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# The Jena Twin Registry and the Jena Twin Study of Social Attitudes (JeTSSA)

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The Jena Twin Registry focuses on identifying twins in eastern Germany. It is based in part on registers of multiple births and data from registration offices, and in part on a volunteer sample approached by media calls and twin clubs. The Jena Twin Study of Social Attitudes (JeTSSA) is the first study based on the Jena Twin Registry. In a sample of 226 monozygotic and 168 dizygotic adult twin pairs, self- and independent reports of significant others (peers, spouses, parents) are collected to estimate genetic and environmental effects on social attitudes and the covariation of genetic influences on personality traits and social attitudes. In addition, the effects of measured environmental variables on attitude formation are examined.

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The aim of the Jena Twin Registry is to recruit adult twins for psychological studies. The regional focus is on the southeastern German states Thuringia, Saxony-Anhalt, and Saxony. We used several sources to contact twins: (1) the birth registry of a large hospital, (2) a list provided by the registration office of the city of Jena, and (3) volunteer twin pairs, who responded to media calls for participation or were contacted via twin clubs.

Germany has no national twin registry. Thus at the time we were beginning to build up the Jena registry, most German twin studies recruited twins by media calls or collaboration with twin clubs. We gained access to the birth records of a large Thuringian hospital that for several decades had specialized on multiple births. We recorded the names and addresses of more than 200 twin births born before 1985. Since our focus was on adult twins, we had to select twins who are 18 years old or older from the twin birth records. After the German reunification there was a high mobility of East Germans. In addition, many street names were changed. Thus many twins from this registry could not be contacted.

In a second step, we contacted registration offices for collaboration. For scientific purposes local registration offices had to be contacted. A number of registration offices refused to cooperate or argued that the computer software used did not allow retrieval of the data we required. The city of Jena registration office kindly provided a list of more than 400 persons who were born on the same day, carried the same

family name, and both lived in Jena at the day of the query. We contacted all possible twins asking both twins to participate in the study. Seventy-four twin pairs participated in the study. Only one pair identified by the registration office data was not a twin pair. In sum, cooperating with registration offices is a good means of identifying twins. However, currently only identification of twins who both live in the region covered by the registration office is possible.

Names, addresses, sex, dates of birth and the method of recruitment were entered in a database, together with additional information on the twins. For particular studies, cooperation with the twin registries in Berlin, Bielefeld, and Saarbrücken is necessary. The coding scheme used allows the combination of our data with that of collaborating registries; however, the twins' written consent is necessary to fulfill the requirements of federal and state laws on the protection of data privacy.

Since as far as we are aware twin registries in Germany are not funded, updates and extensions of the registry are financed from funds for specific twin studies. Twins are asked to inform the registry of changes in address, but we can not periodically verify addresses. Our study of social attitudes was the first study using the data from the Jena Twin Registry.

The Jena Twin Study of Social Attitudes (JeTSSA) focuses on the investigation of genetic and environmental influences on adult social attitudes and discrimination tendencies. It was initiated in 2002 and is part of the research group 'Discrimination and Tolerance in Intergroup Relations', funded by the German Research Foundation. It comprises research questions concerning the structure and the etiology of social attitudes and the tendency to discriminate members of out-groups. Multiple informants (twins, peers, spouses/partners, parents) were approached on the one hand to test the robustness of results across informants and on the other hand to yield valid measures of the twins' rearing environment.

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A main objective of the JeTSSA involved the assessment of social attitudes and environmental variables by reports of significant others in addition to self-reports. Though self-reports can be collected economically, the inclusion of multiple informants allows to control for method effects (Borkenau et al., 2001; Riemann et al., 1997). Moreover, reports of significant others can provide important sources of information. So the availability of independent data from spouses and partners is important, given the substantial assortative mating in attitudes. Parents can supply information on the twins' rearing environment that is independent from the twins' self-reports and allow estimating the validity of the retrospective reports. JeTSSA is the first behavioral genetic study utilizing different types of reports by others on social attitudes.

### Recruitment of Twins, Description of the Sample and Procedure

We describe the procedure and the data collection of JeTSSA here in some detail, as it offers ample opportunity for cooperation with groups working on related issues.

#### Sample

The JeTSSA sample consists of 226 monozygotic (MZ) and 168 dizygotic (DZ) twin pairs, including 67 opposite-sex DZ twin pairs mainly from the Jena Twin Registry. Part of the sample consists of twins that were recruited from the Berlin Twin Registry (Busjahn, 2006) and the Bielefeld Twin Registry (Spinath et al., 2002). Twins were offered a personality profile and a compensation of 12 € for participation.

