

Do Students and Parents Value Same-Gender Teachers?

Evidence from an Online Tutor Marketplace

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Introduction

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- Research Questions: Does this phenomenon extend to the classroom? (i.e. do students prefer to work with teachers of the same gender?) Are there sources of heterogeneity such as by academic subject?

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- Gender matching is especially strong when:
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 - The subject is math
- Suggestive evidence that the Covid-19 pandemic increased gender matching on the platform

Previous Literature & Contributions

Student preferences for same-gender

Teachers: Carrington et al. (2007), Chen, Zhang, and Wang (2021), Lahelma (2006), McGrath and Sinclair (2013), Skelton et al. (2013)

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- Contributions: Observe a broader range of instruction levels. Financial incentives to reveal true preferences. Can tease out student vs parent preferences

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- *Major choice, interest in STEM*: Bettinger and Long (2005), Carrell, Page, and West (2010), Chen, Sonnet, Sadler (2019), Cho (2012), Porter and Serra (2020), Price (2010), Sansone (2017), Sevilla (2023)

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- *Student evaluations of teaching*: Boring and Philippe (2021)

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- Scrape the public profiles of freelance tutors which include reviews left by students and parents
- → Measure gender homophily in the set of student-tutor matches that result in a review

Setting: Online Tutor Marketplace



Math & Chem Tutor
Sylvie T.

★★★★★ 5.0 (159 ratings)

864 hours tutoring

Your first lesson is backed by our **Guarantee**

Hourly Rate: \$95

[CONTACT SYLVIE](#)

Response time: **3 hours**

Featured Review

Exceptional tutor; goes above and beyond!

— Nicole, 143 lessons with Sylvie

My daughter is intimidated by math, and she always Sylvie she went from refusing multiple tutors to looking forward to her sessions! Sylvie always prepares, communicates with my daughter's teachers, and prepares short assignments for between sessions.

About Sylvie

To make a positive difference and be a part of their academic success is what I aim for!

High School Chemistry
College General Chemistry

Pre-Algebra
Algebra 1
Algebra 2
Geometry...
[Read more](#)

Education University of California, Irvine
Chemistry

Policies

- Hourly Rate: **\$95**
- Lesson cancellation: **24 hours notice required**
- No background check
- Your first lesson is backed by our **Good Fit Guarantee**

Schedule

Sat:	Midnight - Midnight
Sun:	Midnight - Midnight
Tue:	Midnight - Midnight

Ratings and Reviews

★★★★★ 5.0 (159 ratings)

Approved Subjects	<p>Business GRE</p> <p>Elementary Education Elementary Math</p> <p>Homework Chemistry, SAT Math, Algebra 1, Algebra 2, Calculus, Geometry, Prealgebra, PreCalculus</p> <p>Math SAT Math, ACT Math, Algebra 1, Algebra 2, Calculus, Geometry, Prealgebra, PreCalculus, Probability, Trigonometry</p>	<p>Most Popular Chemistry, Algebra 1, Algebra 2, Calculus, Geometry, Prealgebra, PreCalculus</p> <p>Science Chemistry, Anatomy</p> <p>Summer Chemistry, SAT Math, Algebra 1, Algebra 2, Calculus, GRE, Geometry</p> <p>Test Preparation SAT Math, ACT Math, GRE, GRE</p>	<p>5 star 11 (7%)</p> <p>4 star 81 (51%)</p> <p>3 star 52 (33%)</p> <p>2 star 2 (1%)</p> <p>1 star 6 (4%)</p>
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Examples of Expertise

Sylvie has provided examples of their subject expertise by answering 1 **Algebra 1** question submitted by students on Wyzant's Ask an Expert.

QUESTION

Find the numbers whose sum is 15 and the second...

SYLVIE'S ANSWERS

Because you are looking for 2 unknown numbers, you can label x for the number - 1st number = 2nd number = Equation 1

[See all of Sylvie's Lessons >](#)

Kind and knowledgeable

Sylvie is patient, great with hints and explains concepts well. Being able to correct with students is a great quality which aids in the learning process. It has been great working with her.

— Neil, 4 lessons with Sylvie

Write so happy we found Sylvie

Sylvie is patient and knowledgeable and has helped my daughter understand algebra II concepts. She was responsive and makes a real effort to meet our scheduling needs, she's fabulous.

— Holly, 10 lessons with Sylvie

Amazing tutor

Sylvie has been incredibly helpful to my daughter. All Spring, she has been so flexible about scheduling and has really worked with her to understand the most difficult topics.

