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Exploring the validity and reliability of Active Motor Card: A Comprehensive Assessment of Gross Motor Development and Physical Fitness in Children Aged 6-9 Years

Exploración de la validez y confiabilidad de la tarjeta motora activa: una evaluación integral del desarrollo motor grueso y la aptitud física en niños de 6 a 9 años

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Abstract. This research presents the Active Motor Card, an innovative evaluation instrument meticulously designed to comprehensively assess gross motor skills and physical fitness development in children aged 6-9 years. The study identifies the essential elements of motor development and physical fitness, highlighting the need for tailored assessments within this age group. The research delineates the process of development, encompassing an extensive review of existing literature, formulation of hypothetical tests, evaluation of content validity, empirical validation, and reliability assessment. The resultant Active Motor Card is validated by experts, thereby demonstrating its alignment with the target population's characteristics. Furthermore, the Gregory Analysis corroborates the appropriateness of each test item, indicating their level of difficulty or ease and their conformity with the expected characteristics of children aged 6-9. The reliability test, utilizing the Cronbach's alpha coefficient, affirms the consistency of the assessment. This product, designed for utilization in various settings, holds great potential as an effective instrument for monitoring children's motor skills and physical fitness, thereby making a positive contribution to the domains of physical education and sports. Further research is advisable to explore additional dimensions and enhance the assessment's validity, complexity, and representativeness across diverse populations.
Keywords: Active Motor Card, gross motor development, physical fitness, children aged 6-9 years.

Resumen. Esta investigación presenta la Tarjeta Motora Activa, un instrumento innovador de evaluación meticulosamente diseñado para evaluar de manera integral las habilidades motoras gruesas y el desarrollo de la aptitud física en niños de 6 a 9 años. El estudio identifica los elementos esenciales del desarrollo motor y la aptitud física, resaltando la necesidad de evaluaciones personalizadas dentro de este grupo de edad. La investigación delinea el proceso de desarrollo, que incluye una exhaustiva revisión de la literatura existente, la formulación de pruebas hipotéticas, la evaluación de la validez del contenido, la validación empírica y la evaluación de la fiabilidad. La Tarjeta Motora Activa resultante es validada por expertos, demostrando así su alineación con las características de la población objetivo. Además, el Análisis de Gregory corrobora la idoneidad de cada ítem de la prueba, indicando su nivel de dificultad o facilidad y su conformidad con las características esperadas de niños de 6 a 9 años. La prueba de fiabilidad, que utiliza el coeficiente alfa de Cronbach, confirma la consistencia de la evaluación. Este producto, diseñado para su utilización en diversos contextos, tiene un gran potencial como instrumento eficaz para monitorear las habilidades motoras y la condición física de los niños, contribuyendo de manera positiva a los ámbitos de la educación física y los deportes. Se recomienda realizar más investigaciones para explorar dimensiones adicionales y mejorar la validez, complejidad y representatividad de la evaluación en diversas poblaciones.
Palabras clave: Tarjeta Motora Activa, desarrollo motor grueso, condición física, niños de 6 a 9 años.

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Introduction

The growth and development of children ages 6-12 years is the most crucial time for developing motion motor and some component fitness. Development motor is divided into 3: locomotor, non-locomotor, and movement manipulative. Component physique anthropometry, agility, balance, coordination, and speed become component fitness. The most important physical thing is to be facilitated by the teacher or trainer. Learning outcomes and Training require existing instruments used to measure results. Study movement is a good instrument for developing motion, motor skills, fitness, and physical needs. There is a preparation process appropriate instrument with core competencies and core competencies in curriculum and characteristics growth development child currently. Developed instruments Ministry of Youth and Sports and Ministry of Education and Culture Still Not yet Can measure the development of motor child ages 6-12 years because the test items developed only focus on components of the physique child test items: The physique still needs to be developed. We still need to focus on components important for levels 6-12 years old: growth anthropometry, development of motion motor children, and *motorbike fitness* (*agility, balance, coordination, and speed*).

Test gross motor development (TGMD) developed by (Ulrich, 2012) consists of 12 divided test items into two domains, the ability domain locomotor and control object. This test has also been validated in various countries; Brazil (Lopes et al., 2018) and Indonesia (Apriyani et al., 2018) have been validated in groups of class III schools based in Bandung City. The validity and reliability process still needs to be improved in level, age, and school; some still need to be in clubs or Sports academies. Something else is necessary exists additional test items in TGMD are enter element fitness physical because the TGMD test items are not yet available. There is evict that, so more research should carry on related Suite combining tests of ability motion motor rugged and fitness physical kids practicing at the club or Sports academy. Because athletes aged 6-12 years are very close in developing motor rugged and physical fitness (Bompa & Carrera, 2015), a similar matter is also presented in the LTAD book (Balyi et al., 2013).

