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## **Permissiveness-Restrictiveness for Twins and Controls in Two Educational Settings: The Swedish Compulsory School and the Israeli Kibbutz**

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**Abstract.** In a previous longitudinal twin project a model was developed for studying heredity-environment interaction. One important environmental dimension in this model is permissiveness-restrictiveness. The purpose of the present study has therefore been to investigate perceived and imposed restrictiveness at the societal and classroom level and possible interactional effects on pupil behavior. Results are reported from grade 4 to grade 6 in Israeli kibbutzim and Swedish compulsory school. One major finding is that no systematic differences have been found between twins and controls in the two countries. In both Swedish schools and Israeli kibbutzim permissiveness-restrictiveness will vary depending upon perspective (perceived or imposed) and upon content (type of subject or rule-breaking activity). Preliminary within-pair comparisons for the Swedish twins are reported for different types of test results. In agreement with the model, logical abstract thinking as well as reading and mathematics achievement seem to be less influenced by hereditary factors in a restrictive educational setting than in a permissive one.

**Key words:** Permissiveness/restrictiveness, School education, Kibbutz, Twins

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### **INTRODUCTION**

Twins are a particularly valuable tool for the study of hereditary and environmental influences on development. Results based upon these types of studies have, however,

sometimes been questioned due to generalizability problems. If twins differ from non-twins in the variables studied, this could seriously impede interpretations. It is therefore of the utmost importance to compare twins with non-twins in these respects.

In a previous Swedish longitudinal twin investigation a model for studying heredity-environment influences was developed [4,5,7]. According to this model, different traits (cognitive and other) are expected to vary in their susceptibility to environmental influences. Also, variation over time with regard to hereditary factors is expected to be larger in a "permissive" environment and smaller in a more "restrictive" environment.

Permissiveness-restrictiveness can be investigated at different educational "levels" [1]: the family, the classroom, the school, the region and finally the societal level. It is also important to take into consideration "perceived" vs "imposed" restrictiveness. Plomin and Daniels [16] have stressed the importance of studying both the perceived and imposed environments shared by individuals with varying degrees of genetic similarity.

In 1982 a collaborative twin study was initiated in Sweden and Israel to compare possible differences in permissiveness-restrictiveness in different cultural settings. The question was asked whether a collective kibbutz environment with apparent limited individual choice would also represent a more restrictive educational environment than the Swedish compulsory school.

The study has been planned to continue for three years so as to be able to investigate possible effects due to an interaction of changes in school organization and in individual development [8,13]. This is the first in a series of reports presenting results from the ongoing project.

Area of this study of twins and singletons in Swedish compulsory schools and Israeli kibbutz schools are:

1. An investigation of genotype-environment interaction and correlation by means of MZ and DZ twin pairs and, in Israel, matched singleton controls.
2. Permissiveness-restrictiveness as perceived by twins and singletons compared with declared permissiveness-restrictiveness by their own teachers in their schools.
3. Children's perception of home and school environment and its relation to various cognitive traits.
4. Similarities in the above perceptions by MZ and DZ pairs and changes in those similarities over the three-year period.

The results presented in this paper are based on the data of the first year of study.

The main purpose of the analysis of the data of the first year was to test the hypothesis that twins are not substantially different from singletons in their test scores nor in their perception of their school environment and thus do not represent a population different from their peer group. This will, then, permit us to generalize from findings on twins to the general population of same age children.

A further aim of this paper is to present initial findings on perceptions of school children aged 9-13 and of their respective teachers, both in Sweden and

in the Israeli kibbutz, with regard to permissiveness in the school situation. In addition to this, some preliminary within-pair comparisons based on Swedish twin data will be presented.

## METHODS

### Sample

To date, approximately 70 pairs of twins in Sweden and Israel have participated in the study. The twins are 9-13 years old and attend grades 4-6. The Israeli group is about a year younger than their Swedish counterpart due to the fact that children begin school at 6 years of age in Israel and at 7 in Sweden. The kibbutz twins are spread out all over Israel, while the Swedish sample is taken only from the Stockholm area. About half are MZ and half DZ of the same sex. Similarity diagnosis is made using the questionnaire method by Cohen and Dibble [3]. In addition to the twins, parents, teachers and caretakers (in the kibbutz) have participated in the study. For some of the data collection, whole classes attended by the twins are used as controls both in Sweden and Israel. In Israel, each twin pair is also matched with a same-sex pair of singletons reared in the same educational group [13,14].

