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The Measurement and Importance of General Reasoning Potentials in Schools and Labor Markets

Pre-Test Report

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IMPRESSUM

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The measurement and importance of general reasoning potentials in schools and labor markets

Pre-test report

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1 Introduction: Why should the SOEP collect data on general cognitive abilities of teenagers?

The project at hand has several goals. The first goal is to improve research on social mobility and social disparities in school attainment by studying intra-group differences. So far, mobility research has focused mainly on differences between but not within social groups. However, by looking more closely at within-group differences—e.g., why some children rise above their parents' educational level and others do not—we can better understand the social mechanisms that produce the obvious overall social disparities in educational attainment and the high odds of class inheritance. The interesting question here is whether intra-class variation in educational mobility is structured by differences in general cognitive abilities or by differing social characteristics within classes (such as unemployment, poverty, or divorce of parents during their children's school career).

The second goal is to investigate the relationship between social origins and educational attainment by examining how the general cognitive abilities of children affect this relationship over the courses of their lives. In order for children's abilities (or learning potentials) to be reflected in their educational attainment, it is necessary for parents and teachers to recognize and foster these abilities. This process of "discovery", however, is embedded in social interaction processes that may depend heavily on children's social origins. Children from different social backgrounds may display differing social and school behavior, and their parents and teachers may have differing expectations for their learning potentials and educational attainment. If SOEP were to introduce a measure of the general cognitive abilities of teenagers, the potential effects of social environment[1] on the relationship between children's general cognitive abilities and their educational attainment could allow us to better understand the social embeddedness of this "discovery process" and identify the social factors shaping it.

The third goal of this project is to examine the impact of educational credentials (certificates) and general cognitive abilities on the individual's labor market chances and access to vocational training. There is an ongoing debate between sociologists and economists on the impact of these two factors. Whereas economists conceptualize educational attainment mainly as an indicator of (train)*ability*—based on human capital and signaling theory—sociologists see the impact of education on employment mainly as the result of *credentialized* recruitment

[1] The SOEP usually provides a variety of information on the social environment by parents' participation in the waves conducted prior to the tests. For the pre-test, we lack this information.

processes (cf., Solga 2005). So far it is difficult to establish a serious empirical basis for this debate because the major data sets available worldwide provide only information on educational degrees achieved, not on general cognitive abilities.

To pursue these research goals (and others), the SOEP team plans to begin collecting data on the general cognitive abilities of the 17-year-old respondents participating in SOEP for the first time. Experimental studies by psychologists have shown that general cognitive abilities (individuals' cognitive rankings) are fairly stable over the life course, especially when considering "fluid" cognitive abilities. In comparison to *crystallized* cognitive abilities, *fluid* cognitive abilities are much less influenced by learning opportunities and acculturation based on education (cf. Cattell 1987). Measuring (primarily) fluid general cognitive abilities at age 17 thus appears to be an efficient and valid data collection strategy to support the research interests stated above, namely the "past" relationship between education and learning potentials as well as the "future" relationship between education, learning potential and training/employment careers (also taking into account SOEP's panel design). If measurement at age 17 proves successful, tests of older respondents will also be possible within longitudinal studies like SOEP.

In this pre-test report, we provide information on (a) the concept and reliability of measuring general cognitive abilities in the SOEP interview situation and (b) initial empirical results on the influence of general cognitive abilities on the relationship between social origins and educational attainment. Because only very few of the 17-year-olds tested have already entered the labor market or vocational training, we do not analyze the third research goal mentioned above (examining the impact of educational credentials). In the real SOEP situation, one has to wait for one or two future waves to have a sufficient number of (unselected) cases to study this issue. Furthermore, the size of the pre-test sample and the missing information on the respondents' social environment during childhood (usually reported by their parents in former waves) restricts the potential for using this data to answer the first two questions. In the real SOEP survey, however, in which tests will be conducted on different cohorts of 17-year-olds over time, a sample size of 700 to 750 cases will be reached within three years.

2 First empirical results on relationships between educational attainment and learning potential[2]

2.1 Tests applied and pretest sample

For assessing the cognitive potential of the participants, the well-established German test "I-S-T 2000 R" developed by Amthauer et al. (2001), has been administered (referred to in the following as *IST-2000R*). The *IST-2000R* draws on the general cognitive ability components that have been found consistently in different models of intelligence structure (cf. Cattell 1987). In particular, these are (a) verbal abilities, (b) numerical abilities, and (c) figural abilities. The total score, consisting of the three content factors, reflects what can be termed reasoning (or general cognitive) abilities.

Each content factor is measured by means of three subscales (each consisting of 20 items): verbal abilities (sentence completion, verbal analogies, finding similarities), numerical abilities (arithmetic operators, number series, arithmetic problems), and figural abilities (figure selection, cube task, matrices). The total time for the administration of this (basic) cognitive ability module is approximately 90 minutes. Because of testing-time restrictions (within a survey of respondents who should stay for years, if not decades, in the prospective panel study SOEP) we decided to present only one subtest of each content area: verbal analogies, number series, and matrices. This selection was driven by the intention to measure more *fluid* abilities and to enable the combination of the three tests as a measurement of *general reasoning abilities*.

Details about the application and (partial) redesign of the tests are provided in Chapter **3.2** The sample tested comprises 230 young people between the ages of 16 and 17. Sampling procedures are described in Chapter 3.3. For our analysis, 193 of the 230 respondents were selected as valid cases for cognitive testing.

The test situation—especially the control of time and "independent" test performance—is very important for the reliability of the *IST-2000R*. We can analyze only the data of those 193 respondents for whom the interviewer was present during the *entire* interview: the other 37 cases were lost due to the interviewer's at least partial absence. In order to avoid this (unfortunate) loss of data in the main SOEP study, the survey institute will have to pay special atten-

[2] The submission of a paper on the basis of the pre-test data is in preparation (cf. Solga/Powell, in prep.).

tion to instructing interviewers to be present constantly during the test, emphasizing as well the importance of strictly controlling the test time.

The sample composition is reported in Table 1. It displays a reasonable (unselected) distribution with respect to gender, school placement (or educational attainment), and social origin. The sample is much better in terms of representativeness than almost all psychological experimental test studies (which usually use very selective samples).

Table 1:
Sample composition

	Cases	**Percent**
(1) Gender: male / female	109 / 84	56.5 / 43.5
(2) School enrolment (*without* vocational schools): yes / no	137 / 56	71.0 / 29.0
(3) School enrolment (*including* vocational schools): yes / no	174 / 19	90.2 / 9.8
(4) School type attended*		
- *Hauptschule* (lower secondary school)	32	16.6
- *Realschule/Gesamtschule* (intermediate secondary school)	94	48.7
- *Gymnasium* (upper secondary school)	62	32.1
- Missing	5	2.6
(5) Parents' vocational education		
- at least one parent holds a university degree	46	23.8
- neither of the parents	143	74.1
- missing	4	2.1
Total	*193*	

* For respondents who had left school at the time of interview: school degree achieved

Source: SOEP Cognitive Test 2005.

As can be seen in Table 2, the differences in test results between the full pre-test and the "valid" pre-test sample are rather small. For the sake of validity we nonetheless base our further analyses only on the "valid" pre-test sample.

Table 2:
Mean (raw) test scores by school type attended – by pre-test samples

School type	Verbal abilities		Numerical abilities		Figural abilities		Reasoning (sum score)	
	Total sample	Valid sample	Total sample	Valid sample	Total sample	Valid sample	Total sample	Valid sample
Lower secondary	6.3	6.0	8.4	8.6	9.4	9.7	24.1	24.4
Intermediate secondary	7.8	7.7	11.3	11.6	10.0	10.1	28.9	29.5
Upper secondary	10.2	10.1	13.3	13.3	11.7	11.9	35.2	35.3
No. of cases	*225*	*188*	*225*	*188*	*225*	*188*	*225*	*188*

Source: SOEP Cognitive Test 2005.

Tables 3 and 4 provide a comparison with the results published in the *IST-2000R* manual (Amthauer et al. 2001). Table 4 shows small differences in the mean raw test scores between the SOEP and the *IST-2000R*: The mean of verbal abilities is slightly lower in SOEP; the means of numerical and figural abilities are slightly higher.

Table 3:
Mean (raw) test scores by school type attended – comparison between "I-S-T 2000 R" and SOEP

School type	Verbal abilities		Numerical abilities		Figural abilities	
	I-S-T*	SOEP	I-S-T*	SOEP	I-S-T*	SOEP
Lower secondary	9.0	6.0	10.5	8.6	9.1	9.7
Intermediate secondary		7.7		11.6		10.1
Upper secondary	11.0	10.1	12.5	13.3	10.4	11.9
No. of cases	*660*	*188*	*660*	*188*	*660*	*188*

* Amthauer et al. (2001, pp. 109-110, 123-124).

These are the means based on raw values. To compare the SOEP results with other samples, one would have to transform the raw values to the standardized values published in Amthauer et al. (2001).

Table 4:
Maximum (raw) test scores by school type attended – comparison between "I-S-T 2000 R" and SOEP

School type	Verbal abilities		Numerical abilities		Figural abilities	
	I-S-T*	SOEP	I-S-T*	SOEP	I-S-T*	SOEP
Lower secondary	18	10	20	19	19	18
Intermediate secondary		15		20		20
Upper secondary	20	19	20	20	19	20
No. of cases	*660*	*188*	*660*	*188*	*660*	*188*

* Amthauer et al. (2001, pp. 109-110, 123-124).

Table 4 shows that the maximum value achieved for some scales is less than 20 in the SOEP. As in the test results published for *IST-2000R*, none of the respondents correctly answered all 20 questions (items) of the verbal test, and none of the respondents from lower secondary schools (the *Hauptschule*) received full scores on the numerical and figural tests. These results should *not* be interpreted as indicating missing or "bad" data: in contrast, they were intended in the construction of the tests (e.g., to be difficult enough to display individual variation).

The pilot study revealed normal distributions for the verbal as well as for the figural test (exactly as expected), while a skewed distribution was found for "number series" (see Figures 1 to 3). How should this skewed distribution be dealt with? Through our discussions with the test authors as well as the researchers who administered the *IST-2000R* to unselected samples (Neubauer et al., in press; Fink/Neubauer 2005), we have learned that a skewed distribution is found in other samples for "number series" as well. The problems of a skewed—violated normal—distribution include analytical restrictions. Because previous studies have revealed a normal distribution for the subtest "arithmetic operators" and "arithmetic problems"—whereby the former tends to measure fluid and the latter crystallized abilities—it would be advisable to replace the scale "number series" with the scale "arithmetic operators" in the main SOEP study.

2.2 Empirical results

Table 5 shows that, as expected by psychologists, the association between social background and cognitive capabilities is stronger for verbal than for numerical or figural tests. The association between parents' vocational education and verbal abilities is significant (based on chi-square tests). This is true to lesser extent for numerical abilities.

