



Executive Functions and Emergent Literacy of Storytelling

Building Brains Together has a passion to expand the neuroscience of building stronger brains through the enhancement of executive functions with an emphasis of addressing early child brain development, teen's brain development and building adult capability. We have previously explored this enhancement through playing more games (see www.buildingbrainstogether.ca). Recently, we have introduced storytelling in our indigenous section which also has many benefits for executive function support for all storytellers and the audience from any culture. The executive function skill definitions that we have brought forward to our community are:

- *Inhibition*: Ability to control impulses (inhibitory control) and to stop engaging in a behavior.
- *Shift*: Ability to move freely from one activity or situation to another; to tolerate change; to switch or alternate attention.
- *Emotional Control*: Ability to regulate emotional responses appropriately.
- *Initiate*: Ability to begin an activity and to independently generate ideas or problemsolving strategies.
- *Working memory*: Ability to hold information when completing a task, when encoding information, or when generating goals/plans in a sequential manner.
- *Plan/organize*: Ability to anticipate future events; to set goals; to develop steps; to grasp main ideas; to organize and understand the main points in written or verbal presentations.
- *Organization of materials*: Ability to put order in work, play, and storage spaces (e.g., desks, lockers, backpacks, and bedrooms).
- *Monitor*: Ability to check work and to assess one's own performance; ability to keep track of the effect of one's own behavior on other people.



Through storytelling and learning about stories through print and pictures will come emergent literacy during brain development in children. Postnatally, the language areas of the brain develop at a similar time with executive functions in addition to other brain areas that can build a strong foundation for learning. The emergent literacy skill



dynamic in the early years and able to develop a good foundation as long as children's environments are rich with resources.

The awareness of print is considered an important factor in developing literacy and reading skills, which has been emphasized if a parent is telling the story to their children, as opposed to others telling the story. These learned skills have been correlated to enhancements in semantic processing [3], cognitive attention, visual attention, and linguistic skills in the brains of preschoolers [4].



An essential tool to capture the young inquiring minds' creative brains are the elements of voice expressions and intonations, verbal imagery and movement of the storyteller's face and body. By using expressions to convey the meaning of the story, children learn to *sustain their attention* longer, and will enhance *working memory skills* around the storyline if it can be told in a *temporal sequence* that

engages children's imaginations. The storyteller will need to develop strong *monitoring* of which events of the story sequence have been told and what is yet to come.

Storytellers also need to *organize* and *plan* their thoughts for an effective way to convey the culture, language, and meaning of the story [1]. All of the events to be told in storytelling are held in *working memory* as the orator can make decisions of how to present the story based on their audience.

Language and *vocabulary* are usually highlighted in storytelling, educating the audience of the words and how they are used. If a story is told in English language, various cultures often insert words of their cultural language for effect and to teach children. For those listening to storytellers, inferences about the story's content must be made and relies upon *implicit memory* of what has already been learned. *Vocabulary* will be recalled and *working memory* are all necessary for the comprehension of the story's message.

Additional skills learned with exposure are an increase in vocabulary depth and comprehension monitoring about various descriptors. *Inhibition* of impulsive assumptions and irrelevant details enhance *attentional control* with a focus on relevant elements and relations that construct a representation of the story. The *shift in attention* through events is necessary to maintain the flow of the story [6].

Good storytellers will also use motor movements to make their stories more exciting and keep their audience attentive. Young children learning the stories through oral traditions will expand their *visual expression* and *creativity* listening to a story that involves language interspersed with active expressions. Children who have exercised storytelling through engagement with play learn many skills of expression and *vocabulary*, while



exercising *working memory* about the story's events. Children as young as five and six years of age can increase their self-expression, self-awareness, and self-esteem through the activity of *narrative* their perspectives through play [5].

Storytelling is considered important for enhancing children's social, emotional, language and identity development. *Inhibitory control*, *attention set shifting*, *communication* and various *social-emotional* skills are considered to develop from the close interactions with others in the role of play and imagination. Creative fluency is also learned in children and adults who use gestures to represent their story's details and meanings and is known to increase the length and complexity of their narrative. These skills require the use of *visuospatial imagery* and *memory* [5].

The *temporal organization* and *sequencing* of events will need to be recalled from memory when re-telling a story in similar fashion, whereas those who use more creative fluency have been found to re-organize or re-define events into a collective story. Learning empathy and theory of mind, or the ability to understand others' mental states, are important for *comprehending* stories. Adults can improve their understanding of *empathy* and others' mental states through learning their stories. These skills are in the developmental stages for learning theory of mind in children [6]. This ability to form an understanding of other people's mental states relies on the life experiences of each individual in addition to *cognitive* capacities. Not everyone will have shared the same experiences and will not envision stories the same way as others; however, everyone can benefit from hearing stories and telling stories to share with others. The indigenous people believe that stories are not written in stone; they are always changing, and it is their responsibility to share them to be passed on to future generations.

References

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