

Background

- Children sometimes suffer from a concussion or Traumatic Brain Injury (TBI) that can affect their performance. They tend to show symptoms such as confusion, disorientation, loss of consciousness, dysfunction of memory (Mendez, Hurley, Lassonde, Zhang, & Taber, 2005).
- These children can present with difficulty on language tasks, such as naming, describing or repeating sentences or stories out loud. Even if they respond correctly to the tasks, they still present a certain delay.
- Currently, there are few assessments that can measure the reaction time on language tasks, presenting a disadvantage in understanding the effects of TBI and concussion in children.
- In a previous pilot study, they examined seven different language tasks that could be possible for our assessment. In order to be useful, the task needed to be one that children without concussion can perform well, but which are not too easy.
- The results showed that two tasks, Rhyming and Story Memory, had problems in their structure. The current pilot study presents improved versions of the two tasks and will examine if they can be suited for our assessment.

Goal:

- 1) For Rhyming Task to increase the performance on the task.
- 2) For the Story Memory to have the same outcome with different stimuli.

Methods

Participants

- Children between the ages of 4 years, 6 months to 10 years.
- They must not have a history or suspicion of concussion or brain injury.
- Must be exposed to 80% of English language.

Procedure

a) Rhyming task

Old version:

The child sits in front of a computer where he/she sees three pictures. Two of the three words rhymes like one another. The participant must press the image that does NOT rhyme like the other two.

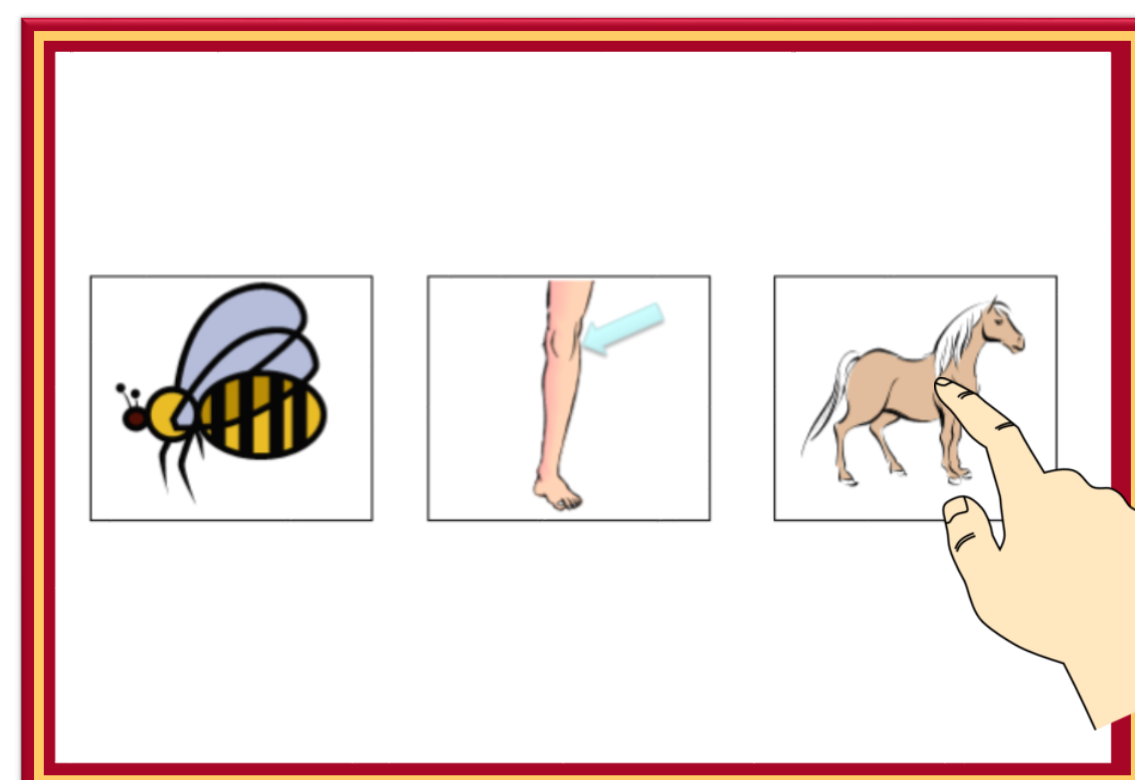


Figure 1: Presents a picture of a bee, knee and horse. The child must choose the word that does not rhyme with the other pictures being the horse.

