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The German
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Panel Study

SoEP

Effects of fine arts' competencies on Educational Outcomes

– Cognitive effects of active practice of music –

Jürgen Schupp

Many thanks to Ralph Schumacher and Marco Caliendo

Non-cognitive Skills: Acquisition and Economic Consequences

ZEW Mannheim, May 17th 2008

The Mozart Effect – Business & Science
Rauscher et al. (2003) in Nature

# Research Questions About Potential Cognitive Effects of Music Lessons

- Does **active practice of music** have **causal** cognitive **effects** on non-musical skills? For example, do music lessons enhance IQ or cognitive potential?

- Are these cognitive effects music specific (more than just attention), and are they large enough to have practical significance?

- Is it adequate to regard music lessons as fast and easy way to promote children's intellectual development?

Experimental and Quasi-Experimental Studies

- To conclude that music lessons have a causal association with IQ that is specific to music, one must demonstrate that nonmusical, extracurricular activities (e.g., sports, drama) do not have comparable effects on IQ (schooling effect)

- Longitudinal design – adequate (randomized) control group

- Schellenberg's (2004) experimental study is as yet the only study worldwide that meets these methodological standards

E. Glenn Schellenberg (2004):
Music Lessons Enhance IQ. *Psychological Science*, Vol. 15/8, 511-249.

- participants / time: 144 six-year-olds / 36 weeks

- experimental groups: two types of music (keyboard or voice lessons)

- control groups: drama lessons / no additional lessons

- results: the increases in IQ in the music groups (7.0 points) were slightly higher than in the control groups (4.3 points)
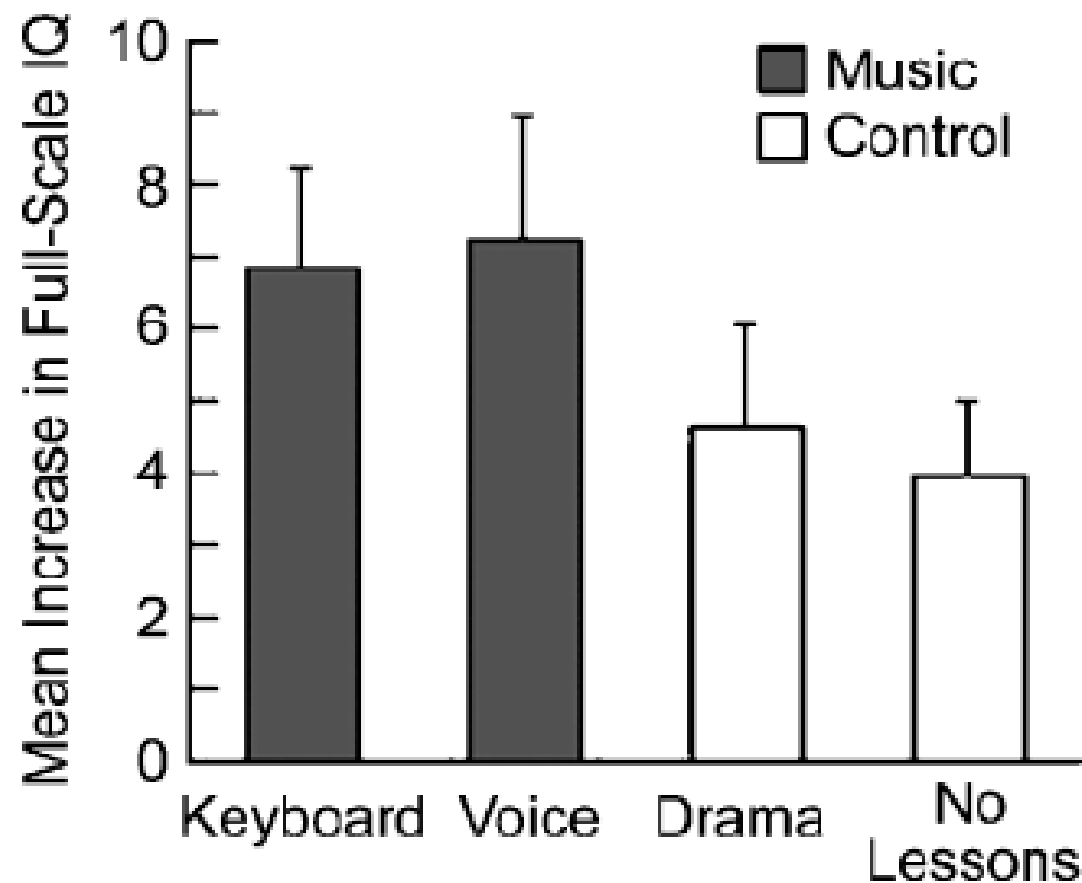
Schellenberg (2004)

Fig. 1. Mean increase in full-scale IQ (Wechsler Intelligence Scale for Children–Third Edition) for each group of 6-year-olds who completed the study. Error bars show standard errors.

Data on participation in musical activities in Germany

- Poor empirical evidence of surveys in school-classes on the impact of music courses

- In the OECD based PISA surveys *no* information on music activity or other fine arts' competencies

- In representative surveys usually only aggregated information on music activity (creative activities like ...)

- No information in special cross-sectional youth surveys in Germany that are replicated every two years (Shell-Youth-Surveys)

- Basic information in German Time-Budget-Study (2001/2002)

- Longitudinal information in Socio-economic Panel Study (SOEP) – quasi-experimental approach is possible

Longitudinal data and empirical results for Germany

- Data – The German Socio-Economic Panel Study (SOEP)

- Descriptive results on active practice of music / sport

- (Retrospective) Information of start with music/sport within in early life-course

  - Choice of secondary school
  - Who gets good grades in school (gymnasium)
  - Who is successful in a test of cognitive potentials

SOEP-instruments used in 2005

- Standard Instruments

  - Address protocol (filled in by Interviewer)
  - Household questionnaire (~10-15 min.)
  - Individual questionnaire for each HH member aged 16 and older
    - not for 16-year old) (~25-45 min.)

- Instruments for specific Target Groups

  - questionnaire „Life History"
    first time respondents aged 18 and over; ~20min.)
  - *questionnaire „Youth/Adolescence" (2000/01) & „DJ – Cognitive Potential" first time respondents aged 16/17 ~25 min + ~ 30 min) – starting in 2006 !!!*
  - questionnaire „Mother & Child" (New born babies)
  - questionnaire „Infant" (Infants of age 2/3)
  - questionnaire „Closing Gap" (Temporary Drop-outs)

  - Experiment on „Trust and Trustworthiness "
    (Only Face-to-Face Sample F)

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Questionnaire "Youth" (started 2000/2001)

- Substitutes former questionnaire "Life history" only for first-time respondents aged 16-17

- Themes covered:

  - Relationship to parents
  - leisure time use
  - *music and sport*
  - school performance
  - educational intentions
  - job expectations
  - personality characteristics
  - family expectations
  - Standard indicators on intergenerational mobility

New Questionnaire "Youth" – Number of cases

Year of survey (cohort)	Number of Cases
2000 (1983)	232
2001 (1982-84)	618
2002 (1985)	352
2003 (1986)	365
2004 (1987)	373
2005 (1988)	368
2006 (1989)	307
All 17-year-old Respondents	2,383

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Detailed questions about active music – starting 2000/2001

16. Are you active in music?
Do you play an instrument or pursue singing seriously?

Yes .... ☐   No .... ☐ ➡ | Skip to question **20**! |
       ⬇

17. What type of music do you make?

Classical .... ☐
Pop / rock / techno / funk / rap / hip-hop .... ☐
Folk music or another type of popular music .... ☐

17a Do you do this alone or in some sort of group?

Alone or with a teacher in lessons .... ☐
In an orchestra or choir .... ☐
In a band .... ☐
In another type of group .... ☐

