Just How Old Is Your Child?

By Craig Stellpflug NDC

An Essay on Sequential Processing

Three ways to document development

There are three ways to document human development. First there is chronological age for the actual time span age of an individual. Then there is neurological age which correlates to the normal neurological advancement age by comparison with the mean average neurological development. And finally there is sequential processing age (closely aligned with academic age) which correlates to the mean average of academic ability and achievement.

The first way to document age is Chronological age. Chronological age is the days, weeks, months, and finally years that a human lives. To say that a baby is six weeks of age means that the baby has survived six weeks of life. This now becomes the chronological age of the baby. Experts now attach certain developmental milestones and neurological development to that chronological age.

The second way is neurological age or developmental age. Neurological age, or developmental age, would be determined by the average age a human achieves certain milestones of development. For instance, by six weeks of age the baby should have reasonable head control and a positive Babinski reflex (automatic toe curling when the bottom of the foot is rubbed in a certain way). If this is true, then the baby is developmentally at six weeks of age. However, if the same baby develops

these milestones at four weeks of life, that baby is at six weeks developmentally in those areas even though it is only four weeks away from its birth. Conversely, if the baby is twelve weeks of age but is just now developing these milestones, that baby is still at six weeks of age developmentally.

In addition to chronological and developmental age, the third way of measuring development that we will concern ourselves with here is the sequential processing age which correlates to the academic age.
For instance, a child at the chronological age of seven should be age appropriately in the second grade and developmentally functioning at certain neurological levels to be “normal” or average. If a child is nine years old and in the second grade, then experts would say that this child is behind academically. A five year old could be neurologically functioning at the level of a second grader and the experts would call this a “bright” or gifted child.

However, this advanced child would not usually be placed in the second grade where it belongs academically, but placed in chronological age classes! This will in turn limit the neurological stimulation of this child and force it to conform to “normal” standards. (This is not done by legal standards and enforcement of laws but rather by the acquiescing parent who allows this to happen when they let “experts” place the child where the expert deems the child belongs while sometimes missing that gifted child.)

Using sequential processing to document neurological age

For the model of development in this article the preferred method of documenting developmental age is sequential processing skills. Sequential processing is an integral part of neurological development and very easy to determine.

Sequential processing is the brain's ability to receive, process, store, retrieve and utilize information in the specific order received by the senses.

For instance, if you speak a specific order of items or show them visually in sequential order to your child, (like "touch your ear and then touch your belly button") we are interested in documenting how many items they can repeat back in the same sequence given.

There are five input senses: seeing, hearing, touching, smelling and tasting. These input senses feed external information to the brain. We will however deal primarily with seeing and hearing in this chapter on sequential processing.

How sequential processing works.

After the chronological age of one year, the neurological processing skills of the child should be one also. This will allow the child to process one thing. For example, you say toes, and the baby reaches for its toes. You say "where's Daddy?" and the baby reaches for Daddy. Visually, you might show the baby a picture or even several pictures laid out and ask the child to point to the picture of Mommy. If they can do this consistently it correlates to the child's sequential processing age of one.

By the chronological age of two, the normal number of sequences a child can complete should be two. Developmentally, this equates to an appropriately developed two year old. For instance, to say, find your shoes and a Kleenex, can the child do this? Or you say point to the raisin and point to the stove, can the child do it in the same sequential order? (You would not want to test shoes and socks as two separate items as they are not actually two separate items but can be easily linked together by association making them one item.)

Interestingly, society has a stigma attached to the "terrible twos" because of the child's narrow ability to process sequences that is limited to "I want" and also "don't want"!

At the age of three, the child should be able to process a sequence of three both visual and auditory. If you send this child on a treasure hunt to find a spoon, a doll, and a book, we are looking for the triumphant return with the goodies found in sequential order. If they can only process two items then developmentally they are still two years of age. When this occurs consistently, the child will act and think exactly like a two year old even though chronologically they are three years old.

To help accelerate your child out of the "terrible twos", increase their processing skills to three! (We will cover this later in the article)

At the age of four, how many items do you think they should be processing? That's right, four - both spoken verbally and taken in visually.

At the age of five, you guessed it! The child should be able to receive, process, store, retrieve, and utilize five items in order from short-term memory to be developmentally “normal” at that chronological age.

Therefore, if you have a five or even a ten year old that socially acts like a two year old, it will behoove you to check the developmental age and processing skills of that child!

The developmental age of six.

At the developmental age of six, a child should be able to sequentially process six items both visual and auditory. The child does not have to be six years chronologically to be a developmental six! They could be four years old and they could be sixteen when they achieve this milestone.

At the developmental age of six an amazing thing happens in the brains processing ability. Six sequences is the foundation for understanding concepts.

An example of a concept is phonetics. Who says that the letters “ph” makes an “f” sound? How does a letter “a” make a long vowel sound one time and a short vowel sound the next? A child can learn to read by visual memorization of words at a very early developmental age (I have two and three year old Down Syndrome kids that can read very well from visually learning flash card words). Every time you see the word ”elephant” you automatically know what it is from memory and not by phonetically sounding it out. Phonetics means very little to a child until the child can process at a level of six sequences. This is why some children struggle so long

and hard to understand phonetics. Raise the processing ability to six and phonetics will fall into place for that child!