Test for the athlete the multilateral phase is closely

related to the development of Skills and motor essential basis in this sport. Research by Johnson et al. (2017) published in the " *Journal of Sports Science and Medicine* " shows that test Skills, like *dribbling, shooting,* and *passing*, can provide an understanding of an athlete's ability. This test makes it possible for the trainer to identify areas for improvement required and design appropriate exercises to improve Skills. Additionally, test conditions, like test speed, power endurance, and strength muscles, can help ensure that the athlete has a solid physique to play mini basketball well.

Using test physique and motor skills also directly impacts an athlete's performance in the match. A study published by (Mayall et al., 2021) in the " *Journal of Sports Performance Analysis* " shows that athletes who get results positive in test Skills motor based on their level with greater accuracy and efficiency in the match. Test physical condition, like Power stands, cardiorespiratory, and strength muscles, to ensure the athlete has enough stamina to survive throughout the match and chase the ball fast. Therefore, tests focus on skills motor basis, and conditions of physique Not only as tools for measuring an athlete's ability but also as an essential foundation to achieve performance in Sports.

Validity and reliability test Skills motion motor skills and conditions physique become This is very important because standardized assessments can be trusted to measure development motion motor rugged and fitness physical child ages 6-12 years, results measurements can be used to control development motor comprehensive child from multiple domains, such as motion locomotor, non-locomotor, and object control. This is important because of ability. Good motor skills are essential for health and well-being - being a kid, okay with daily exercising (French & Thomas, 2016). Additionally, test standards also enable coaches and educators to provide appropriate and effective interventions and monitor a child's progress from time to time. With So, test standards are fundamental to ensure children can grow and develop with Good in aspect motorbike. (Sutini, 2018) . In Indonesia, validation test exercise has been done for some branch sport, like test agility, especially for karate athletes in the Kumite category (Yudhistira & Tomoliyus, 2020), as well as test physique based on Eurofit Fitness (Yudasmara et al., 2020). However, validation test biomotor Still has significant limitations. Although test tests give an outlook valuable in understanding Skills movement and conditions of physique athletes, their use is Still limited to branches of sport and population.

Problems that arise include a lack of tests that can measure Skills, movement, and physique conditions in a way unique in the context of the athlete multilateral phase in Indonesia. Studies previously focused on skills motion Specific in branch sport certain conditions and conditions physique in a way general. Specifically, tests existing biomotors Still category oriented different ages. In other words, there is not yet that test appropriate to measure Skills movement and conditions relevant to physique for athletes multilateral phases in various level ages and levels of expertise. The impact of this situation is that trainers in Indonesia are using appropriate tools and tailored tests to evaluate the results of exercise existing children in the multilateral phase. As I see, there is a need to develop more tests excellent and appropriate to the characteristics of this phase. The test will be developed by a researcher who will combine elements of theory in the development of Skills movement and conditions physique with relevant and specific knowledge for athlete's multilateral phase; the development of these relevant tests is expected to be a significant improvement in understanding and evaluation of ability motion as well as fitness physical athlete. The researcher will do Innovation Suite The test, namely: (1) Preparation of test items, carrying out study characteristics of children aged 6-9 years. This process is what happens: base development instrument development motor and test fitness child. Instruments developed will be through stage validation filled in by experts. Sports evaluation, validity, and reliability tests were conducted in the field. So that the Suite the test developed can meet the criteria of a good instrument.

Materials and methods

Study development Suite test Skills motion motor rugged and fitness physical child aged 6-9 years using a research and development model. This model is used to make it easier to understand the characteristics, validity, reliability, and norms the test will be developed. Stages study adoption from (James R. Morrow, Jr., Dale P. Mood, 2011) Developing Psychomotor Test which has 11 stages, researcher adjusted with a Suite test into five stages:

Stage 1: Literature Review and Analysis Need

Analysis Techniques: Analysis literature involves identifying trends, primary findings, and gaps in relevant knowledge with the development of motor and fitness physical children aged 6-9 years. Analysis Method: A systematic review of articles, analysis of thematic, and mapping literature can be used to identify relevant literature and analyze needed research.

Stage 2: Development Test Hypothetical

Analysis Techniques: Focus on formulation draft tests, structure tests, and suitability with objective research. Analysis Method: Analysis of conceptual and understanding theoretically, including consultation with experts to be sure of the validity of conceptual and interconnectedness tests with objective research.

Stage 3: Content Validity

Analysis Technique: Evaluate the extent of the test covers with good aspects experts desire. Analysis Method: Use the Likert scale on the questionnaire validity content, followed by the Aiken V Index, to measure the level of consensus among a panel of experts.