18. How old were you when you started to play an instrument or pursue singing seriously?

☐☐ years old

19. Do you take or have you ever taken music lessons outside of school?

Yes .... ☐   No .... ☐
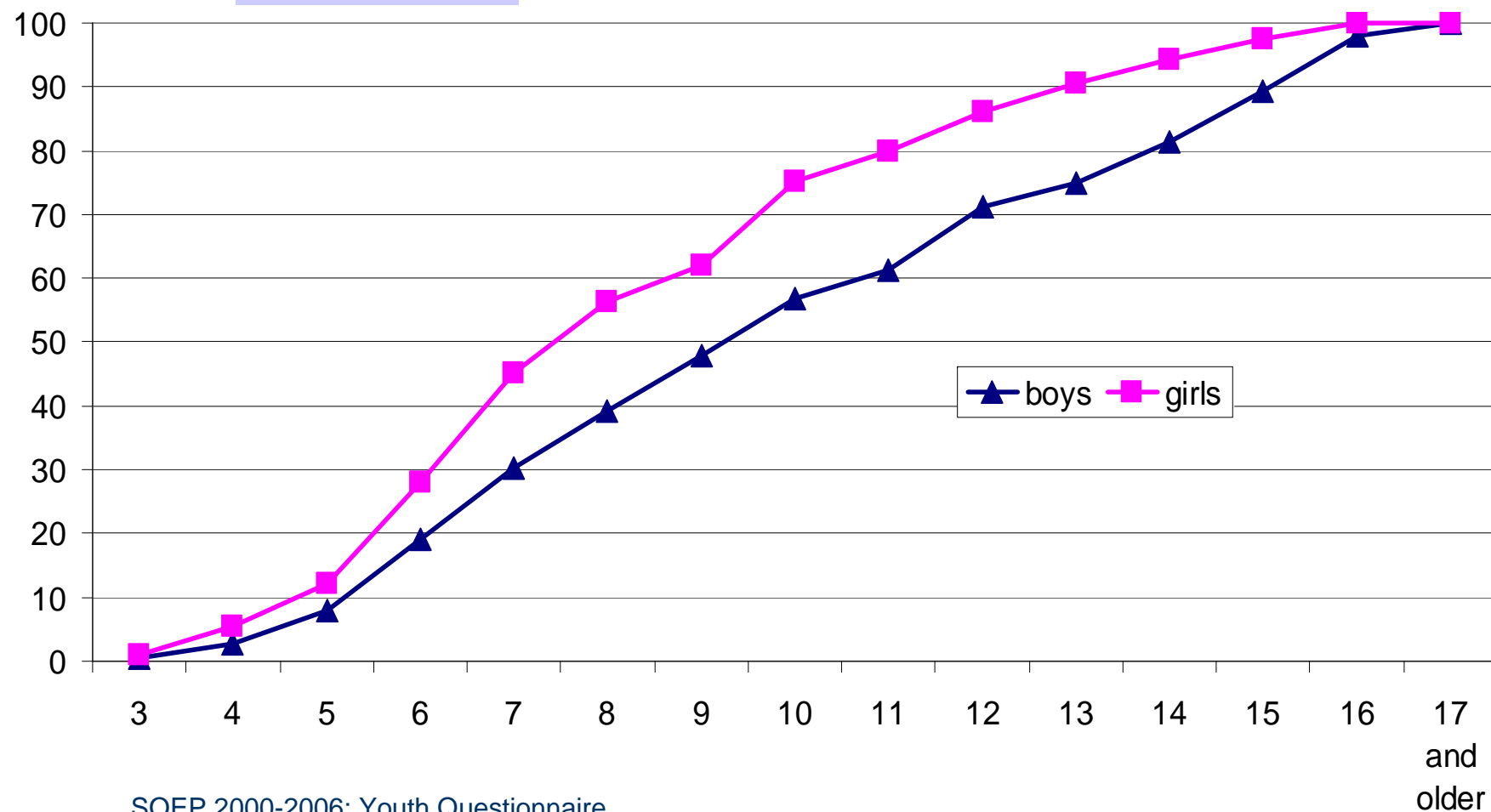
Are you active in music?
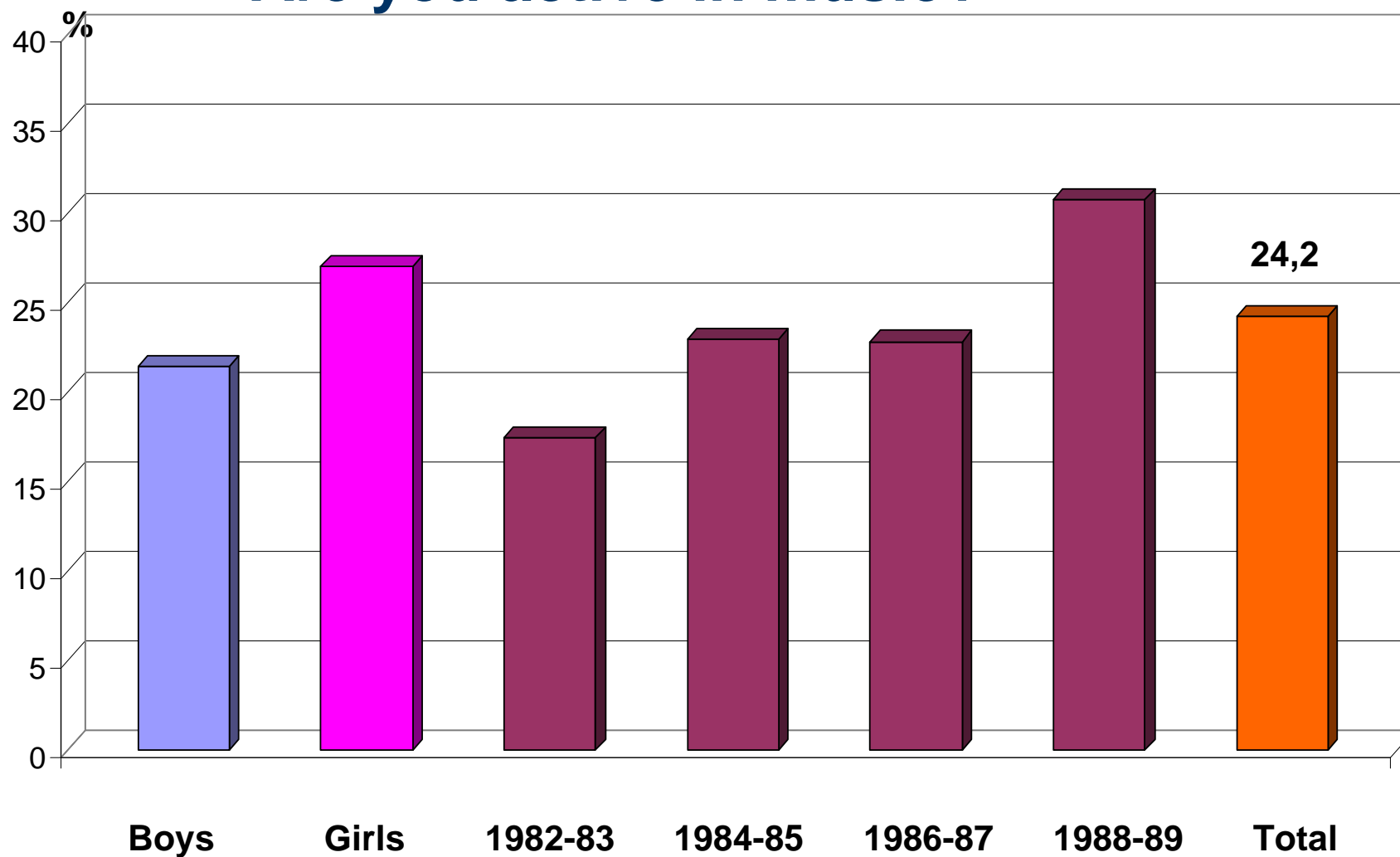
SOEP 2000-2006; Youth Questionnaire;
weighted results.

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Age to start with active music

>>> details

SOEP 2000-2006; Youth Questionnaire.

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Hypotheses on the correlation of early music/sport activity on educational outcomes

- Active music means additional time investment in learning, practicing (performing) – is there a substitution of time for school engagement or do we find an additional outcome?

1. Does early active music increase chances to get into higher educational school track?

2. Does early active music increase chances to achieve better grades in school?

3. Does early active music also increase the cognitive potential (Schellenberg) or is there no effect on cognitive potential (Bourdieu)?

SOEP - Number of cases in models

Total Youth Sample	Music in general	„Mozart" active & early & classic	Sport in general	„Boris " active & early & competition
2.380 (100 %)	607 (25 %)	**114** **(5 %)**	1.683 (71 %)	*438* *(18 %)*
2006 - Sample with measurement of cognitive potential				
711 (100 %)	211 (30 %)	**33** **(5 %)**	543 (76 %)	*153* *(21 %)*

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Choice of secondary school - Results of a multinominal logit

Medium secondary = comparison group)

>>>skip to Boys/Girls

	Higher secondary (Gymnasium)	Lower secondary (Hauptschule)
Gender – Boys	- -	+ + +
Region – East	- - -	- - -
Nationality – Non-German	n.s.	+ + +
Education of Father (other degrees)		
- University graduate	+ + +	- - -
- Interm. school & prof. train.	+ + +	-
- without degree	+ + +	+ + +
Education of Mother (same degree)		
- higher than father	+ + +	-
- lower than father	- - -	+
Active Music (early age)	+ + +	- - -
Active Sport (early age)	n.s.	n.s.
Pseudo R^2	0.1635	0.1635
N of Cases	2354	2354

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Matching – nearest neighbour
Music-Effect on the average school grade
(N=2232)

Two-sample T-test	Mean	Stand. Error
Group 0 (without effect)	2.960	0.015
Group 1 (with effect)	2.607	0.070
Difference	-0.353	0.069
Matching-Sample (Pseudo-R^2=0.1053)	Unmatched	ATT
T-Stat (average school grade)	-5.13***	-3.57***
Treated	2.607	2.607
Controls	2.960	3.354
Difference	-0.353	**-0.748**
S.E.	0.069	0.210

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SOEP

Matching – nearest neighbour
Sport-Effect on the average school grade
(N=2232)

Two-sample T-test	Mean	Stand. Error
Group 0 (without effect)	2.939	0.017
Group 1 (with effect)	2.956	0.033
Difference	-0.017	0.039
Matching-Sample (Pseudo-R²=0.0320)	Unmatched	ATT
T-Stat (average school grade)	0.44 (n.s.)	-0.94 (n.s.)
Treated	2.956	2.956
Controls	2.939	3.156
Difference	0.017	-0.199
S.E.	0.039	0.213

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Matching – nearest neighbour Music & Sport-Effect on the *maths school grade*
- higher secondary school only
(N=699)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.0634		0.0145	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (Maths school grade)	-1.92**	-2.29***	-0.69 (n.s.)	-0.98 (n.s.)
Treated	2.610	2.610	2.783	2.783
Controls	2.865	3.416	2.852	3.076
Difference	-0.255	**-0.805**	-0.069	-0.293
S.E.	0.133	0.352	0.100	0.299

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Matching – nearest neighbour
Music & Sport-Effect on
cognitive potential (N=711)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1523		0.0536	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (cognitive potential)	4.27***	1.87**	3.03***	1.13 (n.s.)
Treated	38.848	38.848	33.967	33.967
Controls	31.532	33.636	31.297	31.046
Difference	7.316	**5.212**	2.669	2.921
S.E.	1.712	2.784	0.882	2.596

Matching – nearest neighbour
Music & Sport-Effect on
verbal potential (N=711)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1523		0.0536	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (verbal potential)	3.67***	0.34 (n.s.)	2.46***	0.61 (n.s.)
Treated	10.939	10.939	9.248	9.248
Controls	8.463	10.515	8.394	8.647
Difference	2.476	0.424	0.854	0.601
S.E.	0.674	1.262	0.347	0.987

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Matching – nearest neighbour Music & Sport-Effect on *numeric potential* (N=711)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1523		0.0536	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (numeric potential)	2.49***	2.04***	1.78**	1.01 (n.s.)
Treated	15.545	15.545	14.105	14.105
Controls	13.382	12.909	13.312	12.863
Difference	2.163	**2.636**	0.793	1.242
S.E.	0.870	1.293	0.446	1.226

Matching – nearest neighbour
Music & Sport-Effect on
figural potential (N=711)

