MAXIMAL DISTANCE THROW IN

GIRLS & BOYS SIX TO TWELVE YEARS OLD

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Original title: "El Lanzamiento a Máxima Distancia de 6 a 12 Años".

Translated by the author.

INTRODUCTION

Evolutional studies of selected motor skills may provide a better understanding of human motor development as well as some relevant clues for improving motor educational programs.

A study about the changes of the maximal distance throw in girls and boys, ages 6 to 12, is presented.

PERSONS TESTED

Girls and boys, ages 6,7,8,9,10,11 and 12, attending the Sports Schools of the National Institute of Physical Education of Barcelona during the 1988-89 course were invited to participate in the research. 10-12 girls and 10-12 boys of each age were tested.

TESTS

A set of four maximal distance throw tests with a tennis ball (55 grams of weight) were performed by each participant (two trials in each test).

Static with the right arm Test (E-D Test).

Static with the left arm Test (E-I Test).

Dynamic with the right arm Test (D-D Test).

Dynamic with the left arm Test (D-I Test).

Development

☺ E-D Test: From the *two-legged stance position* the person must throw with the *right arm* a tennis ball as far as possible without lifting the feet from the ground during the throw and two seconds after it.

☺ E-I Test: The same conditions that were used in the E-D Test, except that the tennis ball must be thrown with the *left arm*.

☺ D-D Test: While *running* at a personal rhythm *without displacement* (skipping at the place) the person must throw with the *right arm* a tennis ball as far as possible and maintain the run for at least two seconds after the throw.

☺ D-I Test: The same conditions that were used in the D-D Test, except that the tennis ball must be thrown with the *left arm*.

Evaluation

The result of each test is the distance in meters at which a tennis ball has been thrown. The throw distance is measured by a measure tape from the throw line to the place where the ball first contacts the ground after having been thrown.

RESULTS

Means and standard deviations were calculated for each age and sex groups using the following variables: static throw, dynamic throw, best static throw, worst static throw, best dynamic throw and worst dynamic throw.

It was considered dominant arm the arm with which the person performed the best throw (the longest throw distance) and non-dominant arm the arm with which the person performed the worst throw (the shortest throw distance).

Nomenclature of the results for tables and graphs

E(DI)= static-right and left arms.

D(DI)= dynamic-right and left arms.

ED= Static with the right arm test.

EI= Static with the left arm test.

DD= Dynamic with the right arm test.

DI= Dynamic with the left arm test.

ME= Best static throw.

PE= Worst static throw.

MD= Best dynamic throw.

PD= Worst dynamic throw.

NIÑOS= Boys.

NIÑAS= Girls.

ESTATICO+DINAMICO= Static + dynamic.

DISTANCIA (M)= Distance (meters).

EDAD(AÑOS)= Age (years).

GRAFICA 1. LANZAMIENTO A MAXIMA DISTANCIA ESTATICO-DINAMICO (NIÑOS Y NIÑAS)= Graph 1. Static-dynamic maximal distance throw (boys and girls).

DOMINANTE= Dominant.

NO DOMINANTE= Non-dominant.

GRAFICA 2. LANZAMIENTO A MAXIMA DISTANCIA EN NIÑOS (SEGMENTO DOMINANTE Y NO DOMINANTE)= Graph 2. Maximal distance throw in boys (dominant and non-dominant segments or arms).

NIÑOS-ESTATICO= Boys-static.

NIÑOS-DINAMICO= Boys-dynamic.

NIÑAS-ESTATICO= Girls-static.

NIÑAS-DINAMICO= Girls-dynamic.

DERECHA= Right.

IZQUIERDA= Left.

GRAFICA 3. LANZAMIENTO A MAXIMA DISTANCIA EN NIÑAS (SEGMENTO DOMINANTE Y NO DOMINANTE)= Graph 3. Maximal distance throw in girls (dominant and non-dominant segments or arms).

ESTATICO= Static.

DINAMICO= Dynamic.

GRAFICA 4. LANZAMIENTO A MAXIMA DISTANCIA NIÑOS-NIÑAS (ESTATICO Y DINAMICO)= Graph 4. Maximal distance throw in boys-girls (static and dynamic).

