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## **Dominance and Submissiveness Between Twins II. Consequences for Mental Health**

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**Abstract.** In a follow-up study of 234 twin pairs, now aged 12-20 yrs, the intertwin relationships were evaluated by the parents and the twins themselves. The dominance-submissiveness aspect was inquired from three separate points of view, physical dominance, psychic dominance, and role of the spokesman. These three different aspects of dominance reflected on the twins' well being and mental health in somewhat different ways. The submissiveness in one area was often compensated by equality or dominance in another area, with only about 10% of adolescents being submissive or dominant in all three areas. According to the parents' reports, the most submissive twins suffered most often from psychosomatic symptoms, and the most dominant ones from nervous symptoms. The twins who themselves reported to be most submissive had most often somatic complaints and scored highest in the Kovacs' Depression Inventory.

**Key words:** **Twins, Dominance-submissiveness, School Achievement, Psychosomatic Symptoms, Depressiveness**

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### **INTRODUCTION**

The fact of living together in a close relationship with another person makes the twin situation an interesting object of study which may be of more general significance for human relationships in a broader sense, perhaps concerning the whole population. One noteworthy feature

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is a tendency towards polar dominance-submissiveness relations.

This study is focused on intertwin dominance and submissiveness and its implications for the mental health of adolescent twins.

## MATERIAL AND METHODS

### Subjects

The basic series of cases consists 335 consecutive twin deliveries which occurred at the Oulu University Central Hospital during the years 1965-73 [4]. These twins were reexamined in 1985, at ages varying from 12 to 20 years, through questionnaires filled in by the parents and the twins themselves. All the pairs in which both twins were still alive are included in the present analyses. This numbered 234 pairs, of which 66 were both girls, 77 both boys and 91 mixed pairs. The parents reported on the twins' school achievement, health status and frequency of psychosomatic symptoms, while the twins themselves filled in the Childrens' Depression Inventory (CDI) [2] modified to exclude the question on suicidal tendencies. Both the parents and the twins answered questions concerning intertwin relationships, with special reference to dominance-submissiveness in its three aspects: physical strength, psychic dominance and the role of spokesman [9].

### Factor Analysis of Psychosomatic Symptoms and Depressiveness

The frequency of psychosomatic symptoms was evaluated by assigning values 0, 1, 2, 3, and 4 for occurrences of never, less than monthly, monthly, weekly and daily, respectively. A sum variable comprising all psychosomatic symptoms was produced by adding together the values for the separate symptoms. Factor analysis yielded two distinct factors, nervous complaints and somatic complaints (Table 1). The original CDI questionnaire included 27 groups of three sentences with stepwise increasing depressive statements, eg, "I am sad once in a while", "I am often sad" and "I am sad all the time", carrying values of 0, 1, and 2, respectively. A sum variable for all the 26 items was constructed from the total scores. Factor analysis produced 5 factors found to explain different aspects of depressiveness, and these were named lack of self-confidence, loneliness, ineffectiveness, anhedonia and hypochondria (Table 2). The results concerning the psychosomatic symptoms indicated by the parents and depressiveness as identified by the CDI questionnaire were combined to form new sum variables from the most prominent items in the factor analysis by summing their values.

**Table 1.** Interpretation of the factor analysis of the twins' psychosomatic symptoms at the age of 12-20 years

Factorization	Variables	Name of factor	Eigenvalue
1st factor	Nervousness, Irritability, Loss of energy	Nervous complaints	2.307
2nd factor	Cephalalgia, Abdominal pain	Somatic complaints	1.542

**Table 2. Interpretation of the factor analysis of the Kovacs' Children Depression Inventory**

Factorization	Variables	Name of factor	Eigenvalue
1st factor	Difficulties in making up one's mind, Inferiority feelings, Feeling oneself to be bad, Guilty feelings	Lack of self-confidence	2.464
2nd factor	Sadness, Crying, Loneliness, Bothering about things	Loneliness	2.406
3rd factor	Achievement at work, Tiredness, Lack of energy at work, Feeling disobedient	Ineffectiveness	2.157
4th factor	Having friends, Having fun, Liking being with people, Content with one's appearance	Anhedonia	2.085
5th factor	Aches and pains, Bad things happening, Eating difficulties, Getting into fights	Hypochondria	1.604

### Dominance-Submissiveness

The dominance-submissiveness feature yielded two sum variables formed by adding the values for the three aspects of physical, psychic and spokesman submissiveness, separately for the parents' replies and those given by the children themselves. These two new sum variables were named overall submissiveness estimated by parents and overall submissiveness estimated by the children.

