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The Position of the Monozygotic Twins Among their School Class-Mates in the Light of Results of Janusz Korczak's "Plebiscite on Likes and Dislikes"

K. S. Sawicki[1], E. Rogucka[2]

[1] *University of Szczecin, Department of Anthropology;* [2] *Polish Academy of Sciences, Institute of Anthropology, Wrocław, Poland*

Abstract. Within the "Wrocław Longitudinal Twin Study" in a part of the material the liking level of singletons (SIN) to identical twins (T_{MZ}) and of T_{MZ} to SIN was analysed cross-sectionally, in the period of 11th to 18th year of life. In each of the 76 classes of elementary and high schools in Wrocław (Poland), including the investigated in 1976-7 T_{MZ} (64 pairs), were evaluated the relations between school-mates, using the Korczak's five-degree scale of liking. The declared by T_{MZ} and SIN liking decreased with age between pupils of the same sex, and increased between pupils of opposite sex, however, in T_{MZ} with some delay. The liking declared by T_{MZ} of both sexes to SIN was on average lower than that declared by SIN to T_{MZ}. The degree of liking declared by SIN to T_{MZ} of the same sex was average higher than in relation of SIN to SIN particularly among girls. Thus, there occurred the so-called "prima donna effect". The liking declared to pupils of opposite sex in relation of SIN to T_{MZ} was on average lower than the analogous one in relation of SIN to SIN and in relation T_{MZ} to SIN even worse. The higher contrast in treating pupils of the same and opposite sex in T_{MZ} than in SIN indicates a lower social maturity in T_{MZ}. A diverse influence of socio-economic conditions on the declared toward then liking by boys and girls was found. The low number of separated twins did not allow to make a generalisation on specificity of their position in class. The sending of T_{MZ} to different classes appeared to be in Wrocław elementary schools sporadic (1 repeater), and in high schools observed in 38%, from that 28% of twins went to equivalent classes, usually in different school, and in 10% of pairs one of the twins repeated the class.

Key words: MZ twins in school, Sociometry, Liking relations between twins and singletons, Korczak's plebiscite on likes and dislikes, "Prima donna effect", Separation of MZ twins in school, "Wrocław Longitudinal Twin Study"

INTRODUCTION

Twins, particularly identical twins (T_{MZ}) make a specific group, not only because of worse pre- and perinatal developmental conditions than singletons, but they are distinguishable also from dizygotic twins by a particularly strong psychical bonds in pairs, intensified also by persons of their environment, who frequently do not distinguish them, treating a pair as an attractive whole. Twins frequently play together, reducing this way their contacts with environment, delaying their progress in language development [8]. Moreover, according to Zazzo, in pairs the occurring specialisation of one co-twin to "represent the pair in contacts with environment" retards the development of self-dependence of the other [26]. To cope with that phenomenon and to prevent an excessive competition between co-twins, and also to facilitate teachers to work in many societies, particularly English speaking societies, the twins in school were separated, sometimes routinely. Now the routine is frequently abandoned, and separation of twins is postulated in well-founded cases, frequently only for a certain period [16].

The procedure in favour of an optimal development of twins needs to know their social position among mates. To have friends and have the feeling to be liked are important health catalysts, thus also for proper physical and psychical development [24].

Within the longitudinal studies on physical development of twins conducted in the years 1967-83 in elementary and high schools in Wrocław by the Polish Academy of Sciences – Institute of Anthropology (Wrocław Longitudinal Twin – WLTS), among children from classes with twins, in 1976-7, the "plebiscite on likes and dislikes" was carried out only once [15]. This plebiscite was used formerly with success by its inventor Janusz Korczak in his educational practical (J. Korczak was a world-wide known pedologist, educator and writer, killed together with Jewish children from the Warsaw Ghetto by the German Nazi in 1942). Imitating the old play of school-girls, who marked their school-mates and teachers with "degrees of likes", Korczak began to use this method in 1904 to children under his charge in holiday camps [3], and in 1920 introduced it as a "plebiscite of likes and dislikes" into his routine determination of the situation of his pupils in orphanage societies. According to Natalia Han-Ilgiewicz's statement, who cooperated with Korczak in 1924-1935 in the Warsaw Institute of Special Pedagogic, his simple method appeared to be more useful in Polish pedagogical practice than the method introduced later (in the thirties) by Jacob Moreno, the author of the notion "sociometry" [7]. At present also among educators the usefulness of "Korczak's view of the child in group" is recognised [25]. In the WLTS the Korczak's plebiscite data were designed mainly for assessment, in particular cases, of the relation between advancement of physical development of twins and the level of liking shown to them by their school mates.

The aim of the present elaboration is to recognise the situation of MZ twins in Wrocław school class groups in 1976-7 in respect of the liking degree with which they were endowed by their class mates.

MATERIAL AND METHODS

76 classes with identical twins (T_{MZ}) were analysed: 34 pairs of boys and 30 pairs of girls. The male MZ twins accounted for 56%, and female MZ twins 57% of all MZ twins, respectively male and female MZ twins investigated within the WLTS. This is a sample of twins from Wrocław schools from the school year 1976/77. In Wrocław elementary schools 12 pairs of MZ-boys and 20 pairs of MZ girls were investigated in 32 classes from 5 to 8 grade, and only in one of them the twin pair was incomplete. In high schools 22 pairs of MZ-boys and 10 pairs of MZ-girls were investigated in 44 classes from I to IV grade, and in 24 classes the twin pairs were incomplete.

