



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 6)

Available online at: [www.ijariit.com](http://www.ijariit.com)

## Ambidextrous performance among children of different ages

K. R. Vimala Devi

[vimaladevikr89@gmail.com](mailto:vimaladevikr89@gmail.com)

Koviloor Andavar College of Physical Education,  
Karaikudi, Tamil Nadu

Dr. G. Ravindran

[drgravindranau@yahoo.com](mailto:drgravindranau@yahoo.com)

Koviloor Andavar College of Physical Education,  
Karaikudi, Tamil Nadu

### ABSTRACT

The purpose of this study was to find out ambidextrous performance among children of different ages. The names of children studying 5th standard, 6th standard, 7th standard and 8th standard were collected from Koviloor Andavar Matriculation Higher Secondary School, Koviloor, Karaikudi, Tamilnadu. Considering the limited number of children it was decided to select seven boys and eight girls from each standard. This study consisted of sixty children comprised of 28 boys and 32 girls. Their age was between 11 to 14 years. Jumping, throwing and hopping is the natural activities of children. They are considered as fundamental motor activity. Among children, the inherent talent and potential can be identified by testing the fundamental motor ability. The standard athletic events involve jumping, throwing and hopping. Assessing the ambidextrous performance would be useful to the physical educationist and coaches to identify the talent. In this respect based on the relevant literature reviewed and in accordance with views of professional experts in Physical Education, the following ambidextrous performance variables were selected for this study there are jumping, throwing and hopping. The factorial design is presented for a notational system. It is a form of the three-factor experiment consisted of gender, different age groups and ambidextrous performance with a repeated measurements on the last factor of jumping, throwing and hopping with right and leg are analyzed by 2 x 4 x 2 factorial ANOVA.

**Keywords**— Ambidextrous, Jumping, Throwing, Hopping and 2x4x2 factorial ANOVA

### 1. INTRODUCTION

The word "ambidextrous" is derived from the Latin roots *ambi-*, meaning "both", and *Dexter*, meaning "right" or "favourable". Thus, "ambidextrous" is literally "both right" or "both favourable". The term ambidexter in English was originally used in a legal sense of jurors who accepted bribes from both parties for their verdict.

### 2. METHODOLOGY

The purpose of this study was to find out ambidextrous performance among children of different ages. The names of children studying 5th standard, 6th standard, 7th standard and 8th standard were collected from Koviloor Andavar Matriculation Higher Secondary School, Koviloor, Karaikudi, Tamilnadu. Considering the limited number of children it was decided to select seven boys and eight girls from each standard. This study consisted of sixty children comprised of 28 boys and 32 girls. Their age was between 11 to 14 years. In this respect based on the relevant literature reviewed and in accordance with views of professional experts in Physical Education, the following ambidextrous performance variables were selected for this study there are jumping, throwing and hopping. The factorial design is presented for a notational system. It is a form of the three-factor experiment consisted of gender, different age groups and ambidextrous performance with a repeated measurements on the last factor of jumping, throwing and hopping with right and leg are analyzed by 2 x 4 x 2 factorial ANOVA.

Table 1: ANOVA For 2x4x2 factorial experiments with a repeated measurements on the last factor of jumping performance

Sources of variance		Sum of Squares	df	Mean Squares	F
Factorial	Mean				
Gender	1.44	0.136	1	0.136	2.869
	1.37				
Age group	1.29	1.298	3	0.433	9.137*
	1.35				
	1.39				
	1.57				
Gender X	1.32	0.162	3	0.054	1.137
	1.44				

Age group	1.38	1.41				
	1.61	1.54				
<b>Factor (Error I)</b>			<b>2.462</b>	<b>52</b>	<b>0.47</b>	
Within						
Ambidextrous X	1.47		0.535	1	0.535	<b>59.95*</b>
	1.34					
Gender X	1.51	1.44	0.001	1	0.001	0.98
	1.37	1.31				
Age group						
Age group X	1.42	1.17	0.130	3	0.43	<b>4.84*</b>
	1.40	1.30				
Ambidextrous jumping	1.46	1.33				
	1.61	1.54				
Gender X	1.44	1.19	0.035	3	0.12	1.29
Age group X	1.47	1.42				
	1.47	1.29				
Ambidextrous Jumping	1.65	1.57				
<b>Factor (Error II)</b>			<b>0.464</b>	<b>52</b>	<b>0.09</b>	

Table 2: Scheffe’s post hoc test for mean differences on jumping performance of different age groups irrespective of gender and different legs (Scores in seconds)

