Gender, competitiveness and career choices along the whole ability distribution

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Section 1

Introduction

Willingness to compete

- A large literature in experimental economics uses Niederle and Vesterlund's (2007) measure of individual willingness to compete
  - Participants receive money for their performance in a task, e.g. adding up numbers
  - Choice between piece rate and winner-takes-all competition
  - Choice conditional on performance taken as binary measure of willingness to compete

Gender differences

- Most studies use this measure to document gender differences in willingness to compete (Croson and Gneezy 2009, Niederle and Vesterlund 2011)
- Typical result:
  - Conditional on performance, women are less likely to choose competition
  - Especially in stereotypically male tasks
- Typical sample: university students

Competition and career choices

- Buser, Niederle and Oosterbeek (2014): willingness to compete predicts study choices of Dutch high school students
- In a companion paper, we show that this replicates using the present data set (Buser, Peter and Wolter, AER P&P 2017)
- Also see Zhang 2014; Reuben, Wiswall and Zafar 2014; Reuben, Sapienza and Zingales 2015; Buser, Geijtenbeek and Plug 2015; Almas et al. 2016; Oppedal Berge et al. 2015)

- Most of these studies look at the top of the ability distribution: MBA graduates, academic level of high school, undergrads at top US universities (exceptions are Zhang 2014 and Almas et al. 2016).

Sample

- Incentivized measure of willingness to compete in large sample of secondary school students from Switzerland covering all ability levels
  - 1514 students from 28 secondary schools in Swiss Canton of Bern
  - First wave (beginning of 8th grade): Background and experimental measure of willingness to compete
  - Second wave (end of 9th grade): Career choices

Research questions

- **How does gender difference in willingness to compete vary with ability?**

- We have both a numbers and a letters task
- We look at secondary school track, GPA and math grades

- Almas, Cappelen, Salvanes, Sorensen and Tungodden (2016): gender difference not present for children with low socio-economic background

Research questions

- **How does willingness to compete predict career choices at different parts of the ability distribution?**
- The Swiss context is especially interesting because a majority of students choose a vocation (apprenticeship) at the end of compulsory schooling
  - Can look at choice between different vocations
  - Can look at choice between vocational and academic trajectories

Section 2

Setting

Educational choice

- 13% choose "bridge year", 67% choose vocational education, and 20% choose academic track
- Academic track: prepares students for university
  - Students choose a specialization
- Vocational track: mostly in form of apprenticeships but also school-based
  - Students pick a profession

Ability levels

- At the time of the survey, students are tracked into three levels of secondary school
- We divide students into four ability levels
  - Top: High level of secondary school
  - Medium-high: medium level of secondary school with GPA higher than 4.75
  - Medium-low: medium level of secondary school with GPA of 4.75 or lower
  - Bottom: low level of secondary school

Descriptive statistics

	Boys (N=760):	Girls (N=754):	Dif:
Compete	0.554	0.419	0.135***
	(0.497)	(0.494)	(0.025)
Compete (numbers)	0.490	0.346	0.144***
	(0.501)	(0.476)	(0.035)
Compete (letters)	0.623	0.496	0.127***
	(0.485)	(0.501)	(0.036)
Score 1 (numbers)	3.508	3.654	-0.146
	(2.257)	(2.232)	(0.161)
Score 2 (numbers)	4.218	4.568	-0.350
	(2.588)	(2.407)	(0.179)
Score 1 (letters)	7.593	8.207	-0.614**
	(2.677)	(2.738)	(0.200)
Score 2 (letters)	9.087	9.880	-0.793***
	(2.811)	(2.942)	(0.213)
Lottery	3.186	2.731	0.455***
	(1.628)	(1.418)	(0.079)
Math confidence	1.999	2.276	-0.277***
	(0.796)	(0.794)	(0.041)