New version

The child sits in front of the computer where he/she sees four pictures. One of the images is bigger than the others. The participant must point to the picture that rhymes with the big picture.

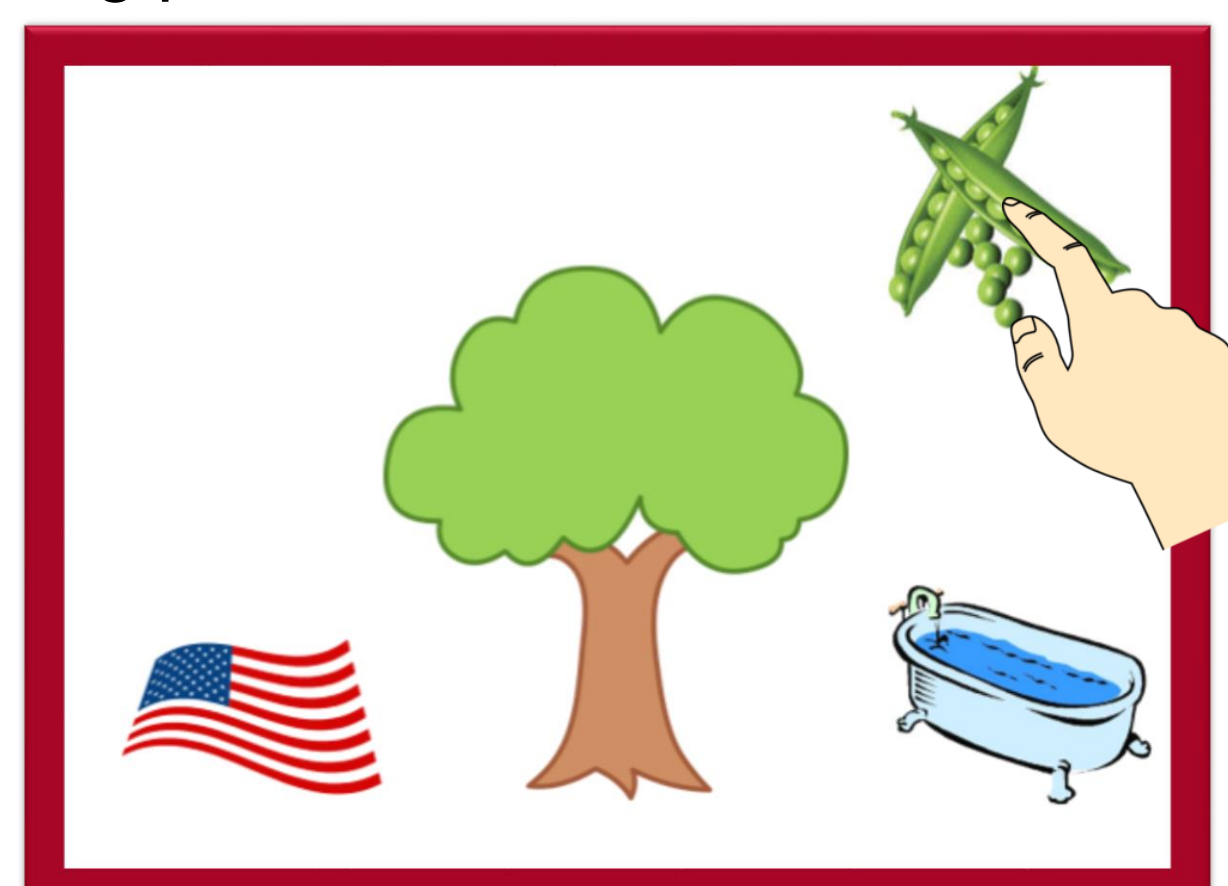


Figure 2: Presents four pictures tree, flag, tub and pea. Tree is bigger than the other pictures. The child must choose the picture that rhymes with tree which is pea.

b) Story Memory

Old version

The child sits in front of the computer; he/she hears a story. After hearing the story will present two pictures, the child must point to the picture that the story mentioned.

