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Living Habits and Personality Development of Adolescent Twins: A Longitudinal Follow-up Study in a Birth Cohort from Pregnancy to Adolescence

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Abstract. The living habits of 289 twins in a one-year birth cohort beginning during pregnancy and followed up to adolescence were compared with those of 11,623 singletons and two sets of controls matched either by maternal factors and place of residence only or by these and perinatal morbidity, all from the same cohort. The twins went in for sports more often than the singletons or any kind of controls. A nonsignificant trend was found indicating that twins smoked less often than their matched controls. The twins also used alcohol less often than their controls. The intrapair similarities of twins were higher than the similarities of twins and either type of controls in all four variables tested: sports, smoking, use of alcohol, as well as having been drunk.

Key words: Twins, Singletons, Adolescence, Sports, Smoking, Alcohol

Longitudinal twin studies have originally been focused mainly on heredity, but increasing interest has later been shown in the implications of the special situation of twinship for their long-term prognosis. The present study was performed in order to evaluate living habits for twins in a one-year birth cohort from Northern Finland, which was compiled during pregnancy and followed up to adolescence.

MATERIAL AND METHOD

The data were collected from a geographically defined area of Northern Finland,

the provinces of Oulu and Lapland. The survey was started during pregnancy, and included all cases with an expected date of delivery in 1966. The investigation at the antenatal clinics covered 96% of all deliveries in the area in 1966 [12]. Single births numbered 11,905 and twin births 163, including 11,744 live-born single infants and 314 twins (153 whole twin pairs, 8 twins whose cotwin was stillborn and two stillborn pairs). 11,623 singletons and 289 twins were still alive at 28 days of age, the latter figure including 144 of the first-born twins and 145 of the second-born ones. Perinatal mortality was thus 2.4% for single deliveries and 11.3% for twins. At the age of 14 years, 286 twins were alive, of which one pair had moved to Australia and had no further contact with the research group. After exclusion of these two children, the final group consisted of 284 twins. Each was assigned two control children from the cohort. The first control child was matched only by sex, mother's place of residence during the pregnancy and mother's age and parity, since the chances of having twins are known to increase with maternal age and parity. Because of the higher perinatal morbidity of twins, each twin was assigned a second control child who was matched by the following factors: sex, mother's age and parity, birth weight, gestational age, intrauterine growth (possible growth retardation in the same percentile as the twin) and occurrence of perinatal asphyxia, hyperbilirubinemia and hypoglycemia.

Information concerning the deliveries and the condition of the neonates was gathered from the maternity hospitals and specialized neonatal departments in Northern Finland. Information on growth and early development was gathered by health nurses at the children's welfare clinics at the age of one year and later information concerning the children's growth, school achievements and living habits from questionnaires filled in by the children themselves at the age of 14 years [13]. At that age, the inquiry of living habits included questions about frequency of sports (Table 1), smoking (Table 2), use of alcohol (Table 3) and having been drunk (Table 4).

Table 1 - Frequency of exercising sports in twins and singletons^a

	Twins		Singletons		I controls		II controls	
	N	%	N	%	N	%	N	%
Every day	47	18.7	1,833	17.4	38	14.4	39	14.8
Every other day	60	23.8	2,127	20.2	55	20.9	51	19.4
Twice a week	67	26.6	2,294	21.8	62	23.6	50	19.0
Once a week	31	12.3	1,677	15.9	32	12.2	56	21.3
Every other week	7	2.8	329	3.1	12	4.6	8	3.0
Once a month	2	0.8	392	3.7	21	8.0	5	1.9
Not at all	38	15.1	1,887	17.9	43	16.3	54	20.5
Total	252	100.0	10,539	100.0	263	100.0	263	100.0

^a I controls are matched by sex, maternal factors and place of residence only, and II controls also by perinatal morbidity. According to χ^2 test the difference between twins and singletons is significant ($p = 0.0367$), between twins and I controls very significant ($p = 0.0052$) and between twins and II controls also significant ($p = 0.0200$).

Table 2 - Frequency of smoking in twins and singletons^a

	Twins		Singletons		I controls		II controls	
	N	%	N	%	N	%	N	%
Never tried	91	35.4	3,478	32.6	78	29.3	98	37.0
Tried once	68	26.5	2,868	26.9	67	25.2	63	23.8
Tried twice or more	61	23.7	2,513	23.5	69	25.9	63	23.8
Smokes once in a while	22	8.6	1,054	9.9	35	13.2	24	9.1
Smokes twice in a week	2	0.8	81	0.8	1	0.4	1	0.4
Smokes daily, 1-5 cigarettes	11	4.2	432	4.0	9	3.4	10	3.8
Smokes daily, 6-10 cigarettes	1	0.4	188	1.8	5	1.9	5	1.9
Smokes daily, > 10 cigarettes	1	0.4	66	0.6	2	0.8	1	0.4
Total	257	100.0	10,680	100.0	266	100.0	265	100.0

^a I controls are matched by sex, maternal factors and place of residence only, and II controls also by perinatal morbidity. According to χ^2 test the differences between twins and singletons, between twins and I controls or twins and II controls are all not significant.

RESULTS

When compared with the singletons, the twins were found to exercise sports more often. The same result was found in the comparison of twins with their controls matched by sex, place of residence and maternal age and parity, as well as with controls matched also by perinatal morbidity (Table 1).