Table 5:
Parents' vocational education and cognitive abilities (Chi-square test)

Variable X_1	Variable X_2	Chi-square	df	Significance (p) (two-sided test)	N
Parents' voc.	Verbal a.	34.35	15	0.003	189
Education	Numerical a.	32.66	20	0.037	189
(1=at least one parent holds a university degree, 0=none of them)	Figural a.	9.07	17	0.938	189
	Reasoning	42.33	40	0.371	189

Source: SOEP Cognitive Test 2005.

The association between parents' vocational education and figural abilities, however, is insignificant. Figures 4 and 5 display, however, *huge overlaps* in the distributions of children's verbal abilities with different social origins (for numerical and figural abilities, we obtain similar pictures not shown here). This indicates that we really do capture fluid—–rather than crystallized (culturally "biased")—abilities with the measurements used (cf. Stern 2001). More importantly, this weak relationship shows that the well-known social disparities in children's school attainment, especially in Germany, cannot be explained by "cognitive stratification" as done by Herrnstein and Murray in their "bell curve" (1994) or recently by Jensen (cf. Stöcker 2005).

Table 6 displays partial correlations between cognitive abilities and a variety of social characteristics. They reveal a number of interesting findings:

- We find a strong correlation between reading as a hobby and verbal abilities (controlling for school type attended or gender). As found in the PISA-studies (Deutsches PISA-Konsortium 2001, 2004), the causation between the two remains unclear. We do not know whether reading improves verbal abilities or, conversely, whether verbal abilities increase the probability of having reading as a hobby. What this significant positive correlation does indicate, however, is the quality of the SOEP measures of verbal abilities and reading behavior.
- Children's general cognitive abilities do *not* affect whether parents pay attention to their school attainment or not (controlling for school type attended and gender). The same applies to whether or not parents assist children with homework. The motivation for parental attention seems to be neither that of helping weaker learners nor of fostering gifted learners. Instead, parents seem to either have or not have a basic attitude of wanting to help their children with homework, regardless of their children's learning potentials.

Table 6:
Partial correlation

Variable X_1	Variable X_2	Control variable(s)	Correlation	Significance (p) (two-sided test)	N
Verbal a.	Hobby: Reading (1=every day – 5=never)	School type attended	**-0.217**	**0.003**	185
Verbal a.	-- " --	Gender	**-0.264**	**0.000**	193
Verbal abilities	Parents pay attention to school achievement (1= very strongly – 4 = not at all)	School type & Gender	0.011	0.881	188
Numerical a.	-- " --	-- " --	0.143	0.052	188
Figural a.	-- " --	-- " --	0.091	0.216	188
Reasoning a.	-- " --	-- " --	0.123	0.093	188
Verbal a.	Parents assist children with homework (1= yes, both – 4 = none of them)	School type & Gender	0.060	0.414	188
Numerical a.	-- " --	-- " --	0.018	0.809	188
Figural a.	-- " --	-- " --	0.106	0.150	188
Reasoning a.	-- " --	-- " --	0.070	0.185	188
Father's education	Respondent's school type attended[(a)]	Reasoning	0.394	0.000	145
-- " --	-- " --	Verbal a.	0.431	0.000	145
-- " --	-- " --	Numerical	0.388	0.000	145
-- " --	-- " --	Figural	0.414	0.000	145
Father's education	Teacher's recommendation for sec. school placement [(a)]	Reasoning	**0.305**	**0.000**	171
-- " --	-- " --	Verbal a.	**0.341**	**0.000**	145
-- " --	-- " --	Numerical	**0.303**	**0.000**	145
-- " --	-- " --	Figural	**0.330**	**0.000**	145
Parents' voc. education	Respondent's school type attended	Reasoning	**0.306**	**0.000**	153
-- " --	-- " --	Verbal a.	**0.300**	**0.000**	153
-- " --	-- " --	Figural a.	**0.381**	**0.000**	153
Parents' voc. education	Teacher's recommendation for sec. school placement	Reasoning	0.251	**0.002**	153
-- " --	-- " --	Verbal a.	**0.248**	**0.002**	153
-- " --	-- " --	Figural a.	**0.320**	**0.000**	153

1= lower secondary school type (*Hauptschule*), 2=Intermediate sec. school type (*Realschule*), 3=high school (*Gymnasium*)

Source: SOEP Cognitive Test 2005.

Controlling for the different components of general cognitive abilities—verbal, numerical, and figural—we find a highly significant correlation between father's education and the respondent's secondary school type as well as teacher's recommendation for secondary school placement.

Table 7:
Intra-group variation (N = 185)

Social Group	Variable X_2	Spearman correlation	Significance (p) (two-sided test)	N
Variable X_1: Respondent's school type attended				
Higher educated parents (at least one holds a university degree)	Verbal a.	**0.390**	0.003	46
	Numerical	**0.333**	0.024	
	Figural	0.243	0.104	
	Reasoning	**0.431**	0.003	
Low- and medium educated parents (neither holds a university degree)	Verbal a.	**0.277**	0.001	139
	Numerical	**0.194**	0.022	
	Figural	**0.288**	0.001	
	Reasoning	**0.309**	0.000	
Variable X_1: Teacher's recommendation for secondary school placement				
Higher educated parents (at least one holds a university degree)	Verbal a.	0.117	0.466	41
	Numerical	0.223	0.161	
	Figural	0.266	0.093	
	Reasoning	**0.314**	0.045	
Low- and medium educated parents (neither holds a university degree)	Verbal a.	**0.277**	0.003	115
	Numerical	**0.285**	0.002	
	Figural	**0.210**	0.024	
	Reasoning	**0.340**	0.000	

Source: SOEP Cognitive Test 2005.

The same result can be found for parents' level of vocational education (i.e., whether at least one of the parents holds a university degree or not). Thus, given the same level of cognitive abilities, children from less-educated families are less likely to attend a higher school type and less likely to get a teacher's recommendation for placement in a higher school type than children from higher-educated families. The distributions of social disparities displayed in Figures 6 to 10 are, therefore, caused by "social design" and not by inherited cognitive differences (see also results presented above). This inference is corroborated by the findings from the logistic regressions on the chances of attending a *Gymnasium* (the academic-track German high school) (Table 8, see esp. Model 1 and 2). First, the estimates of father's education remain overall unchanged when including general reasoning abilities. This finding indicates that the unequal chances are *not* caused by compositional differences in reasoning abilities.

Second, children with lower-educated fathers (who only hold a *Hauptschulabschluss*) need 14 points more on the reasoning ability scale for attending a *Gymnasium* than children with fathers holding a medium school degree (*Mittlere Reife*) and 21 points more than those whose fathers hold an *Abitur* (in a range of the reasoning scale from 0 to 60 points).

Table 8:
Bivariate logistic regressions on attending a Gymnasium / holding an Abitur

	Model 1		(Best fitting) Model 2		Model a		Model b		Model c		Model d	
Independent variables	Exp(B)	P > I z I	Exp(B)	P > I z I	Exp(B)	P > I z I	Exp(B)	P > I z I	Exp(B)	P > I z I	Exp(B)	P > I z I
Parents' vocational education												
None of the parents holds a university degree					1		1		1		1	
At least one of the parents hold a university degree					4.75*	0.00	3.16*	0.00	2.77*	0.04	1.74	0.30
Father's education												
Max. lower secondary	1		1				1		1		1	
Intermediate secondary	2.88*	0.02	3.31*	0.01			3.07*	0.02	3.04*	0.04	3.62*	0.02
Upper secondary	6.75*	0.00	6.27*	0.00			3.51*	0.04	3.10	0.07	3.83*	0.04
Mother's education												
Max. lower secondary									1		1	
Intermediate secondary									1.03	0.95	0.93	0.89
Upper secondary									1.62	0.41	1.62	0.43
Reasoning abilities (sum score)			1.09*	0.00							1.08*	0.00
Intercept	0.01*	0.00	0.01*	0.00	0.32*	0.00	0.15*	0.00	0.14*	0.00	0.01*	0.00
Improvement of fit - Chi-Square (df)	18.56	(2)	18.29	(1)	18.53	(1)	6.93	(2)	1.00	(2)	13.86	(1)
Pseudo-R2 (Nagelkerkes)	0.14		0.27		0.14		0.19		0.20		0.29	
N (attending Gymnasium/not attending)	58/115				57/113							

* = significant p<0.05.

Model e:

Additionally including "Gender": Improvement of fit 1.72 (df=1), p=0.19

Exp(B): male =1, female = 1.65 (p=0.19)

2.3 Conclusions

The reliability of the measures used (taking into account the recommendation to replace "number series" by "arithmetic operations") and the initial empirical results presented above are very promising.

The measurement of general cognitive abilities of 17-year-olds would add an innovative component with high analytical potential to the SOEP.[3]

Compared to the cross-sectional data on 15-year-olds from the PISA studies, the SOEP testing of 17-year-olds offers the unique chance to investigate the relationships between school careers, educational attainment (school degrees achieved) and cognitive abilities. The SOEP cognitive test also makes it possible to disentangle the impact of school attainment and learning potential on future life-course outcomes such as completion of education/vocational training, participation in lifelong learning, employment careers, but also respondents' health behavior and their later involvement as parents in their own children's schooling, etc.

[3] For the possibilities of the measurement of cognitive potentials of adults within the SOEP context cf. Lang (2005).

3 How to measure cognitive abilities in a household panel framework

Design and methodological results of the "youth" pretest for SOEP 2006

3.1 Objectives of the “Youth” Pretest for SOEP 2006

The SOEP Youth Questionnaire is addressed to young people living in SOEP households and surveyed individually when they reach 16 years of age. In this, their first year as participants on their own in the survey, they will complete two questionnaires:

- the INDIVIDUAL questionnaire, which is identical to the one received by all adult survey participants
- the YOUTH questionnaire, which is the youth-specific version of the BIOGRAPHY questionnaire; YOUTH and BIOGRAPHY questionnaires are to be answered only once by every participant.

The YOUTH questionnaire was finally introduced to SOEP in 2001 after extensive pretesting. The database increases by an additional 350 to 400 young people annually with each additional cohort.

The contents of the YOUTH questionnaire describe the “standpoint“ of a panel participant at his or her point of entry into the SOEP longitudinal study. It thus constitutes an additional component of the “biographical perspective” in SOEP, which has been progressively strengthened and expanded in recent years. Other such components include the supplementary questionnaire “Mother and Child“ (since 2003), which mothers answer for their newborn children, and the supplementary questionnaire “Your child at the age of 2-3 years“ (since 2005), which they answer two years later for the same children. Further versions of the questionnaires are planned as well for later stages of child development.

To support SOEP’s biographical perspective, the idea came up of introducing a cognitive test to determine the individual levels of development of the young participants. This could potentially be useful in the context of a longitudinal dataset for measuring further development in later years and also for analyzing the relevance of cognitive capacities—beyond secondary school grades and graduation certificates—in affecting personal biographies and labor market chances.

Three tests were included in the youth questionnaire, each comprising 20 tasks and taking a total of 27 minutes to complete.