The children in the particular classes were more or less of the same age. The youngest were 11 years and the oldest 18 years old (Tables 1 and 3). In the statistical elaboration only evaluations of liking were taken into account concerning pupils present in class during the carrying out of the plebiscite, but in cases of absence of an MZ-twin, the liking declarations referring to him were accepted and processed. Only few persons refused to participate in the plebiscite. Altogether, the data used were obtained from

Table 1 - Numbers of surveyed classes with MZ twins according to: 1) school age of pupils, 2) percentages of boys in the given class, and 3) sex of MZ twins in the given class (b - boys, g - girls). In parentheses: numbers of examined classes with only one twin

School age	Age of pupils (years)	Boys percent in given class								Total		
		0%	1-40%		41-60%		61-99%		0%	0-100%		
Elementary schools		g	b	g	b	g	b	g	b	b	g	b+g
5	~11					2					2	2
6	~12			1	1	2		1		2	4	5
7	~13				5(1)	7				5(1)	7	12(1)
8	~14			1	6	4		2		6	7	13
Σ				2	12(1)	15		3		12(1)	20	32(1)
High schools												
9 (I)	~15	2(2)	1(1)		2(2)	1		1	6(5)	9(8)	4(2)	13(10)
10 (II)	~16		2	1(1)			4(2)	1	4(3)	10(5)	5(3)	15(8)
11 (III)	~17	2	1(1)	2	3(3)		4(2)			8(6)	4	12(6)
12 (IV)	~18		2				1		1	4		4
Σ		4(2)	6(2)	3(1)	5(5)	4(2)	9(4)	2	11(8)	31(19)	13(5)	44(24)
Total (~11- ~18)		4(2)	6(2)	5(1)	17(6)	19(4)	9(4)	5	11(8)	43(20)	33(5)	76(25)

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Table 2 - Distribution characteristics of mean liking degree expressed by the given pupil to the remaining pupils in class (Lx/xx) in all surveyed classes and correlation coefficients of mean values for the given pupil Lx/xx with age ($r_{M/t}$) calculated separately for liking evaluations of boy to boys (b/bb), girl to girls (g/gg), boy to girls (b/gg) and girl to boys (g/bb). The characteristics are given separately for singletons, MZ twins first and second born ($T1_{MZ}$ and $T2_{MZ}$) and MZ twins regardless of birth order ($T(1+2)_{MZ}$)

Lx/xx	Groop	N of pupils	M_M	S_{Mm}	Me_M	Mo_M	SD_M	$r_{M/t}$
b/bb	Singletons	1009	3,750	0,013	3,750	4	0,422	–0,12**
	$T1_{MZ}$	33	3,793	0,071	3,769	4	0,409	–0,02
	$T2_{MZ}$	32	3,780	0,068	3,748	4	0,383	–0,06
	$T(1+2)_{MZ}$	65	3,787	0,050	3,758		0,396	
g/gg	Singletons	894	3,797	0,015	3,800	4	0,438	–0,16**
	$T1_{MZ}$	30	3,947*	0,084	3,962	3,7	0,459	–0,13
	$T2_{MZ}$	31	3,823	0,075	3,833	3,5	0,419	–0,12
	$T(1+2)_{MZ}$	61	3,883	0,057	3,896		0,444	
b/gg	Singletons	769	3,567	0,017	3,563	4	0,482	0,11**
	$T1_{MZ}$	26	3,404*	0,106	3,367	3	0,539	0,06
	$T2_{MZ}$	25	3,488	0,086	3,500	3	0,430	0,03
	$T(1+2)_{MZ}$	51	3,445	0,069	3,432		0,490	
g/bb	Singletons	768	3,325	0,017	3,333	3	0,480	0,27**
	$T1_{MZ}$	27	3,199	0,122	3,143	3	0,632	0,24
	$T2_{MZ}$	27	3,295	0,098	3, 125	3	0,510	0,58**
	T(1+2)MZ	54	3,247	0,079	3,134		0,576	

2031 pupils, including twins. The zygosity of twins was determined by means of serological and morphological examinations, with a reliability of at least 0,9916 [18, 22]. Apart of plebiscite data, also a documentation on familial environment of the twins was collected [22, 23].

In many sociometric elaborations, likes and dislikes are used separately as different characteristics [1, 5, 24]. In the present paper dislikes were recognised as a low degree of liking, and liking understood this way, like Korczak did, is expressed here in a 5-degree scale [13]: the plebiscite form includes in the first column the list of all pupils in the class, every pupil entered in the second column, by each class-mate name, his degree of liking him or her:

5 – I definitely like

4 – I rather like

3 – I am indifferent

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2... – I rather dislike

1... – I definitely dislike

The present version of the plebiscite is one of several versions used by Korczak to indentify the position of child in a group of children of different age [13]. As opposed e.g. to the " verbal version " used by Korczak for surveying pre-school children, the child's self-estimation [14] has not been used in our survey.

The plebiscite was carried out, according to the same instruction, by specially trained psychology students. The students secured the secrecy of the declarations and explained that the evaluation of liking should be a general one, not connected with single behaviour, positive or negative in relation to the person giving the evaluation. In the line concerning their own person, the pupils were instructed to record 3.

Statistical elaboration

The computer program-package SPSS were used for the following calculations:

