

# Teachers-students relationship as longitudinal predictor of academic achievement in Primary Education

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4th z-proso International Network meeting  
(zReN) meeting  
Bayes Centre, University of Edinburgh

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# 1. INTRODUCTION

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# SCHOOL ACHIEVEMENT

## School works

School causes a positive influence in the 95% of students (Hattie, 2009).

The effect size above 0.4 in 50% of the students (Hattie, 2012).

20% of school achievement is attributed to school (Alton-Lee, 2003; Konstantopoulos, 2005).

Differences among countries and geographic areas (PISA, 2009, 2012).

# 1.1. School achievement

Early school leavers **regret** dropping out; they think that they would have had a better life if they had not left school (Koc et al., 2020)

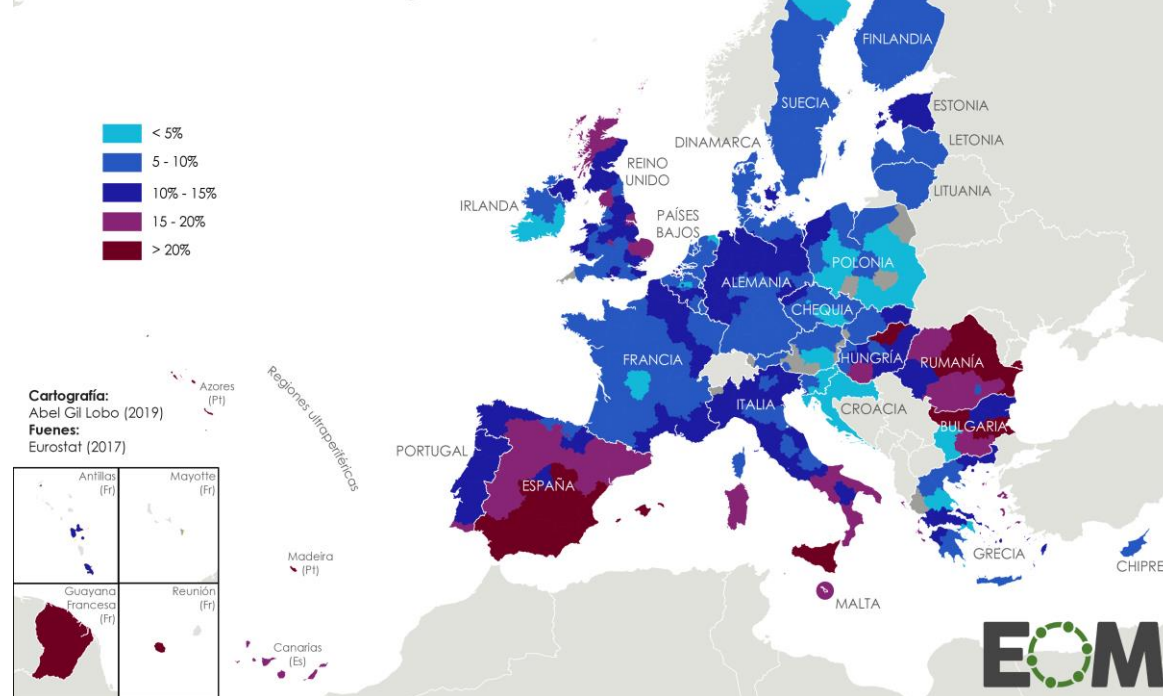
Dropout and **social stigma, ego-resilience, and depressive symptoms** (Kwon, 2020)

Poor self-rated **health** in adolescence, and reduced **work** integration (De Ridder et al., 2012)