The original idea was to allow the SOEP youth survey to begin one year earlier, at the age of 15, and to administer only the cognitive test in the first year. The argument against this kind of design is that young people taking part for the first time would thus be performing a kind of "school assignment". From a motivational point of view, this does not seem like a propitious way to begin participating in SOEP.

The alternative option was:

- to have the young people first answer the YOUTH questionnaire (which is very well received by young people who are living in "SOEP households" because of its specific questions on the life situations of young people) as before,
- to present the cognitive test afterwards as a supplementary questionnaire,
- for the sake of balance, to skip the general INDIVIDUAL questionnaire for these young people taking part in SOEP for the first time (since the questionnaire is focused on employment and income and not yet applicable to the majority of young people).

Currently the SOEP group intends to incorporate this study design into the SOEP main survey in 2006 and to continue it for at least three years. The pretest was conducted as a trial run, preparing the way for the new design.

3.2 Integrating a Cognitive Test into the SOEP Youth Questionnaire

The use of standardized tests to measure cognitive ability is well established in psychological research. In that field, however, the instruments and methods used are designed for studying individual persons. The potential for using these tests in the framework of large-scale surveys with the goal of focusing not on individuals but on whole populations is attracting increasing interest in the research community. Perhaps the most prominent example of recent standardized testing—although with a somewhat different focus—is the PISA study's use of internationally comparative achievement tests in schools.

3.2.1 The I-S-T 2000 R Test

For the SOEP youth survey, we selected a testing instrument out of the classic repertoire of cognitive psychological research tools. This instrument contains extracts from the I-S-T 2000

R of Amthauer et al. 2001. The test is, according to the description in the handbook published by Hogrefe Verlag. "…modular in design, i.e., specific components can be included or left out depending on specific content demands and economic constraints".

The following components were chosen from the complete testing instrument to be used in the youth survey:

- Task group 02: Analogies (AN) to measure verbal cognitive potential
- Task group 05: Numerical Series (NS) to measure numerical cognitive potential
- Task group 09: Matrices (MA) to measure figural cognitive potential

Each of the three task groups contains 20 individual tasks. The allotted times for completing each of the tasks are: 7 minutes for AN, 10 minutes for NS, and 10 minutes for MA. This amounts to a total of 27 minutes for completion of all tasks. Additional time is necessary for the explanation of each of the tasks.

Appendix 1 presents the questionnaire redesigned by TNS Infratest for use in the framework of the SOEP Youth Survey.

Appendix 2 presents the separate questionnaire comprising the test. We show here only selected pages, i.e. the introduction to the test as a whole and the three individual sets of test items. It is clearly not customary to publish testing instruments in the field of psychology, and we are aware that this may raise legal concerns regarding licensing. The original test is published by Hogrefe Verlag and available for use upon purchase of a license.

3.2.2 Adapting the test to the conditions of a large-scale survey

The interview situation in a representative survey differs significantly from the usual testing situation in psychology, where cognitive tests are administered to individuals. The usual situation is characterized by the following:

- The test subjects choose to place themselves in a diagnostic framework to achieve particular objectives; their participation is not in question.
- The tests are explained and administered by trained personnel.
- The individual test results can be compared with the existing reference values and communicated to the test subjects in appropriate form.

The use of cognitive tests in large-scale representative surveys with verbal face-to-face inter-

views differs in that:

- The interviewees have chosen to participate in an interview in which they give information about their living situation and personal attitudes. This does not necessarily mean that they are willing to subject themselves to a test of achievement or knowledge. The question is, thus, how to motivate survey participants to take part in this test.
- The interviewers are not specially trained and educated in the administration of such tests. The test instruments therefore have to be designed in such a way that the procedure is as self-explanatory as possible and the interviewer needs no particular specialist knowledge.
- From the first two points above, it follows that these situations do not provide an appropriate framework for communicating test results to participants because interviewers are not able to put the results in a proper individual context.
- The methods used to carry out survey interviews differ widely. In SOEP, three types of survey instruments and procedures are used: completion of the usual paper questionnaire by the interviewee, completion of the paper questionnaire by the interviewer in a face-to-face interview, and the use of a computer program (computer-assisted personal interviewing, CAPI) in a face-to-face interview. The mode of administering a cognitive test has to be compatible with the interview method used and the resulting interview situation.

Depending on the type of test used and the conditions of the particular survey, different solutions are required to adapt the test to large-scale survey conditions. Two different strategies for solving the problem have been investigated:

- The test could be conducted with computer-assisted personal interviews (CAPI).[4]
- However, for the youth survey, a CAPI-based test appeared impracticable given the type and volume of test items. Thus, the usual "paper and pencil" test form is used here, filled out by the interviewee personally (the prior interview with the YOUTH questionnaire is conducted as a verbal face-to-face interview using a printed questionnaire as well.)

In this case, the cognitive tests are adapted to the conditions of a large-scale survey with a focus on three questions:

- How can we succeed in motivating the young people to fill out the test form (motivational aspect)?

[4] In fact, this strategy was implemented in the parallel test survey of the general population, which was based on CAPI and incorporated two short variants of cognitive testing (Lang 2005).

- How can we foster adherence to the test conditions, particularly time limits for the test items (control aspect)?
- How can we keep the instrument as clear and understandable as possible, so that errors in administering the test can be avoided (ease of use)?

3.2.2.1 On the motivational aspect

The original I-S-T 2000 R test was fairly unappealing aesthetically. While this may not matter to someone who has to take it (for diagnostic reasons), its lack of visual appeal as a barrier to participation for someone who has no specific personal motivation for completing the 60 test questions. To overcome this problem, TNS Infratest has sought to improve the test's "packaging" without changing its content. Improvements have been made both in the text presentation, giving the test a title that appeals to young people and including brief explanations of content and objectives, and in the graphic visual presentation.

What are the chances of success in asking randomly selected young people to take part in a "cognitive test"? Even this term itself could act as a deterrent, and what is worse, a selective deterrent, putting off mainly those individuals who feel that they are not the smartest, who dislike school, who do not enjoy written tests, and so on. In other words, this would induce a differential willingness to participate depending on educational background.

To counteract this, TNS Infratest sought an inoffensive, positive-sounding title. We decided on "Wanna DJ?" where DJ stands for "Denksport und Jugend" (brain-teasers and youth). Calling the test items "brain-teasers" is intended to stimulate the participants' curiosity and ambition. The term DJ (from the English "disc jockey") is commonly used in German, and this allusion is made more explicit in the interview instructions.

For the cover design, a bright, somewhat flashy color scheme was employed to further enhance the hip, casual presentation style. In the pages of the questionnaire that follow, colors were used further to create a friendlier general appearance. The different task groups are color-coded as well, making it easier to navigate through the questionnaire.

The individual task groups are not introduced simply as "Task Group XY", as in the original, but given casual, attention-getting titles that arouse curiosity:

"1. Just the right word…" (for the items testing verbal abilities)

"2. The magic number…" (for the items testing numerical abilities)

"3. A perfect figure…" (for the items testing the figural abilities)

Along with questionnaire design, two further considerations are important for the motivation to participate:

The young people are not given the test immediately, but first a questionnaire in which they can describe their personal life situation and views on a variety of issues. This is a way of "*framing*" the test that follows by placing the young people's personal interests in the foreground. This can help keep them from adopting a defensive attitude when starting the cognitive test itself.

The young people do not receive financial compensation for participating in either the interview or the test itself, as is true for the main SOEP survey as well. Willingness to participate must be based entirely on "intrinsic motives". However, this does not bar the interviewer from giving participants small gifts to thank them and create a friendly atmosphere. In this pretest, each participant received two small "*thank-you gifts*". The gifts that were chosen were directly related to the administration of the test: one was a trendy flashlight pen (which could then be used in taking the test) and the other was a digital stopwatch (used by the interviewer to keep track of the time allotted for completing the test items and given to the participant afterwards).

3.2.2.2 On the control aspect

When the YOUTH questionnaire is completed and the cognitive test begins, the interviewer changes out of the usual role of a neutral test administrator, asking questions and recording answers, into the role of an instructor, giving instructions and checking the time to make sure that the participant has adhered to the rules.

In a large-scale survey where interviewers are scattered throughout an entire country, it would be extremely expensive to train them personally in how to achieve this role change. In order to achieve the effect of personal training in a different way, TNS Infratest focuses on the following aspects of test design:

- Clear design of survey instruments to minimize the need for interviewer training
- Clear written interview instructions that explain the interviewer's tasks.

The interview instructions for this survey are attached in *Appendix 3*. The task of the interviewer in administering the questionnaire is described there as follows:

"This part is to be read and filled out by the young people themselves. Your task as interviewer is:

- *To ensure that the participants understand the test tasks correctly. Please help them by providing explanations or clarifications as needed.*
- *To time them as they complete the three test tasks. The test inicludes a stopwatch that you should use first and then give to the participant as a gift (together with the flashlight pen). Please read the enclosed instructions at home to learn how the stopwatch works.*

***Attention**: It is important to stick to the time limit exactly since the test results are otherwise invalid.*

Please allow the participant to read the explanatory part, and then, referring to the examples, attempt to determine whether he or she has understood the task correctly (please provide any help needed before starting the clock). Tell them the exact allotted time for each of the brain-teaser items. The participant is to answer these questions alone."

Whether or not the stopwatch helps adhere to the time limit is one of the questions that the pretest was designed to answer. Basically, there is no reason why the interviewer could not just as easily use his or her own wristwatch. The main function of the stopwatch is thus to focus both the interviewer's and the participant's attention on staying within the time limit.

It should be kept in mind that with decentralized test administration, one can only guarantee strict control of the testing situation through the use of computer-assisted testing instruments. When test forms are used conventionally, as in the youth survey, the interviewer has to be trusted to administer the test correctly. Whether the time limits are actually adhered to precisely in each individual interview cannot be checked using this procedure.

3.2.2.3 User-friendliness

To ensure high-quality test results—in the sense of reliable and valid answers—easy-to-use testing instruments are critical. This "user-friendliness" involves two aspects: creating understandable tasks and preventing mistakes in the entering of answers.

This is a difficult area, given that the capacity of the participants to understand the tasks and to correctly enter their answers involves the very same cognitive abilities being measured in the test. If, on the other hand, the test design demands cognitive abilities, the particular aspects required could be different than the ones being tested (e.g., verbal abilities). This reflects the complexity of the relationship between test object and test design.

With decentralized test administration in the framework of a large-scale survey, “external” questions of test construction gain greater importance. It would be false to assume that all the potential difficulties encountered by participants in taking the test will necessarily be caught by trained instructors. TNS Infratest has thus revised the test presentation to guarantee that the test is as user-friendly as possible for the interviewees.

These revisions have been taken into account in the instructions introducing each task block. Here the tasks are explained and examples given. The revised instructions were closely modeled on the original testing instrument, but were in some cases condensed, expanded, or formulated in more colloquial language. In addition—and more importantly—the test was modified into a “questionnaire”, a much more familiar format to both interviewer and participant.