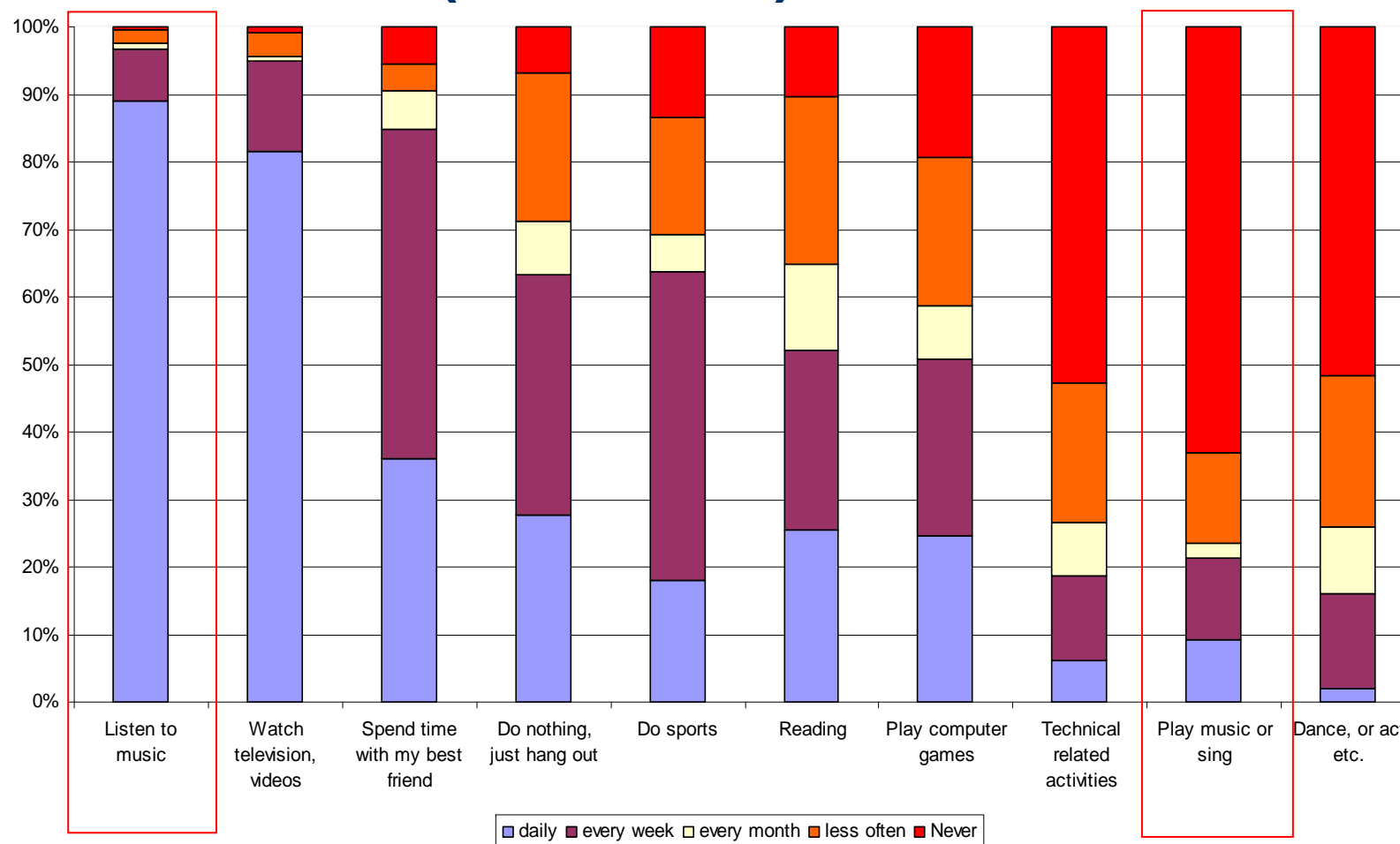| Matching-Sample	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1523		0.0536	
Matching-Sample	Unmatched	ATT	Unmatched	ATT
T-Stat (figural potential)	4.29***	1.74**	3.18***	1.3*
Treated	12.364	12.364	10.614	10.614
Controls	9.687	10.212	9.591	9.536
Difference	2.676	**2.152**	1.023	*1.078*
S.E.	0.624	1.239	0.321	0.827

Summary and Conclusions

- The empirical evidence is consistent with the hypothesis that early participation in musical activities promote intellectual development

- We found only poor (n.s.) evidence that non-musical early activities in sports with competition are positively associated with cognitive potential

- The *direction* of causality is still an open question - but results with Propensity Score Matching techniques that adjust for pre-treatment observable differences between a group of treated and a group of untreated show significant increases in grades and in cognitive potential

- The effect of intensity and duration of music activities could not be tested with SOEP-data

- In a next step the personality trait indicators could be included into the model

- In a few years other outcome variables (wages) can be tested

- Active music is an investment in cultural *and* human capital

Comments welcome !!!

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Additional Slides for Discussion

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Time Use of Teenagers for selected activities (2000-2006)

SOEP 2000-2006; Youth Questionnaire.

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Study by Schellenberg (2003)

Does exposure to music have beneficial side effects? In: I. Peretz & RJ. Zatorre (eds.), The Cognitive Neuroscience of Music, Oxford, 430-448.

- participants: 147 children between age 6 and 11

- variables: IQ and duration of music lessons

- result: music lessons had *small positive* associations with measures of intelligence

- possible explanations:

  - music lessons promote intellectual development
  - children with high IQ are more likely to take and to continue music lessons than children with low IQ
  - better educated parents generally invest more into the intellectual development of their children and tend to provide music lessons for them

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SOEP-Pretest in 2005
- Pilot study of 217 teenagers

- Testing full cognitive abilities and potentials for teenagers (first time respondents) *and* school/training attainment

- Test: I-S-T 2000 R (Amthauer et al. 2001) (copy fee = 1 € / Interview)

- Dimensions:
  - Verbal potential (analogies)
  - Numerical potentials (number sequences)
  - Figural potentials (matrices/pictorial material)
  - Reasoning (= sum score)

- Interview time: 30 minutes for test (stop watch as additional incentive)

- Longitudinal perspective: Information on the respondent's life course before *and* after the ability measurement

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Cognitive Potential of Teenagers

- Introduction of testing cognitive potential for teenagers in 2006 (first year personal interview)

- Cooperation with Elsbeth Stern, ETH, Zürich, and Heike Solga, WZB

- Pretest in 2005 with quota sample of teenagers

- Test: I-S-T 2000 R (Amthauer et al. 2001)

- Dimensions:
  - Verbal potential (analogies)
  - Numerical potentials (arithmetic operators)
  - Figural potentials (matrices/pictorial material)
  - Reasoning (= sum score)

- Interview time: 30 minutes for test
  (stop watch as additional incentive)

- Implementation in SOEP 2006
  - Additional incentives to participants
  - Abdication of questionnaire for adult respondents for one year with core questions of the adult questionnaire
  - Extension of 2 pages in „Youth"-questionnaire

- Longitudinal perspective: Information on the respondent's life course before *and* after the ability measurement

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Cognitive potentials

- **First results of Pretest in 2005:**
  Solga, Heike; Stern, Elsbeth, Bernhard v. Rosenbladt; Schupp, Jürgen; Gert G. Wagner (2006): The Measurement and Importance of General Reasoning Potentials in Schools and Labor Markets. DIW Research Notes 2006-10. Berlin: DIW Berlin.

- **Project funding by Jacobs Foundation „The Discovery of Youth's Learning Potential Early in the Life Course" (2007-2011)**
  PI: Heike Solga (University of Göttingen)
  Co-PI: Elsbeth Stern (MPIB; as of October 1st 2006 FUB), Jürgen Schupp and Gert G. Wagner
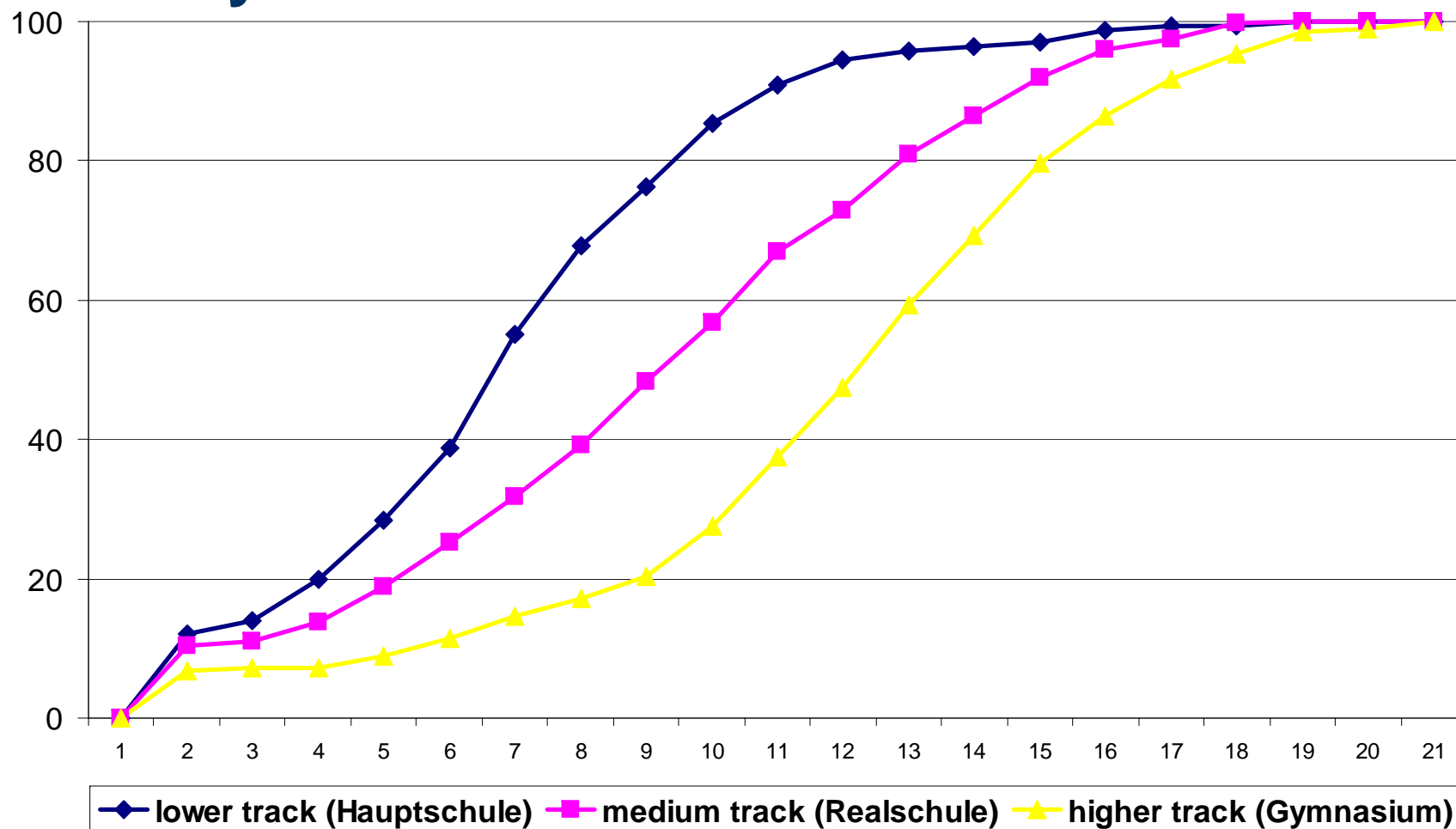
  >>> Skip back to presentation