1. For each pupil from a given class, arithmetical means (M) and standard deviations (SD) were computed as follows: a) degree of liking expressed towards other class-mates (Lx/xx) with separation of evaluations of boy to boys (b/bb) girls to girls g/gg, boy to girls (b/gg) and girl to boys (g/bb); b) degree of liking expressed to given pupil by other pupils (Lxx/x), with separation of evaluations of boys to boy (bb/b), girls to girl (gg/g), boys to girl (bb/g) and girls to boy (gg/b).
2. Further the distributions of these statistics were analysed, comparing liking attitudes of singletons to singletons, MZ twins to singletons and singletons to MZ twins, first in whole material, separating the first born ($T1_{MZ}$) from the second born twins ($T2_{MZ}$), and additionally among youth from high schools, in classes with twins separated on their own free will, or by decision of parents or educators, and classes with twins of which one of the twins was kept back. The separated groups of material were compared in respect to mean (M_M), median (Me_M) and modal (Mo_M) values of M in particular pupils (described above, in point 1), standard deviation of mean values M, designated as SD_M, and also mean standard deviations SD in particular pupils (M_{SD}), and standard deviation of these means ($SD_{M.SD}$) of liking degrees declared by given pupils to male and female mates from class (Tables 2-4 and 8). To facilitate the comparisons, the means M_M of MZ twins liking to singletons and singletons liking MZ twins in particular parts of the material (mentioned in point 1) were expressed in percentages of adequate values of M_M of liking degrees declared by singletons to singletons (Tables 5 and 6), and values of M_M of liking declared by singletons to twins – in percentages of M_M values of liking declared by twins to singletons (Table 7).
3. We also analysed the correlation of the calculated values M and SD of liking degrees, expressed by particular pupils to their male and female mates in class, and the liking attitude of the latter obtained from them, with the age of these pupils. The Kendall's, Spearman's and Pearson's correlation coeffcients in particular groups of the material, separated according to sex, taking into considera-

Table 3 - Age changes in liking characteristics expressed by the given boy (b) or girl (g) to other boys or girls from class (Lx/xx). Symbols as in Table 2

Lx/xx		Age of pupils (years)								L singletons to singletons Total	L MZ twins to singletons Total[1)]
		Elementary schools				High schools					
		11	12	13	14	15	16	17	18		
b/bb	N of pupils	30	69	137	175	221	201	142	34	1009	65
	M_M	3,929	3,806	3,802	3,810	3,761	3,660	3,636	3,861	3,750	3,787
	SD_M	0,414	0,423	0,439	0,386	0,447	0,368	0,444	0,374	0,422	0,396
	M_{SD}	0,868	0,823	0,826	0,786	0,781	0,776	0,805	0,611	0,788	0,775
	$SD_{M.SD}$	0,300	0,308	0,369	0,324	0,317	0,293	0,351	0,398	0,327	0,378
g/gg	N of pupils	32	72	145	165	135	131	161	53	894	61
	M_M	3,964	3,817	3,886	3,836	3,779	3,794	3,673	3,733	3,797	3,883
	SD_M	0,419	0,531	0,449	0,481	0,437	0,347	0,399	0,369	0,438	0,444
	M_{SD}	0,909	0,905	0,898	0,826	0,901	0,782	0,814	0,794	0,848	0,890
	$SD_{M.SD}$	0,341	0,346	0,323	0,303	0,310	0,278	0,319	0,257	0,312	0,312
b/gg	N of pupils	30	69	137	175	77	105	142	34	769	51
	M_M	3,560	3,417	3,604	3,494	3,608	3,484	3,728	3,589	3,567	3,445(*)
	SD_M	0,445	0,388	0,384	0,465	0,433	0,520	0,603	0,340	0,482	0,490
	M_{SD}	0,882	0,687	0,761	0,694	0,738	0,632	0,511	0,505	0,670	0,764
	$SD_{M.SD}$	0,328	0,335	0,300	0,315	0,309	0,371	0,465	0,318	0,368	0,421
g/bb	N of pupils	32	72	145	165	90	99	112	53	768	54
	M_M	3,062	3,131	3,261	3,239	3,501	3,364	3,440	3,579	3,329	3,247
	SD_M	0,463	0,485	0,511	0,460	0,462	0,495	0,412	0,299	0,480	0,576*
	M_{SD}	0,975	0,903	0,894	0,807	0,829	0,776	0,710	0,609	0,810	0,801
	$SD_{M.SD}$	0,304	0,343	0,300	0,276	0,315	0,385	0,333	0,218	0,324	0,334

tion the division into singletons and MZ twins first and second born, appeared to be similar. Therefore, the obtained results are presented only by Pearson's coefficients (Table 2 and 4).

For MZ twins we also calculated correlations of liking statistics, expressed by them to their class-mates (Lx_T/xx) and of liking expressed to them by their class-mates (Lxx/x_T), and the socio-economic status of these twins described by characteristics mentioned in Table 9. These characteristics were taken from previous papers [22, 23].

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Table 4 - Distribution characteristics of mean liking degree expressed by pupils towards a given pupil in class (Lxx/x) in all surveyed classes and correlation coefficients of mean values for the given pupil Lxx/x with age of pupils ($r_{M/t}$) calculated separately for liking evaluations of boys to given boy (bb/b), of girls to given girl (gg/g), of boys to given girl (bb/g) and of girls to given boy (gg/b). Further explanations as in Table 2

Lxx/x	Groop	N of pupils	M_M	S_{Mm}	Me_M	Mo_M	SD_M	$r_{M/t}$ [2]
bb/b	Singletons	1009	3,750	0,014	3,790	4	0,442	–0,12**
	$T1_{MZ}$	34	3,834	0,070	3,810	4	0,410	–0,05
	$T2_{MZ}$	33	3,842	0,070	3,830	3,1	0,404	0.05
	$T(1+2)_{MZ}$	67	3,838	0,050	3,820		0,407	
gg/g	Singletons	894	3,787	0,016	3,820	4	0,491	–0,12**
	$T1_{MZ}$	30	3,970	0,083	4,065	3,1	0,454	–0,16
	$T2_{MZ}$	31	3,969	0,082	4,080	3,9	0,454	–0,23
	$T(1+2)_{MZ}$	61	3,970	0,059	4,073		0,454	
bb/g	Singletons	768	3,534	0,018	3,575	4	0,498	0,03
	$T1_{MZ}$	27	3,514	0,088	3,530	3,3	0,457	0,00
	$T2_{MZ}$	27	3,528	0,092	3,530	3	0,478	-0,03
	$T(1+2)_{MZ}$	54	3,521	0,064	3,530		0,468	
gg/b	Singletons	769	3,364	0,021	3,400	4	0,589	0,19**
	$T1_{MZ}$	27	3,357	0,107	3,290	3,3	0,556	0,32
	$T2_{MZ}$	26	3,288	0,118	3,230	4	0,601	0,28
	$T(1+2)_{MZ}$	53	3,323	0,080	3,261		0,580	