In the test’s original form, task descriptions and answers were separate: there was a “task booklet” and an “answer sheet”. Specific techniques were used to ensure that the participant connects the two correctly, for example, through the numbering of tasks and answers. This original approach was obviously chosen for reasons of economy in test administration. The task booklets are intended for reuse (“Do not write or make any markings in the task booklet!”), such that only one standardized, compactly designed answer form has to be filled out per participant.

The new version of the testing instrument by TNS Infratest integrates the “task booklet” and the “answer sheet” in one instrument, providing a space for answers along with each task. In the case of multiple-choice questions 1 and 3, answer boxes are included so that the participant has only to check the appropriate box. In task 2, where the answer is a number, there is an answer space immediately adjacent to the math problem.

In this way, some of the cumbersome aspects of test presentation, e.g., the numbering of tasks and answers, can be avoided. This encourages the participant to focus all his or her attention on the task at hand. Similarly, the distraction of flipping back and forth between task booklet and answer sheet is avoided entirely. This also limits the danger of making mistakes that can occur in transferring answers to a separate sheet.

Thus, participants’ answers are no longer entered into a compact answer form. This seems unnecessary given that the data in a large-scale survey are processed by computer anyway. The answers in the questionnaire are scanned in and thus saved in data form. Each answer can be defined within the dataset as correct or false. The use of templates to evaluate the answer forms (as applied to the original testing instrument) thus becomes unnecessary and is replaced

by faster and more accurate procedures.

3.3 Design and Implementation of the Pretest Survey

The youth pretest survey was designed to adhere as closely as possible to the procedure for SOEP 2006:

- Young people are surveyed at the age of 16
- Testing instruments include the YOUTH questionnaire and the additional questionnaire "Wanna DJ?" (cognitive test).

Our goal was to carry out 200 interviews to produce a database usable as the basis for carrying out initial analyses.

3.3.1 The sample

The sample is comprised of young people born in 1988. Young people from SOEP households were excluded from being interviewed in the pretest.

The selection of interview participants was made by the nationwide team of interviewers according to quota targets. The broad network of interviewers guaranteed wide regional distribution within the sample. The broad social and educational distribution of respondents is achieved through the definition of three quota groups:

Quota group 1:	Upper secondary school (Gymnasium) students
Quota group 2:	Intermediate secondary school (Realschule) students
Quota group 3:	Lower secondary school (Hauptschule) students, trainees, employed and unemployed individuals

Another objective was to ensure that West Germany and East Germany are represented in a 2:1 ratio.

To acquire addresses of respondents, a letter was sent to SOEP team interviewers asking them to give names of suitable 16-year-olds in their region. From these addresses, 255 were chosen for the total sample in line with the quota distribution described above. The addresses were distributed among a total of 61 interviewers with wide regional dispersion.

3.3.2 The final sample

Of the 255 addresses chosen, 230 individuals were actually interviewed. The high participation rate of 90% is, of course, not comparable with that in a random sample. At the same time,

the number of 230 interviews, which is significantly above the expected 200, shows that the survey was apparently well received among the young people and could be carried out without problems.[5]

The distribution of the 230 interviews across the quota groups corresponds fairly well to the sample plan:[6]

	West	East	Total
Group 1: Upper secondary students	51	25	76
Group 2: Intermediate secondary	52	29	81
Group 3: Lower secondary, etc.	51	22	73
Total	154	76	230

The final sample includes young people from all of Germany's federal states except Bremen and Saarland. The regional characteristics are included with the datasets.

3.3.3 Interviewer Reports

The interviewers were asked to write a short semi-standardized report of their experiences for each interview. Their instructions can be found in *Appendix 3*.

The interviewer report does not refer to the YOUTH questionnaire, which is an already existing instrument, but solely to the supplementary questionnaire "Wanna DJ?". Interviewers were asked about the reactions of the young people to different aspects of the test: the clarity of tasks, presentation of the questionnaire, motivation to participate, reactions to the individual tasks.

The interviewers then entered any notes and comments applicable to the particular interview under the appropriate headings. Word-for-word records of their comments can be provided for evaluation. Furthermore their responses were coded within each of the categories as positive / negative / neutral, and are available in the dataset for quantitative analysis. It should be noted that this information is only available where the interviewer actually made comments.[7]

[5] Two interviewers misunderstood the instructions and instead of conducting face-to-face verbal interviews, allowed the interviewees to complete the questionnaire and cognitive test themselves. Although this was a violation of the rules, the fact that the survey instruments can be worked through without the support of the interviewer does show that they are designed in a user-friendly way. The thirteen interviews are therefore flagged in the data set.

[6] The assignment to quota groups 1 to 3 was checked against the directions in the questionnaire and corrected where necessary. The figures in the summary reflect the corrected assignments.

[7] Depending on the particular aspect, the number of comments ranges between 28 and 90.

3.4 Results of the pretest fieldwork

In our conclusion to this pretest report, we again discuss only that part of the youth survey containing new developments: the cognitive test. The youth questionnaire filled out beforehand by the participants is an established SOEP instrument and does not need to be discussed further here.

One can evaluate the pretest results and experiences based on different criteria:

- On the willingness of young people to participate
- On interviewers' comments about the reactions of the interviewees as recorded in interviewer reports
- On initial examination and evaluation of the data

The young people's willingness to participate was, as stated previously, very high. The survey could thus be carried out in a very short span of time. However the meaningfulness of the pretest is limited in this respect: the interviewees were not selected randomly but by the interviewers themselves to fit the quotas. The willingness to participate in a random sample remains to be seen. On the other hand, teenagers in SOEP households know the yearly "procedure" of interviews.

The interviewer reports can reveal problems that come up during the interview. Interviewers see their task in writing these reports mainly in providing tips that can help to avoid problems. In the majority of cases, the interviewers did not say anything at all about the aspects mentioned, which can be interpreted positively ("no problems"). Their comments and suggestions should be taken seriously, however. They can be summarized as follows:

The *design* of the new questionnaire was generally seen as a success, as being attractive and awakening interest. Only a few interviewees did not like the design at all or had no strong feelings about it either way. The *title of the study*, however, produced polarized responses: some interviewees felt motivated by the association between DJ and Denksport und Jugend (brain-teasers and youth), and found the title original and youthful, while others perceived the Anglicism negatively, or found the title irritating or just silly. The young people often reacted to the *tasks* with amusement and praise ("cool") rather than skepticism or doubt ("What good is that?" "Is this an idiot test, or what?"). The majority of young people found the cognitive test to be an enjoyable and exciting challenge, but for many it was also exhausting and they approached it with reservations ("I wonder if I will be able to do it.").

The test was generally more *difficult than the teenagers expected after studying the examples*. They frequently commented that the examples were too easy compared to the actual tasks and had raised false expectations. This statement should be understood as meaning we meant to trick them ("It could be that none of this is true and they put in mistakes").

The pressure that the young people felt when confronted with the achievement test was expressed in many of their statements. Those who approached it with zeal and enthusiasm were small in numbers compared to those who lost interest, felt annoyed, resigned, overtaxed or even quit before finishing. A further indicator of this is the frequent mention of too little time. These young people perceived finishing as a difficult task.

What can we conclude from our initial examination and evaluation of the data? What does the young people's response behavior say about their manner of dealing with the test questions?

We present a few results here. It should be emphasized that this information is presented without any background knowledge about response distributions in other studies that could be used for norming the test results from I-S-T 2000 R or similar tests.

The test encompasses 60 items in three task blocks (for verbal, numerical and figurative dimensions of cognitive potential). These 60 test questions were answered by 230 young people with the following average results:

Summary 1:
Results of the test (60 questions)
Basis: N = 230

	Average	Minimum	Maximum
Correct answers	29.9	7	53
False answers	22.0	4	47
Not answered	8.2	0	42
Total	60.0		

The figures suggest that the tasks were well designed in terms of both time constraint and level of difficulty. Half of all questions were answered correctly within the allotted time. At the same time, the level of difficulty of the questions poses a significant challenge for the young people. None of the participants answered all 60 correctly. On average, more than one-third of all questions were answered incorrectly. A large number were not completed at all

due to time constraints or for other reasons.

Beyond the averages, we see a very broad distribution of individual values. The test thus reveals a variance in cognitive abilities within the test population.

These individual differences in the results clearly follow the lines of the young people's schooling. If one takes the percentages of participants who completed over half of the questions (more than 30 of 60) correctly as an index for comparing their cognitive abilities, we see that three hierarchically ordered groups emerge from the total picture:

	Percentage with high test results
Group 1: Upper secondary	67%
Group 2: Intermediate secondary	52%
Group 3: Lower secondary, etc.	30%
Total	50%

Corresponding indices can also be assigned to each of the three groups of questions to measure different aspects of cognitive ability, defined as correctly answering more than half, i.e., more than 10 of the 20 questions. Summary 2 shows the results broken down by educational group:

Summary 2:
Cognitive ability by test question groups

	Percentage with high test results for …		
	verbal abilities	numerical abilities	figural abilities
	%	%	%
Group 1: Upper secondary	47	66	67
Group 2: Intermediate secondary	20	59	53
Group 3: Lower secondary, etc.	14	36	33
Total	27	54	51

The results are plausible overall, and give the following insights:

- The task groups differ in their level of difficulty. The percentage of correct answers is only half as high for the items testing verbal ability as for the other two groups. The explanation is probably that with the semantic connections required to answer the questions, the rules and criteria are less clear than for the numerical and figural tasks. Whether or not this

means that the questions testing verbal abilities may need to be revised should be decided by experts in this field.

- We see the hierarchical variation among the three educational groups in each of the three groups of test questions. The gap differs in intensity relative to the different cognitive dimensions: it is greatest with verbal abilities, and smallest with numerical abilities.

From the fieldwork perspective, the pretest can be judged a success: it has succeeded in integrating a sophisticated cognitive test into the interview situation in a large-scale survey in such a way that:

- The interviewees accept the test items.
- Their test answers generate plausible results, producing a dataset that can serve as a basis for analysis.

The pretest has generated no objections against using the cognitive test as a supplementary questionnaire to the youth questionnaire in SOEP. To the contrary, this combination of survey instruments could awaken more interest among young people than the combination of YOUTH and INDIVIDUAL questionnaires up to now: it would make new participants' initiation into SOEP more closely attuned to their interests as young people.

The test instrument and the procedure for using it in the survey have proven their value and do not require significant revision from the fieldwork point of view. There are, however, a series of details that should be discussed and possibly improved, in particular the following:

- It should be determined how to make it easier for the interviewer to keep track of the time. The stopwatch used here helps only to a limited degree (although it does also make a nice gift for the participants).
- In the pretest there were not a many, but still a few inadmissible multiple answers. It should be brought more clearly to the interviewer's attention that multiple answers are not allowed.
- The title "Wanna DJ?" could be reconsidered. The Anglicism "DJ" does not appeal to all participants.

