A case study of evaluation and training of RFS for atypical developing children using PCA Japanese version and MMSTs based on PEAK

Kana Shimoyama, Hiroko Kagawa, Ken Iwamura & Fumiki Haneda
CBS Human support laboratory, Startline CO.,LTD

1 .Background

A relational frame skills (RFSs) training has been shown to improve the human linguistic, cognitive, and intellectual abilities. However, most of the language training conducted in Japan is for aphasia patients or for educational therapy. In addition, intervention program such as PEAK, which focus on training for relational frames to be constructed according to each subject's linguistic ability, are not commonly used.

Purpose

In order to conduct assessment and training of RFSs easier and more common in Japan, we developed a Japanese version of PCA and a PC-based training program based on PEAK, and then we verified its effectiveness on a practical case study.

2.Method-Tool developments

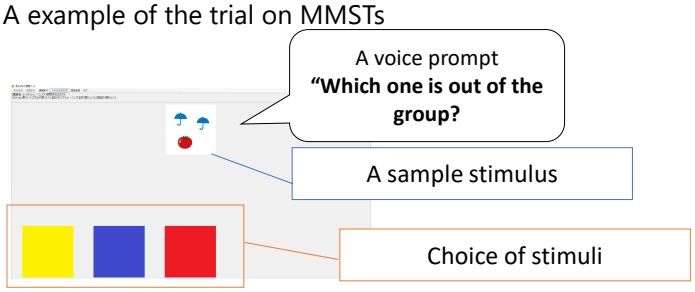
2-1. PCA Japanese Version

We translated the examiner's script into Japanese, changed the illustrations of the foreign coins used in the stimuli to Japanese coins, and changed the alphabetic notation to Japanese. To make it easier to calculate PEAK tasks based on PCA scores, we created a table that automatically calculates the PEAK tasks to be tackled based on PCA scores.

2-2. MMST

To perform 736 training tasks of PEAK manually would require a lot of money, time, and space. To solve this problems, we tried to conduct the tasks using the software, MMST (Multipurpose Matching to Sample) on PC. First, we discussed how many images and audio stimuli we would need to prepare for each of the 736 PEAK tasks, and what kind of stimuli would be required for the MMST. This discussion was conducted by five to six staff members and took about 80 hours in total. As a result of the discussion, tasks that were difficult to implement were not used in the MMST. Similar to the PEAK flip book, the MMST presents a sample stimulus at the top of the screen, and the user selects an answer from a choice of stimuli at the bottom following a voice prompt (as a below example figure). The location of the choice stimuli is randomized, which prevents selection due to positional bias or memory. When the trainee selects a choice, he or she receives appropriate immediate feedback by audio and image stimuli depending on the correct or incorrect answer.

A example of the trial on MMSTs



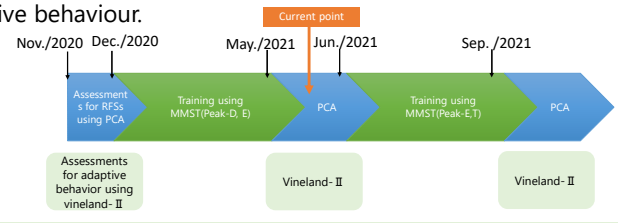
3.Method-A practical case study

Participants: Two children with mild intellectual disability, who go to after-school daycare.

Participants	Age	Sex	FSIQ (WISC)	Characteristics
0003	14	boy	52	Friendly, curious and playful
0005	13	girl	57	Friendly, calm and diligent

Research Schedule

Before training session, the participants were tested their RFSs via PCA. Their caregivers was asked questions of vineland-Ⅱ to assess their adaptive behaviour.

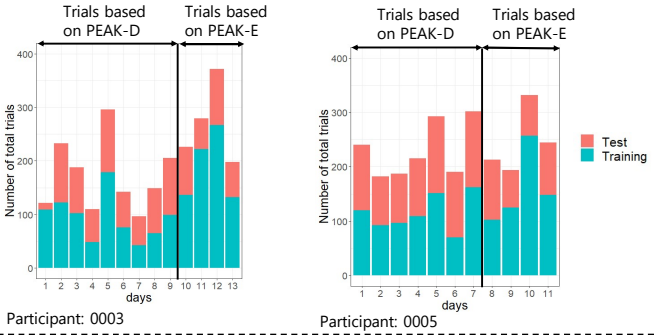


4. Result and Discussion

At this point, the training for MMSTs based on PEAK-D and MMSTs based on transitivity of PEAK-E had been completed. In addition, a second assessment of PCA-E and PCA-T was conducted.

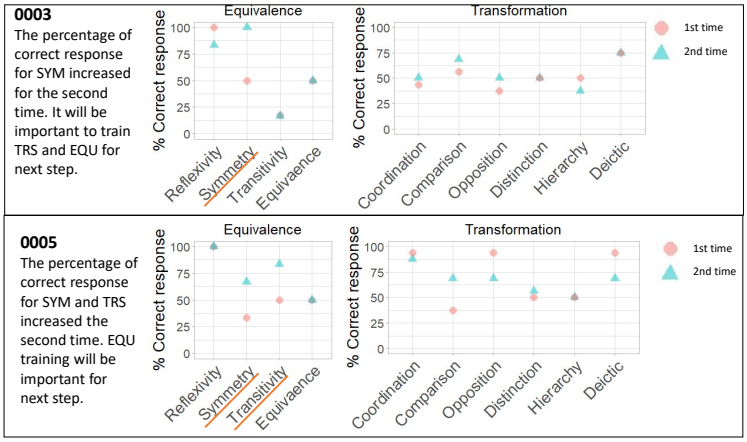
4-1 MMSTs

- Participants engaged in trials from 30 min to 60min a day a week.
- They could respond correctly in most trials, the mean correct response is almost 90 %, and seemed to enjoy and concentrate on the session. Their comments during the session were such as "I want to do more", "It's fun".
- The mean time per trial was 5.5 s and a large number of trials a day, the average is 193 trials , could be performed.
- Participants especially in 0003 engaged in a greater number of trials for trials based on E than for trials based on D.



4-2 PCA

There was a change in the percentage of correct response for PCA between the first and second time. Especially in the subdomain parts in PCA-E, which have been completed the training, the percentage of correct response was higher in the second than in the first.



4-3 Vineland-Ⅱ

The standard score especially in 0003 was changed between the first and second time. The training of RFS might affect their adaptive behaviour in daily life.

Participants	Vineland-Ⅱ Standard scores 0003		0005	
	1st time	2nd time	1st time	2nd time
Communication	26	47	46	46
Daily living skills	51	71	55	60
Socialization	37	35	62	58

5. Conclusion

- The participants were able to engage in a lot of trials a day because time per trial of MMST is very short. Additionally, the children seemed to enjoy performing on the tasks. Training using MMST could help them learn RFS more efficiently.
- The changes in PCA scores suggested that the participants might have improved their RFS. It is necessary to continue to observe how the effects of the RFS training derive their ability in daily life.
- We should provide the more advanced training based on the relational frame theory for the children and examine the changes of scores in PCA and vineland after it. We are planning to increase the number of participants with various characteristics on the future research.