### Questionnaires

Questionnaires were constructed to include background information and to assess permissiveness-restrictiveness in the school and home environment both in Sweden and in Israel. The same type of questions are given to parents, teachers, caretakers (in Israel) and to the children themselves. In this way both the imposed and the perceived restrictions are being studied. In the Swedish study, teachers were interviewed by the research leader, who filled in the questionnaire, while this was done by the teachers themselves in Israel.

While the questionnaires used in Sweden and Israel are similar, but not identical, the same facets are investigated in both countries with consideration to the specific cultural context. The conceptual framework of the design for observations on children's restrictive environment was constructed with the aid of a mapping sentence. It was given in Guttman et al [13] and Canter [2] and relates to the range of restrictions imposed on, or perceived by, the children, teachers, parents and caretakers. It is again presented below to provide the conceptual framework of this study.

### Tests

The following tests have been given to the twins and controls.

1. *In both Sweden and Israel* the Raven Progressive Matrices (sections A-D)



## Data Analyses

In the data analyses performed to date on comparisons of means for twins and controls and for pupils and teachers in the Swedish and the Israeli kibbutz schools, we have used Guttman's [10] efficacy coefficient (Disco). This coefficient, like the coefficient of discrimination (or Pearson's correlation ratio) is always appropriate since consistent estimation at replication is ensured. Disco has been developed by Guttman to assess the efficacy of differences among means in terms of overlap of respective distributions [12]. Disco equals zero if all the distributions overlap in such a way as to have the same means; and it equals 1 if there is no overlap whatsoever between the distributions; there is perfect discrimination between the samples. Intermediate values between 0 and 1 indicate intermediate amounts of overlap. Thus, differences in size of efficacy coefficients are consistent estimates of differences in the population (while this is not the case for comparisons of *t* values or other inferential statistics). *F* is calculated here only for traditional interest in it.

Preliminary comparisons of twins similarities for the Swedish data are given in Table 7. Because of the small number of cases to date, mean absolute differences are given rather than intrapair correlations.

## RESULTS

In the following section, first-year results are presented on the questions given to teachers and pupils both in Sweden and in Israel. In addition, mean scores of various tests will be given. Some preliminary intrapair comparisons for the Swedish twins will also be discussed.

### Restrictions Imposed by Teachers and Perceived by Pupils

#### *Israel*

Table 1 reports means and standard deviations for kibbutz teachers to different questions concerning restrictions imposed on pupils (twins and singleton controls) in the classroom.

Table 1 shows that, according to teachers' opinions, pupils are allowed to disagree in class. In the choice of school subjects, kibbutz teachers seem to restrict these 11 years old children quite a lot. There are no conspicuous differences between teachers' treatment of twins and singletons respectively.

In the kibbutz environment, teachers thus appear to be quite permissive about out-of-school activities, such as going to parties or going to bed at a certain time. This is the traditional area of parental restrictions in other countries. When it comes to ordinary classroom activities, kibbutz teachers seem to allow a great deal

of freedom. Only choice of subjects are rather seldom made by the pupils at this age.

**Table 1 - Extent of restrictions imposed by kibbutz teachers on twins and singleton controls**

Type of restriction	MZ (N=35)		DZ (N=35)		Singleton controls (N=65)		Disco	Eta	F
	X	SD	X	SD	X	SD			
Is child allowed to disagree in class? (1 = very often - 5 = never)	1.83	0.82	2.00	0.76	1.95	0.78	0.15	0.08	0.44
Does child participate in choice of school subjects? (1 = very often - 5 = never)	3.11	0.98	3.03	0.47	3.02	0.67	0.10	0.06	0.20
Do you restrict child in going to parties? (1 = very often - 5 = never)	3.96	1.27	3.10	1.33	3.53	1.32	0.39	0.23	2.33
Do you restrict child at bedtime? (1 = very often - 5 = never)	3.52	1.59	3.20	1.61	3.18	1.59	0.18	0.09	0.34

