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HANDEDNESS AND BIRTH ORDER

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ÖZET

Bu çalışma el tercihi ile düşük (LRBO) ve yüksek riskli (HRBO) doğum sıraları arasındaki ilişkiyi ve ailenin sosyoekonomik düzeyi ile çocuğun el tercihi arasındaki ilişkiyi araştırmak amacıyla Edirne merkezindeki ortaokul 1. sınıf öğrencilerinin tamamı alınarak yapılmıştır.

Ancak yüksek ve düşük riskli doğum sıraları ile el tercihi arasında anlamlı ilişki bulunamamıştır. Beklenenin tersine yüksek riskli doğum sırasına sahip çocuklarda solaklık daha yüksek oranlarda olmasına rağmen aradaki fark anlamsızdır.

Solaklık ile anne eğitim düzeyi ve ailenin sosyoekonomik durumu arasında pozitif korelasyon bulunmuştur.

Literatürde solaklık ile riskli doğum sırası arasında pozitif ilişki bulan çalışmalar olduğu gibi tersi çalışmalar da vardır. Bizim bulgularımız ilişki olmadığı yönündedir.

Anahtar Kelimeler : El tercihi, doğum sırası

ABSTRACT

EL TERCİHİ VE DOĞUM SIRASI

This study was designed to investigate the relation between handedness and highly or lowly risk birth orders (HRBO and LRBO, respectively) and the possible effect of socioeconomical status of the family on the child's hand preference.

Although not significant statistically HRBO was found to be higher among right handers in contrary to the left handers in whom LRBO was higher.

A positive correlations was found between both the maternal education level and socioeconomical status of the families and the left handedness.

We concluded that our findings do not seem to support the hypotesis suggesting that left handedness in some cases may be the sequelas of neurological traumas, the subjects had been exposed, during prenatal and/or natal periods.

Key Words: Hand preference, birth order.

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INTRODUCTION

The common idea about handedness supports the view that the choice of left or right hand use in unimanual tasks is genetically determined (1,2). On the other hand some authors suggest that this is not true for all the subjects and at least in some cases, left handedness may well be the result of certain neurological traumas occured during prenatal and/or natal periods (3-7).

Birth orders may be classified in two categories according to the relative risks (3-5,8,9). These are:a) Low risky birth orders (2. and 3. births) b) High risky birth orders (1. and ≥4. births) Contradictory results have been reported about the frequency of left handedness or non-righthandedness in HRBO (3-6,10-20).

There are many clinical studies reporting either the relationship between handedness and HRBO or between handedness and some neurological disorders such as epilepsy (21,22), mental retardation (23-25), dislexia and stuttering (23,26-28); all seem to support the hypothesis suggesting the positive correlation between the left handedness and prenatal and/or natal neurological traumas, at least (28,29).

This study was designed to investigate the possible associations between the handedness and HRBO plus the socioeconomical statues of the families of 1726 secondary school students.

MATERIALS AND METHODS

The study population comprised 1726 volunteer subjects of which 733 were females (42.5%) and 993 were males (57.5%) with an average age of 12.2 ±0.6 (mean and SD) years. All the subjects were the attending students in the first class of all of the 9 secondary schools located in the center of Edirne in Turkey.

To assess hand preference, all the volunteers were subjected to a Turkish version of Oldfield's questionnaire modified by Geschwind and Behan (27,30,31). The questionnaire includes ten main items such as writing, throwing, toothbrushing among others and five alternatives items for each main item (always right, usually right, either hand, usually left and always left), and the scoring was performed as +10, +5, 0, -5 and -10 for each alternative item respectively.

After having scored the questionnaires, a laterality score (Geschwind Score) was calculated for every subject between +100 and -100. A score of -100 indicated that the subject replied "always left," and +100 "always right" for all items. According the Geschwind scores, the subjects were divided into five groups:

1. GS from 80 to 100	Strong right handers (SRH)
2. GS from 20 to 75	Weak right handers (WRH)
3. GS from -15 to +15	Mixed handers (MH)
4. GS from -20 to -75	Weak Left Henders (WLH)
5. GS from -80 to -100	Strong left handers (SLH)

Table I: Handedness and Gender

Hand Preference	Males		Females		Total	
	n	%	n	% n	%	
SRH	655	66.0	461	62.9	1116	64.6
WRH	250	25.2	226	30.7	476	27.5
MH	16	1.6	7	1.0	23	1.5
WLH	27	2.7	13	1.8	40	2.3
SLH	45	4.5	26	3.6	71	4.1
Total	993	100.0	733	100.0	1726	100.0

Volunteers were also subjected a second questionaire in order to evaluate a possible association between birth orders and the socioeconomical status. Birth orders were classified as either HRBO (1. and ≤4.births) or LRBO (2. and 3.births).