RESULTS

Liking attitude of twins to their class-mates

Individual mean values of liking degrees (M) declared by particular pupils to their class-mates ranged in twins from 1,5 to 5, and in singletons from 1 to 5. The extremely low values occurred both in MZ twins and singletons in relation to the opposite sex. The statistics of liking degrees, presented in Table 2, show that the most frequent (Mo) evaluation of liking was the mark 4, and only girls declared their liking to boys, and male-twins to girls with mark 3. However always, also in relation to the opposite sex and in all age-groups, the means of mean liking degrees (M_M) and medians of individual means (Me_M) were higher than mark 3. Thus, likes dominated over dislikes. Pupils of the same sex, singletons and twins, declared to each other on average a higher liking attitude than pupils of opposite sex, particularly girls to girls (Tables 2-4 and 8).

The declared mutual liking of singletons, as well as of twins of the same sex – boys

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Table 5 - Means (M_M) and medians (M_{Me}) calculataed from means (M), for particular pupils, of liking degrees declared by MZ twins to singletons (Lx_T/xx), in percentages of analogous statistics of liking declared by singletons to singletons (Lx/xx). Values statistically significantly different from 100% are marked by (*) for 0.05<p<0.1; *0,05≥p>0,01; **p≤0,01

Liking degrees declared by twin-boy to singleton boys (Lb_T/bb) in percentages Lb/bb		N of pupils	M_M%	M_{Me}%
Total material:	$T1_{MZ}$	33	101,1	100,5
	$T2_{MZ}$	32	100,8	99,9
	$T(1+2)_{MZ}$	65	101,0	100,2
Separated twins from high school		21	98,9	
Liking degree declared by twin-girl to singletons girls (Lg_T/gg) in percentages Lg/gg				
Total material:	$T1_{MZ}$	30	104,0*	104,3*
	$T2_{MZ}$	31	100,7	100,9
	$T(1+2)_{MZ}$	61	102,3	102,5
Separated twins in high school		6	103,9	
Liking degree declared by twin-boy to singletons-girls (Lb_T/gg) in percentages Lb/gg				
Total material:	$T1_{MZ}$	26	95,4*	94,5*
	$T2_{MZ}$	25	97,4	98,2
	$T(1+2)_{MZ}$	51	96,6 (*)	96,3(*)
Separated twins in high school		13	97,1	
Liking degree declared by twin-girl to singletons-boys (Lg_T/bb) in percentages Lg/bb				
Total material:	$T1_{MZ}$	27	96,2	94,3
	$T2_{MZ}$	27	99,1	93,8
	$T(1+2)_{MZ}$	54	97,7	94,0**
Separated twins in high school		3	94,9	

to boys and girls to girls – decreased with age, however, it increased in relations between pupils of opposite sex. This is in the first by the negative, and positive, in second situation, values of correlation coefficients of means from liking degrees with age ($r_{M/t}$). These coefficients, calculated separately for MZ twins and singletons, did not differ significantly (Table 2).

The large number of singleton allowed observations, on the basis of data from Table 3, to analyse the shown by correlations $r_{M/t}$ tendencies in age changes of individual values M of liking attitudes of singletons to singletons in consecutive age groups in youth, as well as age changes in standard deviations of these means (SD_M), mean values of stan-

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Table 6 - Means (M_M) and medians (M_{Me}) calculated from means (M), for particular pupils, of liking degrees declared by singletons to MZ twins (Lxx/x_T), in percentages of analogous statistics of liking declared by singletons to singletons (Lx/xx). Values statistically significantly different from 100% are marked as in Table 5

		N of pupils	M_M%	M_{Me}%
Liking degrees declared by singleton boys to-twin boys (Lbb/b_T) in percentages Lbb/b				
		34	102,2	100,5
Total material:	$T1_{MZ}$	33	102,5	101,1
	$T2_{MZ}$	65	102,3	100,8
	$T(1+2)_{MZ}$	21	103,3	
Separated twins from high school				
Liking degrees declared by singletons girls to twin-girls (Lgg/g_T) in percentages Lgg/g		30	104,8*	106,4*
Total material:	$T1_{MZ}$	31	104,8*	106,8*
	$T2_{MZ}$	61	104,8**	106,6**
	$T(1+2)_{MZ}$	6	97,1	
Separated twins in high school				
Liking degrees declared by singleton-boys to twin-girls (Lbb/g_T in percentages Lbb/g		27	99,4	98,7
Total material:	$T1_{MZ}$	27	99,8	98,7
	$T2_{MZ}$	54	99,6	98,7
	$T(1+2)_{MZ}$	13	98,7	
Separated twins in high school				
Liking degrees declared by singleton-girls to twin boys (Lgg/b_T) in percentages Lgg/b		27	99,8	96,8
Total material:	$T1_{MZ}$	27	97,7	95,0
	$T2_{MZ}$	54	98,8	95,9*
	$T(1+2)_{MZ}$	3	98,9	
Separated twins in high school				

dard deviations in evaluations of liking in particular children (M_{SD}) and standard deviations from these means ($SD_{M.SD}$).