For statistical analyses, standard statistical packages have been used (SAS and BMDP).

### RESULTS

The distribution of the twins into the categories of dominant, intermediate or submissive within their pair is shown in Table 3, for the three aspects of the polarity and for overall submissiveness. One observation to emerge is that dominance in one area of life is very often compensated for by equality or submissiveness in another. Thus, although 20%-25% of the twins were submissive in each given aspect, only less than 10% were said to be totally submissive.

The reports of submissiveness given by the parents and the twins themselves correlated highly significantly, as seen in Table 4, the correlations being almost equally high for each aspect but somewhat lower for the sum factor.

When compared with boys, the girls had more often somatic complaints and scored

**Table 3. Different aspects of dominance in the twins (N)**

Aspect of dominance	Parents' estimation			Child's estimation		
	Dominant	Intermediate	Submissive	Dominant	Intermediate	Submissive
Physical	100	270	100	164	196	110
Psychic	118	232	118	130	241	99
Spokesman	132	204	132	168	207	97
Overall	30	406	30	63	380	25

**Table 4. Correlations between parents' and child's estimations of intertwin relationship. Significance of difference tested by  $\chi^2$  test**

	N	$\chi^2$	P
Physical dominance	463	161.86	<0.0001
Psychic dominance	460	156.22	<0.0001
"Spokesman" dominance	462	163.14	<0.0001
Total dominance	457	96.12	<0.0001

also higher in the sum variable of total psychosomatic symptoms, while no statistical differences were found in depressiveness between boys and girls (Table 5).

The consequences of the polar dominance-submissiveness relationship were analysed in three areas of the twins' lives: school achievement, occurrence of psychosomatic symptoms and depressiveness. Table 6 shows that the physically submissive twins had the most somatic complaints, lowest self-confidence and most often hypochondriac fears, and felt most lonely and unhappy. The psychically dominant twins were those with the best school-achievement, and psychic submissiveness was reflected in feelings of ineffectiveness and hypochondriac fears, while somatic complaints were most frequent among the leaders in this aspect (Table 7). The role of spokesman seemed to have the least effects on the twins' psychosomatic well-being and mood (Table 8). The sum variable of all three aspects of dominance-submissiveness has its clearest consequences for the twins' well-being (Table 9). The parents' evaluation of dominance and submissiveness suggested that the totally dominant ones most often had nervous complaints, while the submissive ones had somatic complaints. The twins' own responses, on the other hand, showed the most submissive ones to have least self-confidence, feelings of effectiveness and happiness, and to experience somatic complaints most often.

## DISCUSSION

There are many studies concerning the mental health of twins, most of which are focused on the differences between the effects of heredity and environment, and can thus be called studies

**Table 5. Mental health in girls and boys (mean values). Significance of difference tested by median test**

	Girls	Boys	P
<b>PSYCHOSOMATIC SYMPTOMS</b>			
Factorized sum variables:			
Nervous complaints	3.69	3.22	0.0959
Somatic complaints	2.08	1.52	0.0001
Total	6.64	5.45	0.0067
<b>DEPRESSIVENESS</b>			
Factorized sum variables:			
Self-confidence	1.26	1.10	0.0550
Loneliness	0.48	0.35	0.0962
Ineffectiveness	0.79	0.91	0.0684
Anhedony	1.19	0.92	0.0649
Hypochondria	0.43	0.42	0.6962
Total	5.50	5.12	0.0750

**Table 6. Dominance in physical strength and mental health (mean values). Significance of difference tested by median test**