				NIÑOS					
	6 AÑOS	7 AÑOS	8 AÑOS	9 AÑOS	10 AÑOS	11 AÑOS	12 AÑOS		
ED	8,9	10,7	12,2	16,3	19,1	19,6	25,9		ED=TEST ESTATICO CON BRAZO DERECHO
EI	5,1	6,6	7,5	10	11,8	12,8	13,6		EI= TEST ESTATICO CON BRAZO IZQUIERDO
DD	6,1	11,8	9,8	12,4	18,5	17,9	21,8		DD=TEST DINAMICO CON BRAZO DERECHO
DI	4,7	3,8	6,2	9,1	10,5	12,1	13,4		DI= TEST DINAMICO CON BRAZO IZQUIERDO
ME	8,9	11,3	13,2	16,3	19,5	20	26,5		ME= MEJOR LANZAMIENTO ESTATICO
PE	5,1	5,9	7,5	10	11,5	12,2	13		PE= PEOR LANZAMIENTO ESTATICO
MD	6,5	11,8	10	12,7	18,7	17,7	23,6		MD= MEJOR LANZAMIENTO DINAMICO
PD	4,2	3,8	6	8,8	10,3	11,4	14,6		PD= PEOR LANZAMIENTO DINAMICO
E(DI) D(DI)	6,2	8,225	8,925	11,95	14,975	15,6	18,675		
ME MD	7,7	11,55	11,6	14,5	19,1	18,85	25,05		
PE PD	4,65	4,85	6,75	9,4	10,9	11,8	13,8		

				NIÑAS			
	6 AÑOS	7 AÑOS	8 AÑOS	9 AÑOS	10 AÑOS	11 AÑOS	12 AÑOS
ED	5,2	8,6	6,9	10	11,1	13,2	15,6
EI	4,10	6,1	5,9	7	8,1	10	14,2
DD	4,3	8,7	6,2	8,8	9,3	11,1	14,4
DI	3,4	6,1	4,9	6,5	6,7	8,8	11,2
ME	5,5	8,9	7,3	10,3	11,5	13,7	16,1
PE	3,8	5,8	5,4	6,2	7,7	9,2	13,7
MD	4,6	8,7	6,8	9,4	9,3	11,6	14,6
PD	3,1	6	4,4	5,9	6,7	8,4	11
E(DI) D(DI)	4,25	7,375	5,975	8,075	8,8	10,775	13,85
ME MD	5,05	8,8	7,05	9,85	10,4	12,65	15,35
PE PD	3,45	5,9	4,9	6,05	7,2	8,8	12,35