Jumping performance of 5 <sup>th</sup> standard children irrespective of gender and legs	Jumping performance of 6 <sup>th</sup> standard children irrespective of gender and legs	Jumping performance of 7 <sup>th</sup> standard children irrespective of gender and legs	Jumping performance of 8 <sup>th</sup> standard children irrespective of gender and legs	Mean difference
1.29	1.35			0.06
1.29		1.39		0.10
1.29			1.57	<b>0.28*</b>
	1.35	1.39		0.04
	.35		1.57	0.22
		1.39	1.57	0.18

The CI required for significance at .05 level was 0.28

Table 3: Scheffe’s post hoc test mean differences on right legs and left leg jumping irrespective of gender for different standards

Right legs and left leg jumping irrespective of gender for different age groups	Right leg Jumping performance irrespective of gender	Left leg Jumping performance irrespective of gender	Mean difference
5 <sup>th</sup> standard	1.42	1.17	<b>0.25*</b>
6 <sup>th</sup> standard	1.40	1.30	0.10
7 <sup>th</sup> standard	1.46	1.33	<b>0.13*</b>
8 <sup>th</sup> standard	1.61	1.54	0.07

The CI required for significance at .05 level was 0.12

Table 4: ANOVA for 2 X 4 X 2 factorial experiments with a repeated measurements on the last factor of hopping

Sources of variance		Sum of Squares	Df	Mean Squares	F
Between					
Factorial	Mean				
Gender	3.23	3.544	1	3.544	0.00
	3.23				
Age group	3.58	5.769	3	1.923	<b>5.407*</b>
	3.18				
	3.18				
	2.97				
Gender X	3.64	0.264	3	0.088	0.248
	3.11				
Age group	3.20				
	2.97				
<b>Factor (Error I)</b>		<b>18.495</b>	<b>52</b>	<b>0.356</b>	
Within					
Ambidextrous Jumping	3.12	1.436	1	1.436	<b>11.669*</b>
	3.34				
Gender X	3.15	0.101	1	0.101	0.822
	3.31				

Ambidextrous jumping								
Age group X	3.57	3.58	0.474		3	0.158	1.282	
	3.04	3.33						
Ambidextrous jumping	3.06	3.30	0.574		3	0.191	1.555	
	2.80	3.14						
Gender X	3.62	3.66	3.53	3.52	0.574	3	0.191	1.555
	2.98	3.24	3.09	3.42				
Age group X	3.24	3.17	2.91	3.42	0.574	3	0.191	1.555
	2.78	3.18	2.83	3.11				
<b>Factor (Error II)</b>					<b>6.401</b>	<b>52</b>	<b>0.123</b>	

Table 5: Scheffe's post hoc test for mean differences on of different age group children irrespective of gender and irrespective of right and left leg (Scores in counts)

Hopping performance of 5 <sup>th</sup> standard children irrespective of gender and legs	Hopping performance of 6 <sup>th</sup> standard children irrespective of gender and legs	Hopping performance of 7 <sup>th</sup> standard children irrespective of gender and legs	Hopping performance of 8 <sup>th</sup> standard children irrespective of gender and legs	Mean difference
3.58	3.18			<b>0.40*</b>
3.58		3.18		<b>0.40*</b>
3.58			<b>2.97</b>	<b>0.61*</b>
	3.18	3.18		0.00
	3.18		<b>2.97</b>	0.21
		3.18	<b>2.97</b>	0.21

The CI required for significance at .05 level was 0.24

Table 6: ANOVA for 2x4x2 factorial experiments with repeated measure on the last factor of throwing

Sources of variance				Sum of Squares	df	Mean Squares	F
Between							
Factorial		Mean					
Gender	20.25			1435.092	1	1435.092	<b>57.97*</b>
	13.32						
Age group	17.67			453.171	3	121.057	<b>6.102</b>
	13.21						
	17.82						
	18.07						
Gender X Age group	18.25	17.16		505.237	3	168.412	<b>6.80*</b>
	17.43	9.53					
	20.56	14.42					
	24.78	12.19					
<b>Factor (Error I)</b>				<b>1287.217</b>	<b>52</b>	<b>24.754</b>	
Within							
Ambidextrous throwing	22.34			4181.811	1	4181.811	<b>294.93*</b>
	10.78						
Gender X Ambidextrous Throwing	28.22	17.19		501.452	1	501.452	<b>35.366*</b>
	12.29	9.46					
Age group X Ambidextrous Throwing	24.57		10.77	496.806	3	165.602	<b>11.679*</b>
	15.63		10.79				
	23.61		10.95				
	25.54		10.60				
Gender X Age group X Ambidextrous Throwing	25.97	10.54	23.34	10.98	255.818	3	<b>6.014*</b>
	20.72	14.13	11.18	7.87			
	29.28	11.84	18.66	10.18			
	36.91	12.65	18.58	8.80			
<b>Factor (Error II)</b>				<b>737.308</b>	<b>52</b>	<b>14.179</b>	