The flexible choice of interview methods in SOEP does lead to a certain difficulty in integrating the cognitive test into the SOEP questionnaire. All questionnaires, including the YOUTH questionnaire, are designed in such a way that the interview can be carried out verbally and personally or completed by the interviewee himself or herself. With the YOUTH question-

naire, approximately 50% of interviewees take the opportunity to complete it themselves.

In contrast, the cognitive test requires that the interviewer provide guidance and control. For the organisation of the interview, this means that all interviews should be carried out verbally and personally, i.e., that the interviewer has to meet with and interview the young people personally. This makes it much more difficult compared to the previous situation.

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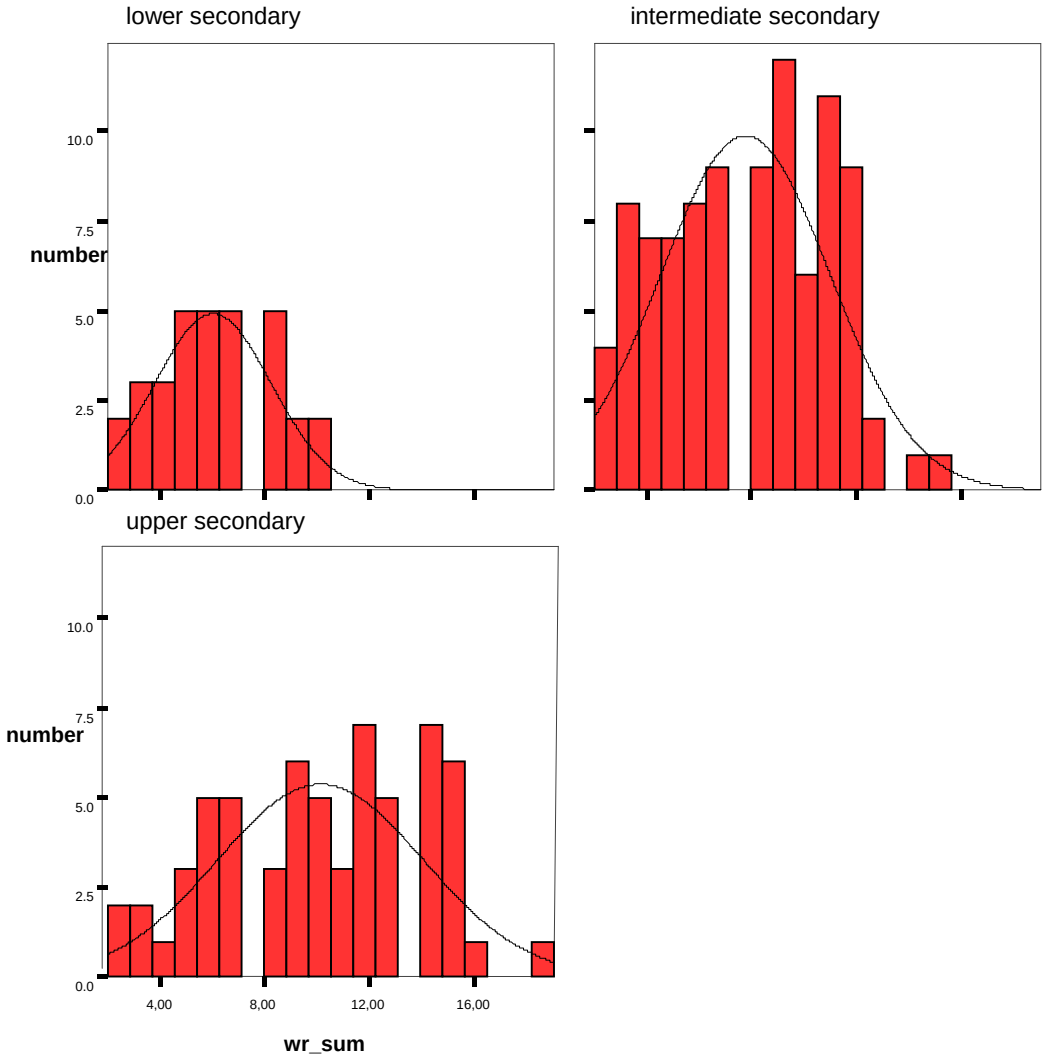
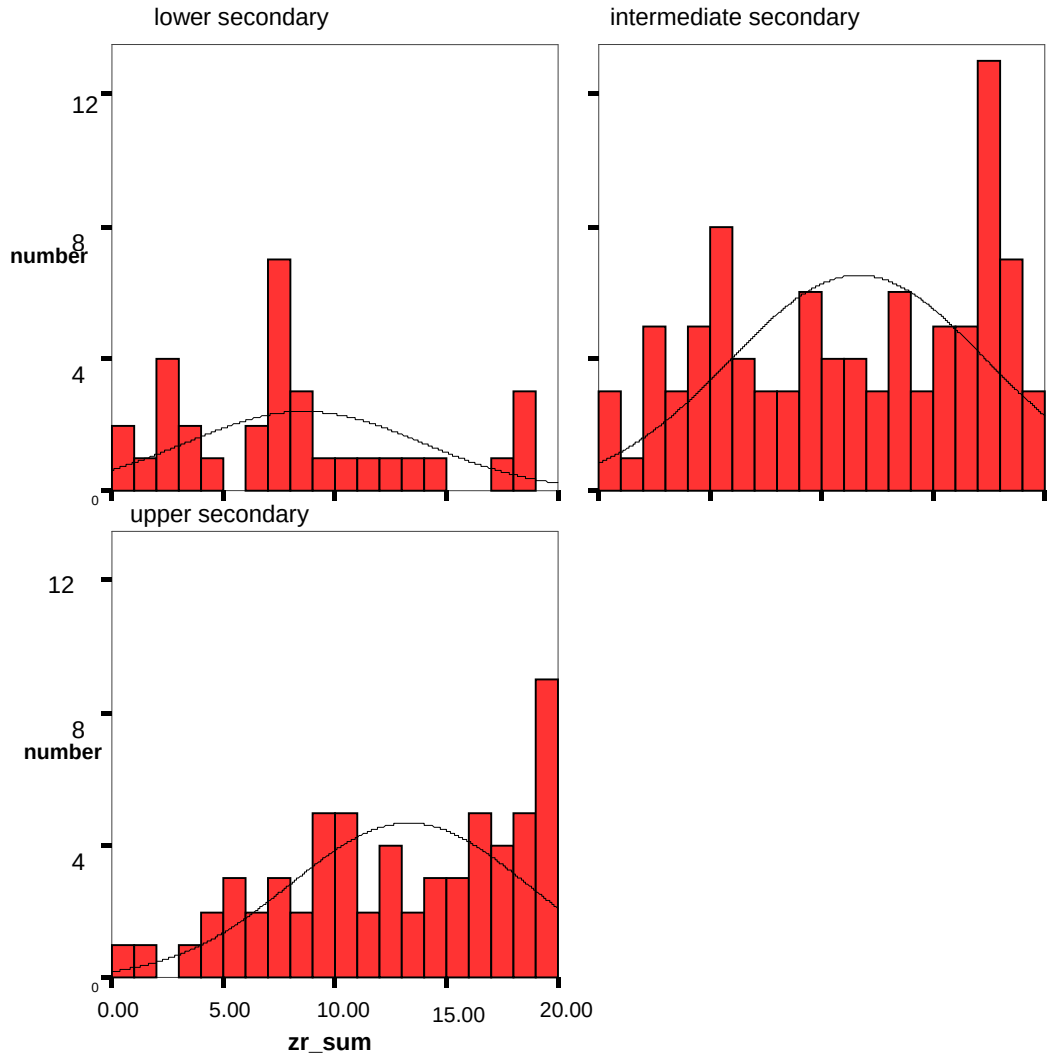
Figures

Figure 1:
Histogram – Verbal abilities by school type attended (N = 188)



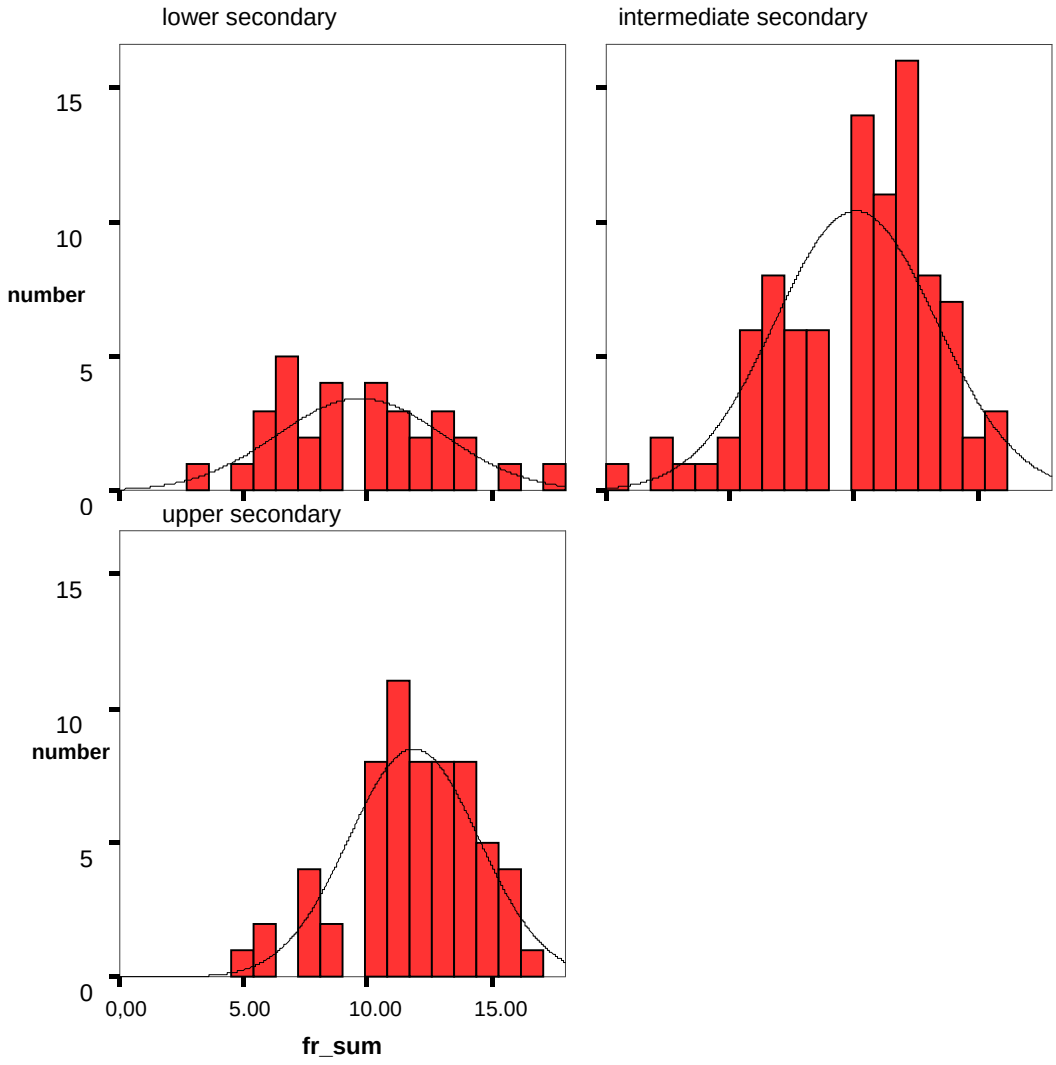
Source: SOEP Cognitive Test 2005.