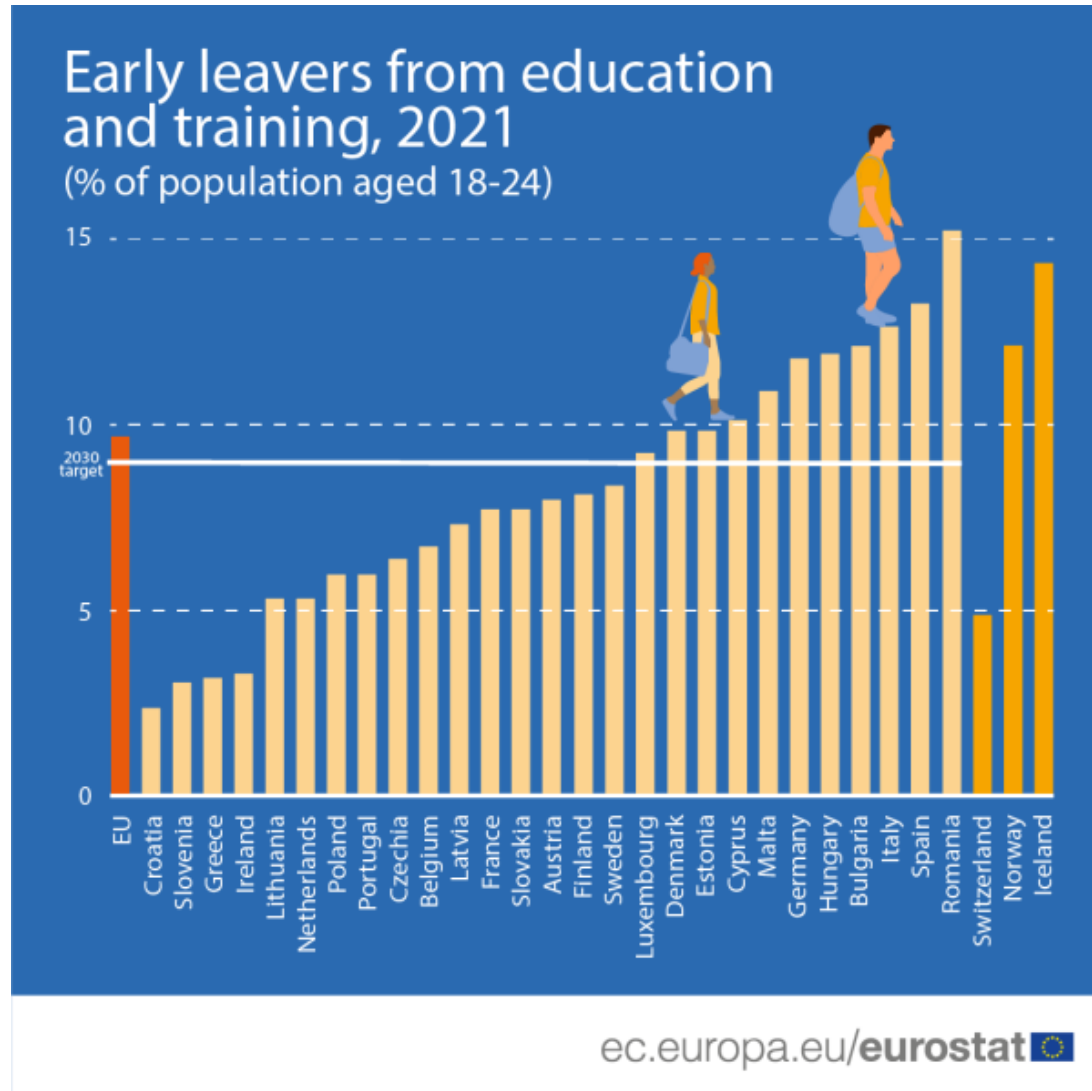
High school dropouts have a strongly increased risk for **sickness and disability in young adulthood** (De Rideer et al., 2013)

## Fracaso escolar en Europa

Proporción de población entre 18 y 24 años sin formación obligatoria



# 1.1. School achievement



- Dropout and **delinquency** (Weerman, 2010)
- School dropout significantly increases the likelihood of **more arrests** among serious adolescent offenders (Na, 2016)
- Relations among **academic achievement, self-concept** (Cvencek et al., 2017), **self-esteem, and subjective well-being** in school (Yang et al., 2019)
- Completing upper secondary education increases long-term **work** participation and lowers **health**-related absence for young men, but effects diminish over time (Hoff et al., 2018)



# 1.2. Teacher and student Previous studies in z-proso

Check for updates

Article

## Teacher-Student Relationships in Childhood as a Protective Factor against Adolescent Delinquency up to Age 17: A Propensity Score Matching Approach

Ingrid Obsuth<sup>1,2</sup> , Aja Louise Murray<sup>1</sup>, Monja Knoll<sup>1</sup>, Denis Ribeaud<sup>3</sup>, and Manuel Eisner<sup>2,3</sup>

**Abstract**

In this paper we examined the impact of the quality of relationships at age 10 on young people's delinquency at age 17. We used a propensity score matching approach to compare the delinquency of young people with high-quality teacher-student relationships at age 10 to those with low-quality relationships. The results showed that young people with high-quality teacher-student relationships at age 10 had significantly lower rates of delinquency at age 17 compared to those with low-quality relationships. This finding highlights the importance of teacher-student relationships in childhood as a protective factor against adolescent delinquency.

