sociological science

Supplement to:

Alon, Sigal, and Thomas A. DiPrete. 2015. "Gender Differences in the Formation of a Field of Study Choice Set." Sociological Science 2: 50-81.

Appendix A. Tests for the Validity of the Unidimensional Preferences Model

Men and Women Combined	Model		
Expected Wage	x	x	
Lagged Sex-Composition of Major		x	
Risk Score for Person-Potential Major Match	x	x	x
Dummy Variables for Majors			x
Hausman test (TECH) *p-value*	<.00001	<.00001	<.00001
Hausman test (TAU) *pvalue*	<.00001	<.00001	<.00001
Women Only	Model		
Expected Wage	x	x	
Lagged Sex-Composition of Major		x	
Risk Score for Person-Potential Major Match	x	x	x
Dummy Variables for Majors			x
Hausman test (TECH) *p-value*	<.00001	<.00001	<.00001
Hausman test (TAU) *pvalue*	<.00001	<.00001	<.00001
Men Only	Model		
Expected Wage	x	x	
Lagged Sex-Composition of Major		x	
Risk Score for Person-Potential Major Match	x	x	x
Dummy Variables for Majors			x
Hausman test (TECH) *p-value*	<.00001	<.00001	<.00001
Hausman test (TAU) *pvalue*	<.00001	<.00001	<.00001

Appendix B: Alternative Specifications for the Multinomial Preferences Model

We examine two alternative specifications for the multinomial process that applicants may follow in reality. The first assumes a sequential decision process in which applicants first determine their top choice and then determine their top choice from the remaining options. We term this alternative a *sequential multinomial preferences model*. The second model for the decision-making process is what we term a *considered options multinomial preferences model*. Under this model, applicants follow a different logic, in which they first narrow their choices to a top group of options and then decide among this top group. Table B1 shows the coefficients on the risk variables that stem from this conceptualization, both for the decision model about the considered option set and for the decision about which of the considered options is the first choice. The table shows, as before, that women applicants are more risk averse than men; women avoid putting a major in risk deciles 1, 2, and 3 into their considered option set even after the baseline "essentialist" preferences are controlled. Panel B reinforces the pattern of gender differences in panel A in showing that men more than women favor riskier majors when choosing which of their considered options should be the first choice. With the data at hand, we cannot adjudicate between the sequential multinomial preference process and the considered options multinomial preference process, but what is clear is that under both models, applicants are more likely to take a risk for their top choice than for the second choice and men take more risks than women.

We also determine whether the sex composition of the major is related to the choice of which major in the considered options set is the first choice, net of the effect of sex composition on the construction of the considered options set. Table B2 replicates the analyses reported in Table 5 but includes analyses for the considered options set. The results show that the process of developing a considered options set is also strongly associated with the gender composition of the alternative majors. The odds that a major will be included in a woman's considered options set rises by 2.1 percent for each one percentage point increase in that major's percentage female at the Technion. It could certainly have been the case that women gave strong weight to a potential major's gender composition in deciding whether to include it as a finalist in her choice but that she made her first choice decision from her two finalist options on other grounds. However, the data support the interpretation that the gender composition of a major plays a continuing role even after a female applicant has whittled down her top choice decision to only two contenders. At the Technion, each percentage point increase in the percentage female of a "finalist" major raises the odds that it will emerge as a woman's top choice by nearly a full percentage point. Thus, under either the sequential multinomial preference model or the considered options multinomial preference model, women applicants are more likely to choose majors that are disproportionately female for their top choices than for their backup choices. The world of second choices is less gendered than is the world of first choices, and the world of considered options is less gendered than is the world of first choices.