**Table 2 - Extent of restrictions perceived by the children (twins and singleton controls) in the kibbutz**

Type of restriction	MZ (N=59)		DZ (N=45)		Singleton controls (N=107)		Disco	Eta	F
	X	SD	X	SD	X	SD			
Are you allowed to disagree during class? (1 = very often - 5 = never)	2.95	1.31	3.18	1.25	2.84	1.42	0.17	0.09	0.94
Do you participate in selection of subjects? (1 = very often - 5 = never)	4.08	1.12	4.52	0.78	4.02	1.22	0.42	0.18	3.39
Do you feel restricted in going to parties? (1 = very often - 5 = never)	3.92	1.30	3.77	1.51	3.76	1.38	0.11	0.05	0.29
Does teacher restrict your bedtime hour? (1 = very often - 5 = never)	4.00	1.39	3.93	1.44	4.06	1.49	0.07	0.03	0.11

Table 2 reports the children's answers to the same questions. There are only minor differences between twins and singleton controls except for the question concerning choice of subject at school. Although all groups say that they have very little choice, this is even more conspicuous for DZ twins. Generally, children feel less

restricted by teacher concerning disagreement in class than in selection of school subjects.

Teachers' and children's answers to the same type of question, show that they agree which type of restrictions that are most frequent.

### *Sweden*

In Sweden teachers have been asked to estimate imposed restrictions on children (both twins and singleton controls) concerning their planning and evaluation in different subjects such as Mathematics and Swedish. In addition to this, the same type of questions were put concerning children's absence from school, late arrival to school and disturbance in class. On the basis of these questions teachers have been classified as mainly permissive or mainly restrictive.

Table 3 presents the number and percentage of Swedish teachers classified as permissive and restrictive in different respects.

**Table 3 - Number and percentage of permissive and restrictive Swedish teachers in different areas**

Area	Permissive		Restrictive	
	N	%	N	%
Mathematics	11	14	65	86
Swedish	42	55	34	45
Absence from class	39	48	43	52
Late arrival	36	45	44	55
Disturbance in class	37	46	43	54

Evidently, Swedish teachers are much more restrictive in Mathematics than in Swedish. In Mathematics they generally say that they follow the textbook very closely and that they give the children very little possibility of own choice. In Swedish, on the other hand, they claim that there is much more influence from the children and that they can choose between different activities. Only about half of the teachers (45%) are classified as restrictive in Swedish compared to practically all (86%) in Mathematics. It should be pointed out that the same person is teaching both Mathematics and Swedish at this stage. The questions about following the regulations at school, such as being absent without permission, arriving late and disturbance in the classroom all give a similar picture. About half of the teachers claim that they are restrictive in these respects and half do not.

Table 4 shows the perceived restrictions by Swedish twins and singletons concerning Mathematics and Swedish as well as questions concerning regulations in the classroom.

Table 4 - Restrictions perceived by Swedish twins and singletons

Type of restriction	MZ (N=71)		DZ (N=76)		Singleton controls (N=1500)		Disco	Eta	F
	X	SD	X	SD	X	SD			
Does teacher tell what to do in Maths? (1 = very often - 5 = never)	2.23	1.31	2.28	1.29	2.16	1.26	0.07	0.03	0.49
Does teacher tell what to do in Swedish? (1 = very often - 5 = never)	1.49	0.79	1.84	1.03	1.74	0.96	0.19	0.06	1.99
Are pupils absent from school without reason? (1 = very often - 5 = never)	4.65	0.72	4.68	0.59	4.62	0.70	0.08	0.02	0.35
Do pupils come late for school? (1 = very often - 5 = never)	3.10	0.80	3.30	0.77	3.22	0.90	0.11	0.03	0.66
Do you have to raise your hand before talking in the class? (1 = very often - 5 = never)	1.51	0.81	1.49	0.96	1.46	0.81	0.06	0.02	0.22

Pupils seem to feel that teachers generally tell them what to do in both Mathematics and Swedish and that there is very little room left for own choice. Being absent from school without reason is more unusual than arriving late for class. Evidently, restrictions are more frequent concerning absence from school, compared with late arrival, which is fairly usual. Speaking in class without being told to is also not allowed by most teachers. There seem to be no differences between twins and controls in their perception of teacher restrictions.