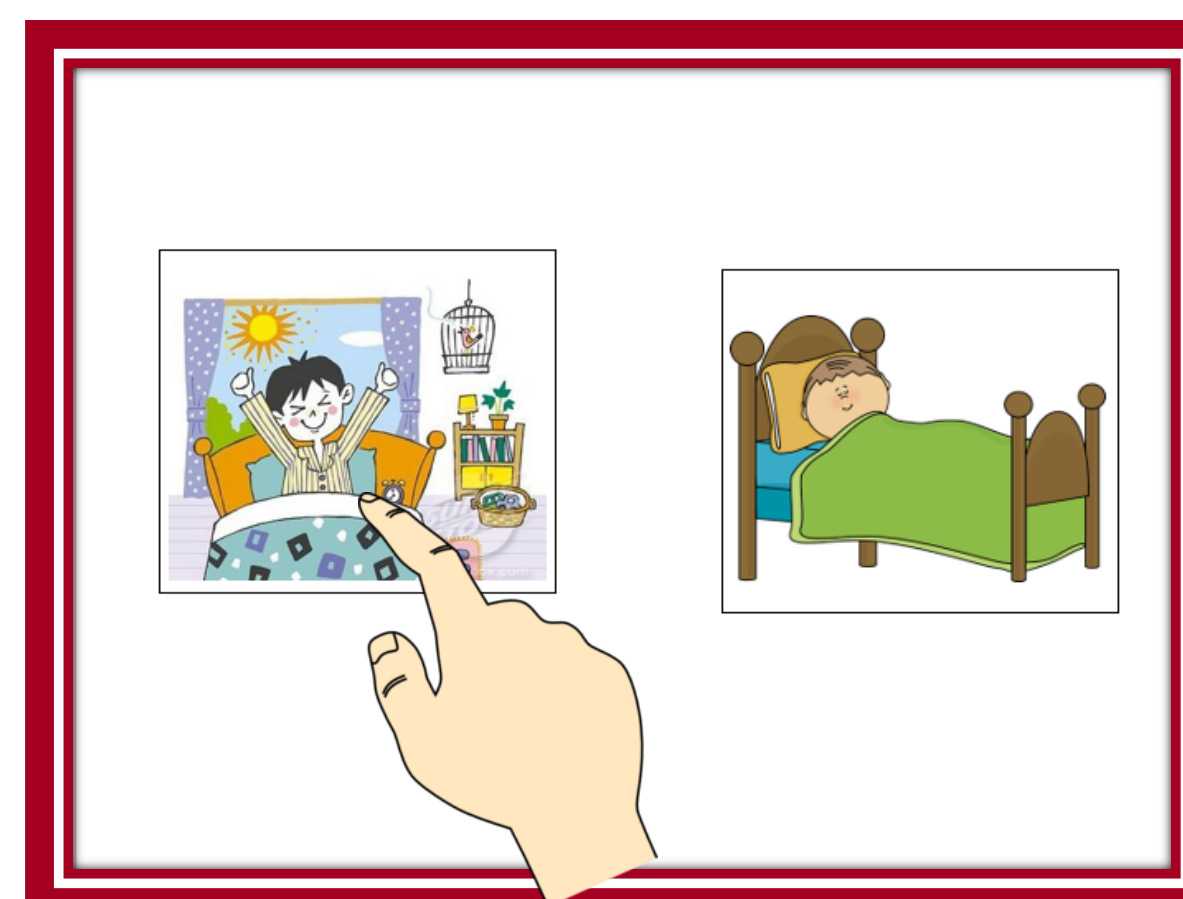


Figure 3: In the story says: "I woke up this morning, remember morning." The child must point at the picture of a kid waking up.

New version

It has the same premise as the old version; only that we change the pictures of the story.

