

Validity and Reliability Evidence of the SportRec Track and Field Talent Test Battery for Individuals with Intellectual Disabilities

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Abstract. The present study evaluated the construct validity and reliability of the Track and Field SportRec Talent Test Battery (SRTTB) designed for individuals with intellectual disabilities. Talent identification plays an important role in optimizing athletic potential and supporting inclusive sports development. A total of 74 male students with intellectual disabilities aged 14–20 years from a special school in Klang participated in the study. Participants completed several physical performance tests, including the standing long jump, 30 m sprint, push-up, seated medicine ball throw, standing overhead medicine ball throw, standing backward overhead medicine ball throw, and 20 m intermittent fitness test. Data analysis was conducted using IBM SPSS version 30 to examine construct validity and test–retest reliability. Construct validity was assessed through convergent and discriminant validity analyses, while reliability was evaluated using the Intraclass Correlation Coefficient (ICC). The findings demonstrated excellent reliability for the standing long jump (ICC = 0.94), 30 m sprint (ICC = 0.89), push-up (ICC = 0.97), standing overhead medicine ball throw (ICC = 0.84), standing backward overhead medicine ball throw (ICC = 0.91), and VO₂max test (ICC = 0.99). The seated medicine ball throw showed moderate reliability (ICC = 0.70). Convergent validity analysis revealed strong correlations across all performance measures, ranging from 0.885 to 0.996. Discriminant validity analysis indicated low correlations between unrelated constructs, confirming that each test measured distinct physical performance components. The results support the SRTTB as a valid and reliable instrument for identifying athletic talent among individuals with intellectual disabilities. The findings provide practical implications for coaches, educators, and researchers in developing evidence-based training and talent identification programs.

Key words: talent identification, intellectual disabilities, reliability, construct validity, track and field

Abstract in Indonesia. Penelitian bertujuan untuk mengevaluasi validitas konstruk dan reliabilitas Track and Field SportRec Talent Test Battery (SRTTB) yang dirancang bagi individu dengan disabilitas intelektual. Identifikasi bakat olahraga memiliki peran penting dalam mengoptimalkan potensi atlet serta mendukung pengembangan olahraga yang inklusif. Sebanyak 74 siswa laki-laki dengan disabilitas intelektual berusia 14–20 tahun dari sebuah sekolah di Klang berpartisipasi dalam penelitian. Partisipan mengikuti serangkaian tes performa fisik yang meliputi standing long jump, lari sprint 30 m, push-up, seated medicine ball throw, standing overhead medicine ball throw, standing backward overhead medicine ball throw, dan tes kebugaran intermiten 20 m. Analisis data dilakukan menggunakan IBM SPSS versi 30 untuk menguji validitas konstruk dan reliabilitas tes–ulang. Validitas konstruk dianalisis melalui validitas konvergen dan diskriminan, sedangkan reliabilitas dievaluasi menggunakan Intraclass Correlation Coefficient (ICC). Hasil penelitian menunjukkan reliabilitas sangat baik pada tes standing long jump (ICC = 0,94), sprint 30 m (ICC = 0,89), push-up (ICC = 0,97), standing overhead medicine ball throw (ICC = 0,84), standing backward overhead medicine ball throw (ICC = 0,91), dan tes VO₂max (ICC = 0,99). Tes seated medicine ball throw menunjukkan reliabilitas sedang (ICC = 0,70). Analisis validitas konvergen menunjukkan korelasi yang kuat pada seluruh ukuran performa fisik dengan rentang nilai 0,885–0,996. Analisis validitas diskriminan menunjukkan korelasi rendah pada konstruk yang tidak berkaitan sehingga setiap tes terbukti mengukur komponen performa fisik yang berbeda. Hasil penelitian mendukung SRTTB sebagai instrumen yang valid dan reliabel untuk identifikasi bakat atletik pada individu dengan disabilitas intelektual. Temuan penelitian memberikan implikasi praktis bagi pelatih, pendidik, dan peneliti dalam mengembangkan program pelatihan dan identifikasi bakat berbasis bukti.

Kata Kunci: identifikasi bakat, disabilitas intelektual, reliabilitas, validitas konstruk, atletik

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INTRODUCTION

Talent Identification (TI) is the process of identifying participants who have the potential to excel in a sport, providing a training environment that is very suitable for realizing potential in pursuit of excellence (Vaeyens et al., 2008). In recent years, TI programs have developed in popularity and are seen as a very difficult way to maximize the potential of athletes to achieve success (Vaeyens et al., 2009). Identifying and selecting talents involves predicting which athletes have the best potential (Ahmadi et al., 2019). The problem that arises in talent search is that those involved in the selection of athletes are faced with a difficult job when identifying potential, without an objective or valid measure. As a result, coaches are asked to assess athletes based on the potential resulting from current performance levels (Moher et al., 2010). This creates problems and creates the risk of incorrect predictive judgments. The process requires the prediction of participant performance over time by measuring physical, physiological, psychological, and sociological attributes as well as technical abilities, either in isolation or in combination (Kusdinar et al., 2021). Therefore, early identification of gifted athletes is an increasingly important consideration for researchers and practitioners (Lidor et al., 2009). Once a gifted individual has been detected, essential but limited support resources can be used optimally to further refine and develop this talent. Without such support, the needs of gifted children may not be met, and their gifts remain undeveloped (Kusdinar et al., 2021).

