

# Syracuse University

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APEAS II

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VALIDITY & RELIABILITY STUDY



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SYRACUSE UNIVERSITY

## **Introduction/Methods**

The purpose of this investigation was to determine the reliability and validity of the APEAS-II.

A total of 30 children ages 6-12 were asked to perform the tasks included in the APEAS-II twice (2-14 days apart) and the TGMD-2 once (on the same day as the first APEAS-II session). All children were scored by a trained physical education professor (who has performed more than 300 motor assessments). The sessions were recorded for later viewing if the scorer needed clarification for any performed skill. The scorer attempted to do all the scoring live because that is how physical education teachers have to do it. Two participants did not complete the second APEAS-II trial.

To determine reliability, intraclass correlation coefficients (ICC) were computed using a random model and the average of the two scores as criterion. ICCs were computed for the total scores and partial scores. ICC standards suggested by Koo and Li (2016) are: poor ( $< 0.50$ ), moderate ( $0.50-0.75$ ), good ( $0.75$  and  $0.90$ ), and excellent ( $>0.90$ ). In addition, in the fields of exercise science and physical education, an ICC  $> 0.80$  is considered desired.

To determine the validity, Pearson correlation coefficients,  $r$ , were computed between APEAS-II and TGMD-2. Standards for  $r$  are: no relationship ( $0.0-0.19$ ), low ( $0.2-0.39$ ), moderate ( $0.4-0.59$ ), moderately high ( $0.6-0.79$ ), and high ( $0.8-1.0$ ).

## **Results**

### *Reliability*

The reliability of the APEAS-II was computed separately for Ocular Control, Posture Imitation, each Balance measure, Alternate Hopping, the sum of Object Control, the sum of Locomotor Skills, and the sum of both Object Control and Locomotor Skills. The results can be seen in Table 1. A moderate ICC was found for Ocular Control and most of the Balance measures. Imitation of Postures displayed poor reliability. Alternate Hopping, Object Control, Locomotor Skills, and the combined Object Control and Locomotor Skills all displayed good reliability and were above 0.8.

### *Validity*

The correlation between APEAS-II Object Control and TGMD-2 Object Control was high ( $r = .84$ ). The correlation between APEAS-II Locomotor Skills and TGMD-2 Locomotor Subset was moderate ( $r = .55$ ). The combination of the 2 APEAS-II scores with total TGMD-2 was moderately high ( $r = .78$ ).

Table 1. Intraclass Correlation Coefficients for APEAS-II

| Measure           | ICC  | Lower Bound | Upper Bound |
|-------------------|------|-------------|-------------|
| Ocular Control    | 0.63 | 0.2         | 0.83        |
| Postures          | 0.12 | 0           | 0.59        |
| Balance L Open    | 0.6  | 0.08        | 0.83        |
| Balance R Open    | 0.62 | 0.12        | 0.84        |
| Balance L Closed  | 0.41 | 0           | 0.73        |
| Balance R Closed  | 0.55 | 0.03        | 0.8         |
| Alternate Hopping | 0.87 | 0.72        | 0.94        |
| Object Control    | 0.81 | 0.56        | 0.92        |
| Locomotor Skills  | 0.81 | 0.58        | 0.92        |
| Object+Locomotor  | 0.81 | 0.57        | 0.92        |

## Conclusions

It is important to remember that all results are sample dependent. The results here provide support for conclusions, but additional data is desirable to further solidify findings. In the current analysis, Imitation of Postures showed to be not reliable and it is likely that adding repeated measure would not correct the problem. Ocular Control and Balance measures were in the moderate range of reliability. Alternative Hopping was considered reliable. Object Control was shown to be both reliable and valid while Locomotor Skill showed to be reliable but with low validity (although the skills assessed were very similar between the APEAS-II and the TGMD-2). The combined scores were shown to be both reliable and valid.

Overall the APEAS-II is able to reliably measure Object Control and Locomotor Skills. It can also identify high achievers and low achievers in a manner that is fairly comparable to the TGMD-2.

## Suggestions

The use of some of the unique aspects of the APEAS-II are questionable due to the reliability. Due to the low reliability of some of the components we would suggest breaking it down into the Imitation of Postures and Ocular Control score, Balance score, Hopping Score, Ball Skills score, Locomotor score, and a combined Object Control + Locomotor. One simple remedy to this would be to provide multiple attempts for the Balance measures, which should improve reliability