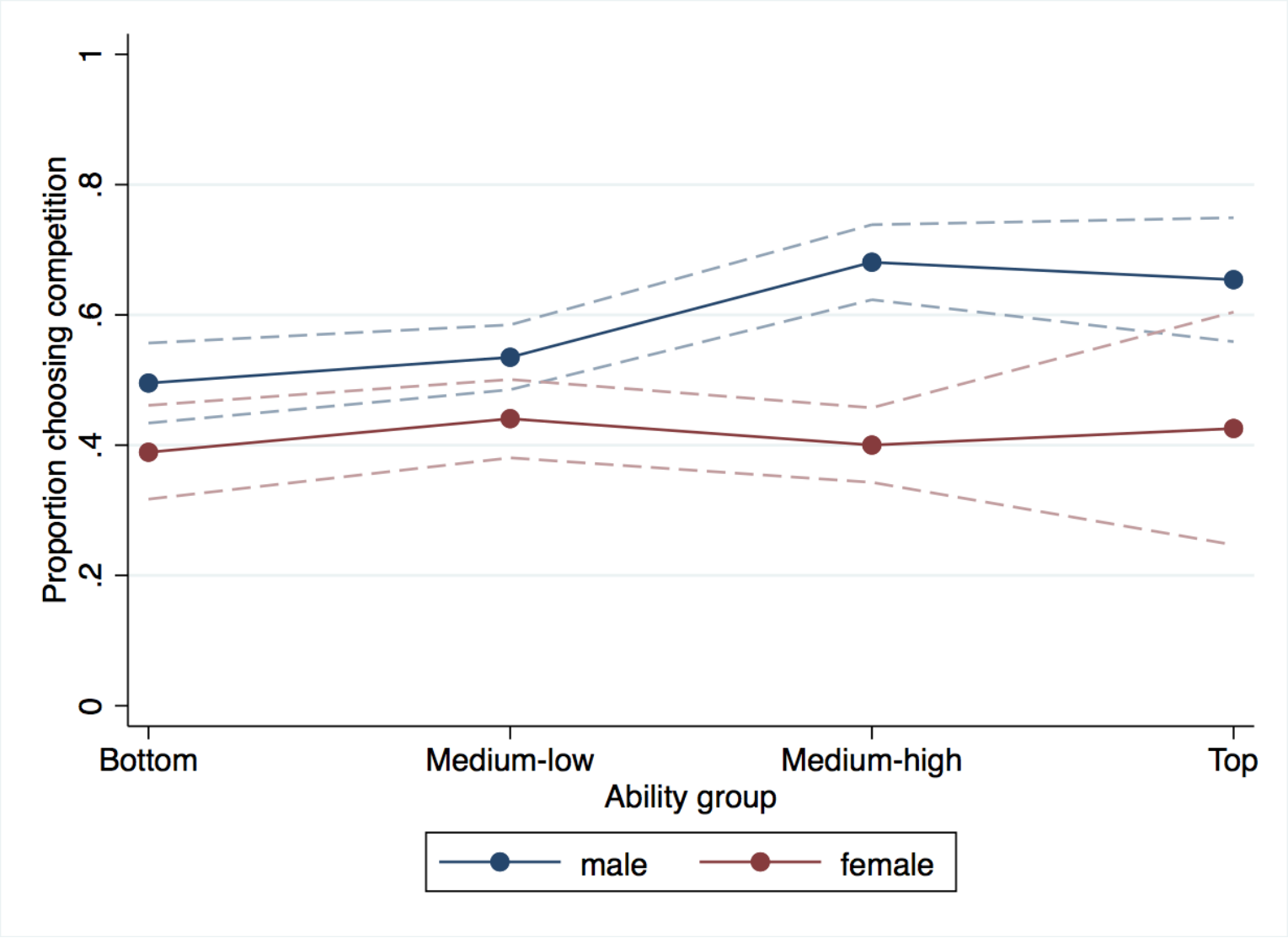
Descriptive statistics

	Boys (N=760):	Girls (N=754):	Dif:
Level=low	0.351	0.296	0.056*
	(0.478)	(0.457)	(0.024)
Level=medium	0.571	0.603	-0.032
	(0.495)	(0.490)	(0.025)
Level=high	0.078	0.101	-0.023
	(0.268)	(0.301)	(0.015)
Math grade (low)	4.616	4.487	0.130*
	(0.700)	(0.720)	(0.064)
Math grade (medium)	4.705	4.786	-0.081*
	(0.566)	(0.629)	(0.040)
Math grade (high)	4.805	4.704	0.101
	(0.572)	(0.612)	(0.103)
GPA (low)	4.515	4.629	-0.114**
	(0.481)	(0.476)	(0.043)
GPA (medium)	4.673	4.846	-0.173***
	(0.382)	(0.434)	(0.027)
GPA (high)	4.780	4.890	-0.110
	(0.336)	(0.369)	(0.062)