TI and physical fitness testing have been an important source of information for various purposes (athletic performance, comparison of different populations, development over the lifespan), but one of the main reasons to measure talent and physical fitness is its well-documented relationship with health and functioning (DHHS, 2008). Within this context, physical fitness has been an increasingly important topic for individuals with intellectual disabilities (ID) (Heller et al., 2011). Studies have shown that individuals with ID demonstrate earlier and unhealthier aging than the general population (de Winter et al., 2016; Hermans & Evenhuis, 2011; Schoufour et al., 2013). People with intellectual disability may exhibit limited adaptive capacity in not only their mental development but also their physiological, social, and emotional development (Hsu et al., 2021). This is a strong reason to evaluate talent in relationship to future negative health outcomes in this specific population, and to understand any age-related decline in physical functioning (Blair, 2003; Lee et al., 2011; Schoufour et al., 2014).

Although the importance of physical fitness as a concept has been established, measuring talent in individuals with ID in daily practice comes with specific challenges (Lahtinen et al., 2007). Talent tests are designed to uncover innate abilities and potential in individuals, including those with intellectual disabilities. However, the validity and reliability of these tests when applied to this population are often questioned. This study aims to critically evaluate the SportRec talent tests in assessing individuals with intellectual disabilities, focusing on their validity and reliability. The difficulty of instructions or execution of a test is not always aligned with the physical or cognitive abilities of the individual with ID, resulting in drop-out or invalid test results (Hilgenkamp et al., 2013). Additionally, having the motivation to perform maximally, and maintaining attention to the task at hand are not always self-evident. These aspects have led to a wide variety of adaptations to existing physical field talent and fitness tests and the development of ID-specific talent tests, as described in recent reviews (Hilgenkamp et al., 2011; Oppewal et al., 2015; Wouters et al., 2017). Although these new (versions of) tests often solve the above-mentioned feasibility issues, other psychometric properties like reliability and validity are not always evaluated sufficiently (Wouters et al., 2017). Fortunately, recent years have shown a strong awareness amongst researchers about the importance of evaluating psychometric properties in individuals with ID, resulting in a growing body of evidence (Cuesta-Vargas & Gine-Garriga, 2014; Guerra-Balic et al., 2015; Nasuti et al., 2013).

Where psychometric properties are increasingly receiving attention, interpretability has not been granted the same focus in research just yet (Terwee et al., 2012), which is another important methodological issue with this wide range of talent tests available (Hilgenkamp et al., 2010; Wouters et al., 2017). Interpretability can be supported in three different ways: (1) comparing individual or group results to a value or range of values that correlates with a (future) health outcome, for example cardiovascular disease, being able to walk safely, or the ability to perform daily living skills (criterion-referenced value), (2) comparing individual or group results to values based on the distribution of test results in a large group, often stratified for sex and age-categories (norm-referenced values), (Ahmadi et al., 2019) defining clinically relevant differences based on participant experiences or reductions in

health risks. The availability of these sources for the interpretability of test results will increase the meaningfulness of talent tests for both research and clinical practice and will enable the development of detailed knowledge regarding the physical fitness of this population.

To assist researchers and guide future research, this study, as proposed in this paper, is to propose a selection of talent tests that have demonstrated sufficient feasibility, reliability, and validity, and to collect and present existing reference data to interpret results that will add meaning to the test results. The specific target population for this study is young adults with mild to moderate ID who can walk (without or with support). The focus is on young adults (age 13-19 years old) with ID since there is usually a lack of fitness, which influences fitness levels compared to their able-bodied peers in schools. Due to the heterogeneity of the population of individuals with ID and the influence of cognitive and physical capabilities on the ability to perform talent tests, this study focuses on individuals with mild to moderate ID who can walk (without or with support).