Table B1. Effects of Difficulty of Being Accepted, by Gender, on Considered Choice Set, TECH

	Considered Choice Set		First Choice, Given the Considered Choice Set	
	F	M	F	M
	(1)	(2)	(3)	(4)
Decile 1	−1.503*	−1.158*	0.709*	1.181*
	(0.0797)	(0.0550)	(0.179)	(0.122)
Decile 2	−0.935*	−0.703*	0.601*	0.856*
	(0.0514)	(0.0357)	(0.115)	(0.0787)
Decile 3	−0.450*	−0.314*	0.430*	0.484*
	(0.0379)	(0.0267)	(0.0808)	(0.0544)
Decile 4	0.0271	0.103*	0.316*	0.383*
	(0.0297)	(0.0214)	(0.0595)	(0.0399)
Decile 6	−0.427*	−0.457*	−0.309*	−0.391*
	(0.0317)	(0.0228)	(0.0644)	(0.0437)
Decile 7	−0.863*	−1.086*	−0.736*	−0.698*
	(0.0382)	(0.0280)	(0.0824)	(0.0579)
Decile 8	−1.521*	−1.726*	−0.923*	−0.950*
	(0.0488)	(0.0353)	(0.111)	(0.0767)
Decile 9	−2.167*	−2.450*	−1.392*	−1.031*
	(0.0622)	(0.0454)	(0.149)	(0.104)
Decile 10	−3.394*	−3.673*	−1.477*	−1.193*
	(0.0921)	(0.0666)	(0.220)	(0.154)
Observations	221,905	485,506	16,658	36,488

Note: Controlling for major dummy variables. Majors 11 (Economic and Management Science) and 8 (Industrial and Management Engineering) were set to zero to identify the model. Standard errors are in parentheses.
*$p < 0.01$, †$p < 0.05$, ‡$p < 0.1$.

Table B2. Measures of the Impact of Gender Composition in the Major on the Pattern of Applications, TECH

	Index of Dissimilarity	Percentage Female in Major	
		Coeff.	*SE*
Unidimensional preference model	0.414	0.0203	(.00049)
Multinomial preferences model			
First choice of all alternatives	0.434	0.026	(.00075)
Second choice of remaining alternatives	0.367	0.016	(.00067)
Considered options model	0.425	0.0206	(.0005)
First choice, conditional on considered options		0.0094	(.0013)

Note: The coefficient for percentage female in major is from the model estimated on female applicants only.

Appendix C: TAU Data and Sample

Tel Aviv University (TAU) is a comprehensive university that, in addition to STEM fields, offers degrees in the social sciences and the humanities. To replicate the Technion analyses for TAU, we limited the TAU analyses to the STEM fields in the applicants' major choice sets. We analyzed data for applications to TAU from 1997 to 2008. The analyses are based on 771,350 person-major-choice observations, based on data from around 20,000 STEM applicants over a period of 11 years (1998–2008; 1997 applicants were omitted). At TAU the STEM fields are less engineering oriented than at the Technion and lean more toward the sciences: during the period of investigation, only one-third of TAU STEM students were enrolled in engineering fields, compared to two-thirds at the Technion. Among STEM applicants at TAU, the share of women between 1997 and 2008 was 43 percent (higher than in the Technion), rising from 40 to 45 percent. During the period of investigation, TAU offered degrees in 22 STEM fields. Additional details regarding the TAU data and the steps required to replicate the Technion analyses for TAU are available from the authors. Figures C1 to C5 and Tables C1 to C7 are obtained from the TAU data.

Figure C1. Distribution of academic scores by gender, TAU.