Teachers claim that they are more restrictive in Mathematics compared to Swedish. No such difference can be found for the pupils. On the contrary, they seem to feel more restricted in Swedish compared to Mathematics.

Pupils seem to feel less restrictions for late arrival compared to absence from school. This distinction is not made by the teachers, however. Approximately half of the teachers say that they are restrictive in both aspects.

## Test Results for Twins and Controls

### Israel

Table 5 shows the test results for twins and singleton controls living in the kibbutz. It can be seen that the differences between twin categories and between twins and controls are very small and insignificant in the kibbutz sample. This is true for all the tests used, verbal as well as non-verbal.



Table 5 - Comparison of kibbutz twins and singleton controls on verbal Wisc, Blocks, reading comprehension and Raven

Test	MZ twins (N = 62)		MZ controls (N = 58)		DZ twins (N = 46)		DZ controls (N = 45)		Disco	Eta	F
	X	SD	X	SD	X	SD	X	SD			
Verbal Wisc	115.45	14.05	118.67	11.20	116.02	12.79	118.36	12.89	0.19	0.11	0.87
Blocks	33.42	11.11	34.35	9.43	31.46	10.37	35.29	9.84	0.21	0.13	1.17
Reading comprehension	37.98	9.46	39.10	7.68	37.37	7.84	37.78	7.72	0.13	0.08	0.42
Raven (A-D)	35.40	8.61	35.97	7.60	33.52	7.98	33.47	8.31	0.24	0.13	1.26

*Sweden*

Table 6 shows the test results for twins and singletons (whole classes) in the Swedish compulsory school.

**Table 6 - Comparison of kibbutz twins and controls in the Swedish compulsory school on opposites, maths, reading comprehension and Raven**

Test	MZ (N = 71)		DZ (N = 75)		Singletons (N = 1540)		Disco	Eta	F
	X	SD	X	SD	X	SD			
Opposites	23.11	5.66	22.25	6.55	22.32	6.04	0.08	0.03	0.52
Maths	13.11	3.24	12.43	3.81	12.82	3.32	0.08	0.03	0.53
Reading comprehension	25.04	2.46	24.75	2.43	24.79	2.97	0.07	0.02	0.23
Raven (A-D)	39.31	5.05	38.16	5.03	38.41	6.10	0.11	0.03	0.68

In the Swedish sample no differences in test results are found between MZ and DZ twins and between twins and controls. This is in agreement with the results for the Israeli sample and seems to indicate that the twin group does not differ from the control group on the types of tests used. The only test that is identical for Sweden and Israel is the Raven. The difference found in means between the two countries for both twins and controls can be accounted for by the 1-year age difference between the two samples. The Israeli sample is of approximately the same age as pupils in grade 4 in Sweden. Comparing the mean scores for these two groups, we can conclude that they are of the same magnitude (Swedish twins and controls in grade 4:  $X = 35.3$ ).

### Within-Pair Similarity for Swedish MZ and DZ Twins

Table 7 reports within-pair absolute differences in test results for Swedish MZ and DZ twins in classroom environments classified as “permissive” or “restrictive” by the research leader.

**Table 7 - Within-pair absolute differences in test results for Swedish MZ and DZ twins in “permissive” and “restrictive” classroom situations**

Test	Classroom situation							
	“Permissive”				“Restrictive”			
	MZ (N = 11)		DZ (N = 11)		MZ (N = 15)		DZ (N = 10)	
	$X_{diff}$	SD	$X_{diff}$	SD	$X_{diff}$	SD	$X_{diff}$	SD
Raven (A-D)	2.82	2.33	4.13	3.83	4.20	3.41	4.72	3.80
Opposites	3.10	4.72	4.27	5.66	4.07	3.70	5.50	4.54
Reading comprehension	1.20	0.98	1.40	1.31	3.40	5.45	1.44	1.26
Mathematics achievement	1.60	1.28	3.00	3.65	3.07	2.46	3.50	3.47

In the “permissive” classroom situation MZ twins are more similar than DZ twins for test results. In the “restrictive” situation, on the other hand, there is a tendency for MZ and DZ twins to be more alike in intrapair similarity. For reading comprehension, there is even a reversed trend so that DZ twins show a smaller average within-pair difference than the MZ pairs. These are, however, only preliminary data due to the small number of pairs and final interpretations must await additional analyses of the twin data.