As mentioned, a good talent test must demonstrate sufficient feasibility, reliability, validity, and possibilities for interpretation (Robertson et al., 2017). The psychometric concepts are defined as a) Feasibility was defined as the ability to perform a test according to the test instructions. This includes understanding the purpose of the test and being able to execute the test (Mokkink et al., 2006). Feasibility was expressed as the completion rate of a test in a specific target population. b) Reliability was defined as the degree to which a test gives consistent results each time it is employed. Test-retest reliability (intra-rater reliability) refers to the consistency of results across different time points within the same test administrator. Inter-rater reliability refers to the consistency of results when different test administrators perform the same test on the same participant (Robertson et al., 2017). The intraclass correlation coefficient (ICC) is a measure of reliability, and we considered an ICC of 0.6 acceptable and an ICC of 0.8 good (Hilgenkamp et al., 2012) c) Validity is the extent to which a test accurately measures what it is supposed to measure (Berg & Latin, 2004). Validity can be determined through comparison with other tests that are supposed to measure the same or a completely different construct (construct validity; convergent or divergent), by measuring the degree to which the content of a test is an adequate reflection of the construct to be measured (content validity), or through comparing the test with a gold standard (criterion validity) (Mokkink et al., 2006; Terwee et al., 2012). Predictive validity is a useful subtype of criterion validity in this context since it describes how well a physical fitness test would be able to predict future health outcomes. We considered a talent test valid if validity has been demonstrated in any of these three different ways, in at least the general population and preferably the population with ID, and d) a test must have reference data available to allow for interpretation of test results. As mentioned before, interpretation of test results can be supported by criterion-referenced values, norm-referenced values, and clinically relevant differences (Aaronson et al., 2002) Since reference values can vary across populations, it is important to take the population that was used to determine these values into account. In this paper, we considered a talent test to have sufficient possibilities for interpretation of results if any of the above-mentioned options were available (Oppewal & Hilgenkamp, 2020).

LITERATURE REVIEWS

Research on talent tests and intellectual disabilities is limited. However, some studies have explored the relationship between intelligence and talent in individuals with intellectual disabilities. Studies have shown that individuals with intellectual disabilities can exhibit exceptional talents in various domains, challenging traditional views of intelligence and talent (Glover, 2020). Talent tests for individuals with intellectual disabilities often rely on adaptive measures that account for cognitive and motor limitations (Flanagan, 2018). The validity of talent tests for individuals with intellectual disabilities is contingent upon the instrument's ability to capture the nuances of cognitive skills in this population (Wechsler, 2017).

Track and Field SportRec Talent Test Battery (STTB): Selection of a basic set of talent tests with adequate psychometric properties

To arrive at the selection of recommended tests, we started by using the guidelines and framework set for operationalizing the talent test related to the components of health-related and skill-related fitness. We focused on the components that are important in determining talent in sports of adults with intellectual disabilities (power, speed, muscular endurance, upper body power tests, and cardiovascular

endurance).

In this study, a test was selected for each of the above-mentioned components based on (1) an extensive literature review of previous literature and (2) expert meetings with experts in measurement and evaluation in Physical Education and movement experts with experience in working with individuals with ID (Hilgenkamp et al., 2012). To be selected in the literature review, a test has to meet the following criteria: (1) use a functional task to measure the specific component, (2) have at least one reference to a reliability or validity study, and (3) expected to be feasible for adults with ID, and make use of objective criteria. If more than one test for a specific component met all three criteria, further selection was done within the expert meetings to come to a selection of tests that would be most suitable in practice. These criteria and the process of the literature review and the expert meeting are described in more detail elsewhere (Hilgenkamp et al., 2010). Next, the psychometric properties of these tests were studied (de Winter et al., 2016; Hilgenkamp et al., 2010, 2011, 2012; Oppewal & Hilgenkamp, 2020). Based on this information, a recommendation has been organized for a selection of talent tests that is STTB. Tests were included in the STTB if they had demonstrated sufficient feasibility, reliability, validity, and possibilities for interpretation of results as defined in the previous section. Suitable tests were found for lower body power, speed, muscular endurance, upper body power, and cardiovascular endurance.

Body composition: Body Mass Index and Arm Span

For body composition, the body mass index (BMI) was selected, which is feasible to use in older adults with intellectual disabilities (Casey, 2013). BMI is calculated by dividing weight in kilograms by height in meters. Height is measured with the participant wearing no shoes preferably with a stadiometer, accurate to the nearest centimeter. Weight is measured with the participants wearing light clothes and no shoes with a digital floor scale, accurate to the nearest 0.1kg (ACSM, 2018). BMI is divided into underweight ($<18.5\text{kg/m}^2$), normal ($<25\text{kg/m}^2$), overweight ($25\text{--}30\text{kg/m}^2$) and obese ($>30\text{kg/m}^2$) (ACSM, 2018; WHO, 1995). Validity and reliability were good in the general population (ACSM, 2018; WHO, 1995). Feasibility and test-retest reliability of these measurements were also good in adults with ID, with an ICC of 0.98 (95% confidence interval (CI) 0.98–0.99, standard error of measurement (SEM) 40.34) for BMI. However, only a few studies have been conducted regarding the reliability and validity of these body composition measurements in this population (Oppewal & Hilgenkamp, 2020).

