

**Renate Valtin**  
**Paper presented at**

**Reading Competence and  
Personality Characteristics -  
findings from PIRLS and PISA**

Paper presented at  
the European Reading Congress in Braga – July 2009

- **In the international literacy surveys not only reading competence is measured but also motivational variables (self-concepts, intrinsic motivation) as well as cognitive and affective aspects of attitudes to school.**
- **These personality characteristics are linked to reading competence and help to explain variance in reading achievement but are also important aims in themselves because they are relevant for lifelong learning. Up to now, these personality factors have not gained much attention.**
- **In this presentation some of the often wide-spread results of PISA 2000 and 2003 and of PIRLS 2001 and 2006 will be reviewed and discussed.**

# Topics of the presentation

1. General remarks about aims of schooling and the concept of school-related personality
2. Some Results of PISA and PIRLS
  - 2.1 Motivation and self-concepts
  - 2.2 Learning approaches
  - 2.3 Attitudes towards school
  - 2.4 Gender differences
3. AIDA: a theoretical framework for a longitudinal study

# School-related personality characteristics

Schülerpersönlichkeit („student personality“):

Concept of various personality characteristics

- which are related to related to learning in school and scholastic achievement
- and influenced by school and classroom context
- Descriptive and normative aspects

# School-related personality characteristics

## Dimensions:

- Relevant for **academic** learning:  
motivation, self-concepts, self-efficacy
- Relevant for **social** skills and successful participation in groups:  
well-being, positive attitudes toward school, sense of belonging

# School-related personality characteristics

## Research areas

- Psychology of personality
- Educational Psychology
- Developmental Psychology
- Sozialisation theory

We have many studies in the following dimensions: achievement motivation, self-concepts, self-esteem, anxiety, well-being, attribution of success and failure

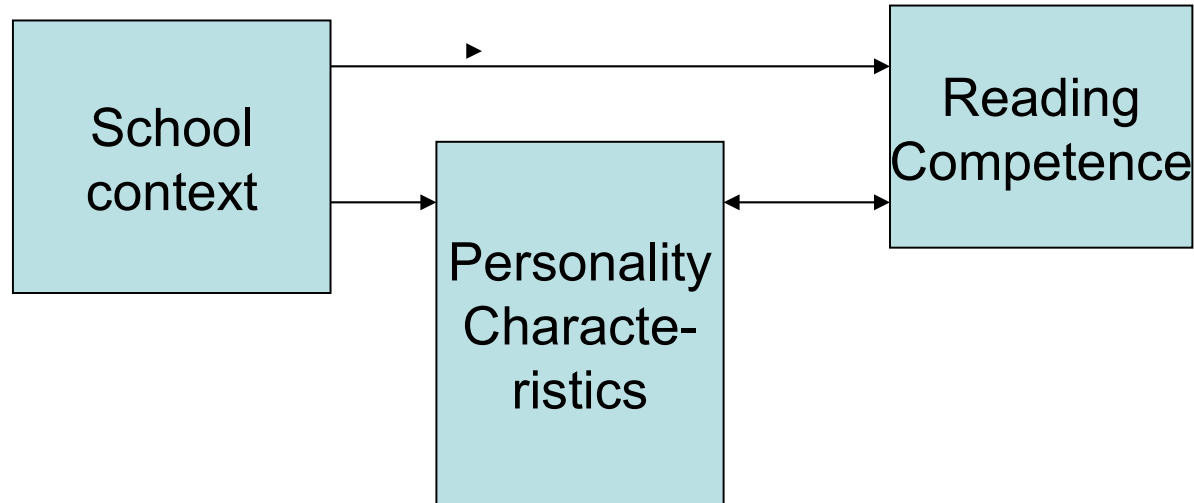
# School-related personality characteristics

## **Desiderata of research :**

Synthesis of the various dimensions – synchron and in development

Comprehensive theoretical models to explain the development of the personality characteristics and their interrelationship, influenced by external conditions

# Model of the relationship between pupils' personality characteristics and reading competence





# PIRLS / PISA: advantages

- Representative samples
- Findings on the relationship between student attitudes and performance and between various student characteristics
- Cross-cultural comparisons
- Differentiated analysis for subgroups (for gender, social background, immigration status, group of poor readers)

# PIRLS / PISA: disadvantages

- PIRLS and PISA studies are not coordinated. Some tests use similar items, others quite different items.
- Self report measures: different cultural norms with respect to modesty and self-assertion, social desirability, different cultural meanings
- In the absence of longitudinal studies we have no evidence for causal relations

# PIRLS / PISA: results

- Motivation and self-concepts
- Learning approaches
- Attitudes towards school
- Differentiated analysis for gender

# PISA 2000: Measures

## MOTIVATION and VOLITION

Domain specific:

- Interest in reading/mathematics
- Engagement in reading

General:

- Instrumental motivation (*I study to get a good job*)
- Effort and persistence in learning (*When studying I work as hard as possible*)

# PISA 2000: Self-related beliefs

Domain specific:

Self-concept of verbal/ mathematical competence

General:

Self-efficacy (*I am certain I can master the skills being taught*)

Academic self-concept (*I am good at most subjects*)

# PIRLS instruments

- Student attitudes to reading (joy of reading): 5 items (4 items identical with PISA)
- Reading for fun outside school (1 item)
- Reading Self-Concept, 2001: 3 items  
2006: 4 items
- Intrinsic/extrinsic motivation (IGLU-E)

# **Results from PIRLS and PISA engagement in reading and reading self- concepts**

Not surprisingly, in nearly all countries reading competence was correlated with reading motivation and self-concepts.

.

# Comparing the age-groups

Difficulty:

Different instruments, scales/index

Different measures

**Motivation:**

- decreasing engagement in reading
- Widening gaps between females and males



*„I do not read for enjoyment out of school“* (% of students)

- PIRLS 2001:  
International ?
- PISA 2000:  
OECD ?

*„I do not read for enjoyment out of school“* (% of students)

- PIRLS 2001:  
International 18  
Russian Federation 6, Germany 14
- PISA 2000:  
OECD 31  
Russian Federation 13, Germany 40  
Finland ?