Stage 4: Validity Empirical and Reliability Test

Analysis Techniques for Validity Empirical: Comparing

results test with observation field or test reference for measuring validity construct. Analysis Methods for Validity Empirical: Analysis statistics, like Gregory's analysis, to measure the extent of the test reflect criteria observation field or test reference. Analysis Techniques for Reliability Testing: Measuring consistency between results test on two tests using coefficient correlation or test-retest method. Analysis Method for Reliability Test: Analysis Reliability test statistics use Cronbach's alpha coefficient

Results

Study construction tests developed by team researcher produce product test Skills motor skills and fitness physical child aged 6-9 years have been carried out validation content, empirical validation, and reliability testing. Research results will explain as follows:

Product study

Test Name

Active Motor Card: Test for gross motor development and physical fitness of children aged 6-9 years.

General Description

This test is designed to measure the gross motor skills of children aged 6-9 years in various aspects of gross motor skills, such as running, jumping, throwing, catching, and fitness. physical

Instructions for use:

- This test can be carried out on a sports field or an area suitable for gross motor movements.
- The supervisory committee or competent teacher needs to understand the instructions for use and test items.
- The test is carried out individually or in small groups.
- Participants will be allowed to undergo each test item in a predetermined order.
- Scores are calculated based on the participant's achievement in each test item. The instruction manual will provide the scoring scale and grading for each test item.

Test Items: This test includes various test items, such as running, hooping, side galloping, jumping, rolling, bouncing, catching, throwing, kicking, agility, balance, and speed.

Duration: The total duration of the test will depend on the number of participants and the number of test items tested. In general, this test can be completed in one or two sessions.

Analysis Results Content validation

Validation is filled using seven experts, three expert academics, and four experts professionals. The expert gives evaluation to products that the team researcher has developed, and the results assessment expert as follows:

Table 1.
Aiken V Analysis Results Expert Test Results

No	Test items	Expert							S1	S2	S3	S4	S5	S6	S7	∑S	n(c-1)	V	Note
		1	2	3	4	5	6	7											
1	Running	4	3	4	4	4	3	2	3	2	3	3	3	2	18	21	0.857	4	Valid
2	Hooping	3	4	3	4	4	4	3	2	3	2	3	3	3	19	21	0.904	3	Valid
3	Side gallop	4	3	3	4	3	4	2	3	2	2	3	2	3	17	21	0.809	4	Valid
4	Jumping	3	4	4	3	4	3	3	2	3	3	2	3	2	18	21	0.857	3	Valid
5	Rolling	3	4	4	3	4	3	3	2	3	3	2	3	2	18	21	0.857	3	Valid
6	Bounce	4	3	3	4	3	4	2	3	2	2	3	2	3	17	21	0.809	4	Valid
7	Catching	3	4	4	3	4	3	3	2	3	3	2	3	2	18	21	0.857	3	Valid
8	Throwing	4	4	3	4	3	4	2	3	3	2	3	2	3	18	21	0.857	4	Valid
9	Kicking	3	3	4	3	4	3	3	2	2	3	2	3	2	17	21	0.809	3	Valid
10	Agility	4	3	4	4	3	4	3	3	2	3	3	2	3	19	21	0.904	4	Valid
11	Balance	3	4	3	3	3	3	2	2	3	2	2	2	2	15	21	0.714	3	Valid
12	Speed	4	3	4	4	4	4	3	3	2	3	3	3	3	20	21	0.952	4	Valid

Aiken's V analysis obtained a high average score for each test item, showing good agreement. It can be concluded that Active Motor Card is valid from facet fill.

Result analysis validation empirical and reliability testing

Analysis validation empirical use Gregory Analysis This analysis is one of the methods used to analyze test items, especially to identify the difficulty and characteristics of test items. In Gregory's analysis, based on the level of difficulty and characteristics. For this analysis, the results are as follows:

Table 2.
Analysis of 12 test items for gross motor skills and physical fitness in children aged 6-9 years using *Gregory Analysis*

No	Test items	Degree of difficulty	Characteristics of test items	Conclusion
1	Running	Easy	Run forward and backward	Valid
2	Hooping	Currently	Jump forward	Valid
3	Side gallop	Easy	Side gallop	Valid
4	Jumping	Currently	Jump forward	Valid
5	Rolling	Difficult	Front roll	Valid
6	Bounce	Difficult	Bouncing the ball forward	Valid
7	Catching	Currently	Catch the ball	Valid
8	Throwing	Currently	Throwing a tennis ball at the target	Valid
9	Kicking	Currently	Kick the ball into the goal	Valid
10	Agility	Easy	Run back and forth	Valid
11	Balance	Currently	Climbing the beam	Valid
12	Speed	Easy	Run 20 meters	Valid

In this analysis, all test items were declared "Valid," indicating that they correspond to the characteristics of the child population aged 6-9 years. Gregory's Analysis helps identify each test item's difficulty level and characteristics, which is vital to ensure that the test is appropriate for the target population.