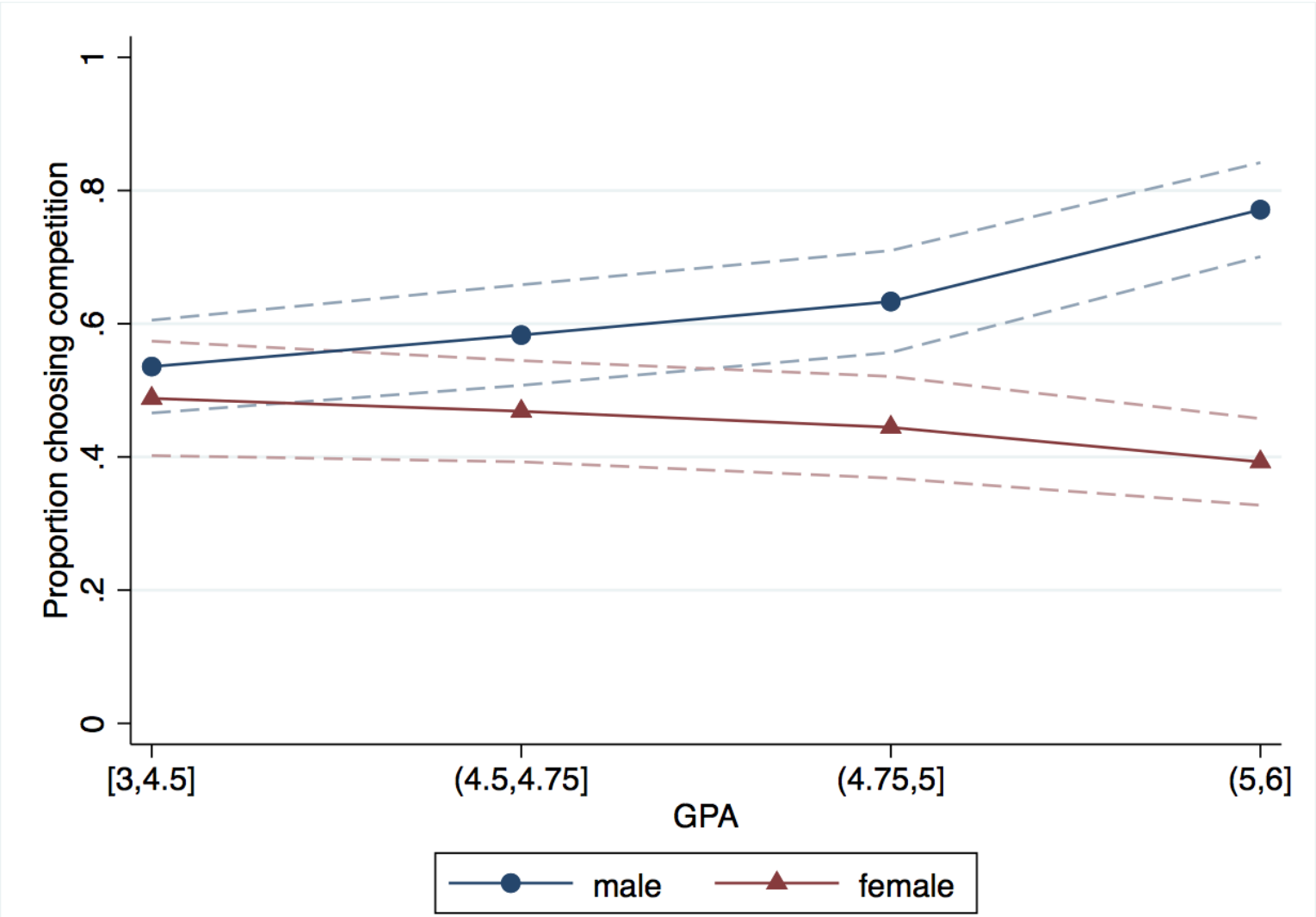
Section 3

How does willingness to compete vary with ability?

Gender difference in willingness to compete by ability level



Gender difference in willingness to compete by GPA (excluding bottom)