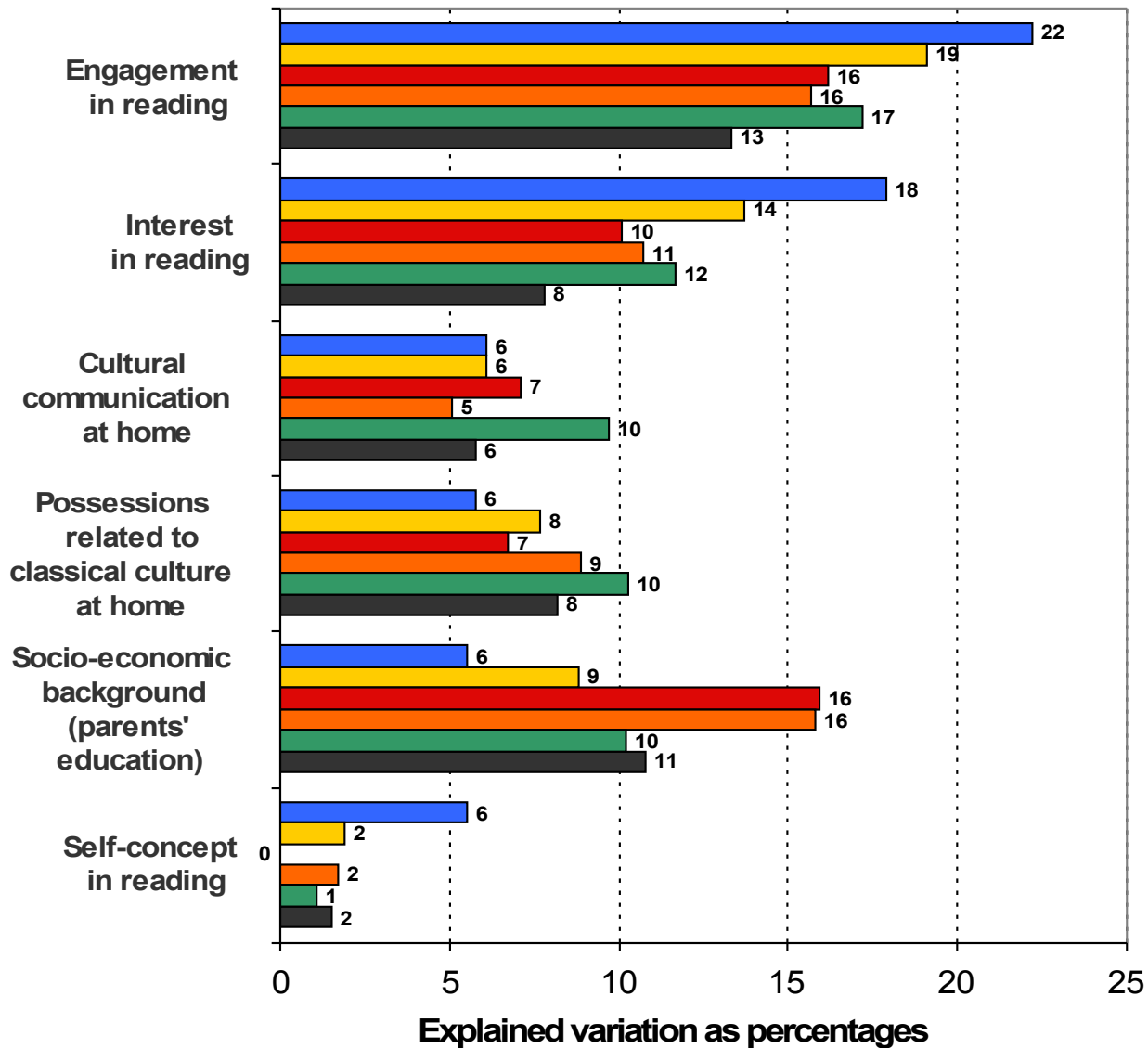
*„I do not read for enjoyment out of school“* (% of students)

- PIRLS 2001:  
International 18  
Russian Federation 6, Germany 14
- PISA 2000:  
OECD 31  
Russian Federation 13, Germany 40  
Finland 23

# **PISA: Important result for engagement in reading**

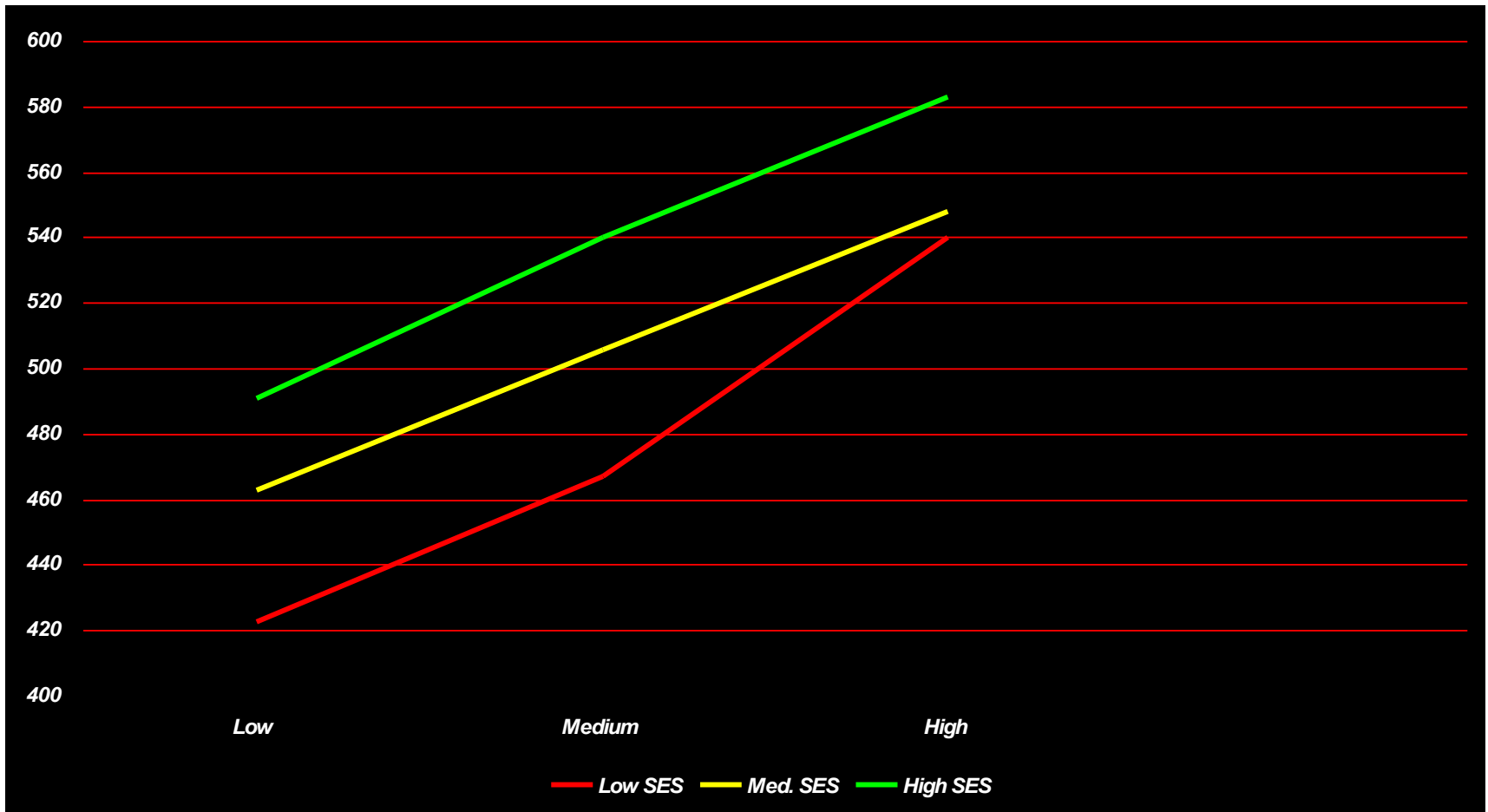
Student engagement in reading has a greater influence on achievement than socioeconomic status or parental occupation (see the next slide from Pirjo Lynnakylä)