Figure 2:
Histogram – Numerical abilities by school type attended (N = 188)



Source: SOEP Cognitive Test 2005.

Figure 3:
Histogram – Figural abilities by school type attended (N = 188)



Source: SOEP Cognitive Test 2005.

Figure 4:
Father's education by children's cognitive abilities (N = 177)

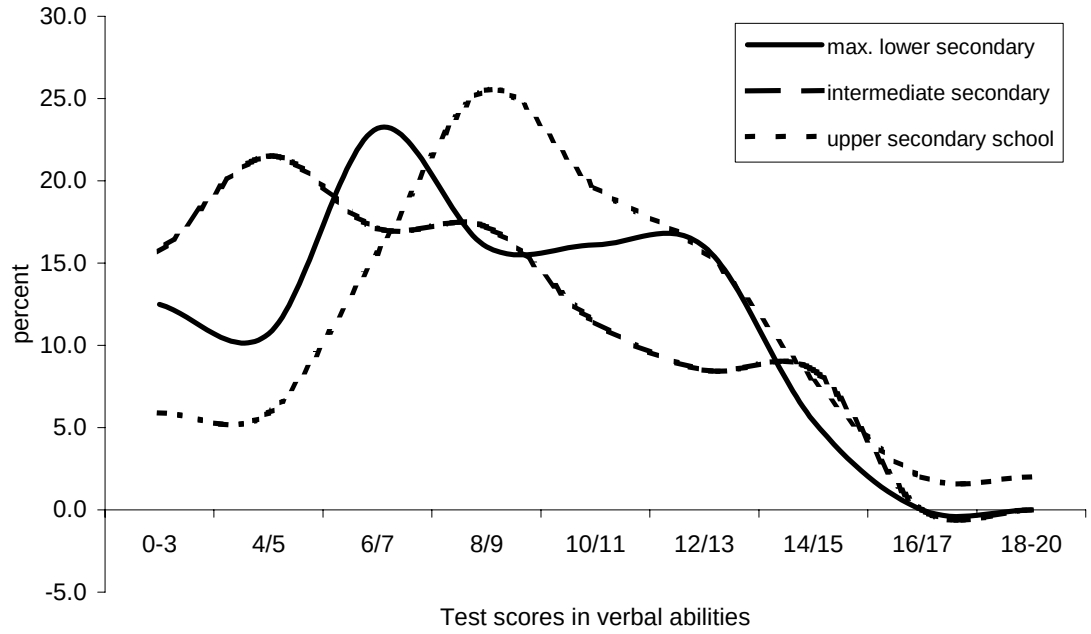


Figure 5:
Mother's education by children's cognitive abilities (N = 185)

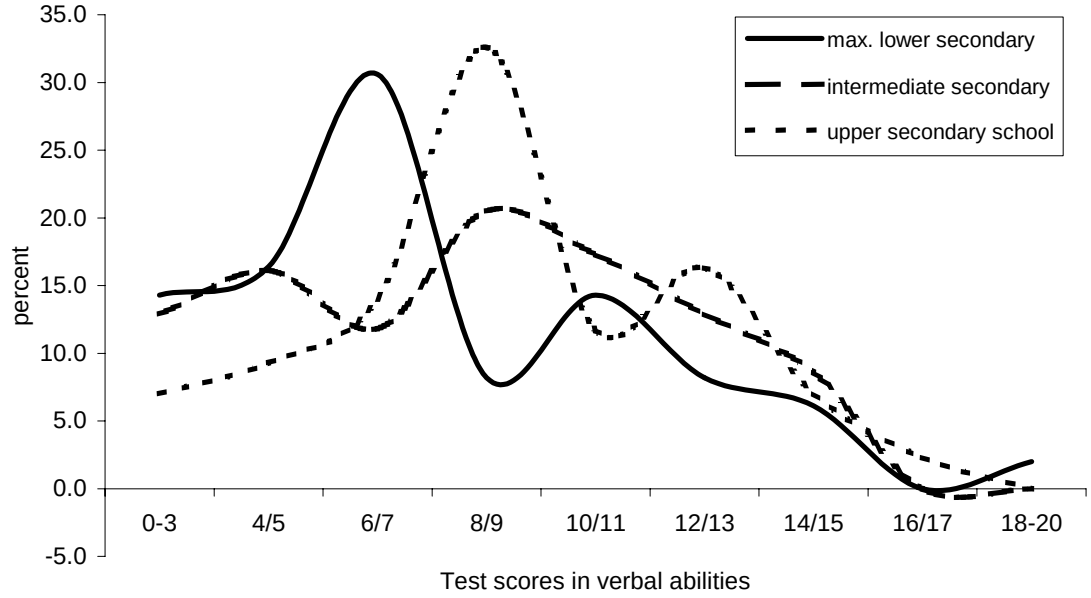
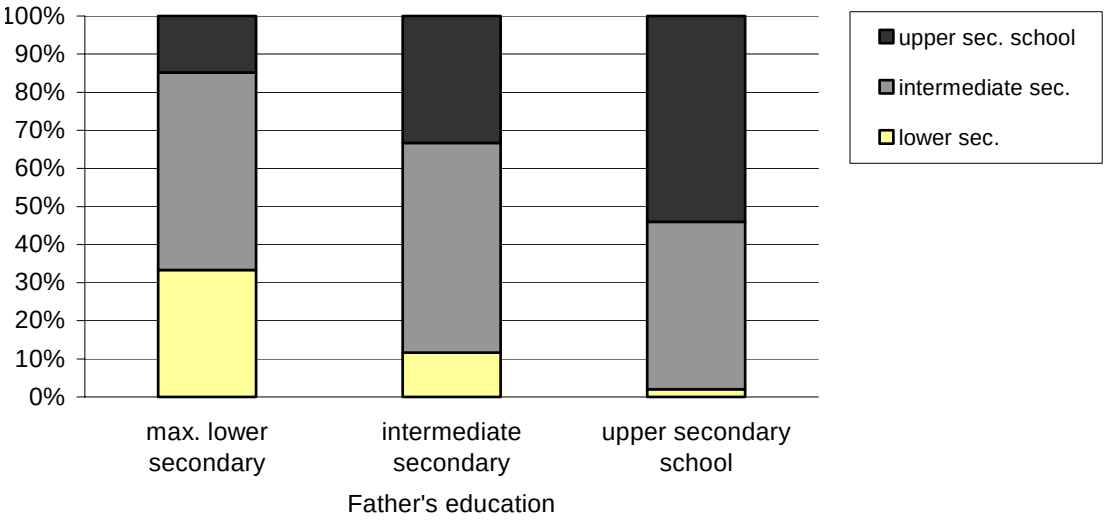
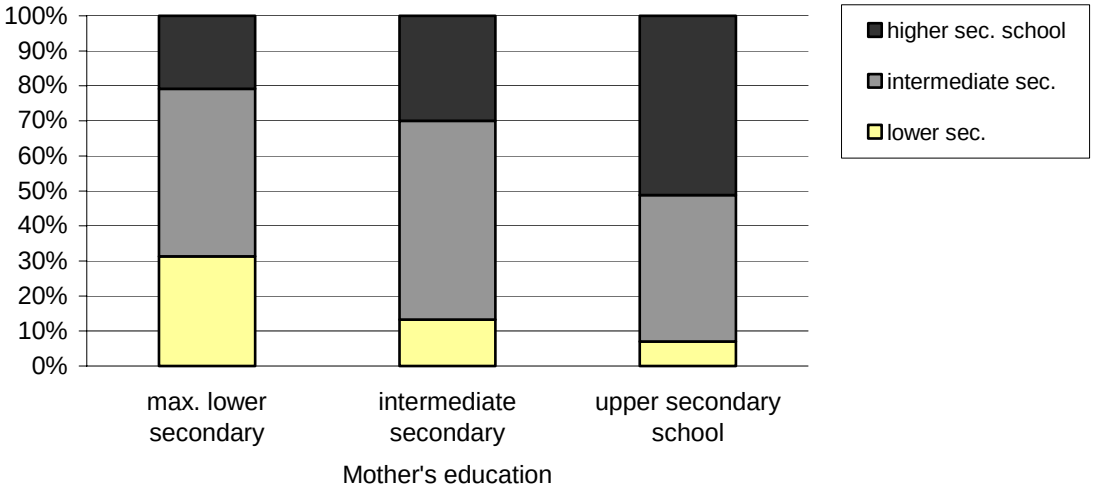


Figure 6:
Father's education by respondent's school type attended (N = 173)



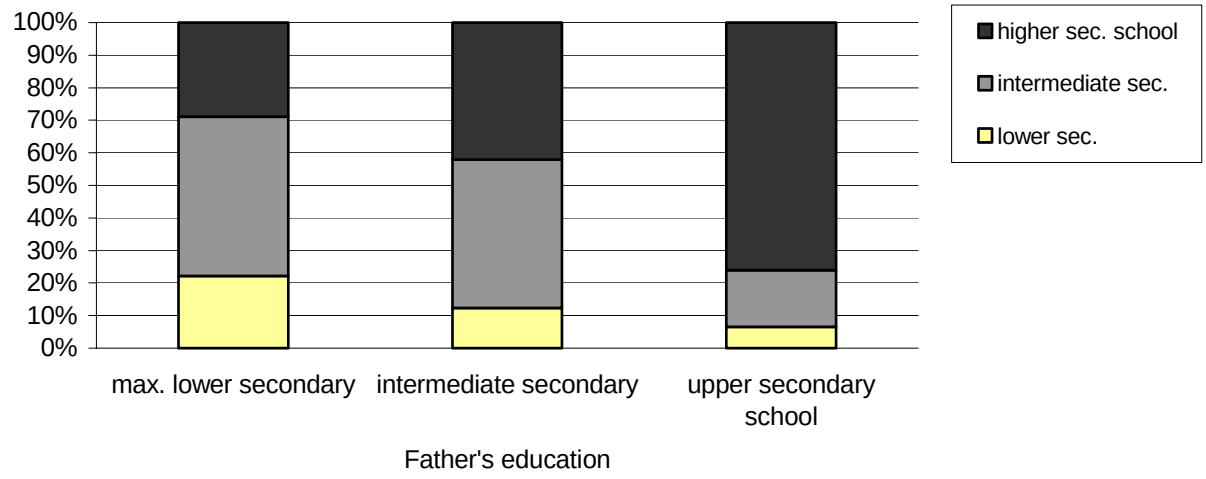
Chi-square-test: 30,121 (df=4) (p=0,000)