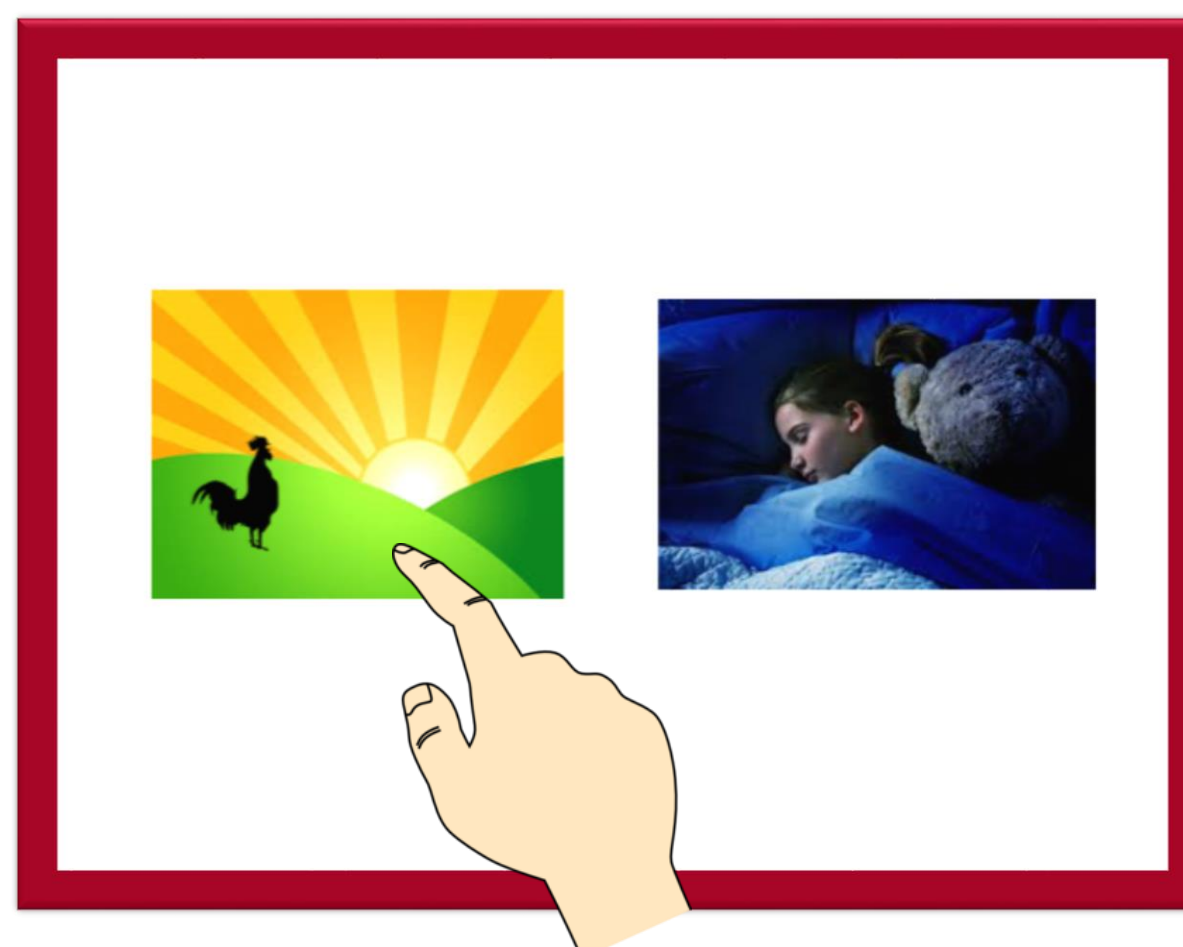


Figure 4: In the story says: "I woke up this morning, remember morning." The child must point of a sunrise.