— Jennifer, 24 lessons with Sylvie

Assigning Proxy for Gender

Tutors:

- Use first name + Genderize.io

Students:

- Method 1: Review mentions gendered, child-related keywords (e.g. “daughter”, “son”, “niece”)
- Method 2: Name associated with review + Genderize.io if no child keywords used

Knowledgeable and patient tutor!

Jane helped my daughter prepare for an Algebra 1 test and was very helpful! My daughter did well on the assignment. I recommend her highly. Great and quick communication.

— Halley 1 lesson with Jane

Descriptive Statistics

- Assign student gender to 89% of reviews, and assign a gender to 88% of tutors
- Analysis sample of 6,463 tutors with 250,000 total reviews

Female Tutors

Statistic	Mean	St. Dev.	Min	Max
Female tutor	1.000	0.000	1	1
Female students	0.609	0.319	0.000	1.000
Hourly rate	66.231	40.501	16	1,001
5-star rating share	0.957	0.080	0.000	1.000
Available hours	50.306	34.281	0	168
No. of hours tutored	582.523	1,195.415	1	15,086
No. of ratings	170.565	356.296	1	4,523
No. of reviews	33.775	74.552	1	1,220
Teaches math	0.482	0.500	0	1
Math review share	0.176	0.277	0.000	1.000
Background check	0.463	0.499	0	1
Age	36.861	12.084	7	78
Smile	0.874	0.332	0	1
Eyeglasses	0.233	0.423	0	1
N				3,091

Male Tutors

Statistic	Mean	St. Dev.	Min	Max
Female tutor	0.000	0.000	0	0
Female students	0.476	0.303	0.000	1.000
Hourly rate	73.675	58.785	11	1,001
5-star rating share	0.957	0.079	0.000	1.000
Available hours	62.524	36.383	0	168
No. of hours tutored	689.733	1,319.922	1	13,883
No. of ratings	205.448	389.282	1	5,654
No. of reviews	43.083	89.104	1	1,937
Teaches math	0.680	0.467	0	1
Math review share	0.227	0.292	0.000	1.000
Background check	0.552	0.497	0	1
Age	37.062	12.057	1.500	88.000
Smile	0.708	0.455	0	1
Eyeglasses	0.316	0.465	0	1
N				3,372

Note: Data collected from the online tutor marketplace Wyzant during fall 2023.

Measuring Homophily

$$StudentShareFemale_i = \alpha + \beta TutorFemale_i + X_i + \epsilon_i \quad (1)$$

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- β is the *relative homophily* statistic
- X' : Tutor profile page and review-level attributes

▶ Covariates

Relative Gender Homophily Results

	<i>Dependent variable:</i>				
	Female Share of Students				
	(1)	(2)	(3)	(4)	(5)
Female tutor	0.134*** (0.008)	0.164*** (0.009)	0.143*** (0.010)	0.144*** (0.011)	0.145*** (0.011)
Constant	0.476*** (0.005)	-4.901 (3.801)	-4.215 (4.108)	-9.033 (5.649)	-8.624 (5.796)
Tutor & review attributes		Yes	Yes	Yes	Yes
Word embedding PC			Yes	Yes	Yes
Facial landmarks				Yes	Yes
Endogenous variables					Yes
Observations	6,463	6,463	6,463	6,463	6,463
Adjusted R ²	0.044	0.093	0.111	0.111	0.112

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Data extracted from Wyzant.com in fall 2023.

Tutor Preferences for Gender Matching

- Data from the Ask an Expert forum, a section of the platform where tutors asynchronously respond to student questions

	<i>Dependent variable:</i>			
	Share female of students			
	(1)	(2)	(3)	(4)
Female tutor	0.027*** (0.008)	0.036*** (0.009)	0.040*** (0.009)	0.023 (0.016)
Constant	0.636*** (0.005)	0.631*** (0.007)	14.657*** (3.345)	10.636 (7.849)
Question attributes			Yes	Yes
Tutor attributes				Yes
Word embedding PC				Yes
Facial landmarks				Yes
Observations	25,141	19,163	19,163	19,163
Adjusted R ²	0.001	0.001	0.004	0.012

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

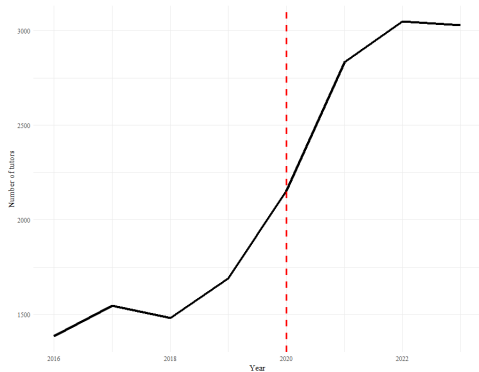
Standard errors are clustered at the tutor level. Columns (2) - (4) are estimated on the sample of tutor answers with no missing question or tutor-level covariates.