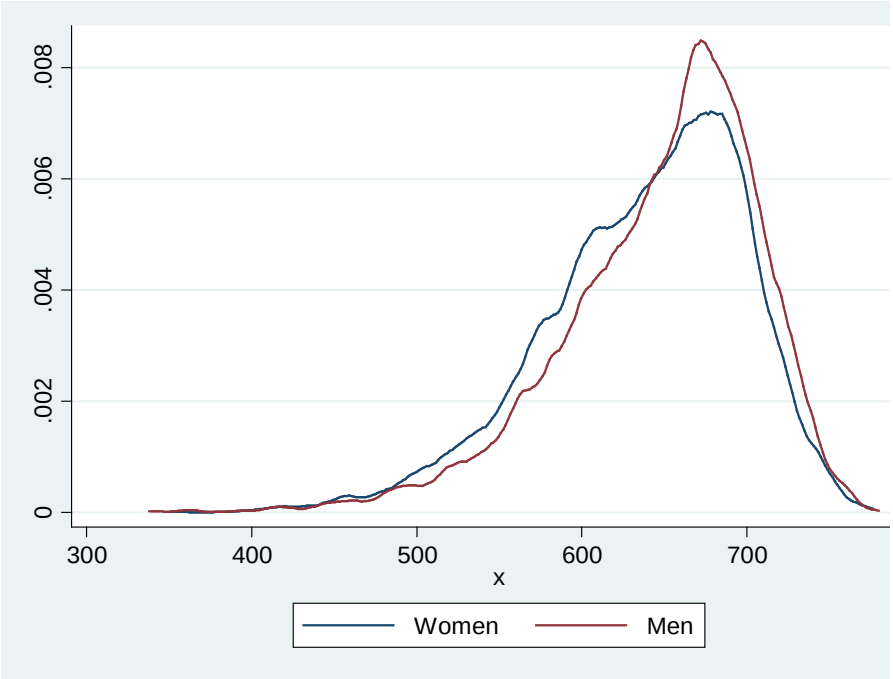

Figure C2. Distribution of first-choice majors, by gender, TAU.

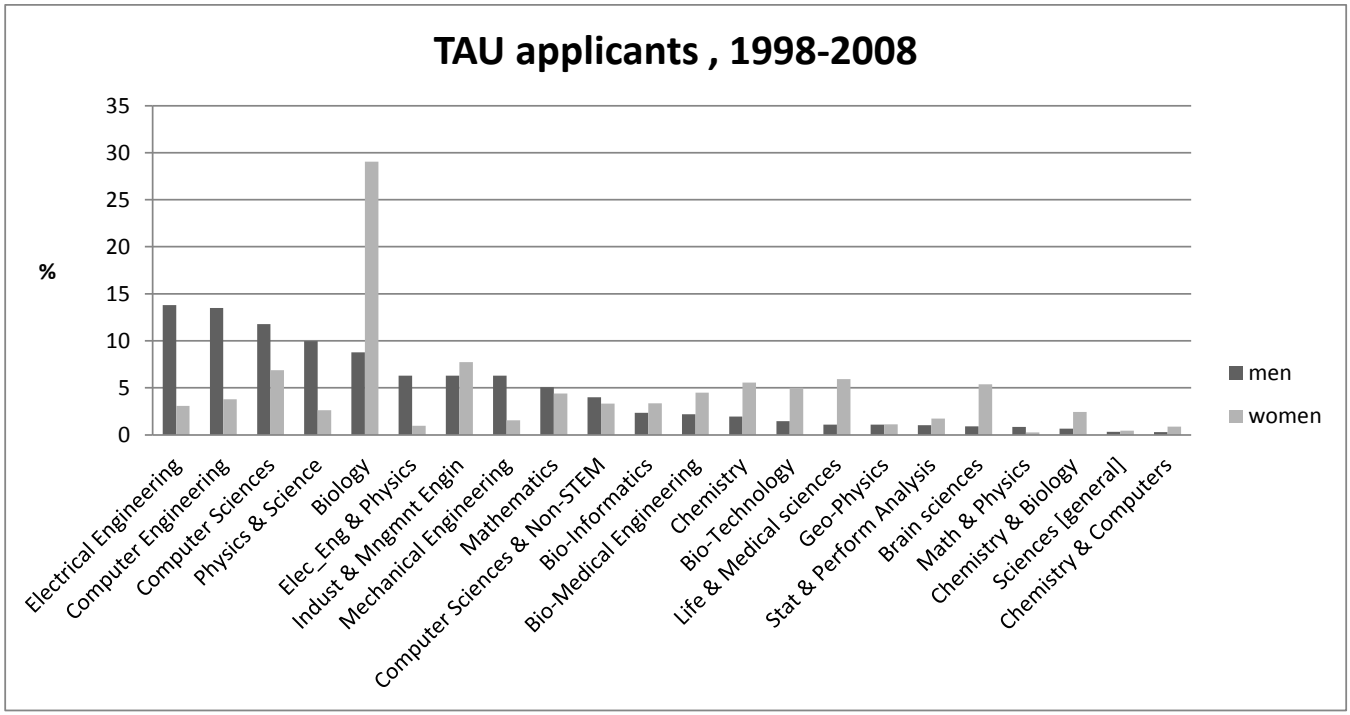

Figure C3. Level of horizontal sex segregation, index of dissimilarity by choice, TAU. The three indices of dissimilarity are the D Index (Duncan and Duncan 1955), the DS Index (Gibbs 1965), and the A Index (Charles and Grusky 2004).