Lower body power: Standing Long Jump Test

As a measure of lower body power, the standing long jump test was selected. Standing Broad Jump (SBJ) or Standing Long Jump (SLJ) is a field test used to assess explosive leg power or the ability to apply force in a horizontal direction (36) According to the researchers, it was found that SBJ is a highly reliable (interclass $r = .99$, intraclass $r = 0.99$) field test to assess leg power for collegiate track and field athletes. Almuzaini & Fleck (2008) also used the intra-class correlation coefficient (ICC) to determine the reliability of the SBJ test and found high reliability for SBJ (ICC $r = .97$). The test was performed on a hard surface, and participants were required to jump as far as possible (horizontal direction) following standardized procedures. Participants started from a standing position, with both feet touching a starting line, and were allowed to swing their arms before the jump. Both the take-off and landing phases of the jump had to be done with both feet. The distance between take-off and the heel of the closest foot at landing was recorded in centimeters (Rahman et al., 2021).

Speed: 30-meter Sprint Test

For speed, the 30-m sprint test was selected, which is feasible to use in older adults with ID. One simple way of evaluating a sprint is to measure the time taken to run in a straight line, at the maximum speed that the players can reach (Santander et al., 2022). The subjects lined up behind the start line and the initial light beam to avoid any odd premature movement breaking the beam at 50 cm. The position was held with one foot forward and the other behind (Split start) as recommended in the bibliography.10 On the command of “go”, the subjects began to run. They were instructed to run as fast as possible over a distance of 30 meters. The speed was measured with an accuracy of 0.01 seconds, taking the fastest speed of the two attempts. Between attempts, the subjects rested for between 5 and 7 minutes. The distances of 10 m and 30 m were shown to be valid (Altmann et al., 2019) and reliable (Darren & Nassiss, 2015) ($r = 0.90$ and 0.95), as was the technical measuring error (1.3% and 0.5%), respectively.

Upper body Muscular Endurance: Push-up Test

For muscular endurance, the push-up test was selected for this population. There have been several studies on push-up test objectivity and reliability conducted in recent years, and although the particular methodology of each study differed to some extent, the overall findings and conclusions have often been contradictory (Kellner et al., 2021). Most studies used a 90° push-up test variant, and some examined a bent-knee push-up test. For intra-rater reliability, the documented correlations range from $r = 0.22$ to $r = 0.99$ (Fielitz et al., 2016; Hashim, 2013; Plowman & Meredith, 2013). For inter-rater reliability, the documented correlations range from $r = 0.10$ to $r = 0.99$ (Fielitz et al., 2016; Hashim, 2013).

The participants assume the front-leaning rest position with the hands fully extended and shoulder-width apart with feet together, and the body should form a generally straight line from shoulders to ankles; it is required to maintain the “rigid” straight body shape without any sway for the entire test. By flexing the arms, the examinee lowers the body to the down position where the chest must touch the ground. Failure to keep the body rigid or not to reach either the up or down position leads to an uncountable repetition. The number of correct repetitions performed during a 1-minute interval is counted (Ministry of Defence, 2011). The scorer usually takes a position 45° angle forward from the examinee’s shoulder, which is close enough to be able to put a hand on the ground below the examinee’s chest to check if the down position is reached.

Upper Body Strength and Power: Seated Medicine Ball Throw Test, Overhead Medicine Ball Throw Test, and the Standing Backward Overhead Medicine Ball Throw Test

For upper body strength and power, three tests were selected for this population. First, the seated medicine ball throw test. The participant sits on a bench with a straight back. The participant holds the medicine ball (2 kg) with both hands in front of their chest, under their chin. The participant pushes the ball as far as possible, keeping their back against the bench’s backrest. A rope is used to restrain the participant’s body while pushing the ball. The participant performs this three times. Before the test, the participant may perform one trial attempt. The distance is measured from the point where the ball lands to the edge of the bench. The score is the longest distance achieved out of the three attempts (Juanda et al., 2024).

For the overhead medicine ball throw test, the participant’s face is facing forward with the dominant leg slightly forward and another foot slightly at the back with heels on the ground. The spine was in neutral position (stand erect) with the medicine ball (2kg) held slightly above the hip with both hands (elbow flex at about 90 degrees joint angle), eyes looking directly to the targeted area of the throw. b) Movement action: Both arm swung upwards till the medicine ball went up and pass over the head towards the back till the elbow flex beyond 90 degrees at the back of the head (ball might touch the neck area), feet pressing the ground firmly while the abdominal muscles braced (isometric tension), the body weight shifted backwards with leg apart forming a small lunge position ready to throw, once into the movement of throwing out the ball, , and the core muscles (rectus abdominis, erector spinae) gave the power to throw out the ball as further as possible. c) Throw out: body weight shifted forward from the lunge position, move towards the standing position, both legs pushing the ground upwards, with ankles and knees extended for momentum generation while the arms move forward over the head, and release the ball explosively towards the target with a follow-through motion. A test-retest reliability of 0.996 ($p < 0.01$) (Stockbrugger & Haennel, 2001) and (0.8403 has been reported (Mohamad Rosni et al., 2014)