## Explained variation in student performance ( $R^2$ )



■ Finland 
 ■ Sweden 
 ■ Switzerland 
 ■ Germany 
 ■ Australia 
 ■ OECD average

# Reading Performance and Socio-Economic Background by Level of Reading Engagement on PISA



# Student approaches to learning: Learners for Life, OECD 2003

## Rationale:

Students who are able and willing to **regulate their own learning** possess important preconditions for academic success and for lifelong learning

## Hypothesis:

Students with positive attitude towards learning (high motivation, positive self-concepts and believing in one's own efficacy as learner) are more likely to use effective learning strategies.

# Student approaches to learning: Learners for Life, OECD 2003

In this analysis 13 student characteristics were examined in 26 countries (120 740 students):

- Motivational preferences and volition
- Self-related beliefs
- Learning strategies (s. below)
- Preferences for learning situations (s. below)



# PISA 2000: learning approaches

## Learning strategies:

Elaboration strategies (*When I study, I figure out how the material fits in with what I have learned*)

Memorisation strategies (*When I study, I memorize all new material so that I can recite it*)

Control strategies (*When I study, I start by figuring out what exactly I need to learn*)

Preference for co-operative learning (*I like to work with other students*)

Preference for competitive learning (*I would like to be the best at something*)

# PISA 2000: learning approaches

## Results:

- ▶ Students who had high scores in motivational variables, self-related beliefs and learning strategies had higher reading competence, within each country.
- ▶ The quarter of students strongest in a particular characteristic perform on average higher between 30 and 100 points on the reading literacy scale (between one half and one and a half proficiency level of competence).

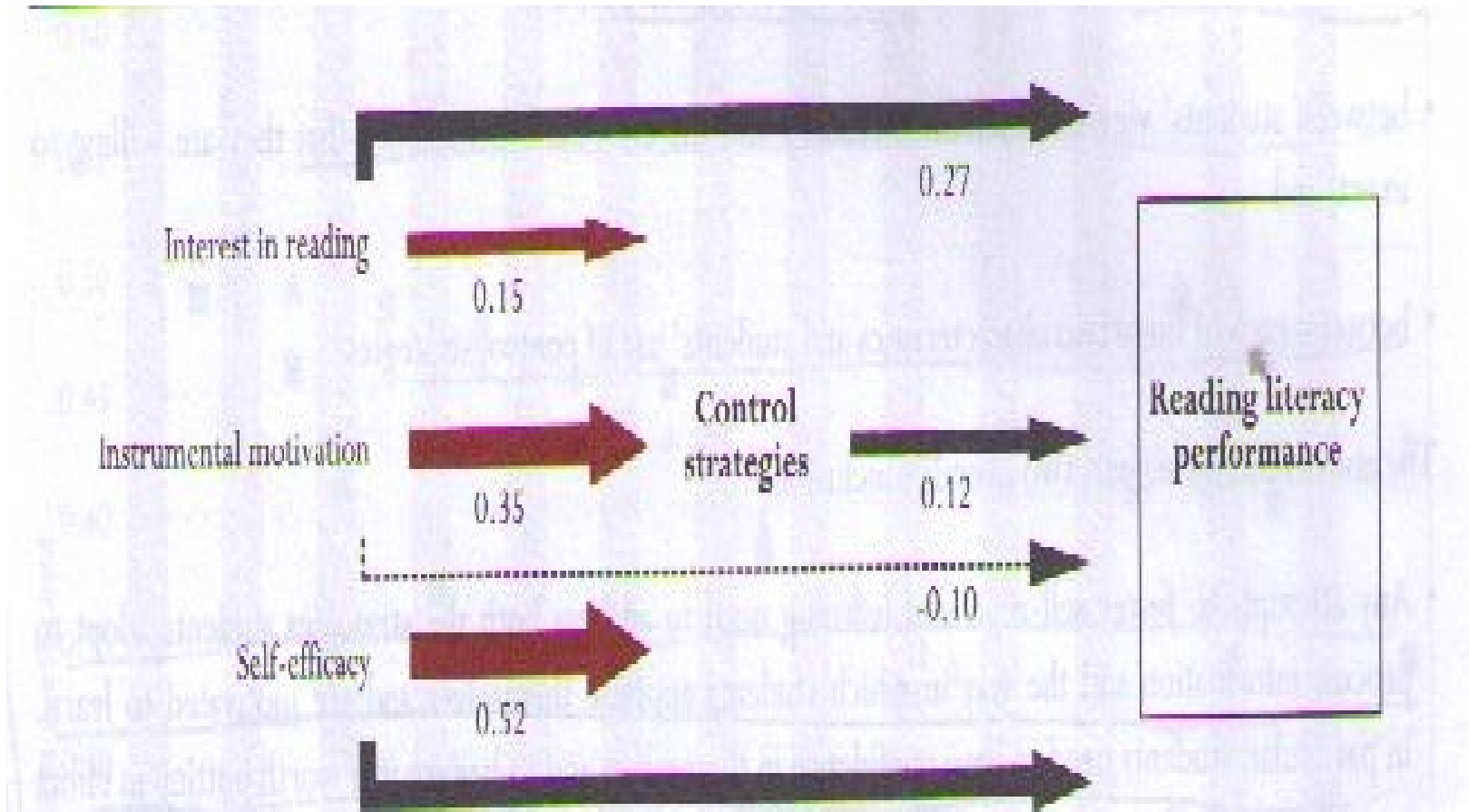
# How student motivation and self-related beliefs are associated with learning strategies

Results :

**Self-efficacy** correlates to control strategies (0.54) and to memorization strategies (0.36)

**Instrumental motivation** correlates to control strategies (0.47) and to memorization strategies (0.40)

# Individual factors associated with control strategies and performance, when controlling for other factors



# Individual factors associated with control strategies and performance, when controlling for other factors

- Interest in reading and self-efficacy have direct effects on performance. Interest in reading is the strongest single predictor of performance in 15 countries.
- When other factors are controlled for, instrumental motivation has no clear association with performance (composition of groups).
- Some of the effect of self-confidence and motivation is mediated by the use of effective learning strategies.