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1–29  
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Psychopathology

## Developmental Trajectories of Self-, Other-, and Dual-Harm across Adolescence: The Role of Relationships with Peers and Teachers

Annekatriin Steinhoff<sup>a</sup> Denis Ribeaud<sup>a</sup> Manuel Eisner<sup>a,b</sup> Lilly Shanahan<sup>a,c</sup>

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Journal of Youth and Adolescence (2021) 50:663–673  
https://doi.org/10.1007/s10964-021-01396-1

EMPIRICAL RESEARCH

## Developmental Cascades from Aggression to Internalizing Problems via Peer and Teacher Relationships from Early to Middle Adolescence

Aja Louise Murray<sup>1,2</sup> · Ingrid Obsuth<sup>3</sup> · Lydia Speyer<sup>2</sup> · George Murray<sup>4</sup> · Karen McKenzie<sup>4</sup> · Manuel Eisner<sup>1,5</sup> · Denis Ribeaud<sup>5</sup>

Research Article

Psychopathology  
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# 1.2. Teacher and student

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- Teachers can create an adequate classroom climate for learning. Effective Teacher–Student interactions could predict student achievement (Allen et al., 2013)
- Self-determination theory **emphasizes the role of teachers' support for students' needs** (Deci and Ryan, 2000; Obsuth, 2021; Reeve, 2006)
- Attachment theories (Bowlby, 1969; Stern, 1977) support the relevance of the teacher-student relationship (**Cornelius-White, 2007**)

## 1.3 School bonding

- Association between student's school bonding and academic achievement (Wong et al., 2022)
- Tan et al. (2022) showed positive correlations between school bonding and achievement in language, with PISA data
- No longitudinal studies in Primary Education were found

# 2. Method

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- Participants
- Instruments
- Design and procedure
- Data analyses

## 2.1 Participants

- **1,253 children** (49.3% female; age:  $M = 8.65$  years,  $SD = 0.37$ , range 7.33-10.06) at teacher survey wave 2.2,
- of which 1,228 (age:  $M = 9.10$ ,  $SD = 0.37$ , range 7.78-10.51) were assessed at child interview wave 3,
- 1,210 (age:  $M = 9.22$ ,  $SD = 0.37$ , range 7.94-10.59) at teacher survey wave 3.1,
- 1,175 (age:  $M = 10.70$ ,  $SD = 0.38$ , range 9.38-12.15) at teacher survey wave 4.1,
- 1,063 (age:  $M = 11.33$ ;  $SD = 0.37$ , range 9.98-12.76) at child survey wave 4,
- 989 (age:  $M = 11.60$ ,  $SD = 0.37$ , range 10.27-12.91) at teacher survey wave 4.2
- 916 (age:  $M = 12.64$ ;  $SD = 0.37$ , range 11.31-14.01) at teacher survey wave 4.3.
  
- **Teachers:** 130 at wave 2.2, 180 at wave 3.1, 250 at wave 4.1, 248 at wave 4.2, and 247 at wave 4.3.

## 2.2 Instruments (1/2)

- **Individual and parental characteristics**

Sex assigned at birth, Parental migration background and Parental formal education level (control variables)

- **Teacher-student relationship items**

At students **aged 8 and 9** (waves 2.2 and 3.1; W2.2 and W3.1), **teachers** rated 1-5:  
“I am on good terms with this child”

At students **aged 9** (wave 3; W3), **students** rated the following item on a 4-point scale: “How do you get along with your teacher?”