The decrease of means from individual liking values (M_M), declared to pupils of the same sex, both in b/bb and in g/gg relation in age groups 11 to 17 years, was approximately monotonous, at the same time the declared liking attitude between girls was constantly higher than between boys. Only in the fast form of high school showed, particu-

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Table 7 - Means (M_M) and medians (M_{Me}) calculated from means (M), for particular pupils, of liking degrees declared by MZ-twins to singletons (Lxx/x_t), in percentages of analogous statistics of liking declared by singletons to singletons (Lx_t/xx). Values statistically signficantly different from 100% are marked by: (*) for 0.05<p<0.1; *p<0,05

		N of pupils	M_M%	M_{Me}%
Liking degrees declared by singleton boys to-twin-boys (Lbb/b_T) in percentages Lb_T/bb				
Total material:	$T1_{MZ}$	33	101,1	101,9
	$T2_{MZ}$	32	101,6	102,2
	$T(1+2)_{MZ}$	65	101,4	101,7
Separated twins from high school		21	104,6	
Liking degrees declared by singletons girls to twin-girls (Lgg/g_T) in percentages Lg_T/gg				
Total material:	$T1_{MZ}$	30	100,6	102,6
	$T2_{MZ}$	31	103,8	106,4*
	$T(1+2)_{MZ}$	61	102,2	104,5*
Separated twins in high school		6	93,6	
Liking degrees declared by singleton-boys to twin-girls (Lbb/g_T) in percentages Lb_T/gg				
Total material:	$T1_{MZ}$	26	103,2	104,8
	$T2_{MZ}$	22	101,2	100,9
	$T(1+2)_{MZ}$	48	102,2	102,9
Separated twins in high school		13	100,2	
Liking degrees declared by singleton-girls to twin boys (Lgg/b_T) in percentages Lg_T/bb				
Total material:	$T1_{MZ}$	27	104,9	104,7
	$T2_{MZ}$	27	99,8	103,4
	$T(1+2)_{MZ}$	54	102,3	104,1*
Separated twins in high school		3	93,0	

larly among boys, an increase in mutual liking declared. In consecutive age groups 11 to 18 years, a slight decrease of values SD_M and M_{SD}, and in girls also $SD_{M.SD}$ was observed (Table 3, parts b/bb and g/gg). The review of individual data has shown, that the decrease of these values, like the decrease of M_M values, is connected with the more and more frequent appearance of declarations " indifferent ".

The relatively low degree of liking declared by pupils of opposite sex, in relation to liking declared by pupils of the same sex, was most evident in younger pupils, particu-

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larly in relation to girls toward boys. It is very interesting the growing wave of liking declared to the opposite sex (particularly in girls) during transition from elementary (secondary) school, into a new environment, to the first form of high school, and a deep depression of liking attitudes in the second form of high school, then in the next forms, the wave of declared liking to the opposite sex grew again, more regularly in girls than in boys (see values M_M in parts b/gg and g/bb in Table 3).

The mean values of standard deviations from individual assessments of liking declared to the opposite sex (M_{SD}), high in young school classes, decreased with the age of the pupils much more than analogous statistics of liking attitudes declared to the same sex (Table 3). Correlation coefficients of these values with age $r_{SD/t}$ were calculated for relations b/bb; g/gg; b/gg and g/bb. They are statistically highly significant and are in turn: -0.09; -0.11; -0.23; -0.25. Constantly higher, in all the surveyed age groups, M_{SD} values in relation to liking attitudes of girls to other pupils, than in relation to liking attitudes of boys to other pupils, particularly in relation to opposite sex, show that girls declared more different liking attitudes to various pupils than boys.

The standard deviations of individual mean values (SD_M) and individual values of standard deviations ($SD_{M.SD}$) of degrees of liking declared to pupils of opposite sex, in the elementary-school period in pupils aged 11 to 14, did not show significant, regular directional changes with age, instead in the first forms of high school their increase has been recorded, particularly in boys, and next a decrease, occurring first in girls and then in boys (Table 3).

The too small number of MZ twin pairs prevented a detailed analysis of age changes in liking, which the twins declared to their school-mates. As mentioned before, we found in singletons and twins the same signs and approximated values of correlation coefficients between M values declared by twins and singleton degrees of liking towards class-mates and age of the pupils (Tables 2 and 4). Also the directions of changes between the analysed statistics of liking degrees declared by a given child to his class-mates turned out to be identical in analogous parts of the whole material of singletons and MZ twins (Tables 2 and 3). The further presented detailed comparison of statistics, showing the level and diversity of liking degrees declared by twins and singletons towards their school-mates, indicates however, in some cases, the occurrence of statistically significant, though small differences between these statistics.

MZ-boys showed to boys from their class, on average, a higher degree of liking (3.787 ± 0.050) than singleton-boys to singleton-boys (3.750 ± 0.013), similarly MZ-girls to girls (values M_M for relations g_t/gg and g/gg were 3.883 ± 0.057 and 3.797 ± 0.015 respectively. However, in relation to opposite sex, MZ twins, so boys as girls, showed a lower degree of liking than singletons. Arithmetical means of liking degrees for MZ twins (M_M for b_t/gg) and singletons (M_M for b/gg) are 3.445 ± 0.069 and 3.567 ± 0.017, and the means M_M for g_t/bb and g/bb are 3.247 ± 0.079 and 3.325 ± 0.017 (Tables 2 and 3). Expressing the M_M of liking attitudes of MZ twins to singletons in percentages of M_M of liking degrees of singletons to singletons reveals greater contrasts between mean and median values of liking degrees declared to pupils of the same and opposite sex by MZ twins than in case of singletons. Worthy of notice is the particularly low liking degree of female twins to boys ($M_{Me} = 94\%$) and the somewhat stronger marked contrasts in expressing liking attitudes to pupils of the same and opposite sex in first born than second born MZ twins: for $T1_{MZ}$ the discussed percent expressions of mean values of

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median liking degrees (M_{Me}) are: for relation g_T/gg 104.3%, and for relation g_T/bb 94.3% (difference = 10%); for $T2_{MZ}$ the respective percentages are 100.9% and 93.8% (difference = 7.1%). The differences in percent values of M_M are: for $T1_{MZ}$ 6.3% and for $T2_{MZ}$ 1.6% respectively. For relation b_T/bb and b_T/gg the differences in per cent values of M_{Me} and M_M are respectively: for $T1_{MZ}$ 6.0% and 4.0%, and for $T2_{MZ}$ 5,4% and 3.0% (Table 5).