# Comparing countries: Profiles of student approaches to learning

Direct comparisons of the average strength of student characteristics in different countries are possible for:

- Use of memorization strategies
- Self-concept of reading/mathematics
- Self-efficacy
- Preference for cooperative learning

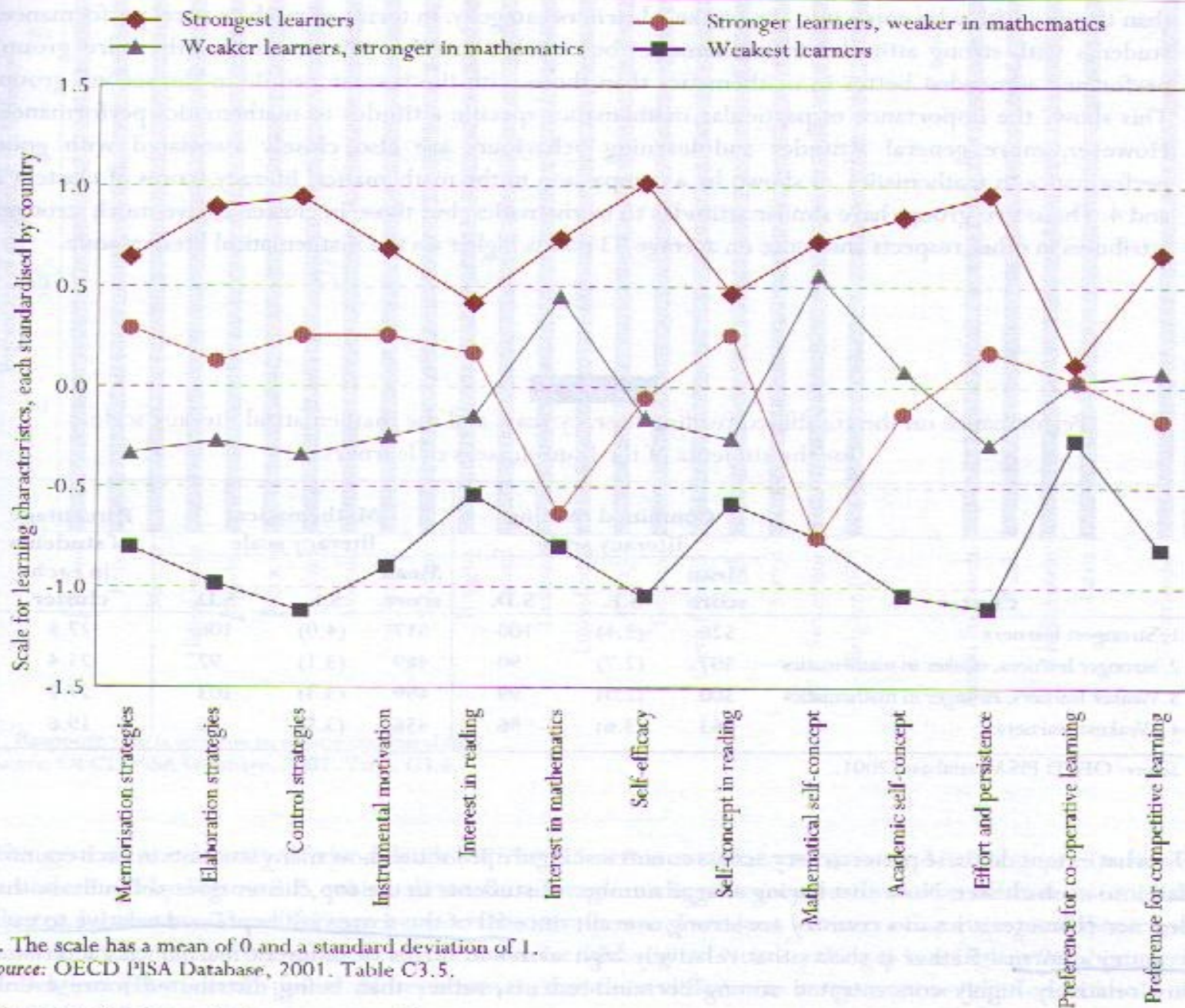
# Comparing countries: Profiles of student approaches to learning

While it is not possible to compare all individual student characteristics across countries, cluster analysis may be used to compare the patterns of such attributes across groups of students in each country.

*Method:* cluster analysis with 13 learner characteristics, standardized for each country ( $M=0$ ,  $SD=1$ ).

Figure 3.6

OECD mean scores in terms of student learning characteristics for the four student clusters



1. The scale has a mean of 0 and a standard deviation of 1.

Source: OECD PISA Database, 2001, Table C3.5.

This analysis shows that:



# 4 Learner-Clusters

- **Strongest learners** (28%): high scores in all measures, use strategies employing comprehension (evaluation and control strategies), have high self-efficacy and effort and persistence.  
Their reading competence is about one level higher as in the group of weaker learners.
- **Weaker learners** (20%), low scores in all learner characteristics, except preference for cooperative learning. Their mean reading score is 463 (mathematics 456).

# 4 Learner-Clusters

- Stronger learners, weaker in mathematics
- Weaker learners, stronger in mathematics
- Reading competence of both groups is average (around 500)

## Differences in learner characteristics by student background (21 countries) - top and bottom quarters of socio-economic status

Characteristic	In how many of the 21 countries is there a significant difference?	OECD average effect size
Self-efficacy	Top quarter stronger in 20 countries	0.40
Academic self-concept	Top quarter stronger in 17 countries	0.32
Self-concept in reading (mathemat.)	Top quarter stronger in 18 (13) countries	0.28 (0.28)
Control strategies (Elaboration)	Top quarter stronger in 18 (13) countries	0.26 (0.22)
Interest in reading	Top quarter stronger in 19 countries	0.26

## Advantages for students from top quarter of socio-economic status

- Highest difference in self-related beliefs, more likely to believe in their ability to tackle learning challenges. Stronger confidence in their ability to perform verbal, mathematical and academic tasks (esp. in Norway, Finland and Sweden)
- Motivation: Students with higher socioeconomic factors show greater interest in reading, in some countries greater interest in mathematics – pattern for instrumental motivation not clear
- Learning strategies: make more use of control and elaboration strategies

# **Attitudes towards School**

# Heuristic model: Attitudes towards School

- **Cognitive** reactions (opinions about school): „*Attitudes towards School*“
- **Affective** reactions (positive or negative feelings towards school):
  - „*Broader engagement in school*“
  - „*Sense of belonging*“
- **Behavioral** reactions: „*Sense of belonging*“ + „*participation*“ („*disaffection*“)

# Attitudes towards school cognitive aspects

The PISA index was derived from students' reported agreement with the following statements

- *School has done little to prepare me for adult life when I leave school*
- *School has been a waste of time*
- *School helped give me confidence to make decisions*

# Attitudes towards school cognitive aspects

The PISA index was derived from students' reported agreement with the following statements

- *School has done little to prepare me for adult life when I leave school (?%)*
- *School has been a waste of time (?%)*
- *School helped give me confidence to make decisions (?%)*



# Attitudes towards school

## **cognitive aspects**

*School has done little to prepare me for adult life when I leave school (OECD 32%)*

Finland ?, Germany ?

