbox"/> no | <input type="checkbox"/> ? | i/d |

Please expand or explain on any of these _____

What other characteristics or events concerned you about the child's AP abilities?

For Office Use									
D	N	M	V	I	O	C	L		tot

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Figure 1. The APD Characteristics of Young Children (ACYC) form.

Figure 1 shows the current ACYC. At the bottom is a table to show the number of concerns that are applicable for each category. The total number of items for each category is shown in Table 1.

D	N	M	V	I	O	C	L	tot
8	5	2	1	1	3	3	1	24

Table 1. The number of items for each category and for the total APD score

Some ACYC Data

Thus far, I only have data for 12 children. Because the choices are *yes*, *no* or *not sure* (Y, N, or ?), one point was given for a 'Y' and ½ point for a '?'.

The age range was 2 to 6 years with a mean age of 3.7. There were 7 boys and 5 girls. The mean number of indicators was 10.9 with a SD of 3.0. The range was 6 to 17

points. The 6 younger children had about 2 fewer indicators than the older ones, but such a distinction is too small and too early to instill confidence in an age influence.

The item with the highest hit rate was *language (receptive, expressive or both)* with 10.5 hits. *Slow to talk* and *bothered by noise* both had 10 points out of a possible 12. *Articulation, vocabulary* and *distracted by noise* were positive on 8 or 9 items.

Summary

It seems that the ACYC is a helpful tool for identifying young children who likely have APD. However, it would not stand alone. I will continue to get information from all 3 sources of information: the case history form, BMQ and the ACYC for young children.

Buffalo Model Questionnaire - Revised

Speaking of the Buffalo Model Questionnaire (BMQ), Tom Zalewski and I have been working on a revision of the BMQ that we are donating to the Educational Audiology Association as a fund raiser.

You will see that the old adage that two heads are better than one applies to us. We went back and forth many times, good naturedly, trying to make the best questionnaire that we could. We also had some outside help from Sam Atcherson and Cindy Richburg who are studying APD questionnaires.

We used all 48 of the items and the six prior therapies of the BMQ for the new BMQ-R, but that's pretty much where the resemblance ends. The new form is quick and easy to score and we made other changes.

The most dramatic revision is that the items are clustered by category. The eight categories, sub-categories etc. are just the same as on the BMQ, but because all of the

DEC, noise etc. items are lumped together you can quickly write down the number for each in the summary table. Along side each item are 3 columns for response. We now have a 'Y' column as before as well as an 'N' column and a 'NA' column. This should end the confusion between a 'no' and a 'not applicable' response.

Some of the other helpful additions in the BMQ-R are a place for comments, explanations and questions. So now when a parent is unsure of what 'Auditory-Visual Integration' means they can state that and we can either explain the meaning or take the lack of clarity into consideration.

We added 'age' and 'grade' at the top of the form as this information is important in interpreting the responses. BMQ-R also asks who is filling out the form. One example of how this could help is that I was once thoroughly confused when the case history form and the BMQ showed no resemblance to one another. When I showed the mother the two forms she began to laugh. She filled out the case history form and asked her, physician, husband to fill out the questionnaire (without checking it). When she saw that it had no relationship to her child she asked for a blank form so she could redo it. I have often suspected that physicians do not read all the pages that we fill out in their offices and now I have further evidence.

Tom and I will be finished with the manual in about a month so I hope EAA will be able to distribute BMQ-R forms and the thorough manual. The manual provides new data and a lot of other information dealing with the questionnaire and its use.

I have every reason to believe that EAA will price the forms at a fairly nominal rate.

* * * * *

Words of Wisdom

I'm sure that you have learned a lot from your patients; how could you not. I was just thinking about some of the insightful and fun things I have picked up from the adults and kids that I am supposed to be helping.

When I first began my practice I had time to run parent-group meetings from time to time. That gave me the opportunity to teach about APD and answer questions. One of the parents was a psychiatrist. When I invited her to a meeting she asked if I would like for her to run a support-group type session. I thought that would be a great idea. At the meeting I spoke for a few minutes and then the psychiatrist went around the room asking parents to share with the rest of us whatever they wanted. Some parents talked about their children, others asked if others had seen certain behaviors in their children that they were noticing etc. Then one parent gave an observation that I will never forget and have often shared (especially with parents who seemed discouraged by their child's APD).

The mother said that in her family, the children who breezed through school have done well in life; but those who struggled have done better. To me it suggests that when things don't come easily to you; you learn that you have to work harder than the other kids in the class. So when you get a job you are willing to work harder than the others and consequently are likely to do a better job than other people who might be rushing through their work activities.

Of course, I am not suggesting that we not help the kids with their difficulties so they can build a great work ethic. * * *

At that meeting another mother stood up and shared this anecdote that I often recall when a youngster is having unusually challenging

times. She said that because of his academic difficulties she must work at home with her son. Oftentimes it is quite frustrating for her when he just doesn't get it.

One day she said, "Listen, that's not what I said." But he still did not respond correctly to the information that she again asked him to listen to. She somehow saw some behavior that caused her to ask him, "Can you tell me what it means 'to listen'?" He said, "Yes, it means that you are supposed to stand very still and to be quiet."

Wow, what if some of the kids don't know words or concepts that we assume they know? If that is the case, then we could be spinning our wheels forever and get minimal results for such a simple reason. And for sure, who but a child with APD is most likely to misunderstand the meanings of words? Consequently, using gestures or perhaps doing some extra explaining would reassure you that the problem is not a basic misunderstanding. * * *

Here is something that a child taught me. She has 50dB conductive loss in one ear. It is associated with chronic otitis media as a child. Not infrequently I find children that I work with still have middle ear problems, unbeknown to the parents (I'm sure that is no surprise to you).

Recurrent OM was a real problem for several children for whom the therapy did not hold. It's unusual to regress but not in that group of kids. Typically, the children (if they are nice easygoing kids) are unaware of the problem or even the hearing loss; perhaps because they have had these events all their lives. But when I asked this 10 year old if she knew when she had middle ear problems she said, "Yes, because it's noisy". What a good indicator to mention to children if they are unaware of the problem. * * * * *