Liking attitudes of boys and girls towards twins (Lxx/x_T)

Statistical variation characteristics of liking declared by singletons to MZ twins show in general a similar picture as the discussed above characteristics individual means of liking declared by MZ twins to singletons. Individual means of liking degrees declared by singletons to MZ twins ranged from 2.0 in combination gg/b_T (in cases the singleton girls expressed their liking to boy-twin), to 4.8 in combination gg/g_T, instead, between singletons from 1.25 for gg/g to 5 for gg/g and bb/g. Modes, means and medians of mean liking degrees to twins are presented in Table 4. Modal values ranged from 3.0 for bb/g_T to 4.0 for bb/b_T and gg/b_T. The values of arithmetical means and medians of mean liking degrees declared by singletons to MZ twins exceeded, in all the combinations, the value 3.

Common features of liking attitudes declared by singletons to twins and by twins to singletons can be summarised as follows:

1. The directions of changes with age of mean values of liking degrees declared by singletons to MZ twins, and also by MZ twins to singletons and by singletons to singletons are the same: the liking attitudes towards pupils of the same sex decreased with age, and increased to pupils of the opposite sex. These correlations were stronger in relations singletons/singletons than in relations singletons/twins and twins/singletons, and in relations with twins they were higher (though statistically not significant) in cases where part declaring liking were girls (compare $r_{M/f}$ in Tables 2 and 4).

2. Liking attitudes declared by singletons to twins and by twins to singletons are, on average, higher between pupils of the same sex than of the opposite sex (Table 2 and 4), and, in case of relations between pupils of the same sex they are, on average, higher; in case of relations between pupils of opposite sex they are lower than in analogous relations, attitudes declared by singletons to singletons (Tables 5 and 6).

3. The gradation of liking attitude declared in various sex combinations, in four situations considered: Lx/xx, Lx_T/xx, Lxx/x, and Lxx/x_T, was the same. This gradation from highest to lowest mean values of liking degrees of M_M for these four mentioned in turn situations, according to data from Tables 2 and 4, is as follows:

	Lx/xx	Lx_T/xx	Lxx/x	Lxx/x_T
Liking attitudes of girls toward girls:	3.797;	3.883;	3.787;	**3.970**
Liking attitudes of boys toward boys	3.750;	3.787;	3.750;	**3.838**
Liking attitudes of boys toward girls	3.567;	3.445;	3.534;	**3.521**
Liking attitudes of girls toward boys	3.325;	3.247;	3.364;	**3.323**

An identical gradation may be shown on the grounds of median values of liking degrees, using date from Tables 2 and 4.

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4. Means of declared liking degrees expressed by twins (Lx_T/xx), or twins (Lxx/x_T), are more differentiated than the analogous means of liking degrees declared by singletons to singletons (Lx/xx and Lxx/x). The spaces between means, presented in arrangement in point 3, are in the mentioned cases for Lx_T/xx and Lxx/x_T respectively: 0.639 and 0.647, and for Lx/xx and Lxx/x they are distinctly lower i.e., 0.472 and 0.420.
5. The differences between means of declared liking degrees of twins to singletons and singletons to twins, and the respective means of liking degrees of singletons to singletons (Lx_Txx – Lx/xx and Lxx/x_T – Lxx/x) are between girls more than twice as large than between boys. According to the data arranged in point 3, they are for girls 0.086 and 0.183, and for boys 0.037 and 0.088 respectively. Analogous differences, in case the boys declared their liking to girls are -0.122 and -0.013, and in case the girls declared their liking attitude to boys -0.078 and -0.054.
6. So in twins as in singletons, the girls gave more differentiated liking degrees to their class-mates than boys (compare values M_{SD} in Table 3).

Differences between characteristics of liking attitudes declared by singletons to twins and characteristics of liking declared by twins to singletons can be stressed in the following points:

a) Means and medians of mean liking degrees declared by singletons to twins were higher than the analogous means and medians of liking degrees declared by MZ twins to singletons (compare values M_M and Me_M in Tables 2 and 4). Taking the values of the latter as 100%, then, in whole material, the mean liking degrees declared by singletons to MZ twins are: for bb/b_T 101.4%, for gg/g_T 102.2%, for bb/g_T 102.2%, and for gg/b_T 102.3%. The respective percentages for medians are somewhat higher and are: 101.7%; 104.5%; 102.9% and 104.1%; the two highest values on statistically significantly higher than 100% (Table 7).

b) In liking attitudes declared by singletons to twins, in contrast of liking declared by twins to singletons, no differences connected with birth order of twins were found.

SEPARATED TWINS

In the analysed material the separation of twins in elementary schools has been recorded only in one per 32 pairs. The reason was one of the boys of an MZ pair was kept back a year.

In high schools in 32 surveyed pairs (22 pairs of boys and 10 pairs of girls), the twins from 12 pairs were separated (9 pairs of boys and 3 pairs of girls), i.e. twins of 8 male-pairs and 2 female-pairs were in equivalent classes, and in two male-pairs and one female-pairs, one of the twins from pair was kept back a year. The repeaters in male pairs were first born twins. The birth order of female repeaters has not been settled. Excluding pairs in which one of the twins was a repeater, the co-twins were separated in 40% of male pairs and in 29% of female-pairs.