- *School has been a waste of time (OECD 8%),*

Finland ?, Germany ?

- *School helped give me confidence to make decisions (OECD 72%),*

Finland ?, Germany ?

# Attitudes towards school

## **cognitive aspects**

*School has done little to prepare me for adult life when I leave school (OECD 32%)*

Finland 21, Germany 43

- *School has been a waste of time (OECD 8%),*

Finland 7, Germany 7

- *School helped give me confidence to make decisions (OECD 72%),*

Finland 79, Germany 56

# Attitudes towards school **cognitive aspects**

A relationship between students' attitudes to school and student achievement is not evident from the data.

But positive attitudes are important outcomes relevant to learning for life.

# **Affective aspects: Broader engagement in school / Sense of belonging**

Students' reports on whether their school is a place where they:

- do not want to go
- often feel bored
- make friends easily
- feel like they belong
- other students seem to like them
- feel lonely (-)
- feel like an outsider (-)
- feel awkward and out of place (-)

# Broader engagement in school **affective** aspects

Agreement of students that their school is a place where they *do not want to go*:

- ? %

# Broader engagement in school **affective** aspects

Agreement of students that their school is a place where they *do not want to go*:

- In 20 of 28 OECD countries, more than 25 per cent of students agree or strongly agree

Germany:

- PISA 2000: 25%
- PIRLS 2001: 24%  
(boys: 29%, girls: 19%)

School is a place where students  
often feel bored

- Nearly ? % of all students report feeling bored at school.

# School is a place where students often feel bored

- Nearly 50 % of all students report feeling bored at school.
- No linear relationship with performance. Students who reported feeling bored in school had better performance in reading, mathematic and science than those who disagreed.



# *My school is a place where I often feel bored.*

1 Strongly disagree   2 Disagree   3 Agree   4 Strongly agree

category	%	Reading	Mathem.	Science
Germany				
1	17	436	451	451
2	32	494	495	495
3	31	506	506	501
4	18	486	495	492
OECD Average				
1	16	479	482	480
2	33	509	508	508
3	33	510	507	508
4	15	497	500	500

# Sense of Belonging: Students' reports on whether their school is a place where they:

Statement	PISA 2003 Germany	PIRLS-Germany 2001
make friends easily	86	88
feel like they belong	87	86
(do not) feel lonely	94	85
(do not) feel like an outsider	94	80

# Broader engagement with school- **behavioral** aspects (Willms 2003)

Willms used a new index: „Engagement at school“ („disaffection“)

measured by

- „Sense of belonging“ and
- „Participation“- (*How many times in the previous two weeks did you ... miss school? skip classes? arrive late for school?*)

# Broader engagement with school- **behavioral** aspects (Willms 2003)

- There is a high prevalence of students who can be considered **disaffected** from school.
- About one in four students has a low sense of belonging.
- About one in five students has very low participation.

# 5 clusters of engagement across all OECD-countries (Willms 2003)

1. **Top-students**: high levels of engagement and strong literacy skills (26%)
2. **Engaged students**: highly engaged at school and average levels of literacy skills (27%)
3. **Students feeling isolated**: low sense of belonging, but fairly high literacy performance (20%)
4. **Absent students**: regularly absent from school and moderately low levels of literacy performance (10%)
5. **Non-academic students**: very low literacy performance, but average levels of engagement (17%)

# Engagement at school and external factors: home

## **Risk factors for student disaffection**

- living in a family of low socio-economic status (i.e., in the lowest national quartile for the country)
- living in a single-parent family
- being foreign-born.

# Engagement at school and external factors: school

- Students who attend schools where there is a concentration of students from low socioeconomic families are more likely to be disaffected from school.

# Engagement at school and external factors: school climate

- Students are more engaged in schools where there is a
  - weak/strong? disciplinary climate,
  - positive student-teacher relations, and
  - low/high? expectations for student success.



# Engagement at school and external factors: school climate

- Students are more engaged in schools where there is a
  - strong disciplinary climate,
  - positive student-teacher relations, and
  - high expectations for student success.

**PISA/PIRLS IGLU:  
Differences between females  
and males**

## PISA 2000: Summary of gender differences

Characteristic	In how many of 21 countries is there a <b>female</b> advantage?	OECD average effect size
Reading interest	in 20 countries	0.53
Self-concept in reading	in 18 countries	0.29
Control strategies	In 16 countries	0.18
Effort and persistence	In 14 countries	0.16

## PISA 2000: Summary of gender differences

<b>Characteristic</b>	<b>In how many of 21 countries is there a <b>male</b> advantage?</b>	<b>OECD average effect size</b>
Mathematical self-concept	in 17 countries	0.25
Self-efficacy	in 18 countries	0.22
Preference for competitive learning	in 16 countries	0.21
Interest in mathematics	In 14 countries	0.20

# Differences for attitudes to school

PISA: Females have higher scores in

- Cognitive aspects of school attitudes
- Affective factors of school attitudes
- Behavioral aspects: higher participation

IGLU: Differences between  
girls and boys

Valtin, Wagner, Schwippert  
(2005)

*Are boys disadvantaged at  
school?*

# Advantages of girls

(=disadvantage of boys)

- More support at home
- Better start into school (knowledge of print)
- More success in school (better grades, less retention)

# Girls: Greater engagement

- Positive learning behavior
- More active engagement in class, even in mathematics
- Stronger interest in reading
- Out-of-school-activities fostering reading



# Girls at a disadvantage

- Greater achievement anxiety (relating to examinations in school and grades)
- Higher incidence of headaches and stomach pain
- Lower self-esteem
- Lower self-concepts in mathematics

# Lower engagement of boys

- Participation in class is lower: Boys report more often that in all class subjects they do secretly other things or are absent-minded.
- Consequently (??) they report that instruction and homework is too difficult for them, even in mathematics.

# Out-of-school-activities

- Boys use computers more often than girls (for computer games)
- More watching of television
- Less reading activities

# Boys: less well-being in school

- Feel more bored, less safe in school
- Feel less support from (female) teachers
- More often victims from violent behavior (we did not ask for offenders)

# Boys: Attribution of failure

- Higher attribution to: *“I did not learn enough at home”, “I cannot concentrate a whole school hour”, “I am not talented for school “*
- More often external attributions:  
*„the teacher did not explain it properly“, „instruction was too difficult“*

# Advantages of boys

- Higher scores in measures of ego-strength
- positive self-concept's (self-esteem, academic self-concept, self-concept of appearance)
  - psychic stability
    - lower achievement anxiety, less psychosomatic complaints, higher success-motivation, „ego-enhancing“ attribution of failure to external factors

# Open questions:

- Are boys disadvantaged in school?
- War on boys?