## 2.2 Instruments (2/2)

- **School bonding scale**

At **age 11** (wave 4; W4), students reported on their school bonding through three items: “I enjoy going to school”, “I enjoy doing my homework” and “I think school is useless” (ranged 1-4) ( $\alpha = .71$ )

- **Academic achievement items** (Mathematics and German language)

At students **8, 9, 10, 11, and 12 years old** (waves 2.2, 3.1, 4.1, 4.2, and 4.3), teachers assessed students’ achievement level as compared to the expected average achievement level at his/her age (i.e., compared to the full same-aged population)



## 2.3 Design and procedure

- The well-known design and procedure of the z-proso project
- Longitudinal prospective study
- Teachers completed a paper-and-pencil student assessment form for each participating student at each wave
- Students completed a paper-and-pencil or were interviewed

## 2.4 Data analyses

- Pearson correlations
- Linear regression analyses were carried out to test if the sex, parental migration background, parental formal education level, teacher-student relationship (reported by teachers at ages 8 and 9 and by students at age 9), and school bonding (age 11) were uniquely related to mathematics achievement (ages 8-12) and language achievement (age 12).

# 3. Results

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- Matrix of correlations
- 3 Lineal regression analyses

# Matrix of correlations with all observed variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Sex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Parental migration background	.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Parental formal education level	-.01	-.29***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Teacher-student relationship reported by the teachers (age 8)	.10***	-.11***	.06*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Teacher-student relationship reported by the teachers (age 9)	.11***	-.14***	.09**	.45***	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Teacher-student relationship reported by the students (age 9)	.10***	.04	.01	.13***	.16***	-	-	-	-	-	-	-	-	-	-	-	-
7. School bonding (age 11)	.19***	.21***	-.08*	.09**	.04	.17***	-	-	-	-	-	-	-	-	-	-	-
8. Mathematics achievement (age 8)	-.16***	-.09**	.20***	.14***	.11***	.06*	-.02	-	-	-	-	-	-	-	-	-	-
9. Language achievement (age 8)	.05	-.17***	.21***	.16***	.16***	.08**	.01	.61***	-	-	-	-	-	-	-	-	-
10. Mathematics achievement (age 9)	-.17***	-.17***	.25***	.09**	.17***	.02	-.06	.59***	.44***	-	-	-	-	-	-	-	-
11. Language achievement (age 9)	.02	-.25***	.26***	.13***	.21***	.05	-.05	.47***	.60***	.69***	-	-	-	-	-	-	-
12. Mathematics achievement (age 10)	-.09**	-.24***	.28***	.15***	.21***	.11***	.02	.48***	.42***	.58***	.50***	-	-	-	-	-	-
13. Language achievement (age 10)	.07*	-.35***	.33***	.18***	.20***	.09**	.02	.37***	.49***	.45***	.53***	.75***	-	-	-	-	-
14. Mathematics achievement (age 11)	-.08*	-.22***	.33***	.14***	.20***	.04	.02	.48***	.40***	.55***	.47***	.79***	.63***	-	-	-	-
15. Language achievement (age 11)	.09**	-.35***	.36***	.15***	.20***	.06	.01	.35***	.47***	.42***	.52***	.63***	.77***	.71***	-	-	-
16. Mathematics achievement (age 12)	-.06	-.24***	.36***	.14***	.22***	.08*	.01	.44***	.39***	.54***	.48***	.76***	.63***	.84***	.65***	-	-
17. Language achievement (age 12)	.07*	-.34***	.38***	.12***	.21***	.07*	-.02	.36***	.46***	.43***	.53***	.62***	.75***	.66***	.82***	.73***	-

***Teacher-Student Relationship Reported by Teachers at age 8***  
***(Lineal Regression Analyses)***

	Mathematics achievement (age 12)			Language achievement (age 12)		
	<i>B (SE)</i>	$\beta$	<i>p</i>	<i>B (SE)</i>	$\beta$	<i>p</i>
<b>Sex</b>	-.23 (.09)	-.09	<b>.01</b>	.14 (.08)	.06	.08
<b>Parental migration background</b>	-.40 (.09)	-.15	<b>&lt; .001</b>	-.67 (.09)	-.26	<b>&lt; .001</b>
<b>Parental formal education level</b>	.14 (.01)	.32	<b>&lt; .001</b>	.13 (.01)	.32	<b>&lt; .001</b>
<b>Teacher-student relationship reported by the teachers (age 8)</b>	.15 (.05)	.09	<b>&lt; .01</b>	.11 (.05)	.07	<b>.03</b>
<b>School bonding (age 11)</b>	.13 (.06)	.07	<b>.04</b>	.09 (.06)	.05	.14