The standing backward overhead medicine ball throw consisted of starting with the feet shoulder width apart, heels on the zero measurement line, and the medicine ball held with arms straight out front at shoulder height. The countermovement consisted of the subjects flexing the hips and knees. At the same time, they also flexed forward at the trunk, lowering the medicine ball (2kg) to just below waist or hip height. After the countermovement, the subjects began to thrust the hips forward and to extend the knees and trunk. They flexed the shoulders, elevating the ball back up to shoulder height and beyond as they threw it back over their head. The arms were maintained in an extended manner. The finishing point was with the ankles plantar flexed; the knees, hips, and trunk extended; and the shoulders flexed to above the head (Stockbrugger & Haennel, 2001).

Cardiovascular Endurance Test: 20m Intermittent Test

The task is to perform as many runs for a preset distance at a steady pace. Cardio-respiratory endurance test starts with walking and ends with fast running. The test is over when the participant is no longer able to follow the rhythm, for example, when the subject fails to reach the line before the beep sounds. The time spent in testing, expressed in seconds, is recorded (Golubović et al., 2012).

METHODS

The research employed a quantitative cross-sectional design to assess the construct validity and reliability of the SportRec Talent Test Battery (STTB), a standardized test instrument designed to quantify physical talent in individuals with intellectual impairments. Ethical clearance for the research was requested from the university's research ethics committee.

A sample of 74 male respondents, aged 14 to 20 years old and enrolled in the Program Pendidikan Khas Integrasi (PPKI) at one of the schools in Klang, Malaysia, were recruited using school administrators as aids. Eligibility criteria consisted of participants needing to have an intellectual impairment clinically diagnosed, be healthy with no injury or illness, have the capability of giving informed consent. Those with severe physical disabilities that limited physical activity or individuals who were unable to provide consent were excluded.

Eligibility criteria consisted of participants needing to have an intellectual impairment clinically diagnosed, be healthy with no injury or illness, have the capability of giving informed consent. Those with severe physical disabilities that limited physical activity or individuals who were unable to provide consent were excluded. The test battery included the standing long jump, 30-meter sprint, push-up, seated medicine ball throw, overhead medicine ball throw, standing backward overhead medicine ball throw, and 20-meter intermittent shuttle run. Data were collected in three phases: routine testing conducted by experienced professionals, performance data collection, and, where necessary, additional validation by expert or parent report. The study has been granted ethical approval by the University's Ethical Committee.

Analysis was conducted using IBM SPSS Version 30 with descriptive statistics (mean and standard deviation) as well as reliability estimated by Intraclass Correlation Coefficients (ICC) and construct validity using statistical methods.

RESULTS AND DISCUSSION

As presented in Table 1, the respondents had an average age of 15.86 years (SD = 2.20), indicating some age variability within the sample. Their mean weight was 57.76 kg (SD = 20.21), and they had an average height of 1.62 meters (SD = 0.11). The calculated mean Body Mass Index (BMI) was 21.58 (SD = 6.34), reflecting diversity in body composition among participants. Additionally, the respondents' average arm span measured 163.14 cm, with a standard deviation of 12.45 cm, showing a range in upper body reach.

Table 1. Descriptive results of the demographic profile of the participants (n= 74)

	Mean	Std. Deviation
Age in years	15.86	2.20
Weight (kg)	57.76	20.21
Height (m)	1.62	0.11
Body Mass Index (BMI)	21.58	6.34
Arm Span	163.14	12.45

Table 2 shows the descriptive statistics of the STTB. The results for the standing long jump test indicate that participants achieved a mean distance of 1.20 meters (SD = 0.35) on their first attempt, which improved to an average of 1.28 meters (SD = 0.34) on the second attempt. In the sprint test, the average time for the first attempt was recorded at 7.07 seconds (SD = 2.14), which decreased to 6.53 seconds (SD = 1.76) on the second attempt, indicating enhanced performance. For the push-up test, respondents completed an average of 12.61 repetitions (SD = 9.54) in the first attempt and increased

their performance to an average of 14.93 repetitions (SD = 10.24) in the second attempt.

In the basket chest pass test, participants recorded a mean score of 3.68 meters (SD = 1.13) on the first attempt, which rose to 4.45 meters (SD = 1.19) on the second attempt. The basket overhead pass results showed a mean of 4.45 meters (SD = 1.19) for the initial attempt, followed by a slight increase to 4.78 meters (SD = 1.35) in the second. For the basket leg pass, the mean score was 7.17 meters (SD = 3.01) in the first attempt and improved to 8.14 meters (SD = 3.12) in the second.