# Longitudinal Study: AIDA (Valtin, König, Wagner et al. Humboldt University Berlin)

## **AIDA (Adaptation in Adolescence)**

longitudinal study: 7<sup>th</sup> to 9<sup>th</sup> grade

focus: - psychosocial development of  
adolescents

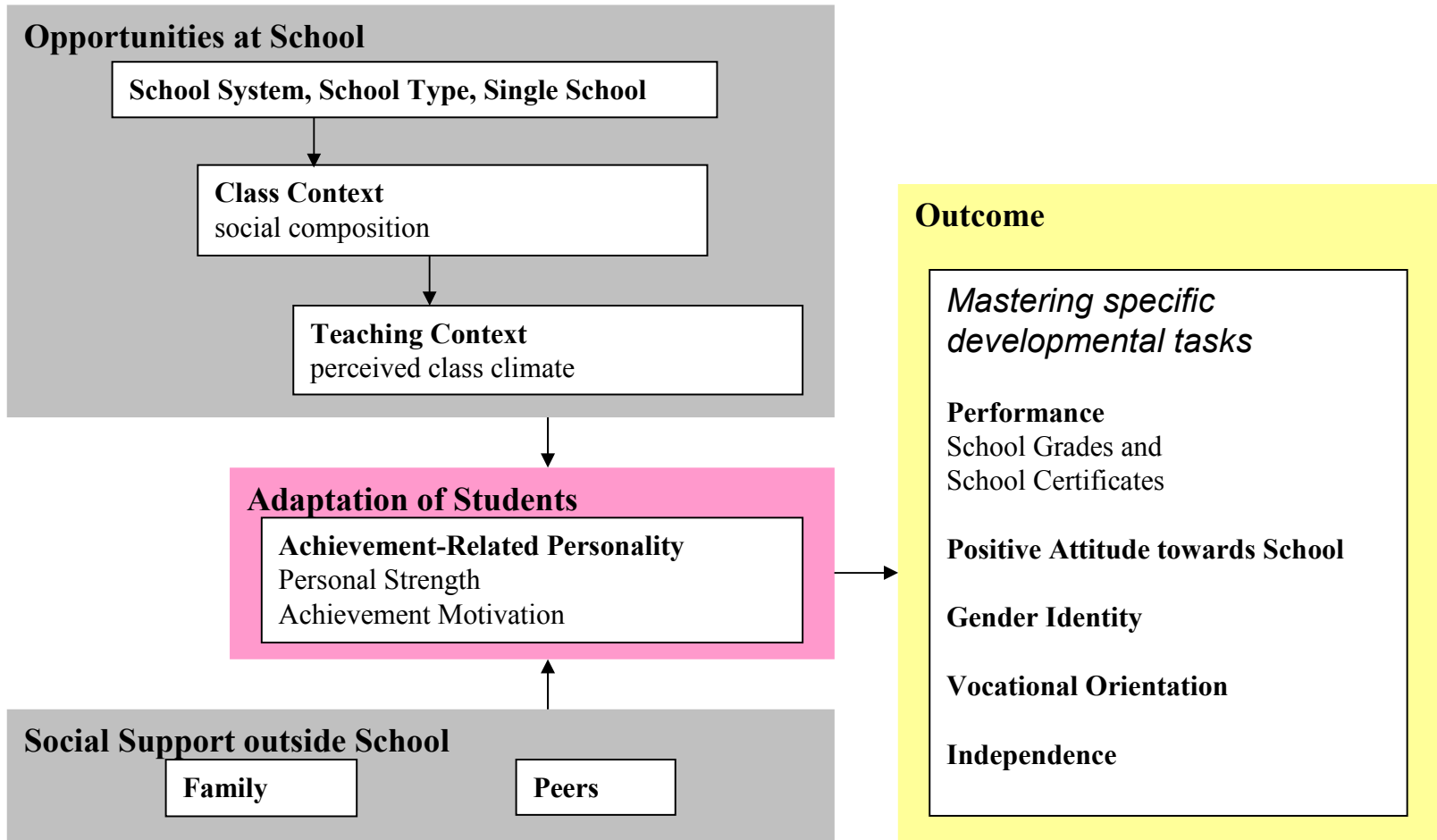
- attitudes and beliefs of students

sample: more than 3000 students for each  
measurement point,

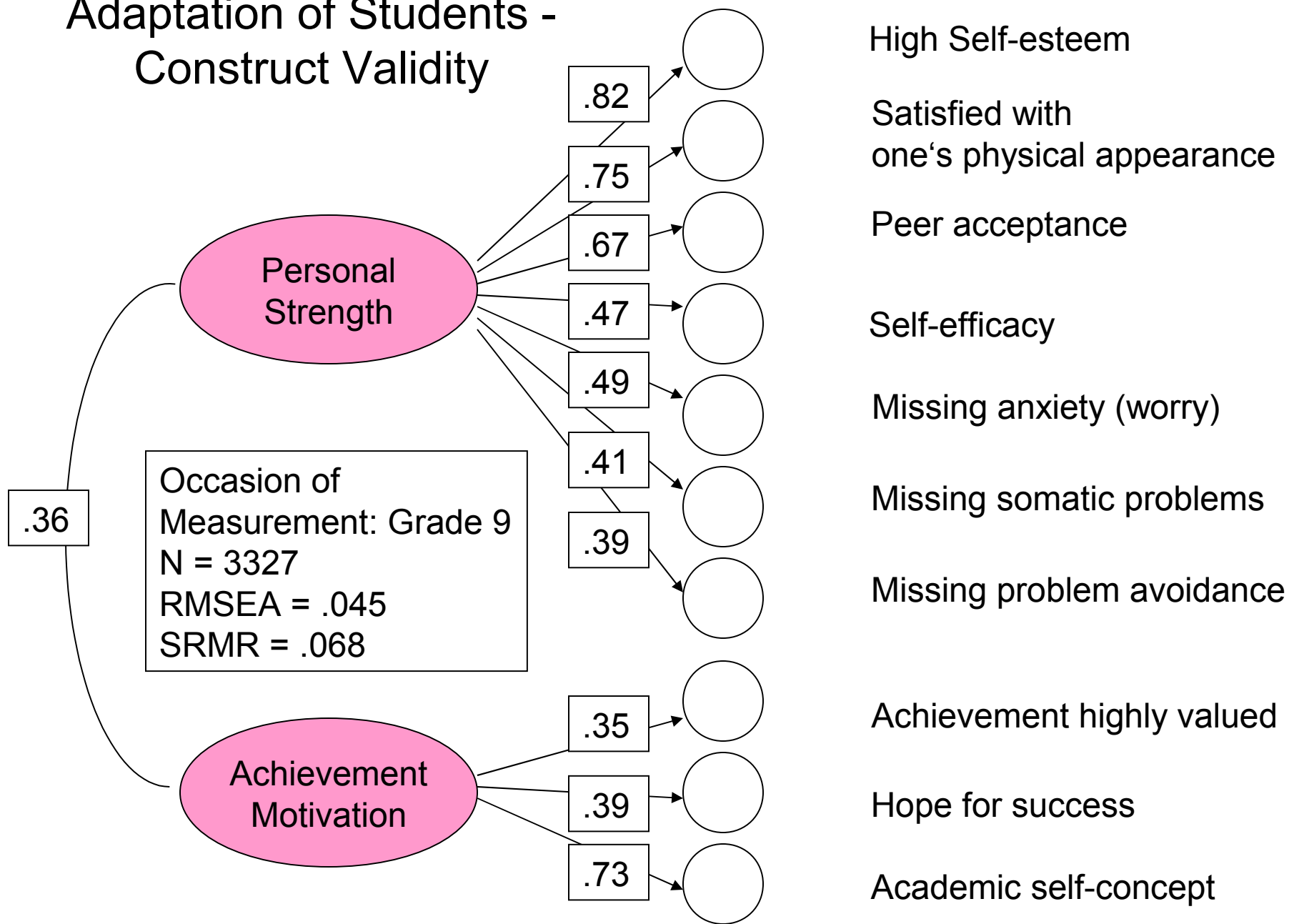
panel-sample from grade 7 to 9 = 1500