Relative Gender Homophily Results: Heterogeneity

	<i>Dependent variable:</i>		
	Share Female Students		
	Parent	Tutor subject	Review subject
	(1)	(2)	(3)
Female tutor	0.085*** (0.016)	0.149 (0.103)	0.040 (0.036)
Female tutor x Parent review	0.149*** (0.027)		
Female tutor x Math		0.052*** (0.018)	0.186*** (0.044)
Female tutor x Science		0.004 (0.017)	0.046 (0.053)
Female tutor x Other		-0.040 (0.103)	0.102** (0.041)
Constant	-8.786 (5.575)	-9.122 (5.630)	-8.604 (5.618)
Observations	6,463	6,463	6,463
Adjusted R ²	0.117	0.112	0.114

Note: *p<0.1; **p<0.05; ***p<0.01
English/writing is the leave-out group in columns (2) and (3).

Covid-19 Pandemic: Rise in Number of Tutors



Relative Gender Homophily Results: Covid-19 Pandemic

	<i>Dependent variable:</i>			
	Share Female Students			
	Unbalanced Panel		Balanced Panel	
	No controls	With controls	No controls	With controls
	(1)	(2)	(3)	(4)
Female tutor	0.115*** (0.010)	0.115*** (0.012)	0.121*** (0.020)	0.095*** (0.027)
Post2020	-0.007 (0.008)	-0.014* (0.008)	-0.025 (0.016)	-0.027 (0.017)
Female tutor x Post2020	0.030** (0.012)	0.029** (0.012)	0.039 (0.026)	0.046* (0.028)
Constant	0.483*** (0.007)	-4.443 (2.771)	0.497*** (0.011)	-9.639 (9.938)
Observations	17,163	17,163	1,948	1,948
Adjusted R ²	0.031	0.078	0.052	0.156

Note:

*p<0.1; **p<0.05; ***p<0.01

Standard errors clustered at the tutor level.

Conclusion and Future Work

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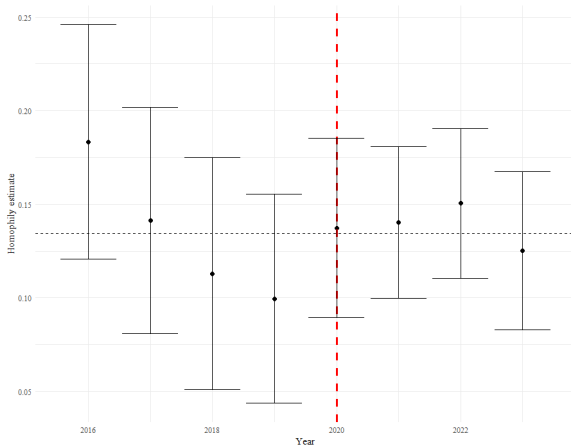
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- Future work:
 - Partner with a platform
 - Hypothetical (or real) choice experiment

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Covariates

- Tutor attributes: Background check indicator, rank in search results, approved subject indicators, whether the tutor has an introductory video, is approved to use IXL, has a cancellation policy, has additional hourly rate details, ever publicly commented on a review, the number of alphanumeric characters in the tutor's: biography, explanation of subject qualifications, and education section, the number of answers posted on the Ask an Expert forum, the tutor's state of residence, and
- Review attributes: Whether the review was written by a parent, mentions subject-specific keywords, and the year the review was left.
- Word embeddings PC: 100 principal components extracted from 786 dimensional word embeddings themselves extracted from tutor-written biographies, subject qualification descriptions, and education summaries
- Facial landmarks: Series of variables extracted from tutor profile photos using Amazon Rekognition's facial analysis capabilities.
- Endogenous attributes: Log of hourly rate, number of hours tutored, number of ratings received, share of ratings that are 5 stars

Covid-19 Event Study: Unbalanced Panel



Covid-19 Event Study: Balanced Panel