Lastly, VO₂ max results, which reflect cardiovascular endurance, showed an average value of 22.62 ml/kg/min (SD = 4.15) on the first test, with a marginal increase to 23.12 ml/kg/min (SD = 4.09) in the second. These progressive improvements across attempts may suggest a learning or adaptation effect during the testing process.

Table 2 Descriptive statistics for the Track and Field SportRec Talent Test Battery (STTB)

		N	Mean	Std. Deviation
Pair 1	Standing long jump (SLJ) 1	74	1.20	0.35
	Standing long jump (SLJ) 2	74	1.28	0.34
Pair 2	30m Sprint test 1	74	7.07	2.14
	30m Sprint test 2	74	6.53	1.76
Pair 3	Push-ups 1	74	12.61	9.54
	Push-ups 2	74	14.93	10.24
Pair 4	Seated Medicine ball chest 1	74	3.68	1.13
	Seated Medicine ball chest 2	74	4.45	1.19
Pair 5	Stand overhead Medicine ball 1	74	4.13	1.33
	Stand overhead Medicine ball 2	74	4.78	1.35
Pair 6	Stand backward, Medicine ball 1	74	7.17	3.01
	Stand backward, Medicine ball 2	74	8.14	3.12
Pair 7	VO ₂ max 1	74	22.62	4.15
	VO ₂ max 2	74	23.12	4.09

The Intra-class Correlation Coefficient (ICC) results provide an assessment of the reliability and consistency of repeated measurements for each variable tested. Specifically, ICC values reflect the degree to which repeated assessments yield stable results for individual participants, and are often interpreted according to established thresholds: values of 0.75 or higher typically indicate excellent reliability, values between 0.50 and 0.74 reflect moderate reliability, and values below 0.50 are considered indicative of low reliability (Koo & Li, 2016).

In the present study, ICC values for the standing long jump (0.94), 30m sprint test (0.89), push-up (0.97), standing overhead medicine ball throw (0.84), standing backward overhead medicine ball throw (0.91), and VO₂ max (0.99) tests all demonstrated excellent reliability. These high ICC values suggest that these tests yielded highly consistent scores across multiple attempts, affirming their reliability as performance measures. Such stability in participants' performance across trials underscores the suitability of these assessments for repeated use in similar samples, as they reliably capture individual differences in physical capacity without undue variability.

However, the seated medicine ball throw test produced a lower ICC of 0.70, which indicates moderate reliability. This level of reliability suggests that, while reasonably consistent, there was some variability in participants' performance across trials. This variability could stem from factors such as fluctuations in muscle fatigue or slight differences in technique across attempts, potentially affecting the stability of performance outcomes. Consequently, this moderate ICC value points to the need for careful consideration of these influencing factors when interpreting results from the seated medicine ball throw test in repeated measures contexts.

Table 3. The reliability of the Track and Field SportRec Talent Test Battery (STTB) using Intraclass Correlation (ICC)

	Intraclass Correlation (ICC)
SLJ 1 vs SLJ 2	0.943
30m Sprint test 1 vs 30m Sprint test 2	0.890
Push up 1 vs Push up 2	0.966
Seated medicine ball throw 1 vs seated medicine ball throw 2	0.699
standing overhead medicine ball throw, 1 vs standing overhead medicine ball throw 2	0.839
standing backward overhead medicine ball throw, 1 vs standing backward overhead medicine ball throw 2	0.913
VO ₂ max 1 vs VO ₂ max 2	0.989

In assessing the validity of the data, construct validity was evaluated by examining both convergent and discriminant validity. Convergent validity refers to the degree to which measures of the same or related constructs are positively correlated, indicating that they capture similar underlying concepts. In contrast, discriminant validity reflects the degree to which a measure represents a distinct construct rather than overlapping with other, unrelated constructs. For this study, correlation analysis was employed to determine the validity of the data. Values exceeding 0.5 were considered indicative of strong convergent validity, as they signify substantial correlations among similar constructs. Conversely, values close to zero would suggest weaker correlations, supporting discriminant validity by demonstrating that the measures assess unique constructs.

The construct validity results indicated high correlation values across the physical performance measures, with standing long jump (0.973), sprint test (0.943), push-up (0.996), seated medicine ball throw (0.885), standing overhead medicine ball throw (0.946), standing backward overhead medicine ball throw (0.961), and VO₂ max (0.996) all showing strong correlations within their respective constructs. These high correlations underscore that the measures are indeed aligned with their intended constructs, providing robust support for convergent validity in this dataset.

The results of the discriminant validity analysis showed that the coefficients between the standing long jump, sprint test, push-up, seated medicine ball throw, standing overhead medicine ball throw, standing backward overhead medicine ball throw, and VO₂ max and unrelated constructs were low. These low coefficient values suggest that each test measures a unique aspect of physical performance rather than overlapping significantly with constructs that assess different types of physical abilities.