# Framework for the Adaptation of Students



# Adaptation of Students - Construct Validity



# Mediator Assumption: Research Question

## Direct Relation

Opportunities at School → Outcome

## Mediated by the Adaptation of Students

Opportunities at School → Adaptation of Students → Outcome

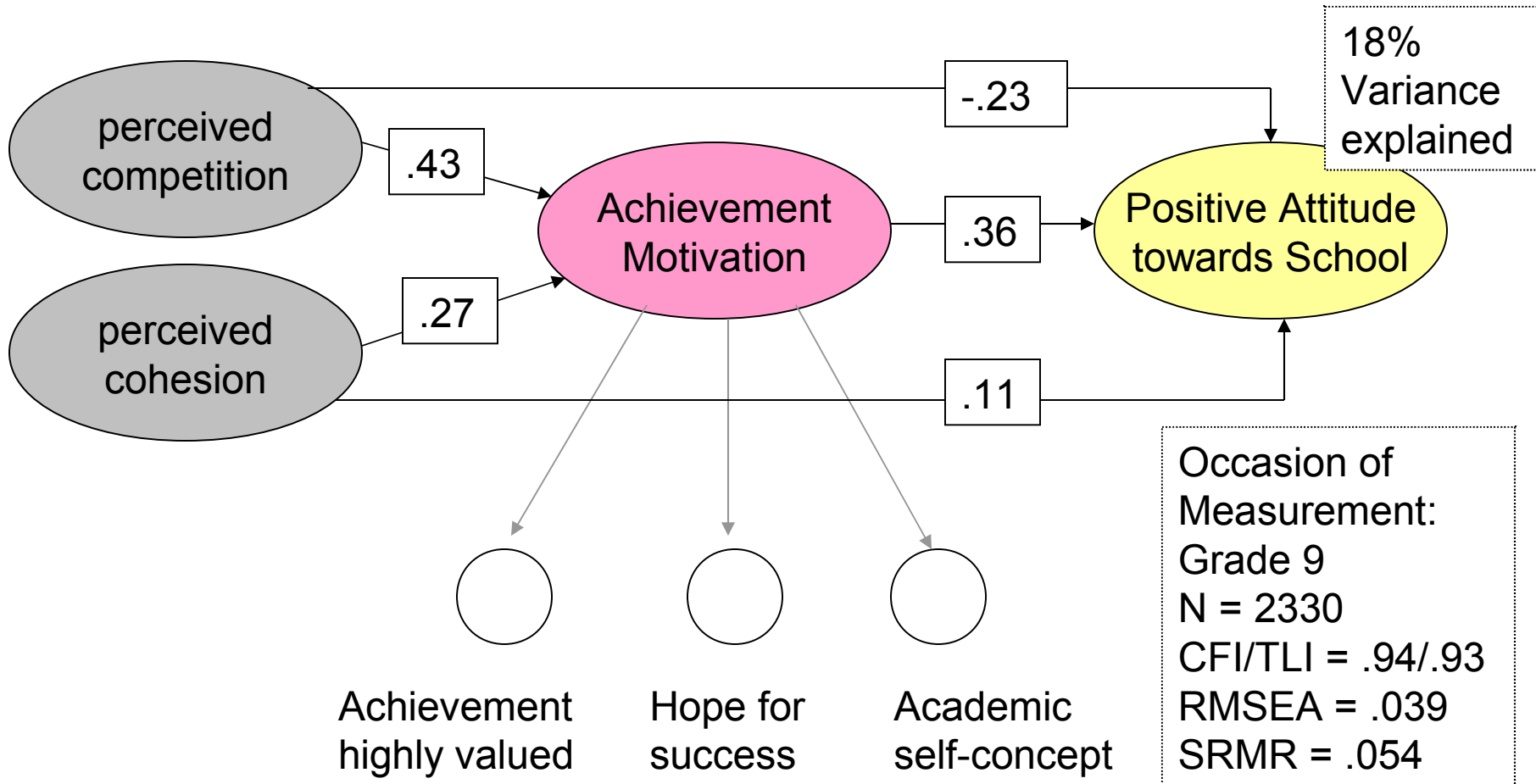
### **For example:**

Is there a direct relationship between the perceived class climate of students and their positive attitude towards school?

Or do we have to assume, that this relationship is mediated by the students' active development of achievement motivation?