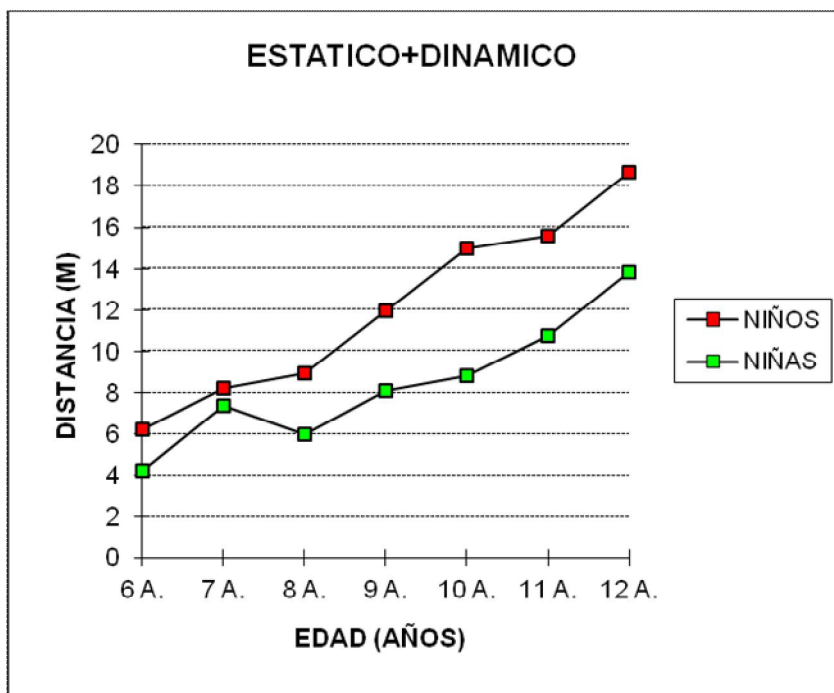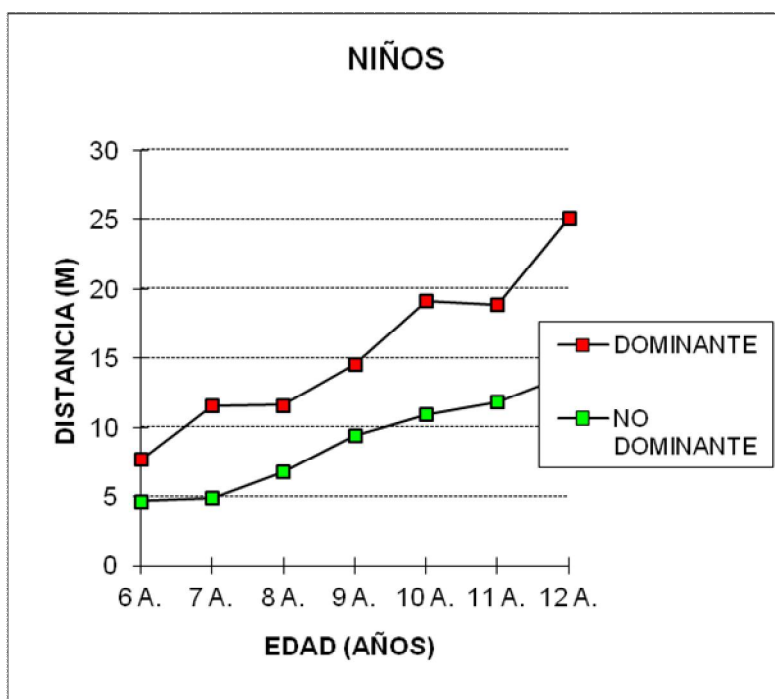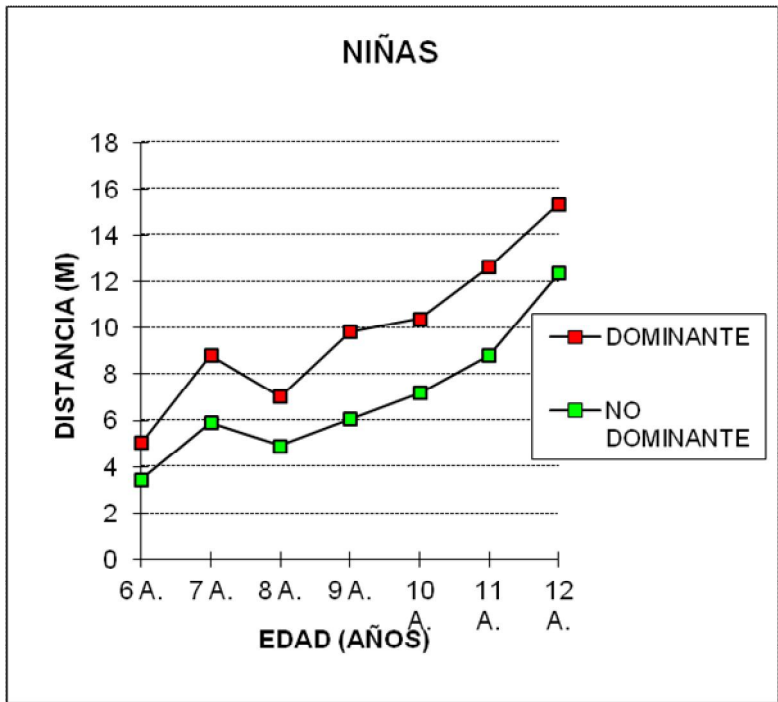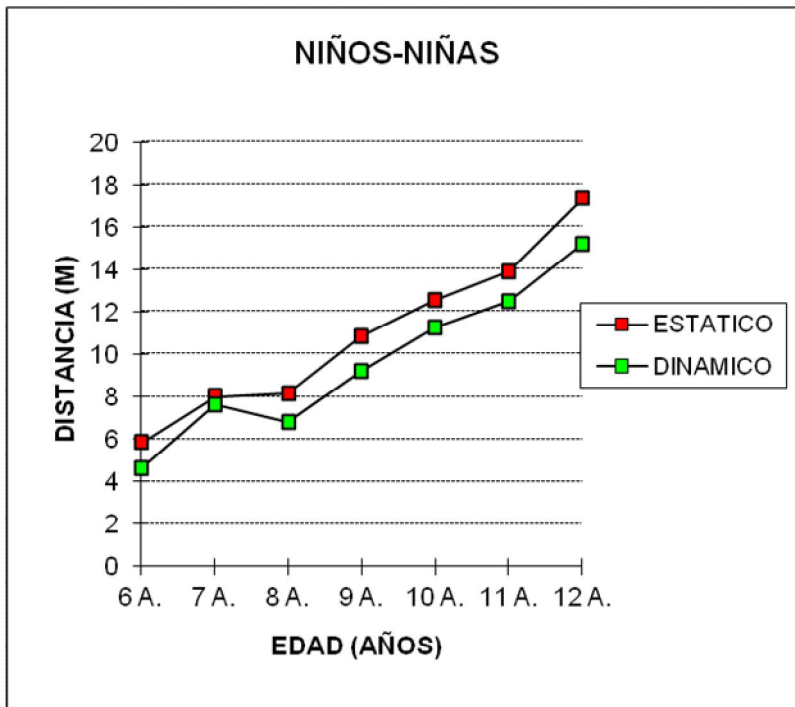|				NIÑAS Y NIÑOS			
	6 AÑOS	7 AÑOS	8 AÑOS	9 AÑOS	10 AÑOS	11 AÑOS	12 AÑOS
ED EI	5,825	8	8,125	10,825	12,525	13,9	17,325
DD DI	4,625	7,6	6,775	9,2	11,25	12,475	15,2

