Is it the school of the fish or the size of the pond that matters?

An experimental examination of reference group effects in secondary school

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Background & Motivation

Motivation

Claire



- Would like to attend grammar school
- GPA 5.0 (out of 6)
- Only two others with grades \geq Claire



Judy



- Would like to attend grammar school
- GPA 5.0 (out of 6)
- Five with grades \geq Judy



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Research Question

Do teachers take the group of motivated students as a frame of reference when deciding upon which students to recommend to the highest secondary school track?

Background: Reference group effects - mechanisms



- 1. Peer's achievement
- 2. Peer's background
- 3. Student self concept

- 4. Size of reference group
- 5. Invidious comparison (teacher)
- 6. Filling-up places (teacher)

I. Teacher effects

Due to unique classroom settings (reference group), prior beliefs and experiences, teacher will differ in their assessment who to recommend for the most advantageous school track.

II. Size of the pond Due to limited places in the short run, chances for a recommendation are smaller when facing a bigger number of competitors.

III. Filling-up of places

Teachers evaluate the fit of a student relatively against the reference group. Individual chances thus diminish with an increasing number of peers who already got a recommendation.

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- Choice experiment
- 3 sets with 3,4,5 students wishing to attend grammar school
- Grades, development, participation, learning & study habits, learning style varied experimentally
- 70 (prospective) secondary school teachers (2 with item non-response)
- Outcome: Vignette student recommended yes/no
- N: $68 \times (3 + 4 + 5) = 816$ vignettes

$$\mathbf{Y} = \alpha + \mathbf{X}\boldsymbol{\beta} + \eta_j + \varepsilon_{ij}, \qquad i = 1, ..., n_j, \ j = 1, ..., J,$$
 (1)

Table 1: Testing different model specifications

Test	Test statistic (df)	p-value

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Logit vs. RE (LR)	28.43(1)	0.000
RE vs. FE (Hausman)	1.35(5)	0.930

	Tom	Sarah	Lisa	Marc
Grade last semester (math)	5	5.5	4.5	5.5
Development of educational performance (compared with previous term)	Better than before	Same as before	Worse than before	Same as before
Participation during class	Actively contributes during class	Contributes only rarely during class	Contributes only rarely during class	Actively contributes during class
Pace of learning	Sometimes takes more time to learn new things	Learns new things easily	Sometimes takes more time to learn new things	Learns new things easily
Learning habits	Has trouble focusing and often needs assistance	Has no trouble focusing and can figure things out for herself/himself	Has trouble focusing and often needs assistance	Has no trouble focusing and can figure things out for herself/himself
Parental educational background	Attended grammar school	Did not attend grammar school	Did not attend grammar school	Attended grammar school
His/her parents would like their child to	complete grammar school	complete a vocational degree	complete grammar school	complete a vocational degree
Grammar school recommendation				

Figure 1: Example set of students (CE)

Results

	Baseline	Controls	Mediator	Interaction
Crada last comostor	0.543***	0.544***	0.479***	0.469***
Grade last semester	(0.011)	(0.011)	(0.023)	(0.024)
Participation (<i>Reference: active</i>)				
not active	-0.085***	-0.085***	-0.079^{***}	-0.078^{***}
not active	(0.023)	(0.023)	(0.022)	(0.022)
Learning & study habits (Reference	e: learns new	things easil	v)	
noode como timo	-0.071^{**}	-0.071^{**}	-0.064**	-0.061^{**}
heeds some time	(0.023)	(0.023)	(0.022)	(0.022)
Methods and learning style (Reference: independent & concentrated)				
rather not concentrated	(0.023)	(0.023)	(0.023)	(0.023)
	-0.025^{+}	-0.026^{+}	-0.017	-0.019
Group size	(0.014)	(0.014)	(0, 014)	(0, 013)
	(0.01.)	(0.01.)	(0.01.)	(0.010)
			-0.400^{***}	-0.462^{***}
Share classmates with recommend	ation		(0.094)	(0.095)
Teacher: experience & knowledge		\checkmark	\checkmark	\checkmark
Teacher: background characteristic	CS	\checkmark	\checkmark	\checkmark
	1.122**	0.999**	2.567***	2.948***
11j	(0.392)	(0.365)	(0.839)	(0.944)
N	816			

Marginal effects; Standard errors in parentheses

 $^{+} p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001$



Figure 2: p(recommendation | X) by % peers with recommendation and grade



Figure 3: p(recommendation | X) by % peers with recommendation and group size

Discussion

Discussion

To sum up:

- Teachers indeed consider group of motivated students as frame of reference
- Size of the pond makes a difference
- Relative impact of being a "big fish": Competition for limited places
- Robustness: Not attributable to other effects, namely, relative performance

Implications:

- Filling up of limited places in a stratified system
- Additional path of reproducing social inequality
 - \rightarrow Able students might be diverted from grammar school, especially in competitive environments
 - \rightarrow Given importance of grades (primary effects) and classroom behavior, likely additional disadvantage for students of lower social origin
 - $\rightarrow {\sf Segregation}$

Thank you for your attention!

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Appendix

Characteristics	Values
Students' characteristics	
Gender	0 Male, 1 Female
Grade last semester	4.5, 5.0, 5.5
Performance	0 better, 1 about the same, 2 worse than before
Participation during class	0 active, 1 not active
Learning and study habits	0 learns new things easily, 1 needs some time
Methods and learning style	0 independent & concentrated, 1 not very ind. & c.
Parental education	0 attended grammar school, 1 didn't attend it
Parental aspirations	0 grammar school, 1 vocational training
Further classroom context	
Group size	3, 4, 5
Subject	0 math, 1 German

Table A1: Characteristics in the experimental setting

	Controls	Mediator	Subsample I	Subsample II
All other exp. characteristics	\checkmark	\checkmark	\checkmark	\checkmark
Group size	0.788^{+}	0.829	-0.027+	-0.021
	(0.110)	(0.121)	(0.015)	(0.015)
Show with recommendation		0.001***		-0.290**
Share with recommendation		(0.001)		(0.103)
Teacher controls	\checkmark	\checkmark	\checkmark	\checkmark
N	816		708	

Table A2: Fixed effects estimates (first two columns, OR) & subsample of those who already teach in secondary schools (last two columns, randome effects, AME)

Robustness

	Order	performance I	performance II
Position in Choice Set			
and	0.017		
2	(0.033)		
ord	0.021		
3	(0.032)		
⊿ th	0.001		
4	(0.037)		
⊏th	0.009		
5	(0.048)		
Polow overage grade		-0.043	
Delow average grade		(0.040)	
Laurat availa			-0.069
Lowest grade			(0.044)
Ν		816	

Table A3: Robustness (AME, RE models, controlled for all other covariates)