

The Charlop-Atwell Scale of Motor Coordination in Young Children

Overview: Charlop and Atwell developed a scale for assessing gross motor coordination in children between the ages of 4 and 6 years. It is intended to be quick and easily used without the need for specialized equipment.

Measures of motor coordination:

- (1) jumping jacks
- (2) jump and turn about face
- (3) hopping on one foot
- (4) "prehistoric animal" (get down on hands and feet with knees straight then move in sequence hand-hand-foot-foot)
- (5) scarf twirl (twirl scarf with arm out straight while walking in a straight line)
- (6) tiptoe balance

Criteria for Jumping Jacks	Finding	Points
objective	does one jumping jack on first trial	6
	does one jumping jack on second trial	4
	does one jumping jack on third trial	2
	unable to do 1 jumping jack	0
subjective precision of movement	arms raised and lowered AND legs moved out and back together (not necessarily in synchrony)	2
	arms raised and lowered OR legs moved out and back together	1
	failure to do either of the above	0
subjective smoothness and flow	continuous movements	2
	slight pauses between jumping jacks	1
	stops before each jumping jack to return to starting position then proceeds	0
subjective flexibility	agile and bendable not stiff and rigid	2
	exhibition of tense and strained movements	1
	jerky robot-like movements	0

Criteria for Jump and About Face	Finding	Points
objective	jumps and lands directly facing the opposite direction	4
	jumps but does not land directly facing the opposite direction	2
	failure to turn facing opposite direction when jumping	0
subjective precision of movement	appears to land with both feet touching the ground at the same time	2
	lands with one foot obviously reaching the ground first then followed by the other foot	1
	steps back or falls when landing	0
subjective flexibility	arms relaxed	2
	arms stiff and rigid	1
	arms moved first before the body turns	0

Criteria for Hopping on 1 Foot	Finding	Points
objective	hops in place for 8 seconds without putting raised foot down	6
	hops in place for 8 seconds with putting foot down only once after 4 seconds	4
	puts foot down within the first 4 seconds	2
	quits before 8 seconds	0
subjective precision of movement	hops relatively in 1 place without moving about	2
	hops within area of 1 square foot	1
	hops without staying in area of 1 square foot	0
subjective smoothness and flow	continuous hopping	2
	slight pauses between hops or unclear about pauses	1
	long pauses between hops	0
subjective flexibility	lands lightly on ground	2
	unclear or lands moderately heavily on ground	1

	lands heavily on ground	0
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Criteria for Prehistoric Animal	Finding	Points
objective	alternates hand-hand foot-foot (at least twice) on first rial of 5 foot distance to be walked	10
	alternates hand-hand foot-foot on first trial at least once	8
	alternates hand-hand foot-foot on second trial at least twice	6
	alternates hand-hand foot-foot once on second trial	4
	shows some indication and attempts to move in sequence	2
	cannot alternate hand-hand foot-foot on any trial or crawls	0
subjective precision of movement	does not bend legs at the knees	2
	bends knees some of the time	1
	bends at the knees while walking	0
subjective smoothness and flow	none or slight pauses in between hand-hand foot-foot sequences	2
	long pauses of 3 seconds or more in between hand-hand foot-foot sequences	1
	falls in between or during sequences of hand-hand foot-foot	0
subjective flexibility	child gets into position of all fours with legs straight quickly and easily	2
	relatively easy for child to get into position of all fours	1
	difficult for child to get into position on all fours	0

Criteria for Scarf Twirl	Finding	Points
objective	does not drop arm and twirls in a moderately straight line; doesn't wander out of 4 foot wide area of imaginary straight line between child and observer	6

	drops arm once and twirls on moderately straight line	4
	drops arm more than once but twirls on a moderately straight line	2
	drops arm more than once and/or can't twirl in a straight line	0
subjective precision of movement	twirls in complete circles facing initial direction	2
	does not twirl in complete circle	1
	failure to twirl	0
subjective smoothness and flow	not stopping between twirls	2
	stopping between twirls	1
	walking between twirls	0
subjective flexibility	while twirling the child shows very graceful movements not stiff and rigid	2
	child exhibits some tense and strained movements while twirling	1
	ungraceful rigid movements while twirling	0

Criteria for Tiptoe Balance	Finding	Points
objective	balances for 8 seconds without putting heels down	6
	balances for 8 seconds putting heels down after 4 seconds	4
	puts heels down within 4 seconds	2
	quits before 8 seconds	0
subjective precision of movement	stands in 1 place without moving feet	2
	moves feet after 4 seconds	1
	moves feet within first 4 seconds	0
subjective smoothness and flow	exhibits no wobbling of any part of the body while balancing	2
	exhibits wobbling after 4 seconds of balancing	1
	exhibits wobbling within first 4 seconds	0

subjective flexibility	child quickly and easily gets on tiptoe on first attempt	2
	child takes 2 attempts to get on tiptoes before balancing begins	1
	child needs extra instructions on how to stand on tiptoe	0

subscore for objective criteria = SUM(points for all 6 objective criteria)

subscore for subjective criteria = SUM(points for all 17 subjective criteria)

total score = SUM(points for all 23 objective and subjective criteria)

Interpretation:

- minimum total score: 0
- maximum total score: 72
- The higher the score the better the motor coordination.
- The scores tend to go higher as the child gets older.

Boys	Poor Performance	Top Total Score
4.0 years old	< 28 (7.1%)	54
4.5 years old	< 31 (5.9%)	64
5.0 years old	< 35 (8.3%)	63
5.5 years old	< 33 (3.7%)	66
6.0 years old	< 21 (3.3%)	68

from Appendix D pages 1306-1307

Girls	Poor Performance	Top Total Score
4.0 years old	< 18 (5.9%)	59
4.5 years old	< 41 (6.7%)	62
5.0 years old	< 29 (5.3%)	66
5.5 years old	< 44 (4.5%)	71
6.0 years old	< 49 (3.8%)	68

from Appendix E pages 1307-1308

Performance:

- The authors found the scale to have high test-retest and interobserver reliability.
- It was felt to show external validity and internal consistency.

References:

Charlop M Atwell CW. The Charlop-Atwell scale of motor coordination: A quick and easy assessment of young children. *Perceptual and Motor Skills*. 1980; 50: 1291-1308.