**Table 7: Scheffe’s post hoc test mean differences on both hand throw for boys and girls in different classes (scores in counts)**

Throwing performance of 5 <sup>th</sup> standard children irrespective of gender and hands	Throwing performance of 6 <sup>th</sup> standard children irrespective of gender and hands	Throwing performance of 7 <sup>th</sup> standard children irrespective of gender and hands	Throwing performance of 8 <sup>th</sup> standard children irrespective of gender and hands	Mean difference
17.67	13.21			<b>4.46*</b>
17.67		17.82		0.15
17.67			<b>18.07</b>	0.40
	13.21	17.82		<b>4.61*</b>
	13.21		<b>18.07</b>	<b>4.86*</b>
		17.82	<b>18.07</b>	0.25

The CI required for significance at .05 level was 2.02

**Table 8: Scheffe’s post hoc test for mean differences on throwing performance of boys and girls in different classes irrespective of hands (Scores in counts)**

Standard	Throwing performance of boys irrespective of hands	Throwing performance of girls in irrespective of hands	Mean difference
5 <sup>th</sup> standard	18.25	17.16	1.09
6 <sup>th</sup> standard	17.43	9.53	<b>7.9*</b>
7 <sup>th</sup> standard	20.56	14.42	<b>6.14*</b>
8 <sup>th</sup> standard	24.78	12.19	<b>12.59*</b>

The CI required for significance at .05 level was 2.12

**Table 9: Scheffe’s post hoc test mean differences on both hand throw for boys and girls in different classes (scores in counts)**

Throwing performance of boys right hands in irrespective of standards	Throwing performance of boys left hands in irrespective of standards	Throwing performance of girls right hands in irrespective of standards	Throwing performance of girls left hands in irrespective of standards	Mean difference
28.22	12.29			<b>15.93*</b>
28.22		17.19		<b>11.03*</b>
28.22			<b>9.46</b>	<b>18.76*</b>
	12.29	17.19		<b>4.9*</b>
	12.29		<b>9.46</b>	<b>2.83*</b>
		17.19	<b>9.46</b>	<b>7.71*</b>

The CI required for significance at .05 level was 2.72

**Table 10: Scheffe’s post hoc test mean differences on right-hand throw for boys and girls in different classes (scores in counts)**

Standard	Throwing performance Children irrespective gender in right-hand throw	Throwing performance Children irrespective gender in left-hand throw	Mean difference
5 <sup>th</sup> standard	24.57	10.77	<b>13.8*</b>
6 <sup>th</sup> standard	15.63	10.79	<b>4.84*</b>
7 <sup>th</sup> standard	23.61	10.95	<b>12.66*</b>
8 <sup>th</sup> standard	25.54	10.60	<b>14.94*</b>

The CI required for significance at .05 level was 2.22

**Table 11: Scheffe’s post hoc test mean differences on right-hand throw for boys in different classes (scores in counts)**

Standard	Throwing performance of boys right hand	Throwing performance of boys left hand	Mean difference
5 <sup>th</sup> standard	25.97	10.54	<b>15.43</b>
6 <sup>th</sup> standard	20.72	14.13	<b>6.59</b>
7 <sup>th</sup> standard	29.28	11.84	<b>17.44</b>
8 <sup>th</sup> standard	36.91	12.65	<b>24.26</b>

The CI required for significance at .05 level was 3.32

**Table 12: Scheffe’s post hoc test mean differences on right-hand throw for girls in different classes (Scores in counts)**

Standard	Throwing performance of girls right hand	Throwing performance of girls left hand	Mean difference
5 <sup>th</sup> standard	23.34	10.98	<b>12.36*</b>
6 <sup>th</sup> standard	11.18	7.87	<b>3.31*</b>
7 <sup>th</sup> standard	18.66	10.18	<b>8.48*</b>
8 <sup>th</sup> standard	18.58	8.80	<b>9.78*</b>

