TEST OF GROSS MOTOR DEVELOPMENT – 2

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PURPOSE:
The Test of Gross Motor Development – 2 (TGMD-2) is a standardized test that measures gross motor abilities that develop early in life.

The test is used to:
a) identify children who are significantly behind their peers in gross motor skill development,
b) plan an instructional program in gross motor skill development,
c) assess individual progress in gross motor skill development,
d) evaluate the success of the gross motor program, and
e) serve as a measurement instrument in research involving gross motor development.

POPULATION:
The TGMD-2 is designed to assess the gross motor functioning in children aged 3 through 10 years.

TEST MATERIAL:

The TGMD-2 test kit includes the Examiner's Manual and a supply of Profile/Examiner Record Forms. The manipulatives used in the administration of the test need to be supplied by the examiner and consist of materials commonly found in schools and gyms and are available for purchase commercially. The list of equipment needed is as follows:

- 8"-10" playground ball
- 4" lightweight ball
- basketball
- tennis ball
- soccer ball
- softball
- 4'-5' square beanbag
- tape(plastic electrical)
- 2 traffic cones
- plastic bat
- batting tee

* All of the above equipment has been put together into a kit on wheels at QACCH

TIME TO ADMINISTER:
The test takes 15-20 minutes to administer per child. Set up and clean-up may take an additional 10 minutes. There is some measuring of distances. To avoid delays and reduce time

spent retrieving balls the examiner should gather several balls to use and move the student through the test items quickly. Usually only one session is required to get through the test, but to provide favourable circumstances so that the evaluation is optimal, several sessions may be needed for certain children.

TEST COMPONENTS:
The TGMD-2 looks at 12 gross motor skills divided into two subtests: 1) Locomotor (run, hop, gallop, leap, horizontal jump, and slide)

2) Object Control (ball skills such as striking a stationary ball, stationary dribble, catch, kick, overhand throw, and underhand roll).

ADMINISTRATION:
If the examiner does not wish to compare student test scores with normative data then the instructions, procedures and performance criteria can be adapted to meet the unique needs of the child.

If the results are to be compared to peers in the normative sample then standardized procedures need to be followed. The following requirements are standard for administering the test most reliably:

1. Prior to testing, fill in the Profile/Examiner Record Form and review all the performance criteria for each skill.
2. Give an accurate demonstration and verbal description of the skill prior to it being performed.
3. Provide a practice trial to assure that the child understands what to do.
4. Provide an additional demonstration when the child does not appear to understand the task.
5. Administer two test trials and score each performance criterion on each trial.

Space Considerations: In planning the work space for this test, one will need to ensure that there is clear space measuring at least 60feet x 30feet, and one wall at which a ball can be thrown or kicked.

Follow the instructions provided on the record form or use the illustrated instructions from the manual (see Appendix A). The performance criteria provide analysis of the quality and maturity of movement. *The examiner needs to be very familiar with these ahead of time and be a keen observer as the child is given only two trials and usually the action is only performed once*.

Scoring: The child is given 1 for a pass, 0 for a failed attempt. There are no partial marks. Add the two trials together to get the total ***Score*** for each performance criteria. Add the total scores for each criteria to get the ***Skill Score***. At the end of each Subtest (Locomotor and Object Control) add up the 6 skill scores to get the ***Subtest Raw Score.*** High scores indicate better performance than low scores.

- Record the Scores in Section II on the front page of the record form.
- Convert the raw scores to standard scores using Appendix B(p.53-56).
- Add the Standard scores for the two subtests.
- Now, refer to Appendix C (p.58) to convert Subtest Standard Totals to the ***Gross Motor Quotient and Percentile.*** The Gross Motor Quotient is the most useful value obtained from the TGMD-2 because it reflects the basic constructs built into the test, is highly reliable and is a composite of both subtests. It is the best estimate of an individual's current gross motor development. High scores indicate well developed locomotor and object control skills. Low scores indicate weak locomotor and object control skills.
- See Appendix D to determine ***Age Equivalents*** (these values should be interpreted with caution.