Gráfico 1

Gráfico 2

Gráfico 3

Gráfico 4

DISCUSSION

Eventhough this type of cross-sectional investigations have obvious limitations compared to longitudinal studies, we consider interesting to point out the following conclusions:

Boys obtain better results than girls in static and dynamic maximal distance throw. At six and seven years old there are tiny differences; however, from eight to twelve years old the differences become bigger and significant (Graph 1). To a certain extent, it can be said that contrary to girls', boys' maximal distance throw dominance is differentiated, especially since eight years old.

An argument in support of this approach must be found by analyzing static and dynamic maximal distance throws with the dominant and non-dominant segment (Graphs 2 and 3). It is observed that girls maintain slightly differences between dominant and non-dominant segment at all ages whilst boys show significant differences already at six years old which increase with age. It is important to look at raw data, inasmuch as units in graphs 2 and 3 are not equal. Added to this, it is particularly interesting to observe that the dominant segment, in terms of static and dynamic maximal distance throw, is the right arm for both girls and boys (Graphs 2a,2b,3a and 3b).

These results could partially explain a faster and earlier development and maturation of dominance, in addition to, specially for maximal distance throw (basically on the dominant segment), bigger levels of fast strength (which also increase with age) in boys than in girls. Nevertheless, a determinant factor should also be taken into account in order to explain these differences: the different degree of motor skills experiences between girls and boys.

Both girls and boys show insignificant differences between maximal distance throw static and maximal distance throw dynamic. There is a parallel evolution with tiny superior values for the static maximal distance throw (Graph 4). Therefore, segmentary tone control capacity makes little influence on this type of maximal distance throw skills. Probably, in precision throws and, to a great extend, in precision-power throws it would exist more significant differences between static and dynamic throw since this type of dynamic throws require a better differential relaxation control or segmentary tone control than static ones.

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RIBERA NEBOT, D. (1989). <u>Valoración del Control Tónico Segmentario en Educación Física</u>. Memoria de Investigación INEF de Barcelona. Documento INEF Barcelona.

SEIRUL-LO VARGAS, F. (1987). <u>Apuntes de Clase de Educación Física de Base</u>. Documento INEF Barcelona.

| | | | | E(DI) | | | |
| | | | | D(DI) | | | |
	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
NIÑOS	6,2	8,225	8,925	11,95	14,975	15,6	18,675
NIÑAS	4,25	7,375	5,975	8,075	8,8	10,775	13,85
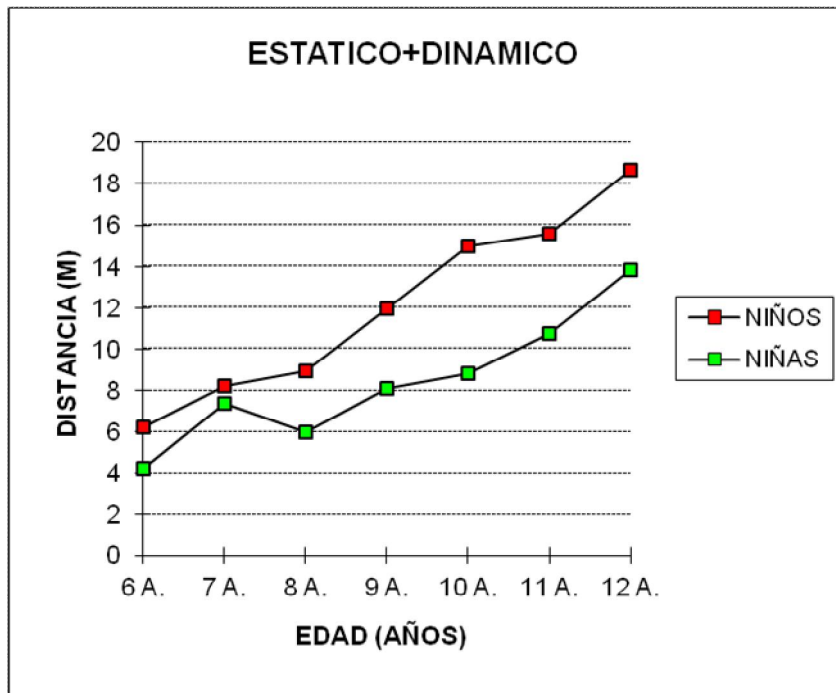
GRAFICA 1. LANZAMIENTO A MAXIMA DISTANCIA ESTATICO-DINAMICO
                 (NIÑOS Y NIÑAS)

| | | | | NIÑOS | | | |
	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
DOMINANTE	7,7	11,55	11,6	14,5	19,1	18,85	25,05
NO DOMINANTE	4,65	4,85	6,75	9,4	10,9	11,8	13,8
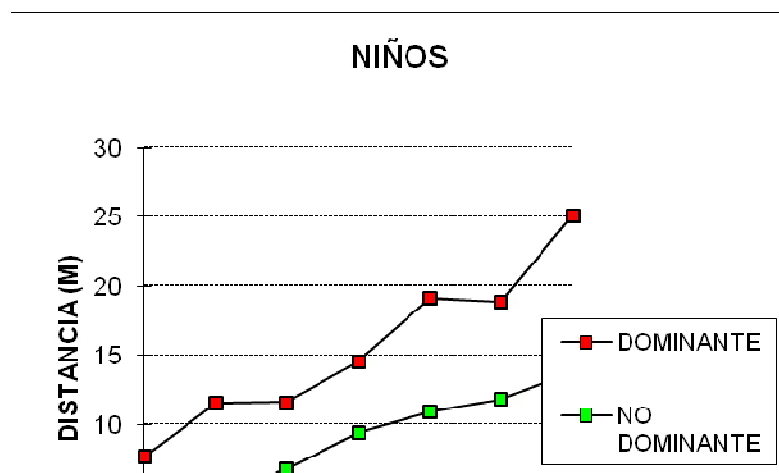
GRAFICA 2. LANZAMIENTO A MAXIMA DISTANCIA EN NIÑOS
(SEGMENTO DOMINANTE Y NO DOMINANTE)