The CI required for significance at .05 level was 3.13

### 3. CONCLUSION

- (a) There was no significant difference between boys and girls on jumping performance irrespective of different age groups and different legs.
- (b) The jumping performance increases as the age increases irrespective of different age groups and different legs.
- (c) There is no significant difference in jumping performance between boys and girls of different age group studying different standard irrespective of legs.
- (d) The jumping performance with right leg was better than the jumping performance with left leg irrespective of gender and different age groups.
- (e) There is no significant difference in jumping performance between right and left leg between boys and girls irrespective of different age group studying different standards.
- (f) There is a significant difference in jumping performance with right and left leg among different age group children studying various standards irrespective of gender.
- (g) There is no significant difference in jumping performance with right and left leg between boys and girls of different age group children studying various standards.
- (h) There is no significant difference between boys and girls on hopping performance irrespective of different age groups and different legs.
- (i) The hopping performance increases as the age increases irrespective of different age groups and different legs.
- (j) There is no significant difference in hopping performance between boys and girls of different age group studying different standard irrespective of legs.
- (k) The hopping performance with right leg was better than the jumping performance with left leg irrespective of gender and different age groups.
- (l) There is no significant difference in hopping performance between right and left leg between boys and girls irrespective of different age group studying different standards.
- (m) There is no significant difference in hopping performance with right and left among different age group children studying various standards irrespective of gender.
- (n) There is no significant difference in hopping performance with right and left between boys and girls of different age group children studying various standards.
- (o) Boys throwing performance was better than girls throwing performance irrespective of different age groups and different hands.
- (p) The throwing performance increases as the age increases irrespective of different age groups and different hands.
- (q) There is no significant difference in throwing performance between boys and girls in favor of boys and also among different age group studying different standard in favor of higher age group irrespective of hands.
- (r) The throwing performance with the right hand was better than the throwing performance with left hand irrespective of gender and different age groups.
- (s) There is a significant difference in throwing performance between right and left hand in favor of right hand between boys and girls in favor of boys irrespective of different age group studying different standards.
- (t) There is a significant difference in throwing performance with right and left hand in favor of right hand among different age group children studying various standards in favor of higher age category irrespective of gender.
- (u) There is a significant difference in throwing performance with right and hand between boys and girls of different age group children studying various standards.

### 4. REFERENCES

- [1] Chicoine AJ, Proteau L, Lassonde M. Absence of interhemispheric transfer of unilateral visuomotor learning in young children and individuals with agenesis of the corpus callosum. *Dev Neuropsychol.* 2000; 18(1):73-94. PMID:11143805 DOI: 10.1207/S15326942DN1801\_5.
- [2] Teixeira LA, Gasparetto ER. Lateral asymmetries in the development of the over arm throw. *J MotBehav.* 2002 Jun; 34(2):151-60. PMID: 12057888, DOI:10.1080/00222890209601937.
- [3] Saba Ghayas and Adnan Adil Effect of Handedness on Intelligence Level of Students © *Journal of the Indian Academy of Applied Psychology*, January 2007, Vol. 33, No.1, 85-91.
- [4] Roche R, Viswanathan P, Clark JE, Whitall J. Children with developmental coordination disorder (DCD) can adapt to perceptible and subliminal rhythm changes but are more variable *Hum Mov Sci.* 2016 Dec;50:19-29.doi:10.1016/j.humov.2016.09.003. Epub 2016 Sep 19. PMID: 27658264, DOI:10.1016/j.humov.2016.09.003.
- [5] Yousefian O, Ballantyne AO, Doo A, Trauner DA. Clock drawing in children with prenatal stroke *Pediatr Neurol.* 2015 Jun; 52(6):592-8. doi:10.1016/j.pediatrneurol.2014.07.036. Epub 2015 Jan 31. PMID: 26002051 PMID: PMC4443472DOI: 10.1016/j.pediatrneurol.2014.07.036.
- [6] Bacelar AM<sup>1</sup>, Teixeira LA. Footedness across ages: the distinction between mobilization and stabilization tasks *Laterality.* 2015; 20(2): 141-53. doi: 10.1080/1357650X.2014.924959. Epub 2014 Jun 10. PMID: 24915515, DOI: 10.1080/1357650X.2014.924959.
- [7] Brouwer RM, van Soelen IL, Swagerman SC, Schnack HG, Ehli EA, Kahn RS, Hulshoff Pol HE, Boomsma DI. Genetic associations between intelligence and cortical thickness emerge at the start of puberty *Hum Brain Mapp.* 2014 Aug; 35(8):3760-73. doi: 10.1002/hbm.22435. Epub 2013 Dec 31. PMID: 24382822 DOI: 10.1002/hbm.22435.