Figure 7:
Mother's education by respondent's school type attended (N = 181)



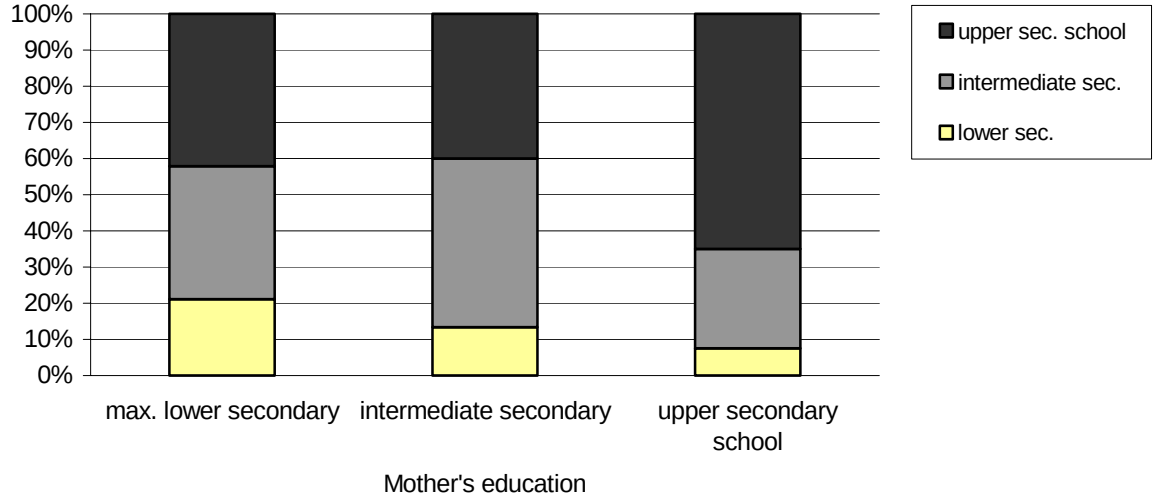
Chi-square-test: 17,332 (df=4) (p=0,002)

Figure 8:
Father's education by teachers' recommendation for secondary school placement
(N = 148)



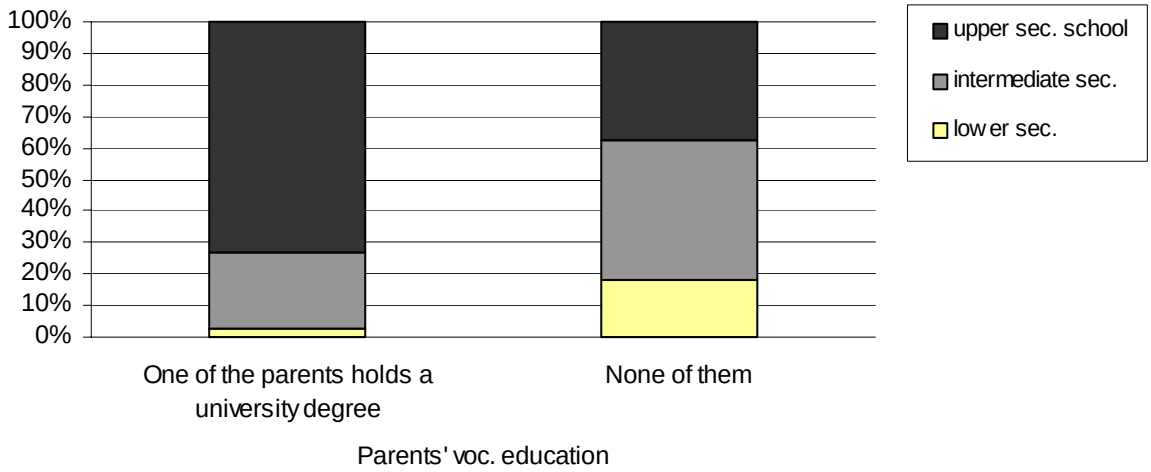
Chi-square-test: 22,931 (df=4) (p=0,000)

Figure 9:
Mother's education by teachers' recommendation for secondary school placement
(N = 153)



Chi-square-test: 8,869 (df=4) (p=0,064)

Figure 10:
Parents' vocational education by teachers' recommendation for secondary school placement (N = 156)



Chi-square-test: 16,721(df=2) (p=0,000)

Appendixes

Appendix 1: Introduction of the redesigned test I-S-T-2000 R

Appendix 2: Interviewer instructions

TNS Infratest Sozialforschung
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Lust auf DJ

DJ steht für „Denksport & Jugend“ und ist die neue Ergänzung unserer Befragung „Leben in Deutschland“ – den Jugendfragebogen unserer Studie haben Sie ja gerade kennen gelernt. Auch DJ wendet sich an junge Menschen, die 1988 geboren sind.

Aber DJ ist anders, es fragt nicht nach Ihrer Meinung, Ihren Neigungen, Ihrer sozialen Situation. DJ ist Denksport. Gefragt ist "Köpfchen, Köpfchen" - aber bleiben Sie locker!

Ihre Teilnahme ist natürlich freiwillig.

Listen-Nr.	**Lfd. Nr.**

Vorname des Befragten:

Bitte in Druckbuchstaben

Ich bestätige die korrekte Durchführung des Interviews:

Tag	**Monat**	**Abrechnungs-Nummer**	**Unterschrift des Interviewers**

Worum es geht? Im Grunde müssen Sie lediglich in ein bestehendes System ein fehlendes Element einordnen.

- **erst Worte,**
- **dann Zahlen,**
- **zuletzt Figuren.**

Und wir fangen immer ganz leicht an. Unsere Mitarbeiterin/unser Mitarbeiter wird Ihnen allerdings für jede der drei Denksportaufgaben nur eine bestimmte Zeit gewähren.

Die Zeit wird mit einer Stoppuhr gestoppt, die Sie zum Schluß als Geschenk erhalten.

Gehen Sie der Reihe nach vor. Aber wenn Sie mal an einer Stelle wirklich nicht weiterkommen sollten, dann atmen Sie kräftig durch und rücken zur nächsten Stelle vor.

Noch eine Bitte: Lösen Sie die drei Denksportaufgaben bitte allein. Schicken Sie doch einfach - bis auf unsere Mitarbeiterin/unseren Mitarbeiter - alle anderen Leute weg!

Also denn: viel Vergnügen…

1. Ein treffendes Wort ...

Was sollen Sie tun?
Wir geben Ihnen in der ersten Zeile drei Wörter vor und markieren mit dem Fragezeichen das fehlende Wort, das Sie zuordnen sollen. Dazu sehen Sie in der zweiten Zeile eine Auswahl von fünf Wörtern. Und welches passt nun?
Schauen Sie noch einmal auf die erste Zeile: Zwischen dem ersten und zweiten Wort besteht eine Beziehung. Zwischen dem dritten und einem der fünf Wörter, die Ihnen zur Auswahl stehen, besteht eine ähnliche Beziehung.

Beispiel:

Wald : Bäume = Wiese : ?

Gräser ... ☒ Heu ... ☐ Futter .... ☐ Grün ... ☐ Weide ... ☐

Hier sind Oberbegriffe und Unterbegriffe gegenüber gestellt. Für den „Wald“ sind „Bäume“, was für die „Wiese“ die „Gräser“ sind. Kreuzen Sie also **Gräser** an.

Ein weiteres Beispiel:

dunkel : hell = nass : ?

Regen ... ☐ Tag ... ☐ feucht ... ☐ Wind ... ☐ trocken .... ☒

Da „dunkel“ das Gegenteil von „hell“ ist, muss zu „nass“ auch das Gegenteil gefunden werden. Hier wird also **trocken** angekreuzt.

H a l t, halt, halt!
Für diese Denksportaufgabe haben Sie 7 Minuten Zeit.
Bitte warten Sie jetzt auf das Zeichen zum Beginn.

Vorher nicht umblättern!

2. Eine goldrichtige Zahl ...

Was sollen Sie tun?
Wir geben Ihnen eine Zahlenfolge vor, die nach einer bestimmten Regel aufgebaut ist. Finden Sie die Regel heraus und tragen Sie die Zahl, die nun folgen müsste, in das Leerkästchen am Ende der Reihe ein. So ähnlich wie in den beiden Beispielen, die jetzt folgen.

Beispiel 1: **2 4 6 8 10 12 14 ?**

In dieser Reihe ist jede folgende Zahl um 2 größer als die vorhergehende
(2 + 2 = 4; 4 + 2 = 6; 6 + 2 = 8; 8 + 2 =10; 10 + 2 = 12; 12 + 2 = 14; 14 + 2 = **?**).

Die Lösung lautet: **16**

Beispiel 2: **9 7 10 8 11 9 12 ?**

In dieser Reihe werden abwechselnd 2 abgezogen und 3 zugezählt
(9 - 2 = 7; 7 + 3 = 10; 10 - 2 = 8; 8 + 3 = 11; 11 - 2 = 9; 9 + 3 = 12; 12 - 2 = **?**).

Die Lösung hier lautet: **10**

Übrigens: Nebenrechnungen sind natürlich erlaubt!

Moment noch!
Für diese Denksportaufgabe haben Sie 10 Minuten Zeit.
Bitte warten Sie jetzt auf das Zeichen zum Beginn.

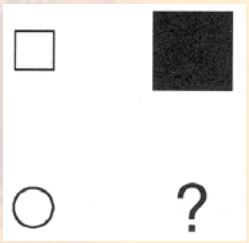
Vorher nicht umblättern!

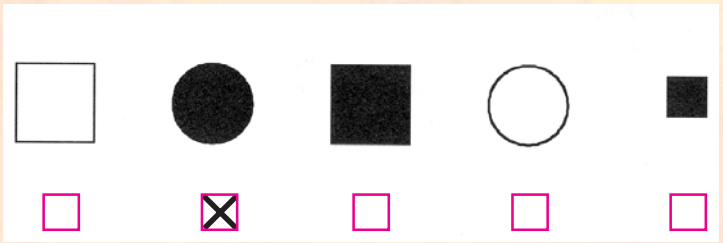
3. Eine passende Figur ...

Was sollen Sie tun?
Wir geben Ihnen auf der linken Seite drei Figuren vor, die einer bestimmten Regel entsprechend aufgereiht sind. Auf der rechten Seitenhälfte sehen Sie fünf verschiedene Figuren zur Auswahl.

Ordnen Sie die richtige Auswahlfigur an Stelle des Fragezeichens ein.