	NIÑAS						
	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
DOMINANTE	5,05	8,8	7,05	9,85	10,4	12,65	15,35
NO DOMINANTE	3,45	5,9	4,9	6,05	7,2	8,8	12,35
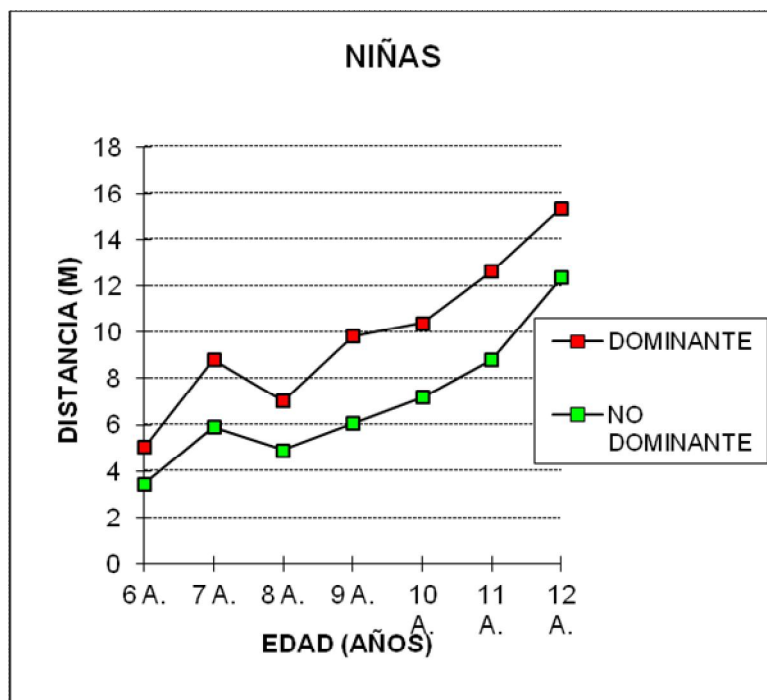
GRAFICA 3. LANZAMIENTO A MAXIMA DISTANCIA EN NIÑAS
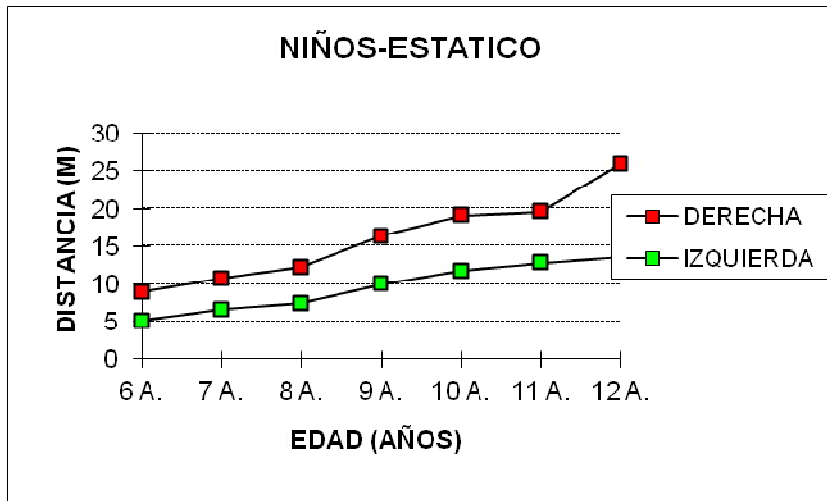**(SEGMENTO DOMINANTE Y NO DOMINANTE)**