$R^2 = .17, F_{(5, 816)} = 34.05, p < .001$

$R^2 = .22, F_{(5, 816)} = 47.64, p < .001$

***Teacher-Student Relationship Reported by Teachers at age 9***  
***(Lineal Regression Analyses)***

	Mathematics achievement (age 12)			Language achievement (age 12)		
	<i>B (SE)</i>	$\beta$	<i>p</i>	<i>B (SE)</i>	$\beta$	<i>p</i>
<b>Sex</b>	-0.25 (.09)	-0.09	<b>&lt; .01</b>	.14 (.08)	.05	.09
<b>Parental migration background</b>	-0.36 (.09)	-0.14	<b>&lt; .001</b>	-0.65 (.09)	-0.25	<b>&lt; .001</b>
<b>Parental formal education level</b>	.14 (.01)	.32	<b>&lt; .001</b>	.13 (.01)	.32	<b>&lt; .001</b>
<b>Teacher-student relationship reported by the teachers (age 9)</b>	.20 (.05)	.13	<b>&lt; .001</b>	.15 (.05)	.10	<b>&lt; .01</b>
<b>School bonding (age 11)</b>	.13 (.06)	.07	<b>&lt; .05</b>	.08 (.06)	.05	.15

$R^2 = .17, F_{(5, 797)} = 34.83, p < .001$

$R^2 = .23, F_{(5, 797)} = 47.72, p < .001$



***Teacher-Student Relationship Reported by Students at age 9***  
***(Lineal Regression Analyses)***

	Mathematics achievement (age 12)			Language achievement (age 12)		
	B (SE)	$\beta$	p	B (SE)	$\beta$	p
<b>Sex</b>	-.23 (.09)	-.09	<b>.01</b>	.14 (.08)	.06	.08
<b>Parental migration background</b>	-.43 (.09)	-.16	<b>&lt; .001</b>	-.69 (.09)	-.27	<b>&lt; .001</b>
<b>Parental formal education level</b>	.14 (.01)	.32	<b>&lt; .001</b>	.13 (.01)	.32	<b>&lt; .001</b>
<b>Teacher-student relationship reported by the students (age 9)</b>	.20 (.07)	.09	<b>&lt; .01</b>	.18 (.07)	.09	<b>.01</b>
<b>School bonding (age 11)</b>	.11 (.06)	.06	.07	.08 (.06)	.04	.18

$R^2 = .17, F_{(5, 808)} = 33.64, p < .001$

$R^2 = .22, F_{(5, 808)} = 47.75, p < .001$

***Teacher-Student Relationship and academic achievement***  
*(Lineal Regression Analyses)*

	Mathematics achievement (age 12)			Language achievement (age 12)		
	<i>B (SE)</i>	$\beta$	<i>p</i>	<i>B (SE)</i>	$\beta$	<i>p</i>
<b>Sex</b>	-.27 (.09)	-.10	<b>&lt; .01</b>	.12(.08)	.05	.14
<b>Parental migration background</b>	-.36 (.09)	-.14	<b>&lt; .001</b>	-.65 (.09)	-.25	<b>&lt; .001</b>
<b>Parental formal education level</b>	.14 (.01)	.32	<b>&lt; .001</b>	.13 (.01)	.31	<b>&lt; .001</b>
<b>Teacher-student relationship reported by by the teachers (age 8)</b>	.08 (.06)	.05	.19	.06 (.06)	.04	.26
<b>Teacher-student relationship reported by by the teachers (age 9)</b>	.15 (.06)	.09	<b>.01</b>	.11 (.06)	.07	.05
<b>Teacher-student relationship reported by the students (age 9)</b>	.15 (.07)	.07	<b>.03</b>	.14 (.07)	.07	<b>.04</b>
<b>School bonding (age 11)</b>	.10 (.06)	.06	.10	.07 (.06)	.04	.28

$R^2 = .19, F_{(5, 808)} = 26,14, p < .001$

$R^2 = .24, F_{(5, 808)} = 34,80, p < .001$

# 4. Discussion and implications

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- The teacher-student relationships, reported both by teachers and students, are longitudinal predictors of school achievement, even years later.
- Teacher training, both pre-service and in-service, should be influenced by the results of this study and similar ones.
- Educational policies related to the curriculum in pre-service and in-service teacher training should also be influenced by these findings.
- If teachers become more effective, **z-proso contributes to making a difference.**

**Thank you**  
Comments are welcome

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