A nonsignificant trend was found indicating that twins smoked less often than their controls matched by maternal factors and place of residence (Table 2).

Table 3 - Use of alcohol in twins and singletons^a

	Twins		Singletons		I controls		II controls	
	N	%	N	%	N	%	N	%
Never	111	43.2	4,405	41.3	91	34.3	122	45.9
Once tasted	100	38.9	3,682	34.5	101	38.1	89	33.5
Tasted some times	42	16.3	2,328	21.8	69	26.0	50	18.8
Monthly use	4	1.6	213	2.0	3	1.1	5	1.9
Weekly use	0	0.0	45	0.4	1	0.4	0	0.0
Total	257	100.0	10,673	100.0	265	100.0	266	100.0

^a I controls are matched by sex, maternal factors and place of residence only, and II controls also by perinatal morbidity. According to χ^2 test the difference between twins and singletons is not significant ($p = 0.1696$), between twins and I controls significant ($p = 0.0482$) and between twins and II controls not significant ($P = 0.6123$).

Table 3 shows that trials with alcohol were less frequent in twins than in the first type of controls, and the same was found for twins with respect to all singletons, but not for twins with respect to controls of second type. As to alcohol abuse, there

was a tendency for twins to have been drunk less often than singletons or the first type of controls, but not less often than the second type of controls (Table 4).

The intrapair similarities of twins were higher than the similarities of twins and either type of their controls in all four variables: sports, smoking, use of alcohol, as well as having been drunk (Table 5).

Table 4 - Occurrence of having been drunk in twins and singletons^a

	Twins		Singletons		I controls		II controls	
	N	%	N	%	N	%	N	%
Never	207	80.5	7,950	74.7	193	72.8	206	77.4
Once, mildly	18	7.0	1,033	9.7	23	8.7	26	9.8
Twice or more often, mildly	17	6.6	829	7.8	29	10.9	19	7.1
Once hardly	5	1.9	372	3.5	6	2.3	7	2.6
2-4 times, hardly	7	2.7	326	3.1	12	4.5	5	1.9
Often, hardly	3	1.2	129	1.2	2	0.8	3	1.1
Total	257	100.0	10,639	100.0	265	100.0	266	100.0

^a I controls are matched by sex, maternal factors and place of residence only, and II controls also by perinatal morbidity. According to χ^2 test the differences between twins and singletons, between twins and I controls or twins and II controls are all not significant.

Table 5 - Similarities (total agreement in replies) between twins and their cotwins, between twins and their I controls (matched by sex, maternal factors and place of residence only), between twins and II controls (matched also by perinatal morbidity)

	Cotwin (%)	I control (%)	II control (%)	P
Sporting	49.6	15.8	15.0	0.0000
Smoking	59.2	28.5	22.5	0.0000
Use of alcohol	61.7	36.1	34.4	0.0000
Having been drunk	77.3	60.2	65.6	0.0055

DISCUSSION

The chances of having twins are known to increase with maternal age and parity. The first controls for this longitudinal study were therefore chosen from the same cohort by matching for sex and maternal age and parity. Since place of residence was thought to affect the living habits of adolescents, at least on account of the existence of certain kinds of possibilities of interests in different cultural environments, this factor was also matched. Because of the twins' higher perinatal morbidity, each twin was assigned a second control matched in this respect as well.

The twins went in for sports more often than all the singletons or any type of their matched controls, and their use of alcohol was less than that of their controls matched by sex, place of residence and maternal age and parity. This result might be interpreted as a consequence of the intertwin relationship, in which the twins support each other to positively valued interests and thus do not feel a need to early trials with alcohol.

Similar comparisons have earlier revealed that the twins continued less often school after the compulsory nine classes of primary and secondary school [9]. Thus, the external indicators of independence achievement in adolescence, eg, living habits often negatively valued by the parents as well as leaving home for further education, seem to be fewer in twins than in singletons. The differences disappeared when comparisons were made between the twins and controls also matched by perinatal morbidity. This might be caused by the well-known fact that the child's diseases or possibilities of handicap very often arouse overprotective feelings in the parents, resulting in a somewhat slower acquisition of independence in the child [2,8].

In some adolescents the achievement of independence has a form of rebellion, while others can get this feeling of personal autonomy smoother, as well-adjusted growth. Smoking and alcohol have often been seen as weapons of adolescents in this fight between generations [5]. It has earlier been stated that twins might achieve autonomy from parents even more easy than singletons, sometimes with the aid of their cotwin [7]. The inner feeling of autonomy can rid the adolescent from the external indicators of it, or weapons in the fight for independence. Thus, the lower use of alcohol in twins may also indicate well-adjusted mental growth, which is in good accordance with the finding that psychiatric treatment in childhood is given only to half of the number of twins one would expect by the occurrence of twins in the population [10]. The adolescent twin, however, has an additional task, ie, that of breaking the dependency tie with the cotwin in order to grow up to be an autonomous individual [7].

While a number of papers have been published on similarities between twins in their development, abilities [3,6,16] and temperament [11,4,1] and also on intertwin identity and dependency [15] few epidemiological studies have followed the same twins from pregnancy up to adolescence and taken account of similarities in living habits. The earlier finding of high intrapair similarity of vocation [9] and the present finding of high intrapair similarity of living habits, might indicate some intertwin dependency or feeling of being like each other, but this in turn may be caused by genetic [14] as well as by environmental factors, such as the style of bringing up children and common values and attitudes in their families.

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