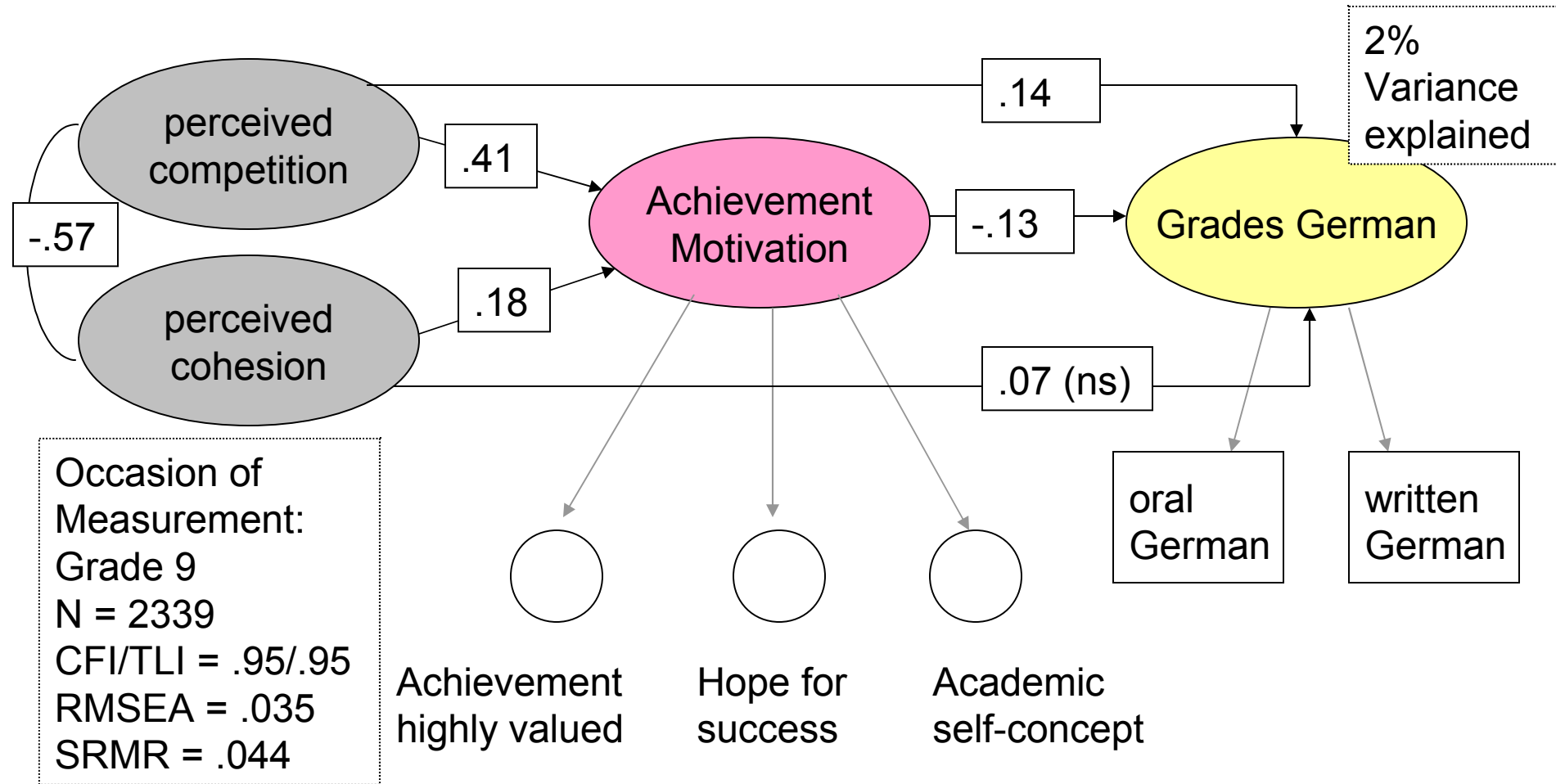
# Mediator Assumption: Path Model

Opportunities at School → Adaptation of Students → Outcome



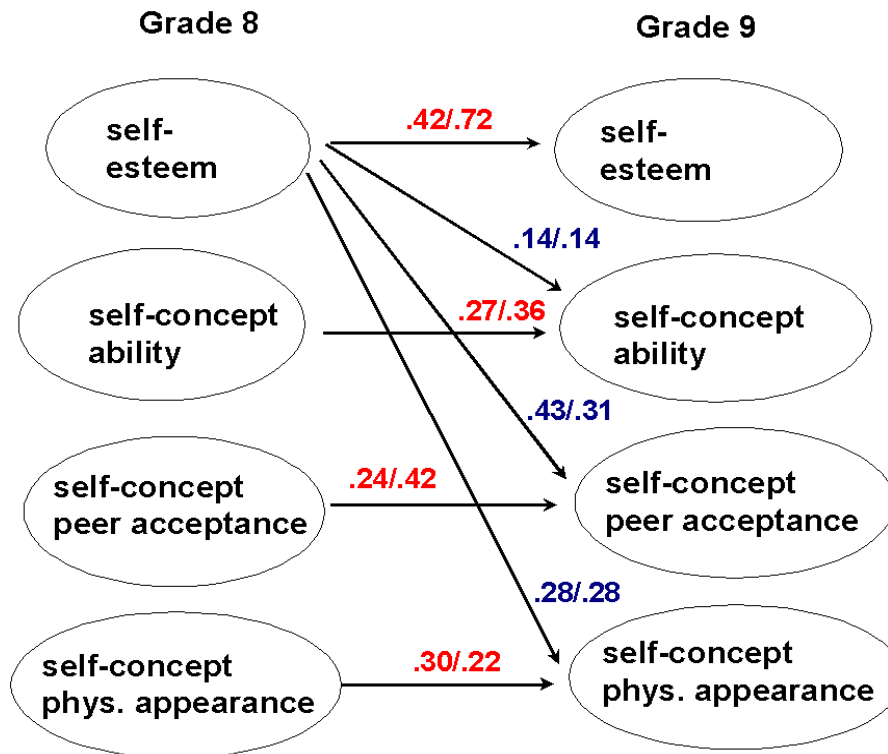
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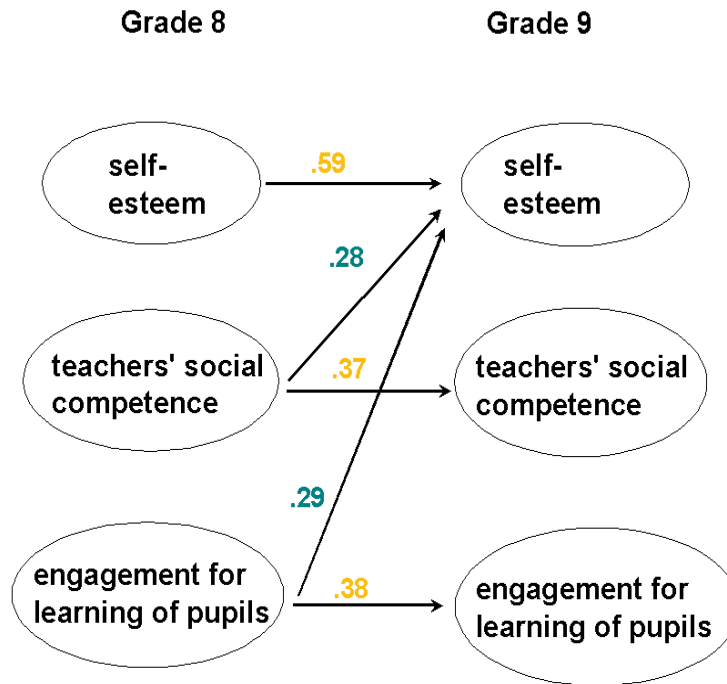
# Top-down-model of self-esteem

first coefficient for male pupils, second coefficient for female pupils



Chi<sup>2</sup> = 1084.12 DF = 183; CFI = .910

# Effects of teachers' competence and engagement



$\chi^2 = 1142$ ;  $DF = 149$ ;  $CFI = .924$

- Thank you very much for your attention!

If you want my presentation or have further questions please write to  
[renate.valtin@rz.hu-berlin.de](mailto:renate.valtin@rz.hu-berlin.de)