Twins were first contacted by mail or telephone to assure that they were willing to participate in this laborious study. Those who complied were provided with the questionnaire set that comprised booklets for self-report, two peer reports, a questionnaire for a spouse or partner and separate questionnaires for the mother and the father (one mother and one father report for each pair of twins). Twins delivered the informant reports to the respective persons, most of whom returned the completed questionnaires reply-paid. The dispatch of test material for the whole sample was completed within about a year and a half, commencing in February 2003. Twins were asked to respond as quickly as possible but no time limit was set. Twins were reminded by phone to complete the data collection. The last filled-out questionnaires were received by the end of 2004.

Altogether, 3424 persons (twins, partners, peers and parents) participated in our study. A total of 962 twins responded by returning the questionnaires. For 364 twin pairs, data for both siblings were available. The mean age of the twin participants was 34.30 years ( $SD = 13.63$ ) ranging between 17 and 82 years. Reflecting the composition of the Jena Twin Registry, the majority of twins lived in eastern Germany (63%). The sample was heterogeneous with regard to education and employment status. On average, twins had completed 11.24 years

( $SD = 1.6$ ) of school education and 3.65 years ( $SD = 2.2$ ) of professional training. Our sample replicates earlier experiences with voluntary participation in so far as female twins (79% of MZ and 80% of same-sex DZ twins) and MZ twins (57%) are overrepresented in the participants.

#### Zygosity Determination

Zygosity was diagnosed by a self-report questionnaire that assesses the frequency of confusing the twins by different relations across the life span as well as physical similarity criteria (Oniszczenko et al., 1993; Oniszczenko & Rogucka, 1996). This diagnosis was validated in an independent sample of 245 twin pairs for whom questionnaire data and genetic finger printing data were available and yielded 93.2% correct classifications (Becker et al., 1997).

#### Peer, Spouse/Partner, and Parents' Reports

Of all participants, 585 provided two peer reports and 167 one peer report. The mean age of peers was 35.12 years ( $SD = 14.18$  years) and females prevailed (71.7%). On average, peers knew the twins for 11.46 years ( $SD = 10.04$  years).

In total, 531 spouse/partner reports were received (age  $M = 37.92$  years,  $SD = 13.89$  years). Three hundred and twenty-three mothers (age  $M = 56.29$  years,  $SD = 10.53$  years) and 271 fathers (age  $M = 58.28$  years,  $SD = 10.75$  years) completed the respective questionnaires. Accordingly, at least one peer report is available for 78.2% of the participating twins, and for 55.2% data of spouses/partners are available. With respect to complete twin pairs, 82.0% mother reports and 68.8% father reports are available.

#### Materials

In addition to the zygosity questionnaire, the German Neuroticism Extraversion Openness-Personality Inventory-Revised (NEO-PI-R; Costa & McCrae, 1992; Ostendorf & Angleitner, 2004) and a translation of Norman's (1963) Adjective Scales (Borkenau et al., 2001) were administered for the assessment of the Five Factor Model of personality and the Big Five. Peers completed the peer report version of the NEO-PI-R. Peers, spouses/partners, as well as parents provided self-reports of personality on Norman's Adjective Scales.

In addition, various constructs of broad dimensions of social attitudes were assessed: (1) Conservatism (using an actualized version of the Schiebel et al. [1984] scale, which in turn is based on Wilson and Patterson's [1968] catch phrase approach), (2) Right-Wing Authoritarianism (RWA, Altemeyer, 1996; translation by Funke, 2003), (3) Social Dominance Orientation (SDO; Pratto et al., 1994; translation by Kämpfe, 2002), and (4) related constructs. Self-reports of Conservatism, RWA, and SDO are available for the twins, their partners, and their parents. In addition, peer reports were collected for these constructs.

Measures of specific social attitudes consisted of self-constructed scales measuring attitudes towards women or men, seven employment groups (employees,

persons performing vocational training, self-employed persons, unemployed persons, civil servants, pensioners, housewives/househusbands), four national groups (Turks, Italian, Swedes, and Poles) and three social minority groups (physically handicapped, mentally handicapped and homosexual persons). Specific social attitudes of twins were rated by twins (towards all groups) and by peers (towards national and social minority groups). In addition, partners provided self-reports of specific social attitudes towards women or men, national, and employment groups. The twins rated their spouses'/partners' attitudes towards women/men and national groups.