From comparison of characteristics of mutual liking attitude between singletons in high-school classes with separated MZ twins (Table 8), with analogous characteristics calculated for the whole analysed material (Table 2-4) it results that the mean level of

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mutual liking declared between persons of the same sex decreased (for relations b/bb and bb/b respectively by 1.6% and 1.4%, and for relations g/gg and gg/g by 1.0% and 0.7%), and between persons of opposite sex it, in general, increased (positive increments were for relations b/gg, g/bb and gg/b 1.8%, 4.7% and 6.1% respectively, and only for relation bb/g a decrease of liking level by 0.7 was noted). This is in concordance with the cases described previously, during analysis of whole material, tendencies in changes of the level of declared mutual liking in children with age.

The comparison of characteristics of liking attitudes between separated twins and singletons, with liking characteristics in relations singleton/singleton (Table 8), did

Table 8 - Comparison of characteristics of mutual liking between pupils in collectives of high-school classes with separated twins: Lx/xx – mean liking degree declared by the given pupils to other class-mates, Lxx/x – mean liking degree to the given pupil, declared by its male and female mates. Other explanations in Table 2

Classes with MZ twins: A - in equivalent class (-) and B - one in lower class (=)	N of pupils		Lx/xx				Lxx/x		
			MM	S_{Mm}	SD_M		M_M	S_{Mm}	SD_M
A. Singletons	253	b/bb	3,76	0,025	0,390	bb/b	3,76	0,026	0,420
MZ twins (–)	17		3,62	0,075	0,311		3,78	0,102	0,419
B. Singletons	382		3,65	0,022	0,427		3,66	0,023	0,444
MZ twins (=)	4		3,79	0,131	0,263		4,00	0,061	0,123
Total: Singletons	635		3,69	0,017	0,416		3,70	0,017	0,437
MZ twins	21		3,65	0,069	0,310		3,82	0,087	0,390
A. Singletons	238	g/gg	3,76	0,025	0,392	gg/g	3,76	0,029	0,448
MZ twins (–)	4		3,99	0,079	0,157		3,49	0,201	0,402
B. Singletons	231		3,75	0,026	0,400		3,76	0,030	0,452
MZ twins (=)	2		3,71	0,356	0,504		3,97	0,165	0,233
Total: Singletons	469		3,76	0,018	0,396		3,76	0,021	0,450
MZ twins	6		3,90	0,154	0,344		3,65	0,188	0,421
A. Singletons	173	b/gg	3,57	0,037	0,492	bb/g	3,60	0,044	0,576
MZ twins (–)	12		3,48	0,097	0,337		3,56	0,200	0,693
B. Singletons	220		3,67	0,036	0,537		3,44	0,037	0,543
MZ twins (=)	I		4	–	–		3,14	–	–
Total: Singletons	393		3,63	0,026	0,520		3,51	0,028	0,563
MZ twins	13		3,52	0,102	0,352		3,53	0,195	0,675
A. Singletons	177	g/bb	3,49	0,030	0,398	gg/b	3,56	0,029	0,383
MZ twins (–)	2		3,62	0,077	0,109		3,64	0,060	0,085
B. Singletons	166		3,47	0,038	0,486		3,59	0,037	0,505
MZ twins (=)	1		2,67	–	–		3,33	–	–
Total: Singletons	343		3,48	0,024	0,443		3,57	0,024	0,446
MZ twins	3		3,30	0,323	0,457		3,54	0,115	0,162

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not show statistically significant differences between "acting solo" twins and singletons.

However, it is emphasised that with the low number of separated twins found in the analysed material, only very large differences could be shown.

The influence of socio-economic conditions of MZ twins upon their position in class

The relations between mean liking-degree values declared by twins to singletons (Lx_T/xx) and singletons to twins (Lxx/x_T) and socio-economical conditions of the twins appeared to be statistically significant only in case of female twins (Table 9).

Girl-singletons declared on average a higher liking attitude to girl-twins reared in generally better conditions, expressed by the index of "environmental goodness" [21] with rich outfit of the flat and low number inhabitants in flat, as important factors.

Table 9 - Correlations (Pearson's r) between socio-economic characteristics of MZ twins and liking level declared by them to boys and girls from class (Lx_T/xx) and the liking level declared by boys and girls from class to twins (Lxx/x_T). Because of the high differentiation of proportions of numbers of boys and girls in the surveyed classes (comp. Table 1) only correlations within pupils of the same sex were calculated, excluding separated pairs in result of repeating a class. Consideration was given to 62 male twins (bb) and 60 female twins (gg)

Socio-economic characteristics of MZ twins	Sex	Lx_T/xx	Lxx/x_T
Social status (education and profession of parents)	bb	–0,21	–0,21
	gg	–0,10	0,20
Educational level of father (scale 1-7)	bb	–0,05	–0,17
	gg	–0,12	0,16
Educational level of mother (scale 1-7)	bb	–0,06	0,07
	gg	0,00	0,20
Occupational status of father (scale 1-4)	bb	–0,10	–0,06
	gg	–0,27*	–0,04
Occupational status of mother (scale 1- 4)	bb	–0,12	–0,12
	gg	0,02	–0,02
Number of persons per room in twins apartment	bb	0,06	0,02
	gg	–0,36**	– 0,37**
Outfit of apartment	bb	0,02	–0,07
	gg	0,03	0,48**
Urbanization of locality in which father was born	bb	0,01	–0,13
(1 - village, 2 - town, 3 - city)	gg	0,28**	–0,22
Urbanization of locality in which mother was born	bb	0,19	0.09
(1 - village, 2 - town, 3 - city)	gg	0,17	–0,14
Index of environmental goodness	bb	–0,18	–0,15
	gg	0,12	0,34**

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Girl-twins, of which the parents were born in cities (particularly their fathers) declared on average a higher liking attitude to their girl-classmates than in situation when the parents were born in a less urbanized environment. The high number of inmates in flat, and a high occupational status of the father, were negatively connected with liking declared by girl-twins to their girl-mates.