## DISCUSSION

In a previous longitudinal twin study [5] it was found that different characteristics varied in their susceptibility to environmental influences. Also, variation over time with regard to hereditary factors was larger in a “permissive” environment and smaller in a “restrictive” environment. The question was therefore asked whether a collective kibbutz environment, with apparent limited choice, would also represent a more restrictive educational environment than the Swedish compulsory school. A three-year follow-up study of a twin and control sample in Israeli kibbutz schools and Swedish compulsory schools has therefore been initiated. This is the first in a series of reports from that study. One pertinent question is whether the *twin* and *control groups* are comparable in different respects. Both test results and perceptions of school environment have been compared for the two samples. One of the major findings in this study is that no systematic differences in these respects have been found in either of the two countries. This is an important condition for future generalizability.

A comparison of Israeli kibbutz teachers’ and Swedish teachers’ perception of permissiveness-restrictiveness in the classroom shows that both teacher groups tend to tolerate quite a lot of disturbance in the classroom. The Swedish teachers make no distinction between disturbance by the pupils in the classroom and absence from school, while the kibbutz teachers seem to use more restriction in forcing the pupils to come to school. This is probably easier to do in a kibbutz society, where the parental roles are transferred to the teacher and the smaller size of the community allows for more social control. With regard to pupil participation in the planning of their studies, kibbutz teachers report a great deal of restriction. Swedish teachers tend to distinguish between different types of subjects, and more restrictions are imposed in Mathematics than in Swedish.

The pupils in the kibbutz school think that they have fairly little influence on the choice of subject and activity in the classroom. In expressing disagreement, however, they feel more “free” towards their teachers. The Swedish pupils make a distinction between their participation in different subjects. In Mathematics they seem to experience more freedom to participate than in Swedish.

Comparing teacher-imposed and pupil-perceived restriction, it was found that kibbutz teachers report average restrictions in choice of subject, while the pupils feel much restricted in this respect. Disagreement in the classroom is also perceived by the pupils to be more restricted than by the teachers. A quite unexpected result

can be seen when comparing Swedish teacher and pupil perception of restrictiveness in different subjects. Teachers say that they allow less pupil participation in Mathematics than in Swedish, while the opposite is true for the pupils. In Mathematics the pupils often get a certain number of mathematical problems to solve each week, but no directions when or in what order to do this. This evidently has the effect of making the pupils feel more "free" to decide themselves than in a subject such as Swedish, where the teachers say that they allow more pupil participation.

It can therefore be seen from this study that permissiveness-restrictiveness has to be studied from different perspectives (imposed or perceived) and for different contents (different subjects or rule-breaking activities).

Eventually, the *interaction of hereditary influences and permissiveness-restrictiveness* in different respects has to be investigated in relation to pupil behavior. Some preliminary results have been reported for the Swedish sample. Using an overall measure of teacher permissiveness-restrictiveness estimated by the test leader, it can be seen that for all the tests MZ twins seem to be more concordant than DZ twins in "permissive" classroom situations. In "restrictive" situations, the differences between MZ and DZ in within-pair similarity seem to be smaller, which would indicate that environmental factors are more influential in deciding behavior variation [7].

These results are, however, preliminary and based on small groups of twins. They must therefore be further investigated for a larger twin sample and for different perspectives and contents with regard to permissiveness-restrictiveness.

The overall impression of this cross-cultural comparison of permissiveness-restrictiveness in educational settings is that restrictive influences at the societal level need not automatically lead to greater restrictiveness at the classroom level.

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