SOEP-Test in 2006
## - Some Results on cognitive ability

Mean of test-score (1-20)
by track of secondary education

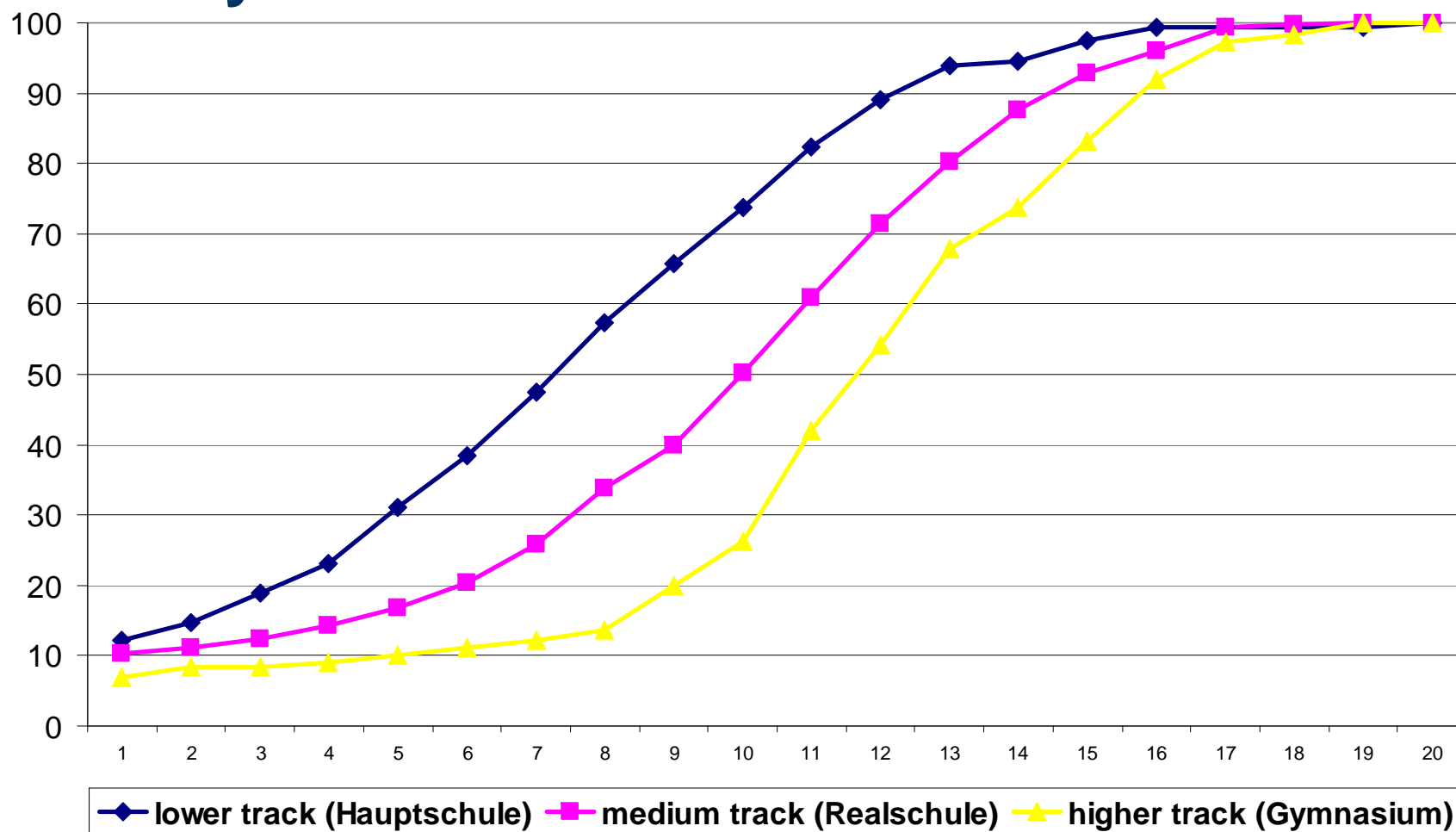| Track of school	Type of cognitive ability		
	Verbal potential	Numerical potential	Figural potential
Lower track (Hauptschule)	5,3	10,1	6,6
Medium track (Realschule)	7,5	11,9	8,8
Higher Track (Gymnasium)	10,1	14,3	10,7
Total	7,7	12,1	8,8

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Distribution of Verbal Potential by track of school

Distribution of Numerical Potential by track of school

Legend:
- lower track (Hauptschule)
- medium track (Realschule)
- higher track (Gymnasium)

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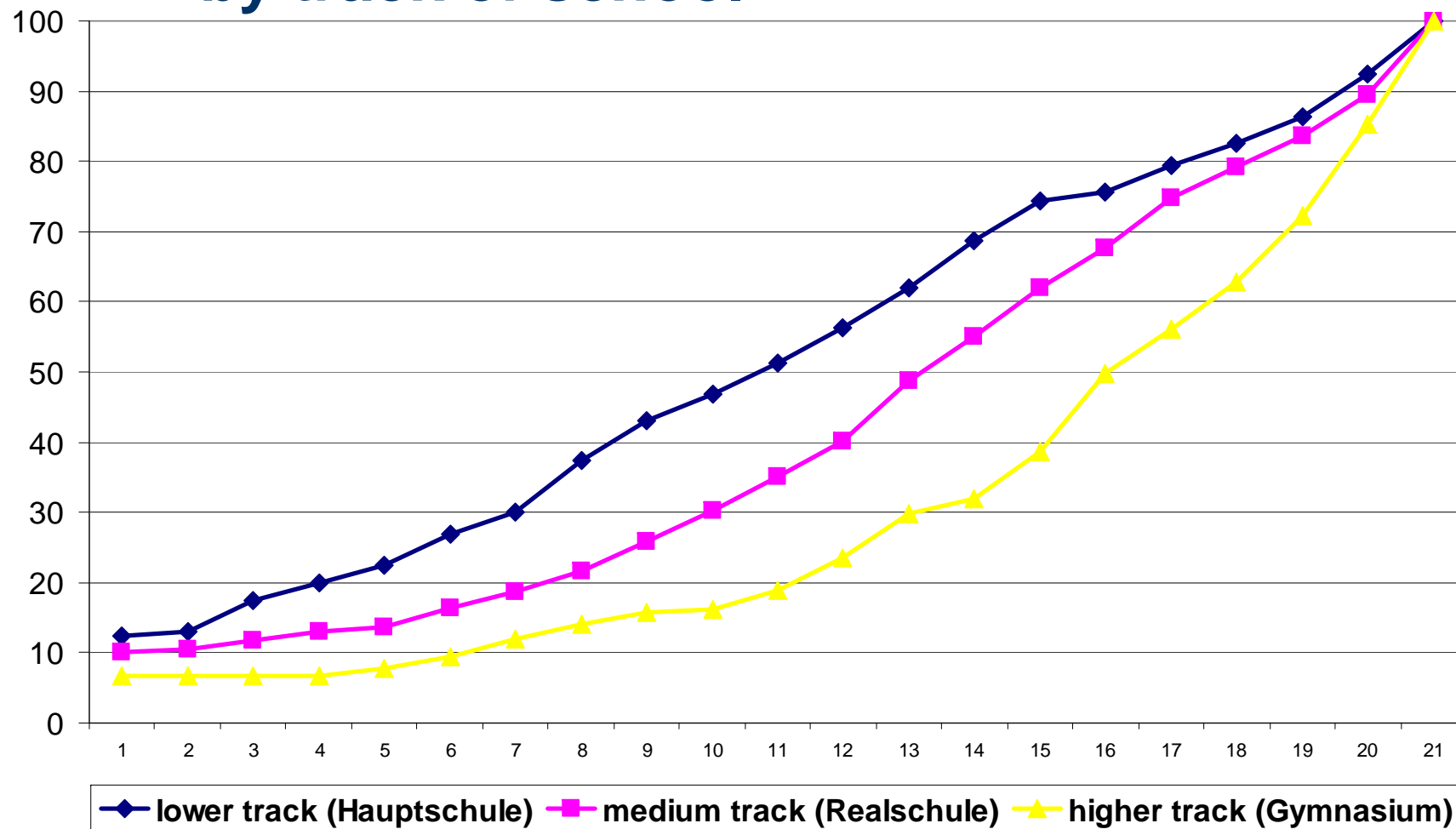
Distribution of Figural Potential by track of school

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Artistically activity (including music activity) in Germany (2001/02)

Source: German Time-Use Study 2001/2002
by Federal Statistical Office, Wiesbaden.

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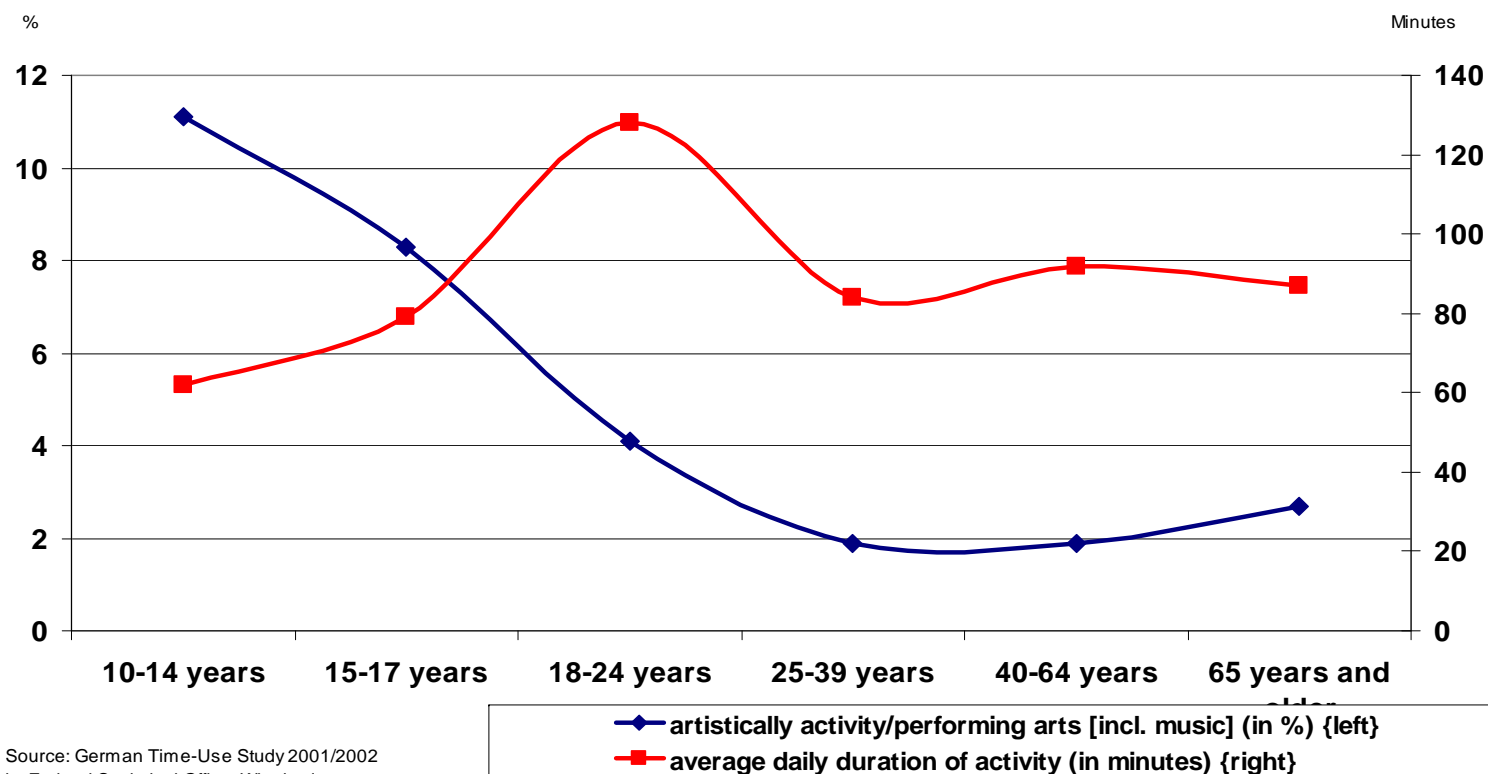
Time use for entertainment and cultural activities (hours:minutes per week)