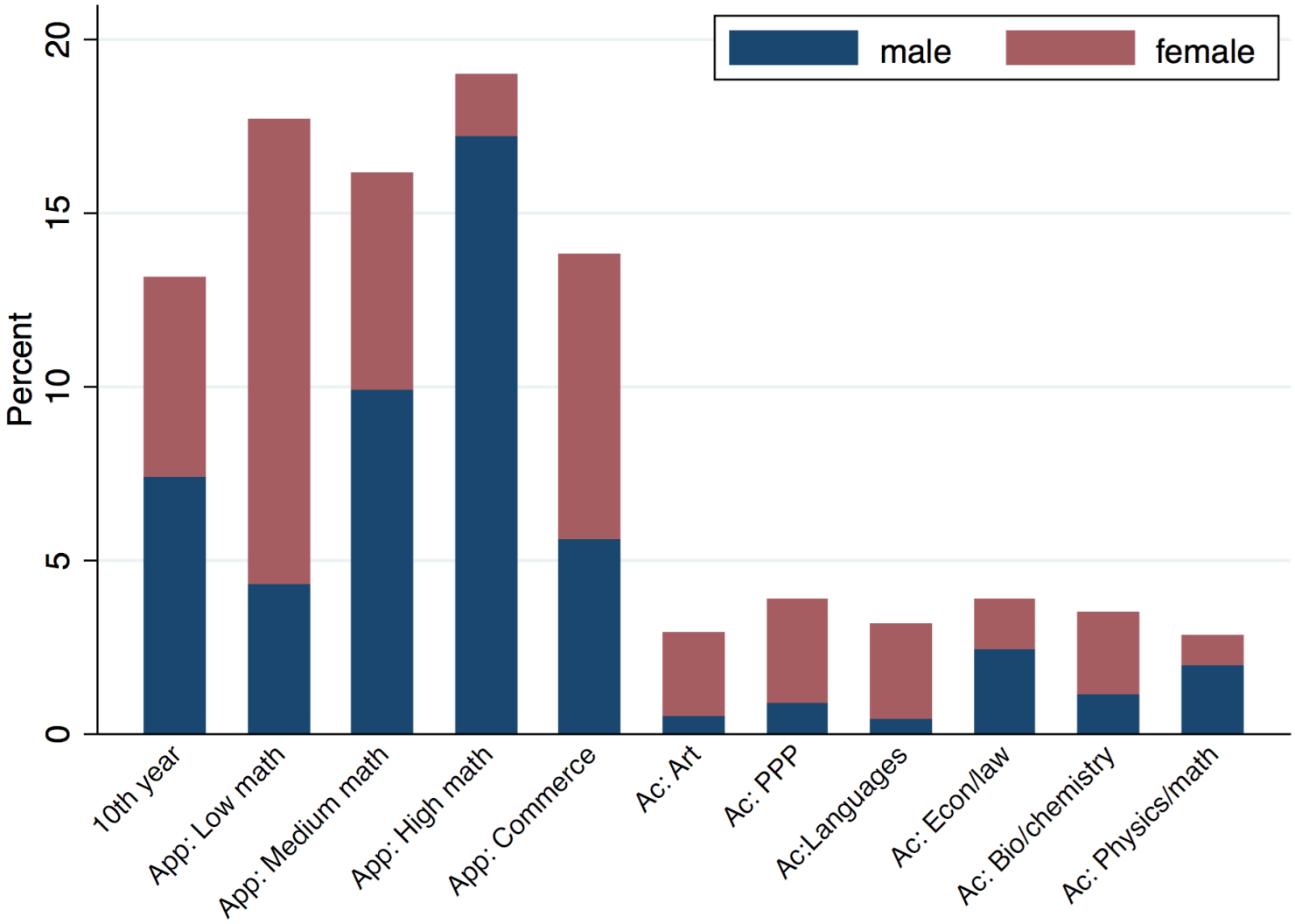
Gender difference in willingness to compete by ability level

- Pattern is the same for Numbers and Letters tasks
- Pattern is the same when using math grades instead of GPA

Section 4

Does willingness to compete predict career choices at different ability levels?

Grouping choices by math intensity



WTC and career choice: medium and high level (N=862)

			Academic			
	Art	PPP	Lang	Econ	Bio/chem	Phys/math
Compete (m)	0.008	-0.012	-0.022*	-0.009	-0.028*	0.041**
	(0.011)	(0.017)	(0.012)	(0.027)	(0.017)	(0.019)
Compete (f)	0.022	0.019	-0.036	0.003	0.043*	0.028*
	(0.022)	(0.026)	(0.022)	(0.017)	(0.022)	(0.016)
Compete (all)	0.015	0.004	-0.029**	-0.003	0.009	0.034***
	(0.012)	(0.017)	(0.013)	(0.017)	(0.013)	(0.010)

Controlling for task, performance in the task, secondary school level, GPA, math grade, school fixed effects, risk preferences and confidence in own math abilities

Correlation of wtc with career choice: medium and high level (N=862)