Another example of a concept will be numerals. Who says that the numeral “5” equals five cookies? Five fingers can equal five cookies but the numeral “5” is a concept even as all numerals are. A child who processes less than six sequences can count and understand five fingers, five horses, and five gum drops, but will have trouble relating five any things to the numeral “5”.

In light of this we may better understand why we start our kids into school with math and language, etc. at about the age of six.

The average American.

The average American adult processes at about the sequence of seven sequences both visual and auditory. This equates to the developmental age of seven! The higher abilities above seven a person achieves, the higher functioning individual he or she is academically and socially.

I have found that the more successful college kids have a higher than average processing skills abilities.

I have also seen students in college that could only process six sequences and have seen them struggle to maintain passing grades in classes. The higher the processing skills, the less the struggle the college student has to maintain good grades!

Every infant is born with the innate potential to achieve genius levels! It is only a matter of opportunities that are presented to the developing child's brain that determines that child's academic acumen. Training a child in accelerated processing skills will shorten the learning time in any subject considerably. There is no reasonable excuse for any child to fall short of genius! It is a matter of parenting and instruction not eugenics (good breeding).

Take, for instance, Einstein. The average human brain weighs about 24 ounces. Einstein's brain weighed in a couple of ounces less than average! About 10% less! If acumen is the matter of brain volume, then Einstein should have been 10% less than average. So the conclusion to that fact is that it is not an issue of the volume of grey matter, but the organization thereof along with processing skills that makes the genius!

The disparity between auditory and visual skills

Sound social decisions are based in strong auditory processing abilities. The social skills center of the brain is located in the pre-frontal cortex of the brain. It is an area that completes development in the teenage years and early twenties. A well developed social skills center, however, is limited by sequential processing skills.

In this computer and television age with all the video games and visual input we get day in and day out, we are starting to process higher visually, but are losing ground in auditory skills. Decades ago it was not this way. We were an auditory society and processed higher in the auditory processing skills.

Video games that hurtle objects across the visual fields along with faster modes of travel (cars, trains and etc. with velocity over 15-20 mph) cause a peripheral blur of objects to the brain and is a recently new development in input to the human brain. This new input is helping cause a societal shift in processing abilities and is an exacerbating factor to the rising incidents of violence, degradation of moral values, and rampant diagnosis ADD/ADHD, AADHD, and other disorders of the brain.

I always recommend a near balance between the visual and auditory processing abilities. For instance, if a child can process six things visually he should be near a six in auditory skills. If there is more than a two point spread between the two processing abilities, then we need to exercise the weaker ability more.

I personally recommend that a higher level of one auditory sequence over visual function be preferred for greater sociological function in the individual.

Symptoms of low processing abilities.

Some symptoms of low processing abilities are: inability to accomplish tasks, preferring to play with younger children, inappropriate and childlike emotions, poor decision making skills, delayed thinking, poor academic performance, problems with phonetics, poor social skills, bullying, and even intra-versions.

Testing the child.

When testing your child for sequential processing ability, start with a low sequence of perhaps one or two items

and progress by adding one more item to the sequences until the child consistently fails to repeat the items back in the proper order. When they can consistently accomplish a sequence number of for instance, five sequences, and do this nine out of ten tries, this will give you a good idea of where your child is at in their processing ability.

When checking the auditory sequence abilities, speak them in a monotone (one tone) voice so as not to provide emphasis to any one item. Say the items clearly and allow one second intervals between items. Immediately let the child repeat the sequence back to you. An example of an auditory sequence of four, you might use these items (remember to call them out in one second intervals!) car, tree, soap, and banana. Notice that the items are unrelated to prevent “linking by association”.

When checking visual sequencing abilities, use picture flash cards of items, random numerals or random alphabet letters (printed on a note card), point to objects in a room or even items in a picture. When using picture flash cards, take about one second to show each picture making sure not to linger or elaborate on any one picture. When using flash or note cards with numerals or letters, show the card for no more than 3 seconds before hiding it from their view and let them tell you what the order was.

Utilize this exercise in two minutes auditory and two minutes visual sessions to help build the sequential processing ability in the child.

Bridging the gap

Bridging the gap is a process whereby you can help your child achieve the next level of sequences. It is for use to raise the sequential processing ability after the child can consistently repeat back a number of sequences either auditory or a visual. For instance, if your child starts out at a consistent ability to repeat four sequences, work on five to expand their ability to that level. If they are struggling to do five after a day or two, or just need some affirmative triumphs, you can give them a sequence of four. Then after they repeat that sequence in order, give them the same sequence in the same order but add on new item to the end of it. This bridging will show them the success of doing five sequences which will help raise the intensity of the exercise.

Another way to bridge is to use related items at first (shoes, socks, toes, feet) and then gradually shift to unrelated items until all items are unrelated. Another example of four related items would be apple, banana, orange, and grape.

Making your own flash cards.

To make your own flashcards with random numerals or alphabet letters or a mix thereof, print them in ½ inch tall block style characters upon a 3X5 note card. Use a black felt tip marker when making these cards. You will want to make at least fifty cards all with different sequences to start. Then when for instance, your child can do three sequences on a flashcard and is ready to attempt four, you can just simply add digits or letters to the beginning and end of the existing sequences. If you have cards with too many digits, simply cover the unneeded characters with your finger as you flash them to the child.