NIÑAS Y NIÑOS						
	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
ESTATICO	5,825	8	8,125	10,825	12,525	13,9	17,325
DINAMICO	4,625	7,6	6,775	9,2	11,25	12,475	15,2
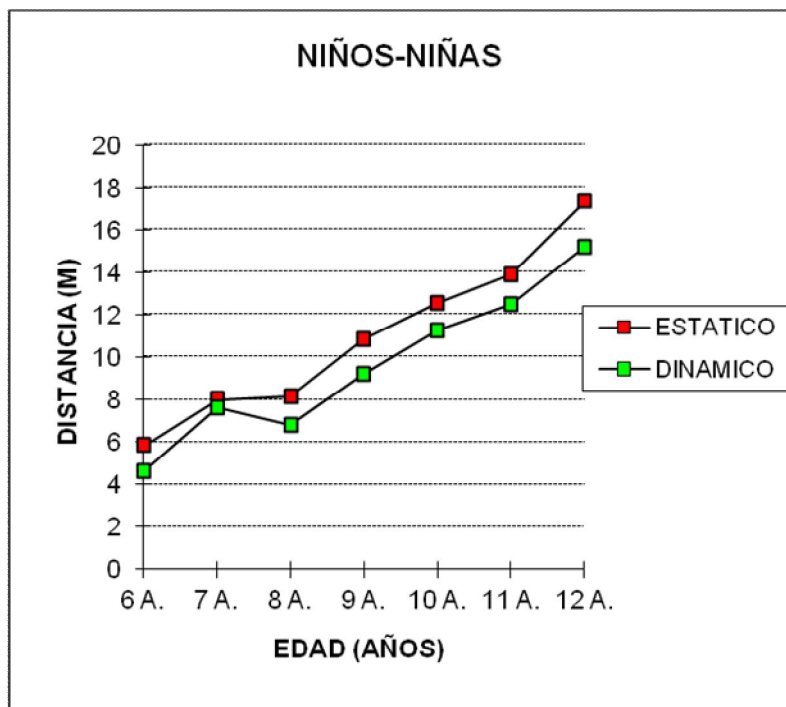
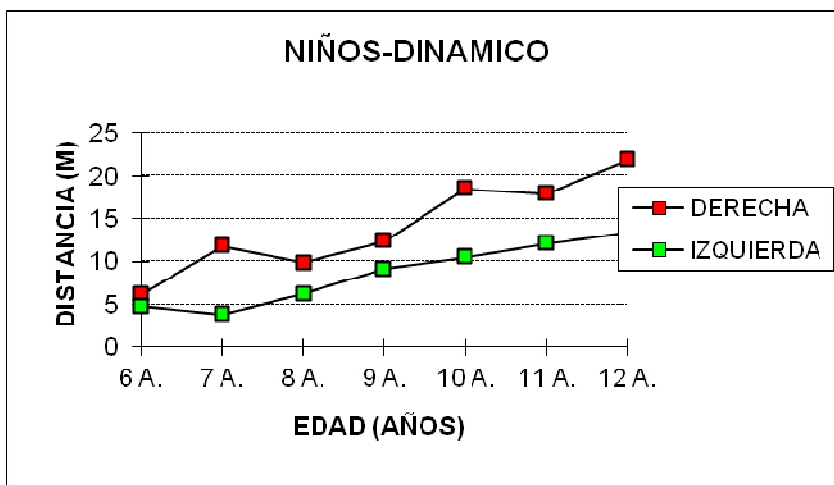**GRAFICA 4. LANZAMIENTO A MAXIMA DISTANCIA NIÑOS-NIÑAS**
(ESTATICO Y DINAMICO)

NIÑOS-ESTATICO						
	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
DERECHA	8,9	10,7	12,2	16,3	19,1	19,6	25,9

IZQUIERDA		5,1	6,6	7,5	10	11,8	12,8	13,6

A.

NIÑOS-DINAMICO

	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
DERECHA	6,1	11,8	9,8	12,4	18,5	17,9	21,8
IZQUIERDA	4,7	3,8	6,2	9,1	10,5	12,1	13,4

B.

GRAFICAS 2.A. Y 2.B.

NIÑAS-ESTATICO

	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
DERECHA	5,2	8,6	6,9	10	11,1	13,2	15,6
IZQUIERDA	4,1	6,1	5,9	7	8,1	10	14,2

	6 A.	7 A.	8 A.	9 A.	10 A.	11 A.	12 A.
			NIÑAS-DINAMICO				
DERECHA	4,3	8,7	6,2	8,8	9,3	11,1	14,4
IZQUIERDA	3,4	6,1	4,9	6,5	6,7	8,8	11,2

NIÑAS-DINAMICO

GRAFICAS 3.A. Y 3.B.