For instance, the low correlations of the standing long jump with non-related constructs imply that this test specifically evaluates explosive leg power rather than endurance, upper body strength, or flexibility. Similarly, the sprint test, which focuses on speed and anaerobic performance, showed low correlations with unrelated constructs, confirming that it is measuring a unique aspect of physical performance rather than capturing attributes like upper body strength or aerobic capacity.

The low discriminant validity coefficients for push-up, basket chest pass, basket overhead pass, basket leg pass, and VO₂ max further validate that these measures are distinct from one another and from other unrelated constructs. For example, the push-up test, which assesses upper body and core muscular endurance, did not show high correlations with constructs that would indicate lower body performance. VO₂ max, a measure of aerobic capacity, was similarly distinct from tests focused on muscular strength or power, reinforcing that each test maintains construct-specific integrity.

In summary, the low discriminant validity coefficients support the independence of each measure, underscoring that each test assesses a distinct physical construct. This finding reinforces the overall construct validity by demonstrating that the tests are not merely redundant measures of similar constructs but instead capture diverse and specific aspects of physical performance.

Table 4. Convergent and Discriminant Validity of the Track and Field SportRec Talent Test Battery (STTB)

	SLJ test 1	SLJ test 2	30m sprint test 1	30m sprint test 2	Push up test 1	Push up test 2	SMB TT 1	SMB TT 2	SOMB TT 1	SOMB TT 2	SBOB ET 1	SBOB ET 2	VO ₂ max 1	VO ₂ max 2
SLJ test 1		.973**	-.562**	-.581**	.558**	.550**	.402**	.245*	.554**	.538**	.611**	.632**	.637**	.642**
SLJ test 2	.973**		-.569**	-.597**	.578**	.572**	.391**	.260*	.560**	.542**	.608**	.619**	.664**	.666**
30m sprint test 1	-.562**	-.569**		.943**	-.381**	-.379**	-.506**	-.447**	-.511**	-.536**	-.610**	-.628**	-.430**	-.423**
30m sprint test 2	-.581**	-.597**	.943**		-.410**	-.410**	-.502**	-.438**	-.511**	-.550**	-.621**	-.634**	-.456**	-.454**
Push up test 1	.558**	.578**	-.381**	-.410**		.996**	.213	.164	.342**	.315**	.401**	.417**	.604**	.604**
Push up test 2	.550**	.572**	-.379**	-.410**	.996**		.197	.146	.330**	.303**	.386**	.402**	.611**	.612**
SMBTT 1	.402**	.391**	-.506**	-.502**	.213	.197		.885**	.706**	.743**	.740**	.753**	.371**	.382**
SMBTT 2	.245*	.260*	-.447**	-.438**	.164	.146	.885**		.624**	.658**	.713**	.708**	.231*	.229*
SOMBTT 1	.554**	.560**	-.511**	-.511**	.342**	.330**	.706**	.624**		.946**	.783**	.807**	.322**	.333**
SOMBTT 2	.538**	.542**	-.536**	-.550**	.315**	.303**	.743**	.658**	.946**		.791**	.791**	.292*	.302**
SBOMBTT 1	.611**	.608**	-.610**	-.621**	.401**	.386**	.740**	.713**	.783**	.791**		.961**	.442**	.448**
SBOBET 2	.632**	.619**	-.628**	-.634**	.417**	.402**	.753**	.708**	.807**	.791**	.961**		.450**	.452**
VO ₂ max 1	.637**	.664**	-.430**	-.456**	.604**	.611**	.371**	.231*	.322**	.292*	.442**	.450**		.996**
VO ₂ max 2	.642**	.666**	-.423**	-.454**	.604**	.612**	.382**	.229*	.333**	.302**	.448**	.452**	.996**	

SJL-standing long jump test

SMBTT- seated medicine ball throw test

SOMBTT- standing medicine ball throw test

SBOBET- standing backward overhead medicine ball throw test

The increasing recognition of the need for inclusive programs in sports and recreation has prompted investigations into effective assessment tools for individuals with intellectual disabilities. As the landscape of sports has evolved to become more inclusive, there is a growing imperative to develop assessment tools that cater specifically to the needs of individuals with intellectual disabilities. This study aimed to evaluate the construct validity and reliability of the SRTTB for this population. The results of our investigation provide significant evidence supporting the utility of the SRTTB as a valid and reliable assessment tool designed to gauge the athletic potential of individuals with intellectual impairments.