	Parents' estimation				Child's estimation			
	Domi- nant	Inter- mediate	Submis- sive	P	Domi- nant	Inter- mediate	Submis- sive	P
<b>SCHOOL ACHIEVEMENT: Average grade</b>								
All subjects	7.72	7.74	7.69	0.7803	7.66	7.65	7.81	0.4512
Theoretical subjects	7.62	7.78	7.66	0.1554	7.64	7.71	7.84	0.3028
<b>PSYCHOSOMATIC SYMPTOMS</b>								
Factorized sum variables:								
Nervous complaints	3.24	3.45	3.58	0.4262	3.12	3.68	3.50	0.0534
Somatic complaints	1.73	1.67	2.07	0.0167	1.69	1.72	1.98	0.540
Total	5.84	5.78	6.62	0.2634	5.46	6.08	6.59	0.1953
<b>DEPRESSIVENESS</b>								
Factorized sum variables:								
Self-confidence	1.05	1.10	1.44	0.0572	0.97	1.06	1.64	0.0001
Loneliness	0.41	0.34	0.60	0.0096	0.34	0.32	0.66	0.0011
Ineffectiveness	0.90	0.76	0.97	0.1985	0.78	0.71	1.13	0.2012
Anhedonia	0.96	1.02	1.08	0.6282	0.85	0.98	1.37	0.0166
Hypochondria	0.37	0.40	0.53	0.0316	0.38	0.39	0.54	0.1415
Total	4.92	4.94	6.18	0.0726	4.53	4.56	7.35	0.0016

**Table 7. Psychic dominance and mental health (mean values). Significance of difference tested by median test**

	Parents' estimation				Child's estimation			
	Domi- nant	Inter- mediate	Submis- sive	P	Domi- nant	Inter- mediate	Submis- sive	P
<b>SCHOOL ACHIEVEMENT: Average grade</b>								
All subjects	7.95	7.79	7.40	0.0001	7.93	7.72	7.49	0.0256
Theoretical subjects	8.11	7.72	7.37	0.0001	8.00	7.63	7.58	0.1967
<b>PSYCHOSOMATIC SYMPTOMS</b>								
Factorized sum variables:								
Nervous complaints	3.39	3.47	3.41	0.5752	3.44	3.43	3.52	0.7649
Somatic complaints	1.88	1.73	1.71	0.0476	1.61	1.87	1.71	0.9256
Total	5.98	5.98	5.89	0.8592	5.72	6.09	6.06	0.8423
<b>DEPRESSIVENESS</b>								
Factorized sum variables:								
Self-confidence	1.11	1.13	1.27	0.9957	1.05	1.10	1.50	0.1306
Loneliness	0.51	0.39	0.32	0.1733	0.45	0.37	0.44	0.2716
Ineffectiveness	0.77	0.71	1.10	0.0248	0.74	0.78	1.08	0.0534
Anhedonia	0.94	1.07	1.01	0.8713	0.91	1.10	1.07	0.0739
Hypochondria	0.47	0.33	0.55	0.0134	0.38	0.45	0.43	0.9470
Total	4.97	5.02	5.68	0.7335	4.79	5.15	6.21	0.4414

of twins. The literature on twins, on the other hand, including problems of human relationships, such as intertwin identification, dependency and the tendency towards a polar dominance-submissiveness relationship, is relatively meagre. The more dependent and submissive member of the pair has been found to be more apt to develop mental disorders characterized by ego weakness, eg, schizophrenia [8,3,7] or anorexia nervosa [1,6] and a study of discordant pairs with the index twin having an affective, anxiety or somatoform disorder [10] has found that this was most often the submissive member of the pair.

The parents' and children's own views on the dominance question correlated highly significantly, especially concerning all the three aspects separately, whereas combining of the aspects lowered the correlations slightly. The conclusions can be drawn that awareness of this dominance is quite objective information, and thus forms a good basis for further examinations of the consequences of dominance.

The combination of all three aspects of dominance to form a sum variable also reduced the numbers of those who were clearly the dominant or submissive one and increased the intermediate group. The conclusion can be drawn that dominance in one area of life is quite often compensated for by equality or submissiveness in another.

The present study was focused on the consequences of intertwin relationships. The "leaders", especially in psychic dominance and in the parents' estimation, were most often