The tendency to discriminate against women or men, other employment groups or nationals was measured with self-constructed scales. Twins' tendency to discriminate against these groups was rated by the twins themselves (towards all groups) and their peers (towards national groups). Furthermore, partners of twins provided self-ratings (towards all groups) on these discrimination measures. The twins rated their spouses'/partners' tendency to discriminate against women/men and national groups.

Several measures of the twins' environment at various stages of their life were assessed. First, the Block Environmental Questionnaire (BEQ; Block, 1971; Hur & Bouchard, 1995) provided a retrospective measure of family environment, containing the scales acceptance/rejection by mother and father, family cohesion, intellectual orientation of mother and father as well as family organization. Whereas twins evaluated family environment with regard to all six scales of the BEQ, parents independently rated family cohesion and organization as well as their own acceptance/rejection and intellectual orientation. In addition, the relationship between twins and their parents in twins' adolescence were reported by twins and by parents. Thereby, measures of the relationship between twins on the one hand and their mothers and fathers on the other hand consisted of items regarding quality of the relationship, extent of influence on different areas of life, parents' educational goals, and their significance as models. Furthermore, twins and their parents rated the overlap of the twins' social networks at several ages (before school enrolment, between the ages of 7 and 13 years, between the ages of 13 and 18 years, during vocational training and from vocational training until the present). Finally, significant interaction partners of the twins (parents, twin sibling, other siblings, partner, and the most important peer during and after school days) were rated by twins with regard to social attitudes, focusing on central facets of Conservatism.

### Major Achievements

We are still in the process of analyzing the data. The first analyses from the JeTSSA provided evidence for substantial genetic influence on self- and peer-reported personality traits (between 49% and 60% of phenotypic variance for NEO-PI-R domain scores),

validating findings from earlier twin studies (see Riemann & Spinath, 2005).

Self-report data on broad dimensions of social attitudes showed a similar etiology. Univariate analyses of RWA, Conservatism, and related constructs provided evidence for substantial additive genetic influences in a range similar to broad personality traits (between 41% and 64% of phenotypic variance) and no reliable effects of the environment shared by twins, again replicating earlier findings. Genetic effects were smaller for self-reports of SDO. Effects of the nonshared environment explained about 70% of the phenotypic variance of SDO. Behavioral genetic investigations of SDO are not available in the literature.

The analysis of self-reported specific social attitudes revealed varying etiologies of social attitudes. Whereas for attitudes towards women, homemakers, employees and Polish people, modest to moderate genetic effects were estimated, attitudes towards men, civil servants, pensioners, trainees, self-employed and Turkish people showed weak effects of shared environment. Except attitudes towards Polish people, effects of specific environment were most important. Analysis of attitudes towards disabled persons and homosexuals yielded substantial genetic effects, while influences of the nonshared environment were of minor importance. For the tendency to discriminate against people of foreign nationalities again genetic effects and influences of non-shared environment were substantial, and there were no effects of the shared environment.

Estimates of genetic and environmental effects for peer reports of social attitudes differed substantially from those for self-reports, while highly similar results were obtained for self- and peer-reported personality traits. Univariate analysis of peer reports of social attitudes (not controlling for assortative mating) indicated strong effects of the environment shared by twins.

A central aim of our study is to estimate common genetic influences on personality traits and social attitudes using multivariate analyses. Broad dimensions underlying specific social attitudes showed substantial genetic correlations with personality traits, whereas environmental correlations were of minor importance. Genetic influences on personality traits explained about one third of the genetic effects on RWA, Conservatism and SDO. Accordingly, a substantive amount (about two-thirds) of genetic influence on broader social attitudes is specific to social attitudes. Similarly, analyses of specific social attitudes as towards national groups revealed considerable genetic correlations with personality traits and broader social attitudes. Genetic effects on personality traits and broad dimensions of social attitudes explained about 50% of the genetic effects on specific social attitudes.

We found substantial assortative mating for social attitudes. Twin-partner correlation ranged between .19 (SDO) and .49 (RWA) for broader social attitudes. Specific social attitudes correlated between .11 and .36 and tendencies to discriminate out-group members

between .35 and .46. Spouse and partner influences on social attitudes will be examined using bivariate structural equation modeling.

### Future Plans

In the course of 2006, univariate and multivariate analyses of specific and global social attitudes in JeTSSA will be completed. We are planning a longitudinal extension of our study with a second measurement in about 5 to 6 years.

The Jena Twin Registry will be updated and extended using registration office data.

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