RESULTS

Hand preferences and the sex distributions among the study population were presented in Table I. The birth orders and hand preferences of the whole study group, of only male subjects and of only female subjects were represented in Tables II, III ,IV respectively.

The association between the birth orders and the hand preferences represented in Table V and Table VI; the handedness being subgrouped as left and right handers in Table V and right or non-right handers in Table VI.

Table II: Birth Order and Handedness in Population

Birth Order	SRH		WRH		MH		WLH		SLH	
	n	%	n	%	n	%	n	%	n	%
HRBO	585	52.4	239	50.2	12	52.2	16	40.0	35	49.3
LRBO	531	47.6	237	49.8	11	47.8	24	60.0	36	50.7
Total	1116	100.0	476	100.0	23	100.0	40	100.0	71	100.0

FD=4; X^2=2.95; p=0.57

Table III: Handedness And Birth Order in Males

Birth Order	SRH		WRH		MH		SLH		WLH	
	n	%	n	%	n	%	n	%	n	%
HRBO	325	49.6	120	48.0	7	43.8	9	33.3	23	51.1
LRBO	330	50.4	130	52.0	9	56.2	18	66.7	22	48.9
Total	655	100.0	250	100.0	16	100.0	27	100.0	45	100.0

FD=4;X^2=3.08;p=0.54

Table IV: Handedness And Birth Order in Females

Birth Order	SRH n	SRH %	WRH n	WRH %	MH n	MH %	WLH n	WLH %	SLH n	SLH %
HRBO	260	56.4	119	52.7	4	57.1	7	53.8	12	46.2
LRBO	201	43.7	107	47.3	3	42.9	6	46.2	14	53.8
Total	461	100.0	226	100.0	7	100.0	13	100.0	26	100.0

FD=4; X^2=1.70; p=0.79

DISCUSSION

Although being statistically insignificant, our findings which were conflicting with the "pathological left handedness hypotesis" showed that the rate of HRBO was higher in righthanders group while LRBOamong the left handers.

On the other hand, this results proved to confirm the studies carried out by Hubbard (14) and by some other resarchers who reported that norelationship exist between handedness and birth order (10,11,13-20).

Bakan, determined the hand preferences of his subjects by asking the usual choice of hand for writing in his study(4). Some authors reported that instrument usage is age-related (32,33). On the other hand, Badien's study population comprised children among whom instrument usage was difficult to be asssessed certainly.(3). The rates Leviton and Kilty reported for the left handers in their resarches seem to be incompatible for a reliable statistical evalution (6). Consequently these different and somewhat conflicting results could be interpreted as this field of medicine need further scientific investigations.

Bakan has suggested a presence of a possible association between handedness and low socioeconomical status, because of the risk of perinatal mortality and birth complications encountered among thisfamilies (34). We found statistically significant negative correlation between Geschwind scores and either economical status or mother's educaion level (r= -0.11; p 0.016, r= -0.11; p=0.001 respectively) (35). The study carried out by Leiber and Axelrod also confirms this negative corelations (36).

Table V: Handedness and Birth Order

Birth Order	Females RH n	Females RH %	Females LH n	Females LH %	Males RH n	Males RH %	Males LH n	Males LH %	Total RH n	Total RH %	Total LH n	Total LH %
HRBO	379	55.2	19	48.7	445	49.2	32	44.4	824	51.8	51	45.4
LRBO	308	44.8	20	51.3	460	50.8	40	55.6	768	48.2	60	54.6
Total	687	100.0	39	100.0	905	100.0	72	100.0	1592	100.0	111	100.0

FD=3;X^2=7.37;p=0.06 FD=1; X^2=1.80; p=0.28

Table VI: Non-Right Handedness and Birth Order

	Females				Males				Total			
Birth	RH		NRH		RH		NRH		RH		NRH	
Order	n	%	n	%	n	%	n	%	n	%	n	%
HRBO	379	57.7	23	50.0	445	49.2	39	44.3	824	51.8	63	47.0
LRBO	308	42.3	23	50.0	460	50.8	49	55.7	768	48.2	71	53.0
Total	687	100.0	46	100.0	905	100.0	88	100.0	1592	100.0	134	100.0

FD=1;X^2=0.83;p=0.33 FD=3;X^2=7.67;p=0.53

There are many studies reported about the handedness and neurological diseases. The results of our study show that no relationship between handedness and birth order.

Bee has reported that intelligence quotient (IQ) is higher in first child of families (37). It was found that, although insignificant statistically, HRBO children have been found to be more successfull in school compared with LRBO children (35).

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