		Vocational				Academic	Joint
	10th year	Low	Med	High	Com	Combined	p-val
Compete (m)	0.016	0.028	0.031	-0.117**	0.063**	-0.022	0.012
	(0.026)	(0.023)	(0.028)	(0.047)	(0.030)	(0.040)	
Compete (f)	-0.019	-0.023	-0.037	0.039*	-0.039	0.079*	0.024
	(0.026)	(0.041)	(0.030)	(0.022)	(0.034)	(0.041)	
Compete (all)	-0.002	0.002	-0.004	-0.037	0.011	0.030	0.015
	(0.020)	(0.025)	(0.021)	(0.025)	(0.024)	(0.023)	

Controlling for task, performance in the task, secondary school level, GPA, math grade, school fixed effects, risk preferences and confidence in own math abilities

Correlation of wtc with career choice: bottom level (N=370)

			Vocational			Joint
	10th year	Low	Med	High	Com	p-val
Compete (m)	-0.165***	0.080	0.095	0.013	-0.023	0.001
	(0.046)	(0.052)	(0.066)	(0.053)	(0.018)	
Compete (f)	-0.079	0.150	-0.112	0.039	0.003	0.259
	(0.069)	(0.103)	(0.088)	(0.035)	(0.039)	
Compete (all)	-0.131***	0.107**	0.014	0.023	-0.013	0.000
	(0.036)	(0.045)	(0.052)	(0.038)	(0.019)	

Controlling for task, performance in the task, GPA, math grade, school fixed effects, risk preferences and confidence in own math abilities

Section 5

Conclusions

Conclusions

- Boys are more willing than girls to compete conditional on ability in both a numbers and a letters task
- This gender gap in willingness to compete varies systematically with ability
  - Gap is largest for highest-ability students
  - This is because high-ability boys are more competitive

Conclusions

- There are significant gender differences in career choices both at the vocational and at the academic level
- Career choices correlate with willingness to compete
  - at different ability levels
  - but effects are strongest at the top
- Most potential for willingness to compete to explain gender differences in career choices at the top

Section 6

Appendix

Top group (N=120)

			Academic				Academic
	Art	PPP	Lang	Econ	Bio/chem	Phys/math	Combined
Compete (m)	0.032	0.005	-0.069	0.038	-0.075	0.181*	0.116
	(0.067)	(0.081)	(0.071)	(0.123)	(0.126)	(0.097)	(0.209)
Compete (f)	0.002	0.067	-0.132	0.047	0.174**	0.108	0.267*
	(0.133)	(0.042)	(0.097)	(0.072)	(0.073)	(0.071)	(0.126)
Compete (all)	0.016	0.039	-0.103	0.043	0.061	0.141**	0.198
	(0.085)	(0.038)	(0.080)	(0.087)	(0.074)	(0.047)	(0.114)

Medium-high group (N=346)

			Academic				Academic
	Art	PPP	Lang	Econ	Bio/chem	Phys/math	Combined
Compete (m)	0.042	-0.001	0.005	-0.083	-0.043	0.048	-0.032
	(0.027)	(0.042)	(0.023)	(0.073)	(0.043)	(0.042)	(0.103)
Compete (f)	0.075**	-0.036	-0.028	-0.043	0.000	0.032	-0.000
	(0.035)	(0.054)	(0.035)	(0.036)	(0.037)	(0.023)	(0.063)
Compete (all)	0.062***	-0.023	-0.015	-0.058	-0.016	0.038*	-0.012
	(0.021)	(0.043)	(0.023)	(0.035)	(0.026)	(0.021)	(0.056)

Medium-high group (N=346)

		Vocational			
	10th year	Low	Med	High	Com
Compete (m)	-0.021	0.078	0.021	-0.183**	0.138**
	(0.041)	(0.054)	(0.049)	(0.084)	(0.060)
Compete (f)	0.042	-0.098*	-0.036	0.063**	0.029
	(0.027)	(0.052)	(0.042)	(0.030)	(0.051)
Compete (all)	0.018	-0.031	-0.014	-0.031	0.070*
	(0.028)	(0.041)	(0.035)	(0.034)	(0.039)

Medium-low group (N=396)

			Vocational			Academic
	10th year	Low	Med	High	Com	Combined
Compete (m)	0.021	-0.019	0.026	-0.060	0.061	-0.028
	(0.041)	(0.033)	(0.057)	(0.064)	(0.048)	(0.034)
Compete (f)	-0.047	0.085	-0.058	0.010	-0.121*	0.131**
	(0.049)	(0.054)	(0.054)	(0.050)	(0.063)	(0.065)
Compete (all)	-0.008	0.025	-0.010	-0.031	-0.016	0.039
	(0.032)	(0.028)	(0.036)	(0.042)	(0.040)	(0.033)