DISCUSSION OF RESULTS AND CONCLUSIONS

1. The decrease with age in successive classes, so in singletons as in MZ twins, of the mean level of liking declared to pupils of the same sex, and the rise of this level to pupils of opposite sex, and the observation that twins in those classes declare usually higher liking attitude to pupils of the same sex, and a lover to the opposite sex (Table 2 and 3) finds confirmation in literature data on the average lower social-maturity in twins than singletons.

The more frequent delay in social development in MZ than DZ twins and singletons may be connected with biological and social reasons [4]. Among biological reasons the most important and most frequent, particularly in the analysed MZ twins, born in the years 1958-1965, were the premature births [19].

Other, very significant for some twins, biological reasons developmental disturbances is the characteristic for MZ twins transfusion syndrome, leading to an unequal development of the foetuses, recorded in Poles in ca. 9% of monochorionic twin pregnancies [17] and also the birth traumas, more frequent in twins, particularly MZ, than in singletons [2, 6, 17].

The mentioned biological factors cause often disturbances in functioning of the central nervous system [6]: e.g. low reactivity, tractability, depressions, lower biological immunity and social-adjustment ability of stricken with them twins among class-mates [9]. The mentioned traumas concern however only a fraction of twins. Therefore their results are not so great, like the results of the described in the introduction, specific social situation of twins. This situation, when twins are reared together, leads always, through intense interactions between them, and separation, thus also an automatic decrease of intensity of interactions of each of the twins with parents and other persons, leads above all to language handicaps, and in results, also to limitation of general cognitive abilities [8]. This situation may become worse in results of unequal treatment of twins by their parents and siblings [4], e.g., only even as consequence of the fact that after birth one of them leaves with mother the hospital earlier and joins as first the family [8].

2. The average lower liking degree declared in classes towards male-twins than to female twins, and the lower, in case of boys, correlations between the age of twins and the average for the given pupil liking degree values which it declares to other pupils and is declared by them (Tables 2 and 4), may be connected with the delays and language defects more frequent in boys which hinder their social adjustment, as described in specific literature [4, 8, 9].

3. The differences between twins and singletons found in declarations of liking to their class-mates, result probably in a higher degree from the delayed social maturation of twins, in relation to singletons, than from their retardation of growth and sex matura-

tion, like language delays, which, according to Friedrich [4] and Hay et al. [8, 9], are connected more with contact handicaps with persons from outside the pair than with handicaps of the twins' potential abilities.

The review of literature shows that on the average the lower body measures and the later adolescence of twins, as compared with singletons, in school-age children are observed in such populations in which the average conditions of postnatal development are similar in singletons and twins [10], particularly when the conditions are bad, hindering the catching-up of effects connected with premature births [21]. In the Wrocław material, the average body measures of MZ twins and the averages of bone age and appearance of particular stages of development of secondary sex characters did not differ from the respective characteristics in DZ twins and were not lower than those in singletons surveyed 7 years before [11, 12, 19, 20]. This is connected with better postnatal living conditions of MZ twins than, on the average, DZ twins. It was found, that MZ twins came more often from less numerous families, their parents less often had their origin in villages and had on the average a higher educational level than parents of DZ twins [21, 22]. This of cause is a situation connected with particular socio-economic conditions of the analysed population during our survey.

4. The results of the carried out plebiscite gave an interesting picture of the so-called "prima donna effect" described for the first time by Koch [10]. This effect depends on concentrating attention by class-mates and other persons on twins as an attractive phenomenon. Therefore, particularly girl-twins, establish easily friendships, at least a declared one, to some extent on credit, without large effort in gaining and maintaining it. In the carried out plebiscite the "prima donna effect" concerned only the relation of girls to girls, and in much lower degree of boys to boys. However, for girls the boy-twins and for boys the girl-twins were, according to their declarations, on the average less likable than singletons of the opposite sex (Tables 5 and 6). The "prima donna effect" did not occur at all in classes with separated twins (Table 8).

5. The interpretation of the described differences in treating twins by singletons and singletons by twins need further studies on a more numerous material allowing a more detailed analysis very important in this age changes.

6. It is interesting that significant correlations between socio-economic conditions of twins and liking attitudes, declared by singletons to twins and the contrary, occurred in relations between girls, but not between boys (Table 9). This may be, in part a result of the lower social maturity of boys, who in their liking attitudes do not bargain for this type of material reasons, and in part may be caused by a differentiation of liking attitudes, wider in girls than boys, towards particular pupils (compare values M_{sp} in Tables 2-4), what facilitated the display of these correlations. The explanation of the specificity of motivation of liking attitudes to school-mates in boys and girls of various school age, and the explanation of reasons presented here, higher in girls than in boys, differentiation of liking degrees to class-mates, needs further investigations.

7. The carried out study shows that the position of MZ twins in school-class may depend on the proportion of boys to girls in this class, and it is probably on the average better, particularly in elementary school, in situation when twins are in a numerous group of pupils of the same sex as the twins. Assuming that the declarations of liking attitude expressed by the pupils in the plebiscite are true, in the mentioned situation, twins going

to the same class, on the average, are cherished by a higher liking attitude than singletons. It would be reasonably to use it for the benefit of twins and the whole class, increasing the interactions of each co-twin with persons from their closest environment, or, if possible, not through localisation of twins in different classes, because such an artificial split may be painful for them and troublesome for their families.

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Correspondence: Dr hab. Konstanty S. Sawicki, University of Szczecin, Department of Anthropology, Ul. Felczaka 3a, 71-412 Szczecin, Poland; e-mail: sawko@sus.univ.szczecin.pl.