hours

Source: German Time-Use Study 2001/2002
by Federal Statistical Office, Wiesbaden.

Legend:
- artistically activity/performing arts [incl. music]
- reading
- listening to radio, music, tapes
- TV and video

Values shown: 00:27, 04:21, 00:41, 13:14

>>> back

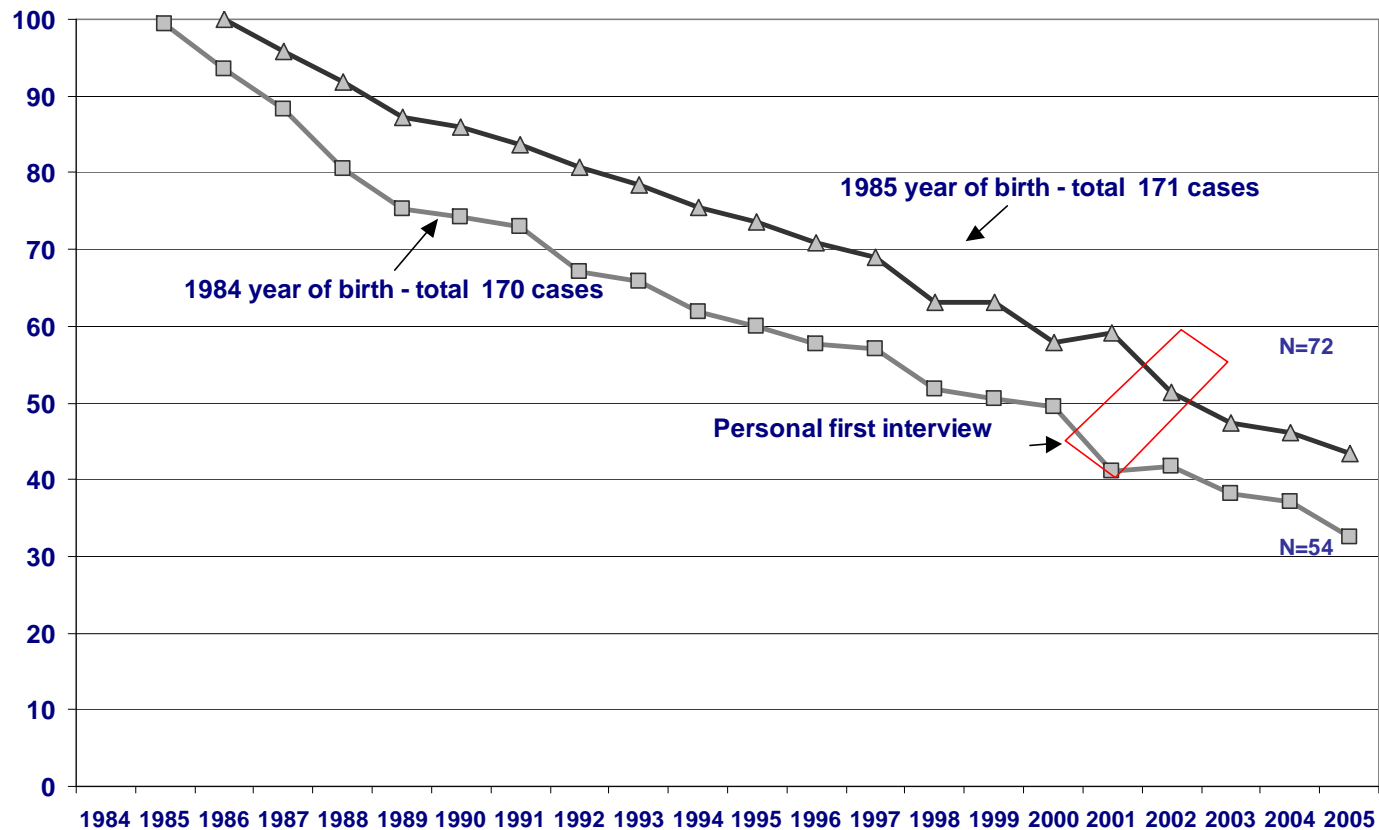The German Socio-Economic Panel Study
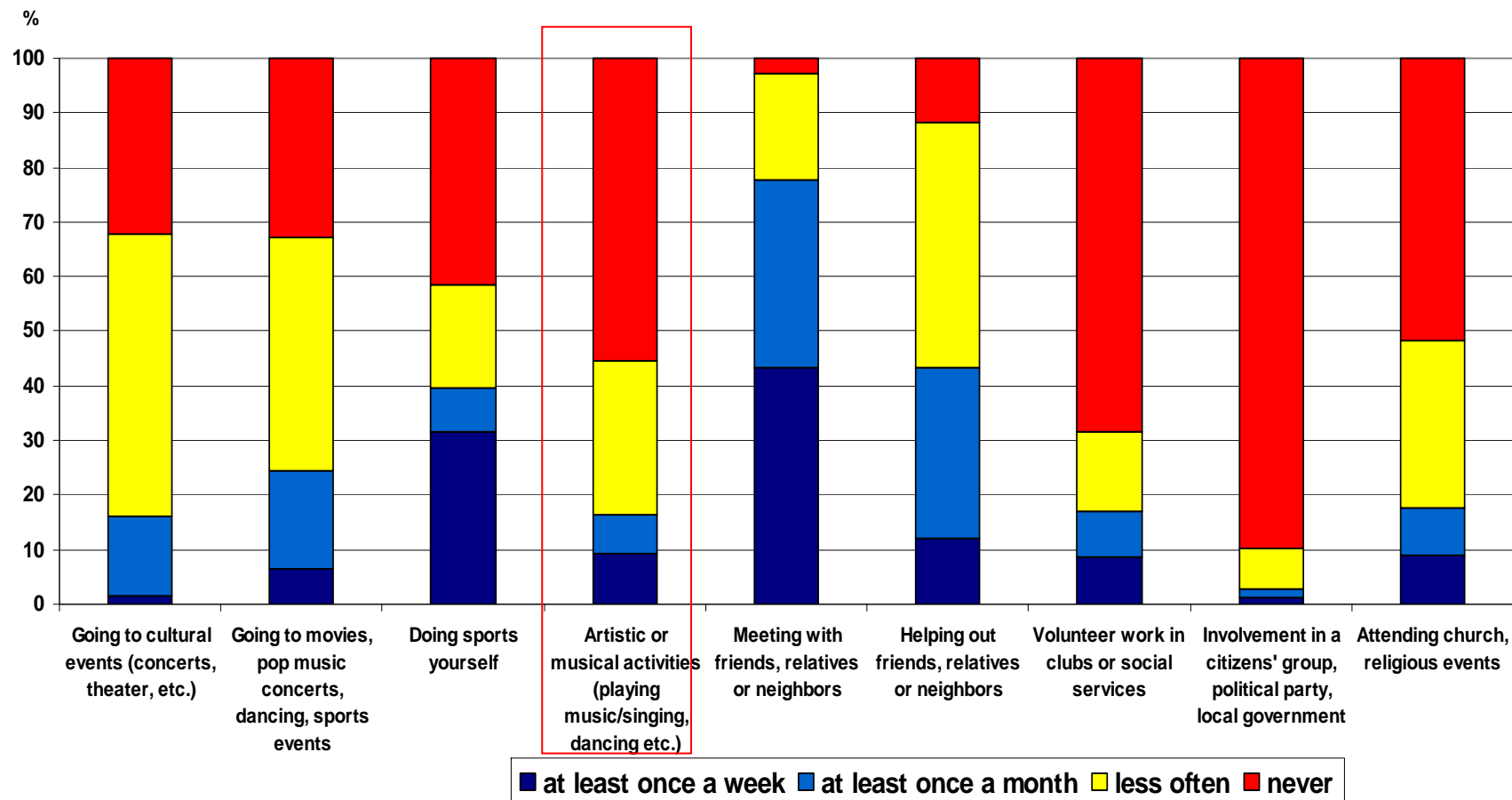
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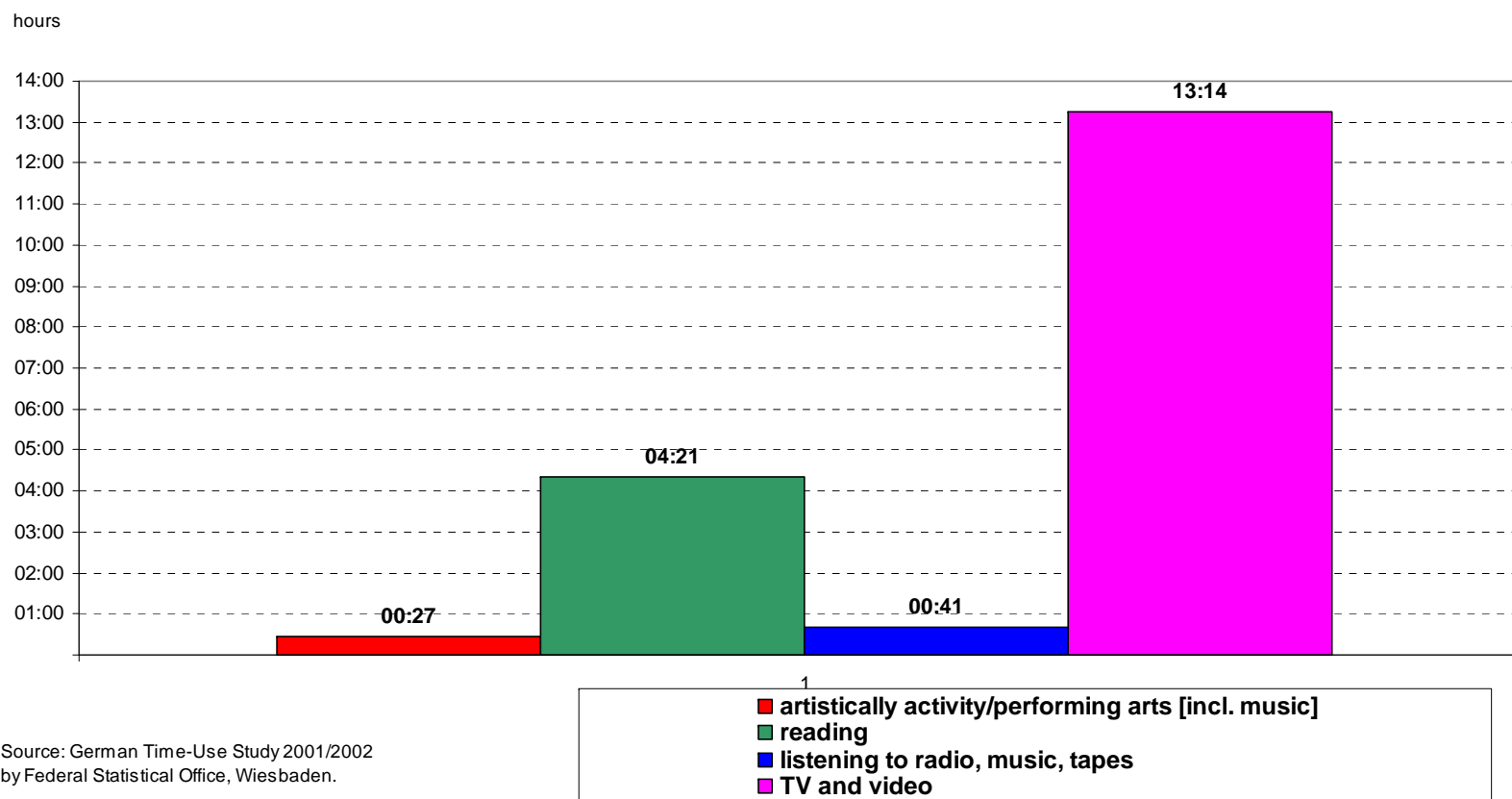
Governance of Survey Instruments and Methodology