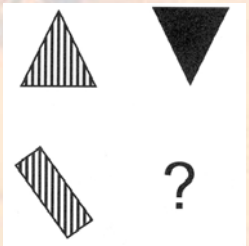
Beispiel 1:

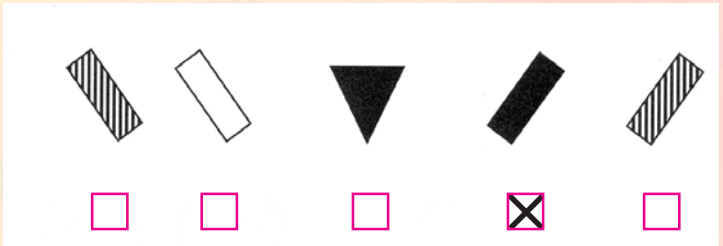




Im Beispielkasten ist neben dem kleinen weißen Quadrat ein großes schwarzes, also muss auf den kleinen weißen Kreis ein großer schwarzer Kreis folgen. Kreuzen Sie also das Kästchen unter dem **schwarzen Kreis** an.

Beispiel 2:





Im zweiten Beispielkasten folgt auf das erste gemusterte Dreieck ein schwarzes, das gespiegelt, also auf den Kopf gestellt wurde. Entsprechend muss die gesuchte Figur ein gespiegeltes, schwarzes Rechteck sein.
Hier kreuzen Sie also das Kästchen unter dem **schwarzen Rechteck** an.

Es ist immer nur eine Lösung richtig!

Moment noch!
Für diese Denksportaufgabe haben Sie 10 Minuten Zeit.
Bitte warten Sie jetzt auf das Zeichen zum Beginn.

Vorher nicht umblättern!

I N T E R V I E W E R A N L E I T U N G
Projekt Nr. 44899 / Welle 01
Pretest "Jugend“ für Leben in Deutschland
PAPI/ Quote

Bitte nutzen Sie für **inhaltliche** Rückfragen zu diesem Projekt folgende Telefonnummern:

☎ **0800-1009455**
☎ **089 / 5600 – 1306**
☎ **0800-Nr.** Ihres Regionalleiters wie gewohnt für **Terminfragen**

Juni 2005 / RUN

Liebe Interviewerin,
lieber Interviewer,

anbei erhalten Sie die Befragungsunterlagen für den angekündigten Pretest zu unserem Großprojekt "Leben in Deutschland", für den Sie uns bereits Zielpersonen gemeldet haben.

WORUM GEHT ES:

In der Studie "Jugend“ für Leben in Deutschland werden zum einen biographische Daten u.a. zu den Bereichen Schule/Ausbildung, Familie und Freizeit, erhoben. Zum anderen geht es um Fähigkeiten der Problemlösung von Jugendlichen, die mit einer Reihe von Denksportaufgaben gemessen werden. Es handelt sich hier um zwei unterschiedliche Erhebungsinstrumente und Verfahren, die unterschiedliche Anforderungen an den Interviewer stellen.

Wir möchten von Ihrer langjährigen Erfahrung profitieren, indem Sie uns wichtige Erkenntnisse aus der Befragungssituation mitteilen. Dazu gibt es einen Erfahrungsbericht, in dem *Sie* uns bitte möglichst ausführlich Ihre Eindrücke zur Befragung festhalten (ein Erfahrungsbericht für jede durchgeführte Befragung).

ZIELPERSONEN:

Zielpersonen sind die von Ihnen gemeldeten Jugendlichen des Geburtsjahres 1988 (siehe Kopie des Rücksendecoupons). Wir unterscheiden 3 Quotengruppen:

- Gruppe der Gymnasiasten (Quotengruppe 1),
- Gruppe der Realschüler (Quotengruppe 2),
- Gruppe der Hauptschüler/Azubis/Erwerbstätigen/Arbeitslosen (Quotengruppe 3).

Sollten einzelne Jugendliche nun doch nicht an der Befragung teilnehmen können, ersetzen Sie diese bitte mit Jugendlichen dergleichen Quotengruppe.

ACHTUNG:	**Jugendliche aus Befragungshaushalten der Studie "Leben in Deutschland" dürfen auf keinen Fall befragt werden!**

Freiwilligkeit und Datenschutz:

Bitte weisen Sie jeden Befragten auf die Freiwilligkeit der Teilnahme hin und übergeben Sie – spätestens am Ende des Interviews – das Merkblatt "Erklärung zum Datenschutz". Verwenden Sie dazu die Datenschutzerklärungen aus Ihrem Vorrat.

ANLAGE DER UNTERSUCHUNG:

Quoten-Auswahl-Verfahren
Papier-Studie

ZUM ABLAUF DER BEFRAGUNG:

(1) Der Jugendfragebogen aus „Leben in Deutschland“

Diesen Fragebogen kennen Sie schon aus der Befragung „Leben in Deutschland“. Achtung: er ist etwas erweitert und an einigen Stellen modifiziert.
WICHTIG: Dieser Teil der Befragung soll unbedingt als persönlich-mündliches Interview durchgeführt werden.

(2) Der neue Fragebogen „Lust auf DJ“ (DJ, gesprochen: „Di Dschäi“, steht als Abkürzung für „Denksport & Jugend“)

Diesen Teil sollen die Jugendlichen selbst durchlesen und bearbeiten. Ihre Aufgabe als Interviewer ist:

- Sicher zu stellen, dass der befragte Jugendliche die Testaufgaben richtig versteht. Bitte helfen Sie ihm ggf. mit Erläuterungen und Erklärungen.
- Die Zeitmessung bei der Durchführung der drei Aufgaben. Dazu liegt für jeden Test eine Stoppuhr dabei, die Sie bitte verwenden und hinterher dem Befragten (zusammen mit dem Leuchtkugelschreiber) als Geschenk übergeben. Machen Sie sich zu Hause mit den Funktionen der Stoppuhr vertraut, eine Anleitung ist Ihrer Sendung beigefügt.

Achtung: Das genaue Einhalten der Zeitvorgabe ist wichtig, da sonst die Testergebnisse nicht brauchbar sind.

Zum Testablauf im Einzelnen:
Der Fragebogen „Lust auf DJ“ besteht aus drei Denksportaufgaben mit je 20 Teilfragen, denen jeweils ein Erklärungsteil mit Beispielen vorausgeht. Die drei Denksportaufgaben umfassen:

- Ein treffendes Wort (Zeit für die Bearbeitung 7 Minuten; bitte stoppen!),
- Eine goldrichtige Zahl (Zeit für die Bearbeitung 10 Minuten; bitte stoppen!) und
- Eine passende Figur (Zeit für die Bearbeitung 10 Minuten; bitte stoppen!).

Ermöglichen Sie dem Jugendlichen den Erklärungsteil zu lesen und versuchen Sie anhand der Beispiele festzustellen, ob der Jugendliche die Aufgabe richtig verstanden hat (bitte geben Sie hier vor Beginn der Zeitmessung im Bedarfsfall die nötige Hilfe). Unterrichten Sie ihn genau über den vorgegebenen Zeitrahmen für jede der drei Denksportaufgaben. Der Jugendliche soll die Denksportaufgaben allein lösen. Weisen Sie noch einmal darauf hin, dass der Jugendliche die einzelnen Teilaufgaben nacheinander lösen soll, wenn er jedoch an einer Stelle nicht weiter kommt, eine Teilaufgabe überspringen kann.

Sobald der Jugendliche bereit ist, geben Sie das Startsignal zum Umblättern und starten Sie die Stoppuhr.
Nach Ablauf der vorgegebenen Zeit geben Sie bitte das Zeichen zum Ende der Bearbeitungszeit. Sollte der Jugendliche alle Fragen vor der Zeit beantworten, gehen Sie vor zur nächsten Aufgabe. Bitten Sie den Jugendlichen umzublättern und gehen Sie mit den weiteren Denksportaufgaben ebenso vor.

Es kommt darauf an, von den 20 Testfragen pro Denksportaufgabe so viele wie möglich zulösen. Die meisten Jugendlichen werden vermutlich nicht alle schaffen und das ist ganz normal. Sparen Sie nicht mit Lob und Anerkennung!

(3) Zuletzt füllen Sie bitte den Erfahrungsbericht möglichst ausführlich aus und schildern uns darin Ihre Eindrücke zur Befragung (ein Erfahrungsbericht für jede durchgeführte Befragung).

TERMIN:

Der letzte Rücksendetermin für Ihre vollständig bearbeiteten Interviews ist

Montag, der 27. Juni 2005 (Datum des Poststempels)

Schicken Sie bitte bei auftretenden Termin- oder Durchführungsproblemen auf keinen Fall unbearbeitete Unterlagen ohne vorherige Rücksprache an das Institut zurück.

Wichtig: Bitte Listen- und lfd. Nummer auf beiden Fragebogen und auf dem Erfahrungsbericht eintragen.

Herzlichen Dank für Ihre Bemühungen und viel Erfolg bei der Durchführung der Befragung.

Mit freundlichen Grüßen

TNS Infratest Holding GmbH & Co. KG
Einsatzleitung

Anlagen:

Jugend-Fragebogen
Fragebogen „Lust auf DJ“
Erfahrungsbericht(e)
Quotenliste
Rücksendekuvert
Zielpersonengeschenke
Gebrauchsanweisung

Wir erhalten zurück:

alle Befragungsunterlagen

Listennummer: _____ laufende Nummer: _____

ERFAHRUNGSBERICHT ZUM FRAGEBOGEN "LUST AUF DJ"

Projekt 44899 Welle 01
„Jugend" für Leben in Deutschland / Pretest

Der Prüfstein für neue Fragebogen ist die Praxis. Für den Jugendfragebogen liegen uns dazu zentrale Hinweise aus früheren Berichten von Ihnen oder/und Ihren Kollegen bereits vor. Darum begrenzen Sie Ihre Berichterstattung hier bitte primär auf den neuen Fragebogen „Lust auf DJ".

1. Wie war es beim Übergang vom Jugendfragebogen zum Fragebogen „Lust auf DJ"? Fand der Jugendliche die erklärenden Texte von S. 1 und S. 2 (z.B. „Denksportaufgaben") gut verständlich? Wie war die Reaktion des Jugendlichen?

2. Wie gefielen dem Jugendlichen Aufmachung und Titel? Gab es hierzu eine Stellungnahme oder Meinung? Konnten wir den Jugendlichen erreichen?

3. Hat der Jugendliche die Aufgabenstellungen verstanden? Funktionieren die Beispiele?

Allgemein: _____

Aufgabe 1: Ein treffendes Wort _____

Aufgabe 2: Eine goldrichtige Zahl _____

Aufgabe 3: Eine passende Figur _____

4. Wie stand es mit dem Durchhalten der Motivation beim Jugendlichen? Traten an irgendeiner Stelle im Verlauf des Interviews Ermüdungserscheinungen auf?

5. Traten für Sie als Interviewer Probleme mit der Befragung (beim Erklären, bei der Zeitnahme, usw.) auf?

Allgemein:

Beim Erklären der Aufgabe:

Bei der Zeitmessung und -begrenzung

	1	2	3
Quotengruppe:	☐	☐	☐

Interviewdauer für „Lust auf DJ“: _____ Minuten

Bundesland Ort, Datum Abr.Nr. Name (deutlich)

Unterschrift: