

MENTAL GYMNASTICS - Bilateral Integration and Cognitive Loading

This activity helps to develop the integration of the two halves of the brain, and the ability to multitask. The inclusion of this technique in therapy has been shown to have a catalytic effect, doubling the rate of progress, cutting the length of therapy in half in virtually all cases.

This activity integrates at least five sensory and motor skills: Visual (for balance); Auditory/temporal (the rhythm); Gross Motor; Fine Motor (ankles and toes used in balancing); and the Vestibular sense (balancing/bodily coordination).

TIMING - This activity should take about five minutes for each daily session, if possible. This activity is very useful and it should be strongly considered an important exercise. Please do not omit it. Half the time is spent on tapping, half on hopping – never both at the same time.

EQUIPMENT - The ideal piece of equipment is a "rebounder"-type trampoline. They are often found at garage sales and/or flea markets for a few dollars. Brand new ones are available for \$30.00 - \$40.00 at discount houses and sporting goods centers. The object is to reduce the ankles' impact force with the floor, if at all possible. In lieu of a tramp, an old cushion or a folded Orlon blanket, or even a couple thick shaggy rug samples available for under a dollar at flooring centers will suffice. As a last possibility, it may be done on the floor itself.

METHOD - The training uses tapping to train the rhythm in the brain only, the therapeutic value comes from hopping, which is gradually added in as noted below. The tapping rhythm is trained using the hands to tap a surface while standing (seated if standing is too difficult at first). The performance should be smooth, even, steady -- missing no beats -- as if a metronome were beating (consider using a metronome to create a sense of regular rhythm, started at 70 beats per minute). Watch for signs of unevenness/segmenting of the production (a conscious switch from right to left hemispheres of the brain ["tap-TAP -- tap-TAP" is generally heard]). Automaticity needs to be stressed, so that the production of the rhythm appears virtually effortless.

- A. TAP 1 and 1 (left, right, left, right) - Goal: slow, steady, even, automatic production. ("TAP-TAP-TAP-TAP", etc.)
- B. TAP 2 and 2 (left, left, right, right) - GOAL: as above. You should be able to add in the hopping of 1 and 1 (left foot, right foot) as one half of the training session (about half of the training session for this activity).
- C. TAP 1 and 2 (left, right, right) - Goal: as above. Watch for and avoid "tap-tap-TAP/tap-tap-TAP", that is, a 'segmentation' with a rest beat added in. There should be no emphasis on any of the beats. Start 2 and 2 hopping (left foot, left foot, right foot, right foot) if skills allow -- 1 and 1 hopping must appear very automatic before you do, however.
- D. TAP 2 and 1 (left, left, right) - Goal: as in C. Also, start 1 and 2 hopping if ready for it, testing as you did the hands in C. for best performance. If not ready, continue 2 and 2.
- E. Alternate Tapping -- Switch 1/2 and 2/1 upon command. Also, start hopping 2

and 1 if 2 and 2 and 1 and 2 patterns are automatic by now. Work on 1 and 2 and 2 and 1 patterns until your child is able to switch easily back and forth (with the loss of no more than one beat) upon your command.

COGNITIVE LOADING -- After all the rhythms can be easily produced as tapping and as hopping (or upon the instruction of the therapist) these activities are added to the hopping:

A. FAMILIAR TERMS -- have the child repeat all the family names that he/she can, known addresses, telephone numbers, the alphabet, nursery rhymes, give directions on how to drive to school, to church, how to get to different rooms in the house from the front and back doors, describe pets, etc. -- all while maintaining the rhythm. Stress that it is more important to keep the rhythm going than to keep talking -- and not to stop hopping while thinking of the answers. Practice with all the rhythms (hopping only - tapping will no longer be needed).

B. FAMILIAR CONCEPTS -- count by ones to 100 (less for younger children), counting by twos, then by fives, counting by odd numbers, then threes, fours, sevens. These demands can be reversed at any time -- but at all times, tailor the task to assure the child's success with a bit of "reaching". We don't want to expose the child to repeated failure -- there's enough of that already in your child's life. Use the alphabet--by sections--forward and backward (your child shouldn't have to recite from /a/ to /e/ to give you /f/ through /m/) -- only do them backwards in three, four, or five letter segments at first -- whatever your student can succeed with.

C. UNFAMILIAR CONCEPTS -- You can practice spelling lists, or spelling words backwards, or counting by adding/subtracting sums (i.e., add 3, then subtract 2 from each answer starting with 1 -- or another, different starting number). Vary the sequences. Present math facts in unique ways: "How many 4's are there in 24?" or, "How many times can I subtract 3 from 27?" etc.

D. OTHER --- You may also be given a chart of arrows to have the child recite the directions of while hopping and pointing with their arms in a whole-body, exaggerated way. This helps to embed a sense of directionality in the child's mind and helps to minimize the tendency to visually scan words backwards.

For those with oculomotor problems, the following will be recommended: imagine cards at the four corners of the wall in front of you at the floor and ceiling. While hopping 2 and 2, look to each of the corners for the two beats of each foot's hops. Continue for at least ten times around. [NOTE: You do not need to do this procedure unless directed.]

Background -- (Cont'd.) Research at the University of Illinois in 1990 showed that simple mental tasks are best handled by using one hemisphere of the brain at a time, and that complex mental tasks were best handled by the use of both hemispheres of the brain simultaneously. Schoolwork requires complex thinking. The smooth usage of both sides of the brain together is an acquired skill, in large part. We become more adept at interweaving their activity as neuromaturation occurs and spatial-motor skills become refined. Unfortunately, our "modern" society and sedentary lifestyles have de-

emphasized pure motor skills activities and have tended to replace those activities with adult, thought-oriented activities in their place. This appears to be a totally inadequate preparation for thinking for a significant sector of our school-age population. And so, we have a growing number of children who are taught to think, perhaps also taught to do, but who have had less than adequate opportunities to think and do simultaneously. The performance of any one skill degrades when an additional sensory or motor stimulus is added to input, in a phenomenon known as cognitive loading. (The old story about people so uncoordinated that they can't walk and chew gum at the same time illustrates the folk awareness of this.)