Evaluation: Descriptive ratings are given for the Subtest Standard Scores and the Gross Motor Quotient (See Table 3.2). The percentiles can be determined by using Table C.1 in Appendix C.

Summary:

Descriptive rating	GMQ standard score	Percentile score
Very Superior	>130	99th
Superior	121-130	92-98th
Above Average	111-120	76-91st
Average	90-110	25-75th
Below average	80-89	10-24th
Poor	70-79	2-8th
Very poor	<70	<1st

STRENGTHS:

- Test items are familiar activities and easy to explain
- Short time to administer (15-20 min.)
- Materials are commonly available in schools or child development centres and are inexpensive to purchase
- Detailed performance criteria increase reliability when scoring
- Each skill component is analyzed which can pinpoint areas in need of intervention
- User friendly illustrated guide for administration found in Appendix A
- Test items are a good composite of gross motor skills

LIMITATIONS:

- Needs a lot of room and a wall
- Test reliability – even at a coefficient of .95 there is still a 15% error built in.
- Need to be cautious about making a judgement solely on the test results as they do not tell the whole story of why a child performed at that level on that particular day in that

situation. There are other factors to consider such as poor motivation, inexperience, developmental disability etc.

STANDARDIZATION:

The TGMD-2 was normed on a sample of 1,208 persons in 10 states in the U.S. The demographics of the sample were representative of the entire school age population of the U.S. (including age,gender, region, race, rural vs. urban, parental education and disability).

VALIDITY:

The validity of a test refers to the degree to which theory and evidence support the stated aims of the test. The TGMD-2 has proven that it is reliable in three areas:

- *Content-Description Validity*- Three content experts judged unanimously that the specific gross motor skills selected were representative of the gross motor skills domain and are frequently taught to this age group. Conventional item analysis using the item discrimination index also determined that the items of the TGMD-2 were "good" in that they satisfied the item discrimination and item difficulty criteria.
- *Criterion-Prediction Validity*- This would indicate the effectiveness of a test in predicting and individual's performance in specific activities. A valid test would also correlate well with other tests of similar abilities (eg. gross motor development). The moderate to strong correlation between the TGMD-2 subtests and criterion variable (the Basic Motor Generalizations subtest of the Comprehensive Scales of Student Abilities (CSSA)) support the criterion-prediction validity of the test.
- *Construct-Identification Validity*- This relates to the degree to which the underlying traits of a test can be identified and the extent to which these traits reflect the theoretical model on which the test is based. Five basic constructs thought to underlie the TGMD-2 were tested: Age differentiation, Group differentiation, Item validity, Subtest correlations, and Factor analysis. Test results supported the TGMD-2's construct-identification validity in all 5 constructs. (See Chapter 6 for details)

RELIABILITY:

The study of a test's reliability centres on estimating the amount of error associated with its scores. The error variance is reported in terms of a reliability *coefficient* which in order to be considered reliable should reach at least .70, preferably .90 or above.

Three sources of error variance were analyzed in relation to the TGMD-2 subtest and quotient scores; these were *content sampling, time sampling, and interscorer differences.*

- *Content Sampling*- measures homogeneity of the test items. The more items relate to each other the more reliable they are in testing a particular ability. All but one of the coefficients for the TGMD-2 subtests exceed **.80** and the coefficients for the quotients reach or exceed **.87.** Thus the TGMD-2 is found to be reliable across all demographic subgroups and shows no bias relative to those groups.
- *Time Sampling*- This looks at the extent to which a child's performance is constant over time and is estimated using the test-retest method. The coefficients reach or exceed **.88** which shows that the TGMD-2 scores are stable over time.

- *Interscorer Differences*- The TGMD-2 was found to have a coefficient of **.98** for test scorer reliability.

In summary, the TGMD-2 evidences a high degree of reliability, possesses little test error and can be used with confidence.