- Planning and *running the longitudinal survey* and provide measures of the determinants of socio-economic behavior and social change.

- Main advantages of *panel data* are:
  - Decomposition of gross and net changes
  - Analysis of causal relationships
  - Control for otherwise unobserved heterogeneity

- Questionnaire - Timing of Replication
  - Year by year
  - Bi-annual
  - Up to 5 (and more) years replication period on survey topics

- Strengthening *new areas* of the survey that provide *better* measures of the determinants of socio-economic behavior

- Keeping a *fair balance* of the need of *continuity* ("*just stupid replication*") and *innovative developments* in the social sciences and survey methodology

The „golden" cohorts in SOEP – born after the survey started

1985 year of birth - total 171 cases

1984 year of birth - total 170 cases

N=72

Personal first interview

N=54

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Time Use of Adults for selected activities (2005)

SOEP 2005; Personal Questionnaire.

Choice of secondary school - *Boys*
Results of a multinominal logit
Medium secondary = comparison group)

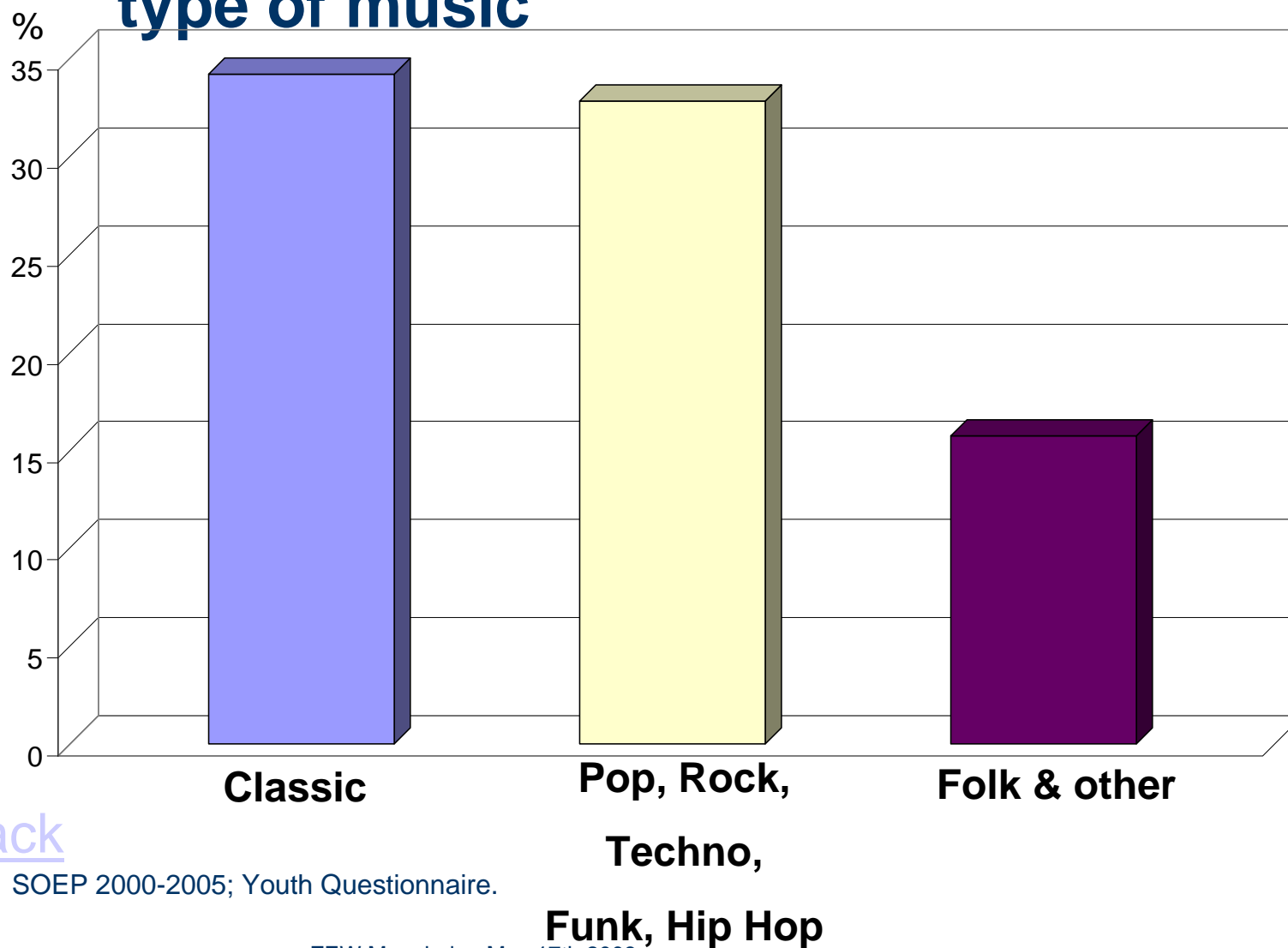|	Higher secondary (Gymnasium)	Lower secondary (Hauptschule)
Region – East	- - -	- -
Nationality – Non-German	n.s.	+ + +
Education of Father (other degrees)		
- University graduate	+ + +	- - -
- Interm. school & prof. train.	+ + +	n.s.
- without degree	+ +	n.s.
Education of Mother (same degree)		
- higher than father	+ + +	-
- lower than father	- - -	+
Active Music (early age)	+ + +	- - -
Active Sport (early age)	n.s.	n.s.
Pseudo R2	0.1745	0.1745
N of Cases	1170	1170

Choice of secondary school - *Girls*
Results of a multinominal logit

Medium secondary = comparison group)

>>>skip back	Higher secondary (Gymnasium)	Lower secondary (Hauptschule)
Region – East	- -	- -
Nationality – Non-German	n.s.	+ +
Education of Father (other degrees)		
- University graduate	+ + +	n.s.
- Interm. school & prof. train.	+ + +	n.s.
- without degree	+ +	+ + +
Education of Mother (same degree)		
- higher than father	+ + +	n.s.
- lower than father	- - -	n.s.
Active Music (early age)	+ + +	- -
Active Sport (early age)	n.s.	n.s.
Pseudo R2	0.1514	0.1514
N of Cases	1184	1184

Take music lessons outside of school by type of music

SOEP 2000-2005; Youth Questionnaire.