**Table 8.** The role of spokesman and mental health (mean values). Significance of difference tested by median test

	Parents' estimation				Child's estimation			
	Domi- nant	Inter- mediate	Submis- sive	P	Domi- nant	Inter- mediate	Submis- sive	P
<b>SCHOOL ACHIEVEMENT: Average grade</b>								
All subjects	7.74	7.82	7.56	0.0388	7.81	7.82	7.63	0.2362
Theoretical subjects	7.79	7.81	7.53	0.4116	7.87	7.67	7.59	0.3423
<b>PSYCHOSOMATIC SYMPTOMS</b>								
Factorized sum variables:								
Nervous complaints	3.56	3.20	3.60	0.0337	3.46	3.30	3.74	0.4525
Somatic complaints	1.75	1.74	1.81	0.1408	1.72	1.75	1.89	0.2000
Total	6.24	5.60	6.34	0.1420	5.95	5.86	6.34	0.6852
<b>DEPRESSIVENESS</b>								
Factorized sum variables:								
Self-confidence	1.09	1.10	1.33	0.3701	1.06	1.18	1.33	0.4562
Loneliness	0.53	0.34	0.37	0.0413	0.41	0.39	0.44	0.5736
Ineffectiveness	0.76	0.80	0.97	0.2731	0.78	0.80	0.99	0.3639
Anhedonia	0.98	0.90	1.24	0.0446	0.92	1.03	1.25	0.1282
Hypochondria	0.47	0.37	0.45	0.3844	0.37	0.45	0.43	0.1698
Total	5.12	4.88	5.80	0.2842	4.75	5.36	6.02	0.4306

those with the better school achievements. This result may be interpreted as suggesting that the parents base their evaluation of dominance partly on school achievement, or equally possibly, that the more able twin becomes the dominant one.

The somatic complaints of cephalalgia and abdominal pain were more frequent among those physically submissive and psychically dominant. These observations can be seen as a result of sex, as the girls have been found to be more often physically submissive and psychically dominant [5]. The most frequent somatic complaints in the group of totally submissive twins cannot be explained by sex, however, and can thus be seen as a consequence of submissiveness itself. The process of constantly adapting oneself to the will of others and being obedient to others seems to give rise to psychosomatic symptoms.

Nervous complaints were most frequent among the twins who were seen by their parents as the totally dominating ones. This result is quite understandable, as to be the leader means to always take the response, while the "followers" have it easier. The present result is in good accordance with the findings of Tienari [9], the more dominating twin being apt to have neurotic symptoms more often, while character neurosis was often the fate of the submissive members.

Depressiveness seems to be concentrated in the submissive members of the pairs, especially in the twins' own judgement. One part of this result may lie in the fact that depressive persons

**Table 9. Overall dominance and mental health. The points of dominance in physical, psychic and spokesman aspects are summed and classified into three categories: dominant, intermediate and submissive (mean values of total score). Significance of difference tested by median test**

	Parents' estimation				Child's estimation			
	Dominant	Intermediate	Submissive	P	Dominant	Intermediate	Submissive	P
<b>SCHOOL ACHIEVEMENT: Average grade</b>								
All subjects	7.68	7.78	7.25	0.0125	7.81	7.74	7.42	0.3507
Theoretical subjects	7.89	7.77	7.17	0.2065	7.98	7.70	7.46	0.3027
<b>PSYCHOSOMATIC SYMPTOMS</b>								
Factorized sum variables:								
Nervous complaints	4.62	3.25	4.23	0.0064	3.15	3.43	4.23	0.5357
Somatic complaints	2.15	1.68	2.50	0.0001	1.71	1.73	2.35	0.0250
Total	8.17	5.62	8.25	0.0005	5.38	5.88	8.52	0.0195
<b>DEPRESSIVENESS</b>								
Factorized sum variables:								
Self-confidence	1.04	1.14	1.59	0.0911	0.93	1.13	2.21	0.0001
Loneliness	0.43	0.39	0.46	0.5299	0.32	0.41	0.48	0.6417
Ineffectiveness	0.90	0.79	1.33	0.3584	0.76	0.79	1.74	0.0324
Anhedonia	0.83	1.02	1.17	0.5169	0.81	1.01	1.96	0.0055
Hypochondria	0.52	0.40	0.57	0.2788	0.39	0.41	0.72	0.1568
Total	4.89	5.09	6.70	0.5614	4.35	5.12	9.64	0.0832

very often feel themselves to be "followers" and do not have the courage to see themselves as "leaders". On the other hand, to be the submissive one means that there are many fewer opportunities to show one's real abilities and feel successful, so that depressiveness found in the submissive members of the pairs is most probably also a consequence of their position.

As nervous symptoms tend to accumulate in the dominant members and depressiveness and somatic complaints seem to be the fate of the submissive ones, the compensation of submissiveness in one area of life by dominance or at least equality, in another area, is an ideal situation for a pair of twins. This enables us to give some advice to the parents of twins. If they are able to affect inter-twin relationships in any way, they ought to see to it that neither twin dominates the other in all areas of life.

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