Results

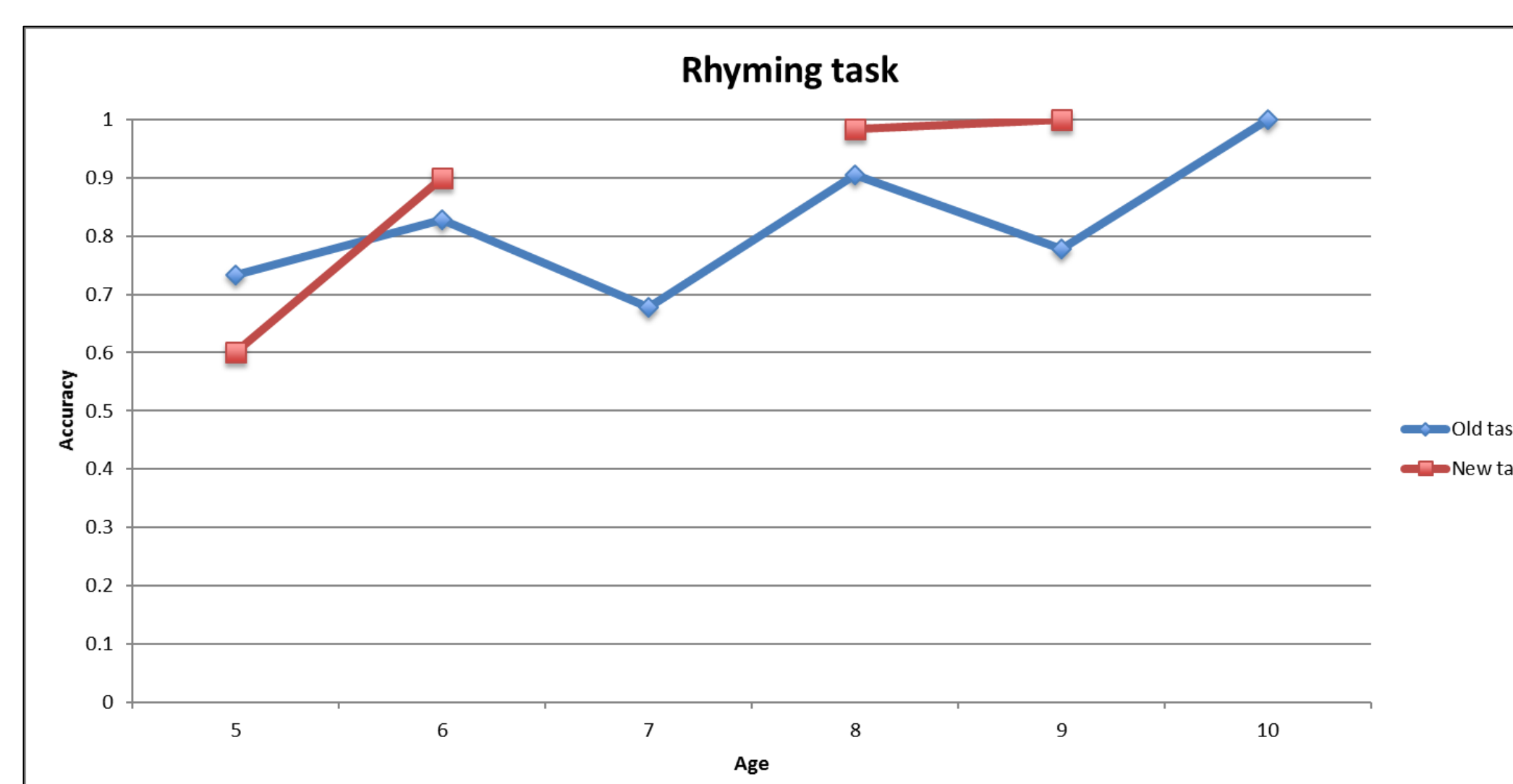


Figure 5: There is a significant difference between performance on the old and new rhyming tasks. This can show that the updates made to the tasks were successful by the corrects items on the task.