>>>back

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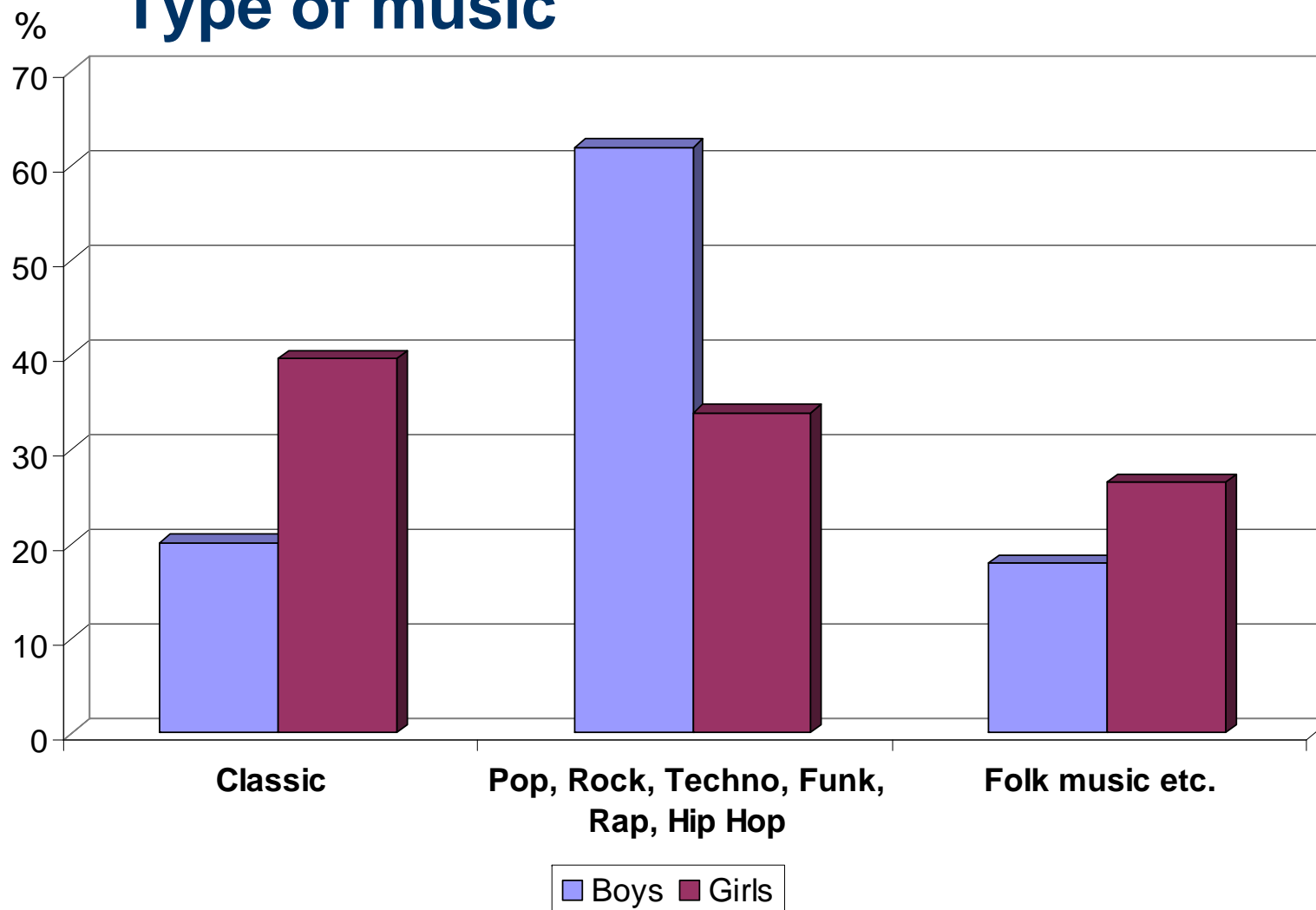Socio-Economic
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Some empirical indicators on active music in Germany

- The German Association of singers „Deutscher Sängerbund" is representing 20,000 choirs with 1.7 million members

  - thereof nearly 700,000 active singers

- In Germany exist more than 900 music-schools with about 850,000 active students

>>> more results

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Source: Statistical Yearbook 2005, Federal Statistical Office. Wiesbaden

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Type of music

SOEP 2000-2006; Youth Questionnaire.

Type of music activity

%

Boys ■ Girls

>>>Lessons?

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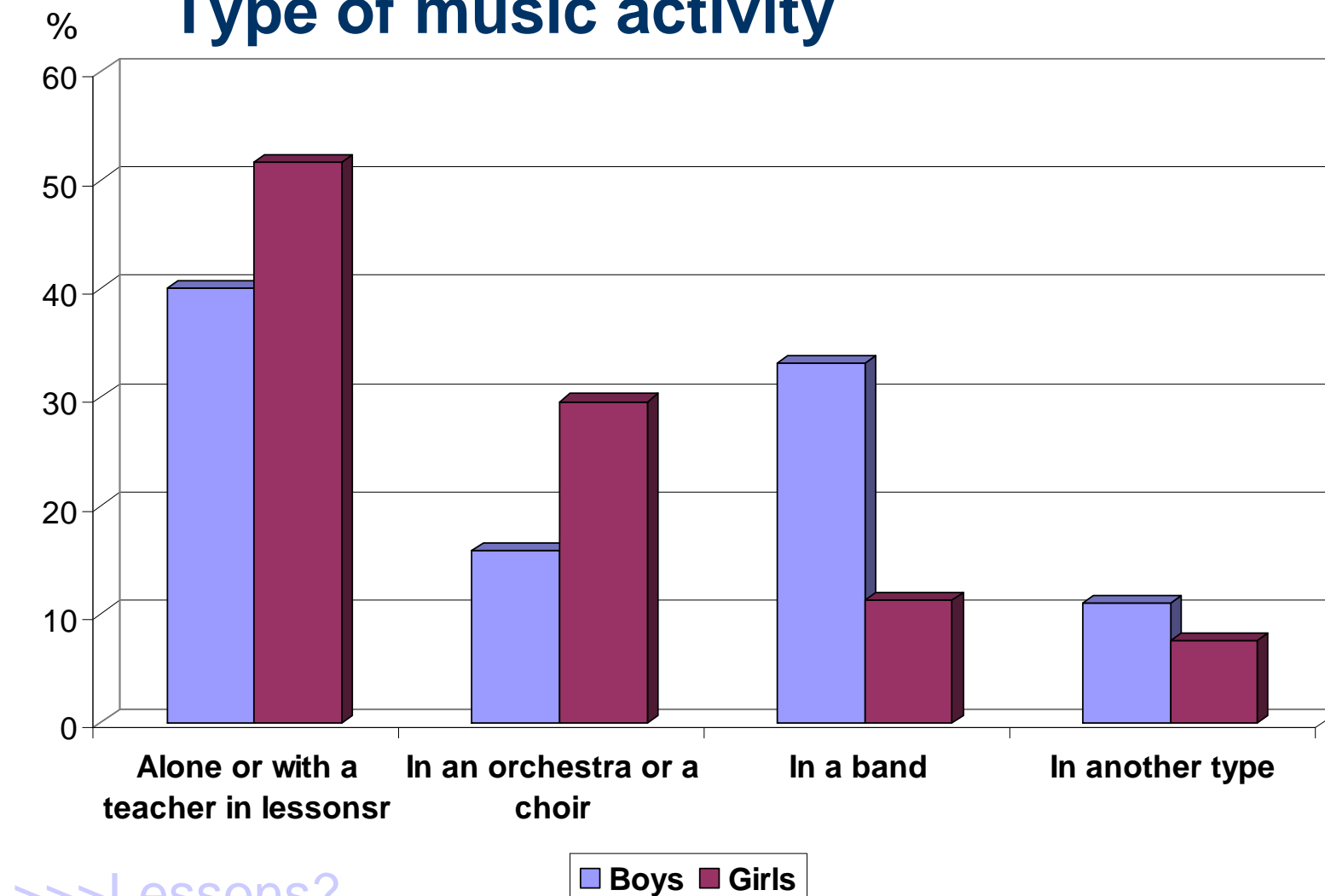
Active Music by Track of Secondary School >>> back

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Matching – nearest neighbour
Music & Sport-Effect on
the *German school grade*
(N=2232)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1053		0.0320	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (German school grade)	-4.59***	-2.48***	1.65**	-1.53*
Treated	2.541	2.541	2.948	2.948
Controls	2.906	3.108	2.874	3.283
Difference	-0.366	**-0.568**	0.073	-0.336
S.E.	0.080	0.229	0.044	0.219

Matching – nearest neighbour
Music & Sport-Effect on
the *Maths school grade*
(N=2232)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1053		0.0320	
Matching-Sample	Unmatched	ATT	Unmatched	ATT
T-Stat (maths school grade)	-2.88***	-3.54***	-2.73***	-0.89 (n.s.)
Treated	2.694	2.694	2.843	2.843
Controls	2.979	3.712	2.993	3.117
Difference	-0.286	**-1.018**	-0.151	-0.274
S.E.	0.099	0.287	0.055	0.308

Matching – nearest neighbour
Music & Sport-Effect on
the *Foreign Language school grade*
(N=2232)

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.1053		0.0320	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (foreign language school grade)	-4.48***	-2.14***	2.52***	0.04 (n.s.)
Treated	2.586	2.586	3.079	3.079
Controls	2.995	3.243	2.950	3.067
Difference	-0.409	**-0.658**	0.128	0.012
S.E.	0.091	0.308	0.051	0.288

Matching – nearest neighbour
Music & Sport-Effect on the *average school grade* - higher secondary school only
(N=699)

|	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.0634		0.0145	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (average school grade)	-3.03***	-2.33***	0.95 (n.s.)	-1.02 (n.s.)
Treated	2.541	2.541	2.826	2.826
Controls	2.807	3.113	2.763	3.025
Difference	-0.265	**-0.571**	0.063	-0.200
S.E.	0.088	0.245	0.066	0.196

Matching – nearest neighbour
Music & Sport-Effect on the *foreign language school grade* - *higher secondary school only*

(N=699)

|	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.0634		0.0145	
Matching-Sample	Unmatched	ATT	Unmatched	ATT
T-Stat (foreign language school grade)	-2.66***	-1.25 (n.s.)	2.15***	-0.30 (n.s.)
Treated	2.519	2.519	2.911	2.911
Controls	2.807	2.870	2.736	2.981
Difference	-0.288	-0.351	0.175	-0.070
S.E.	0.108	0.281	0.081	0.232

Matching – nearest neighbour
Music & Sport-Effect on the *German school grade* - *higher secondary school only*

	Active Music (early age & classic)		Active Sport (early age & compet.)	
Pseudo-R²	0.0634		0.0145	
Matching-Sample	**Unmatched**	**ATT**	**Unmatched**	**ATT**
T-Stat (German school grade)	-2.52***	-2.19***	1.09 (n.s.)	-1.08 (n.s.)
Treated	2.494	2.494	2.783	2.783
Controls	2.748	3.052	2.701	3.019
Difference	-0.254	**-0.558**	0.082	-0.236
S.E.	0.101	0.255	0.076	0.218