The reliability Test uses Cronbach's alpha coefficient and the results obtained. The reliability test technique produces a Cronbach's alpha coefficient of 0.88, which shows that this test has good reliability.

Discussion

The term validity refers to how accurately a measurement tool measures what it is intended to measure. The importance of content validity in evaluating measurement tools is discussed in the provided paper. Content validity refers to how well the measurement tool fulfils its intended testing purpose by effectively measuring all relevant aspects of the evaluated construction. The authors highlight the need for empirical content and validity in measurement tools. Measurement tools with high content validity accurately fulfil their measurement function, whereas measurement tools with low validity produce data that do not align well with the purpose of the test. (Alim et al., 2023; Benito-Colio & Solanellas, 2022; Serbetar et al., 2019)

Validation results fill, validate empirically, and reliability testing show that this test is valid and reliable for measuring ability motion, motor skills, and abilities physique children aged 6-9 years. This shows suitability with results validation empirical support study earlier that showed a positive connection between physical activity and developmental motor child (Wang et al., 2023). Existing articles give proof of validity and reliability evaluation of competent motor skills for children disabled with intellectual and autism (Batez et al., 2021). This article also highlights the importance of Motor skills development in children and their impact on daily life and participation in activity physique (Derikx et al., 2021). Studies show that evaluations like Test Proficiency Bruininks-Oseretsky-2 Motor and Test Coarse-2 Motor Development psychometrics are suitable for assessing competence motor skills in children with ID and autism in the arrangement-based field (Robinson et al., 2015).

The research results also provide a description related to the crucial validity reliability test, such as the test The development of Gross Motor-3 (TGMD-3) has been proven own validity and reliability robust construction _ in measure Skills motor rude to children cross-type gender and group age (Mayall et al., 2021). Using evaluation development motors such as TGMD-3 can inform development programs motoric and supportive decision curricula at school. Function motor harsh and judgmental fitness health has obtained adequate and capable reliability parameters _ to determine differences in children ages 9 to 12. Test Gross Motor Development 3rd edition (TGMD-3) has discovered its internal structure that is valid and constitutes the valid size of Skills fundamental motor skills in children age school essential. These findings support the use of evaluation motor rude to children on a school basis to evaluate their ability to physique

The researcher's validation process describes the study development test required systematic stages to obtain a valid and reliable test, so the developed test can measure the ability of motor kids and physical fitness. The result of a valid and reliable test can provide information to teachers and schools to design device-appropriate teaching _ with participant education.

The results of this research also have implications for tests and measurements in the field of physical education and Sports; this test can be used in a way that is effective in monitoring the development of children and identifying the need for intervention If required. This research contributes positively to the field measurement of ability motion, motor skills, and abilities physique of children aged 6-9 years. This is appropriate with the results of research battery test for assessment movement for children Edition The second (MABC-2) is an established tool for monitoring and assessing _ the development of motor skills in children. This includes three range age and content eight motorbike items in each range. MABC-2 has been discovered to have good reliability and validity (Robinson & Palmer, 2021). However, there are also questionnaires and tools. Other screens are available to identify complex motor skills in children. A systematic literature review found 11 questionnaires for parents, teachers, and children, but none were found to be valid for the screening-based population as the only tool measurement (Serbetar et al., 2019). One of the tools screening that meets the characteristics necessary for psychometrics for children school base is Mobile Screen 6-8, which can be recommended for steps First in diagnostic strategies sequentially (Agarwal et al., 2020). Overall, these tools and assessments can effectively monitor the child's development and identify the need for intervention If necessary.

Conclusion

This research successfully produced a guided test of Skills, rugged motor, and fitness corporeal, named "active motor card." The tests prepared have gone through validity and reliability tests, which show the reliability and validity of this measurement. However, this research will continue to mature necessary additional dimensions studies, primarily involving variable predictors. Thus, research can detail influencing factors results test and provide more understanding of deep related Skills motor rugged and fitness physical being measured.

Besides that, it is recommended to do tests on more samples to get norm more tests representative. With more group breadth, results can be generalized with more reasonable results, and the norm-resulting test will follow a diverse population. With so, though this research contributes significantly to the development of motor skills and

physical fitness, there is potential for research to carry on to increase the validity, complexity, and representativeness of developed tests.

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