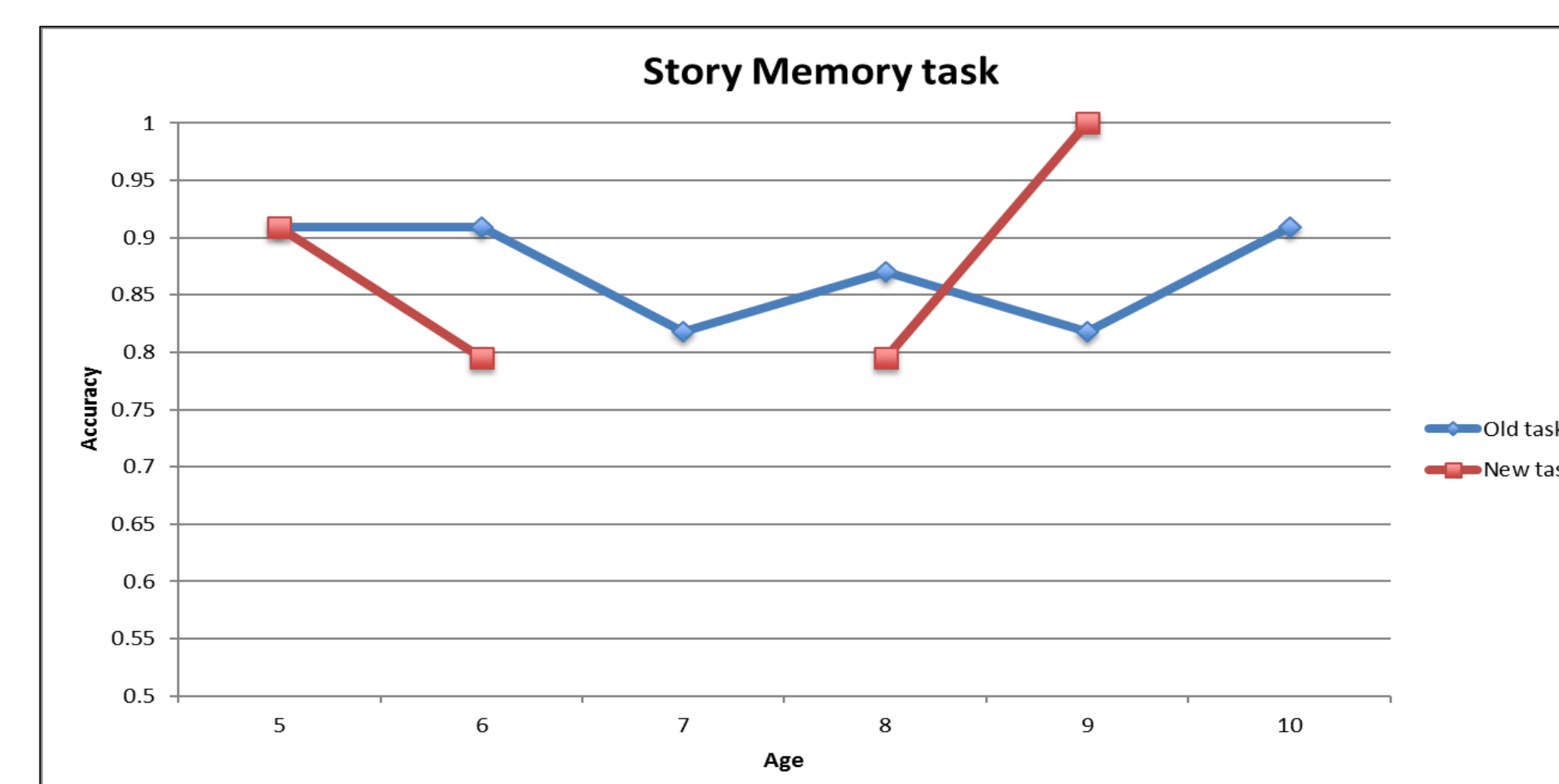


Figure 6: The chart presents an increase in performance on the new task. However, while children performed slightly better on the old task, given the new item images, there was no significant difference in their performance.

Discussion

Rhyming task

- There was a significant difference between the performances.
- This can be shown by an independent-sample t-test that was used to determine if the difference between the two variants of the Rhyming task was significant. We found a significant difference between the two versions (mean accuracy old version: 79%; new version: 92%; $t(20)=2.10$, $p=0.048$).
- Children between the ages of 4;6 to 5 years showed more difficulty rhyming than children between 6 to 9 years. This suggests that children develop their rhyming skills further as they acquire more language and vocabulary.



Story Memory

- While children performed slightly better on the old task, given the new item images, there was no significant statistical difference in the performance.
- An independent-sample t-test was used to determine if the difference between the two variants of the Story Memory task was significant, but no significant difference was found between the old and new versions (average old version: $M=88%$; new version= $84%$; $t(13)=0.82$, $p=0.42$).
- Giving the alterations, children continue to understand the task.

Conclusion

In both versions of the study, the goal was to identify an assessment that determine language difficulties in children with concussions. The results showed that the changes made on the two selected tasks were appropriate for the study. It also gave us information on how children apply and address language. The results have contributed to our understanding on how to best assess language in children with TBI and concussion.

Future studies

This is an ongoing, and we will be collecting more data to determine the effectiveness of the tasks. In the future, we will extend the task to test children with TBI and concussion. However, in the future we will test the task to children with TBI and concussion and find if there is a difference in response time in language.

References

Mendez, C. V, Hurley, R. a, Lassonde, M., Zhang, L., & Taber, K. H. (2005). Mild traumatic brain injury: neuroimaging of sports-related concussion. *The Journal of Neuropsychiatry and Clinical Neurosciences*, 17(3), 297–303. <http://doi.org/10.1176/appi.neuropsych.17.3.297>

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