Pattern of Active Sport

Pattern of Active Music

ZEW Mannheim, May 17th 2008
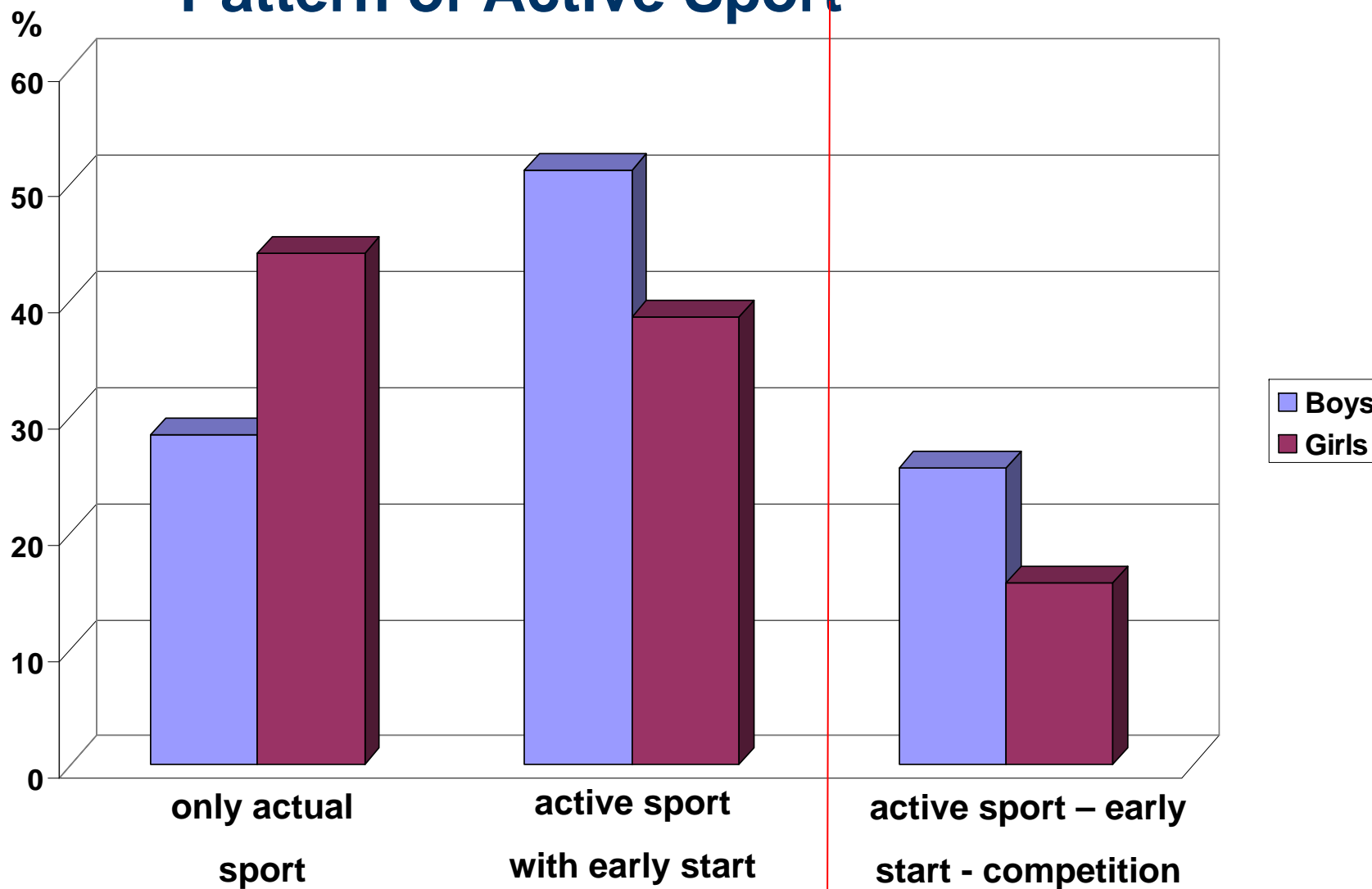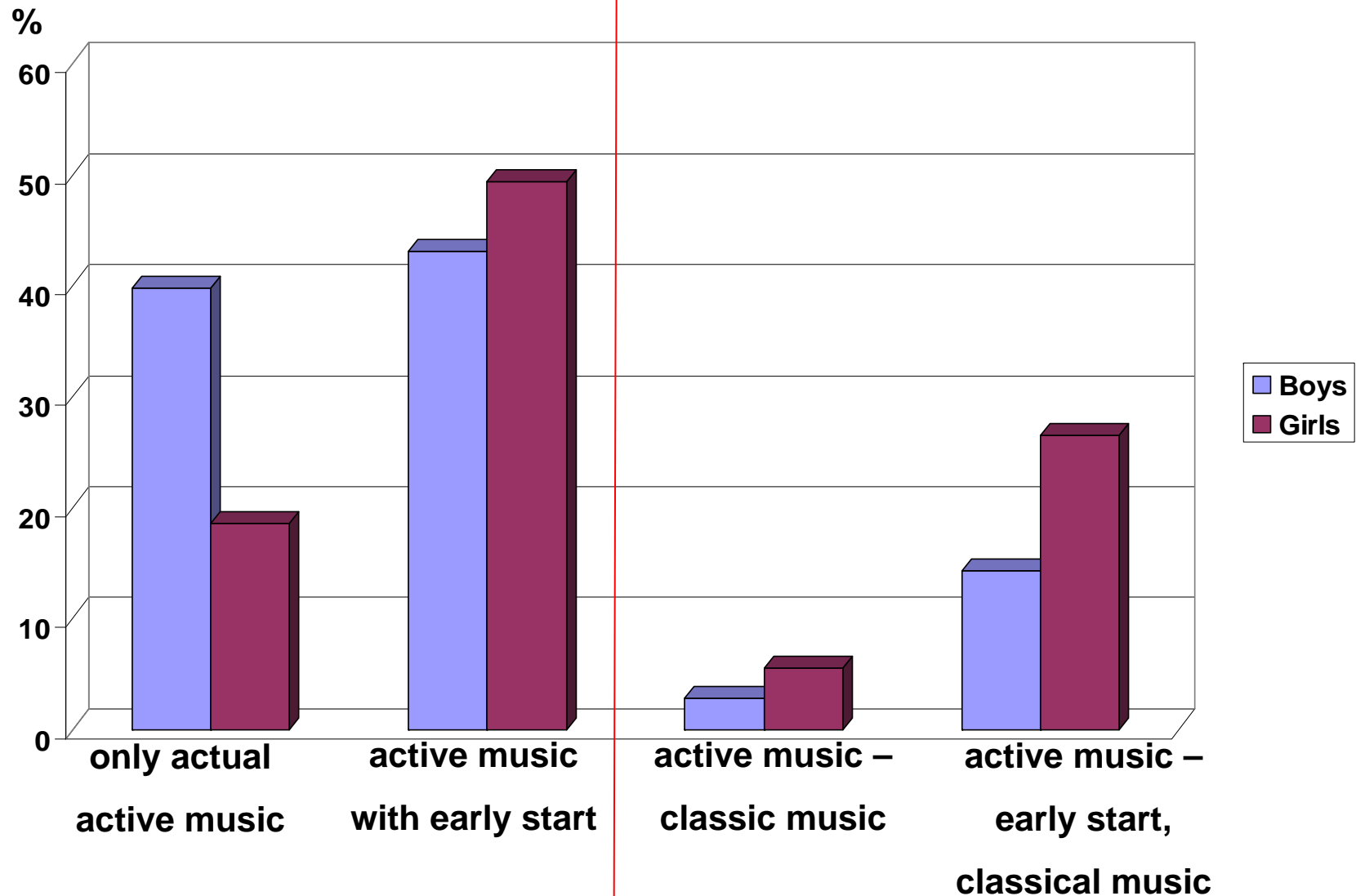
Outline

- Motivation: why should music make you smarter – cognitive effects of music lessons - outcomes of music?

- Empirical evidence of cognitive effects

- Active practice of music in Germany

- Practice of music and patterns of social structure

- Outcomes of active practice of music in Germany

- Identification of Treatment-Effects of Music

- Summary and Conclusion

The German Socio-Economic Panel Study

School grades at higher sec. school Results of a OLS regression model

	Average school grade (German, Maths, Foreign Language	School grade German
Gender – Boys	- - -	- - -
Region – East	+ + +	+ + +
Nationality – Non-German	n.s.	n.s.
Education of Father (other degrees)		
- University graduate	+	n.s.
- Interm. school & prof. train.	n.s.	n.s.
- without degree	n.s.	n.s.
Education of Mother (same degree)		
- higher than father	n.s.	n.s.
- lower than father	n.s.	n.s.
Active Music (early age & classic)	+	+ +
Active Sport (early age & compet.)	n.s.	n.s.
R^2	0.0512	0.0948
N of Cases	699	699

School grades at higher sec. school Results of a OLS regression model

	School grade maths	School grade foreign language
Gender – Boys	n.s.	- - -
Region – East	+ +	n.s.
Nationality – Non-German	n.s.	n.s.
Education of Father (other degrees)		
- University graduate	+	+
- Interm. school & prof. train.	n.s.	n.s.
- without degree	n.s.	n.s.
Education of Mother (same degree)		
- higher than father	n.s.	n.s.
- lower than father	-	n.s.
Active Music (early age & classic)	+ +	+
Active Sport (early age & compet.)	n.s.	-
R2	0.0240	0.0588
N of Cases	699	699

Cognitive Potential
Results of a OLS regression model

	Additive Index	Verbal Index
Gender – Boys	n.s.	n.s.
Region – East	+	+ +
Nationality – Non-German	- - -	- - -
Education of Father (other degrees)		
- University graduate	+ + +	+ + +
- Interm. school & prof. train.	+ + +	+ +
- without degree	n.s.	n.s.
Education of Mother (same degree)		
- higher than father	n.s.	n.s.
- lower than father	n.s.	-
Active Music (early age & classic)	+ + +	+ + +
Active Sport (early age & compet.)	+ + +	n.s.
R2	0.1260	0.1789
N of Cases	711	711

>>> Details on cognitive potential

The German Socio-Economic Panel Study

SOEP

Cognitive Potential
Results of a OLS regression model

	Numerical Index	Figural Index
Gender – Boys	+ +	n.s.
Region – East	+	n.s.
Nationality – Non-German	- - -	- - -
Education of Father (other degrees)		
- University graduate	+ +	+ + +
- Interm. school & prof. train.	+ +	n.s.
- without degree	n.s.	n.s.
Education of Mother (same degree)		
- higher than father	n.s.	n.s.
- lower than father	n.s.	n.s.
Active Music (early age & classic)	+ + +	+ + +
Active Sport (early age & competit.)	n.s.	+ + +
R2	0.0541	0.0995
N of Cases	711	711

Determinants to practice music/sport - Results of a binary probit model
not practicing music and not practicing sport = reference groups)

	Practicing Music (classic, early)	Practicing Sport (early, competition)
Gender – Boys	- -	+ + +
Region – East	- -	- - -
Secondary School-Track (medium)		
- lower secondary school	n.s.	- - -
- higher secondary school	+ + +	n.s.
Education of Father (other degrees)		
- University graduate	n.s.	n.s.
- Interm. school & prof. train.	- -	n.s.
- without degree	n.s.	n.s.
Education of Mother (same degree)		
- higher than father	n.s.	n.s.
- lower than father	n.s.	n.s.
Pseudo R^2	0.1523	0.0536
N of Cases	711	711