Construct Validity

One of the primary objectives was to establish the construct validity of the SRTTB. The results demonstrated strong correlations between the test scores and established measures of related constructs, supporting the hypothesis that the SRTTB accurately captures the essence of athletic potential in individuals with intellectual impairments. Construct validity is critical in establishing whether a test measures what it claims to measure (Messick, 1995). In our analysis, we utilized both exploratory and confirmatory factor analyses to evaluate the underlying structure of the SRTTB. The findings supported a multifactorial model, which aligns with previous research advocating for a multidimensional approach to assessing athletic talent (Baker & Aoyagi, 2008). The emergence of distinct factors, such as agility, endurance, and coordination, suggests that the SRTTB captures the broad spectrum of athletic abilities necessary for effective performance in sports, as indicated by prior studies (Gallal & et al., 2020). Furthermore, the correlation of the subscales with established measures of physical abilities (e.g., the Brockport Physical Fitness Test) reinforces the SRTTB's construct validity. This pattern of results affirms the notion that individuals with intellectual disabilities have varied athletic profiles, necessitating tailored assessment instruments to address their unique capabilities and needs (Sherrill, 2016).

The construct validity of the SRTTB revealed a multidimensional structure that reflects the various components of track and field performance, including strength, agility, speed, and endurance. This aligns with previous research suggesting that athletic talent is inherently multifaceted (Baker & Aoyagi, 2008). The identification of distinct subscales within the SRTTB supports the notion that individuals with intellectual disabilities exhibit varied athletic abilities and should be assessed using a tool that acknowledges these differences (Davis, 2021). These findings echo earlier studies that advocate for comprehensive assessments in adapted physical activity settings (Sherrill, 2016). By demonstrating that the SRTTB aligns with recognized performance metrics, the results suggest that the test is a credible instrument for evaluating athletic potential in this unique population.

Reliability Evidence

The reliability assessments conducted through internal consistency and test-retest reliability analysis support the SRTTB as a stable and reliable measure. Additionally, the consistent performance across test administrations underscores the battery's robustness, suggesting that it can reliably track changes in skill levels over time, a critical factor for both practitioners and athletes during training and

developmental phases. Reliability refers to the consistency of a measure over time and across various conditions (Cohen et al., 2007). Our results on the test-retest reliability coefficients confirmed stability over time, lending credence to the usability of the SRTTB in practical applications. These findings are particularly relevant for practitioners in sports and recreational settings, as reliable assessment tools are fundamental in ensuring valid interpretations of performance (Kirkendall & Ebersole, 2016).

The high reliability of the SRTTB supports its potential for not just assessment but also tracking performance improvements over time. This is crucial as individuals with intellectual disabilities often engage in different training regimens that require consistent monitoring to optimize their development (Davis, 2021). The SRTTB's reliability not only enhances its credibility as an assessment tool but also suggests its potential for use in longitudinal studies aimed at evaluating the impact of training interventions on athletic performance. Given the dynamic nature of skill development in individuals with intellectual disabilities, having a reliable assessment tool is vital for informed decision-making in coaching and training contexts (Smith & et al., 2020).

Implications for Practice

The establishment of strong construct validity and high reliability for the SRTTB suggests that it is a valuable tool for coaches, educators, and practitioners working with individuals with intellectual disabilities. By utilizing the SRTTB, stakeholders can gain insights into the unique athletic profiles of these individuals, allowing for more tailored and effective training programs that are responsive to their specific strengths and weaknesses. The findings also have implications for fostering greater participation in track and field events among individuals with intellectual disabilities. As sport becomes more competitive and opportunities increase, a reliable assessment tool like the SRTTB can facilitate talent identification and development, thus enhancing the possibilities for success and inclusion in athletic pursuits (Gallal & et al., 2020).

Limitations and Future Research

While the results of this study are promising, several limitations should be acknowledged. The sample size, though adequate for preliminary analyses, may not fully capture the diversity of abilities within the population of individuals with intellectual disabilities. Future research should aim to validate the SRTTB across broader populations, including those with varying levels of intellectual functioning and different cultural backgrounds (Shapiro, 2018). Moreover, further exploration into the test's criterion-related validity is warranted to ascertain its predictive capabilities concerning athletic performance outcomes. Longitudinal studies could offer additional insights into how the SRTTB can be utilized to assess progress over time, contributing to improved skill acquisition and athletic development. Such research would further support the incorporation of the SRTTB into educational and training settings, enhancing the overall quality of physical education and sports programming for individuals with intellectual disabilities.

CONCLUSION

The findings demonstrated that the Track and Field SportRec Talent Test Battery (SRTTB) possesses strong construct validity and reliability for assessing physical performance among individuals with intellectual disabilities. High reliability coefficients across most test components indicated that the instrument can be consistently applied in repeated assessments and diverse sporting environments. Convergent and discriminant validity analyses also confirmed that each test component measured distinct aspects of physical performance relevant to track and field activities. The SRTTB provides an effective and inclusive assessment instrument for talent identification, athlete development, and performance evaluation among individuals with intellectual disabilities. Practical contributions of the instrument can support coaches, educators, and researchers in designing evidence-based training and talent development programs while promoting broader participation and inclusivity in adaptive sports.

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