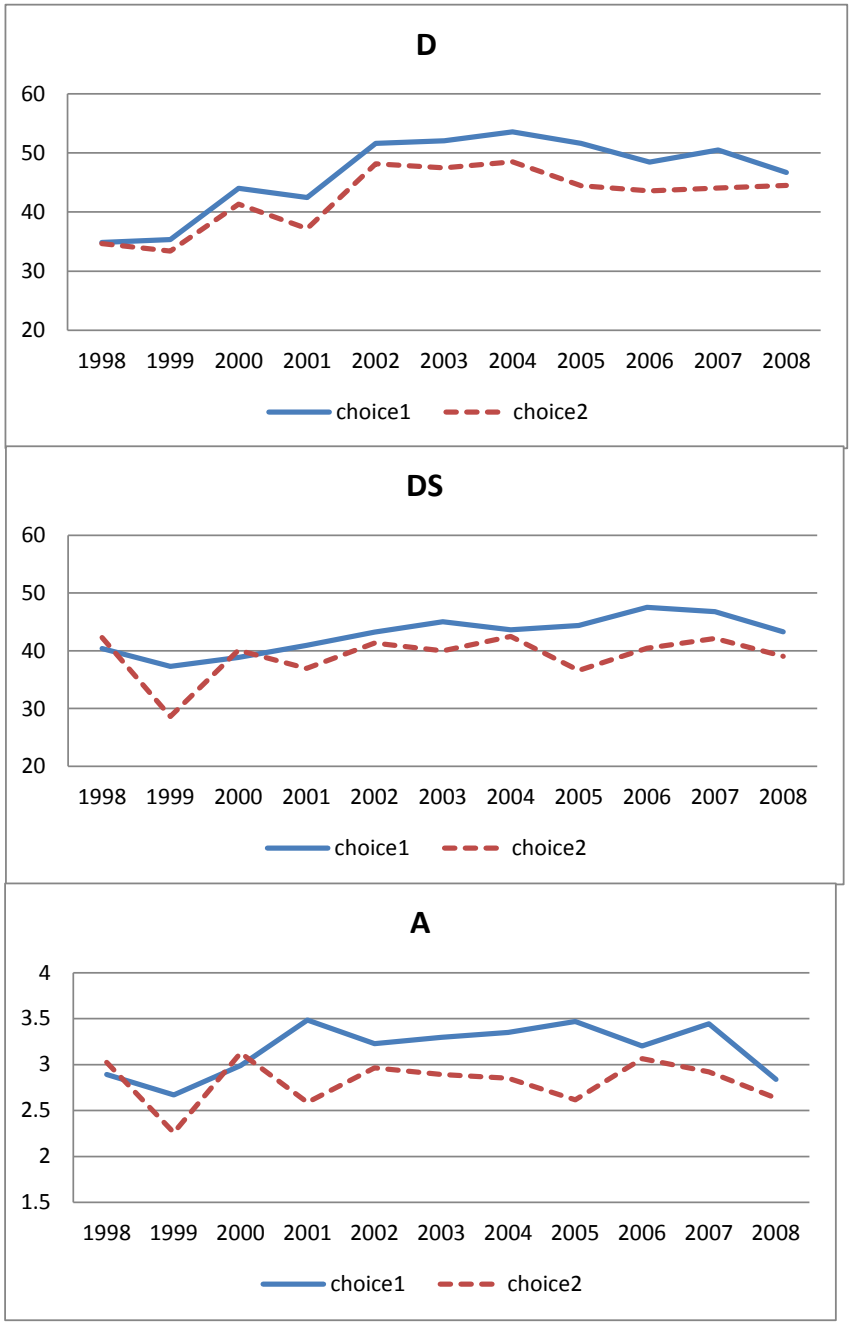

Figure C4. Unidimensional preferences model: Effects of difficulty of being accepted on choice, TAU. (*A*) Without controlling for major dummy variables. (*B*) Controlling for major dummy variables. Based on the results of Table C3.

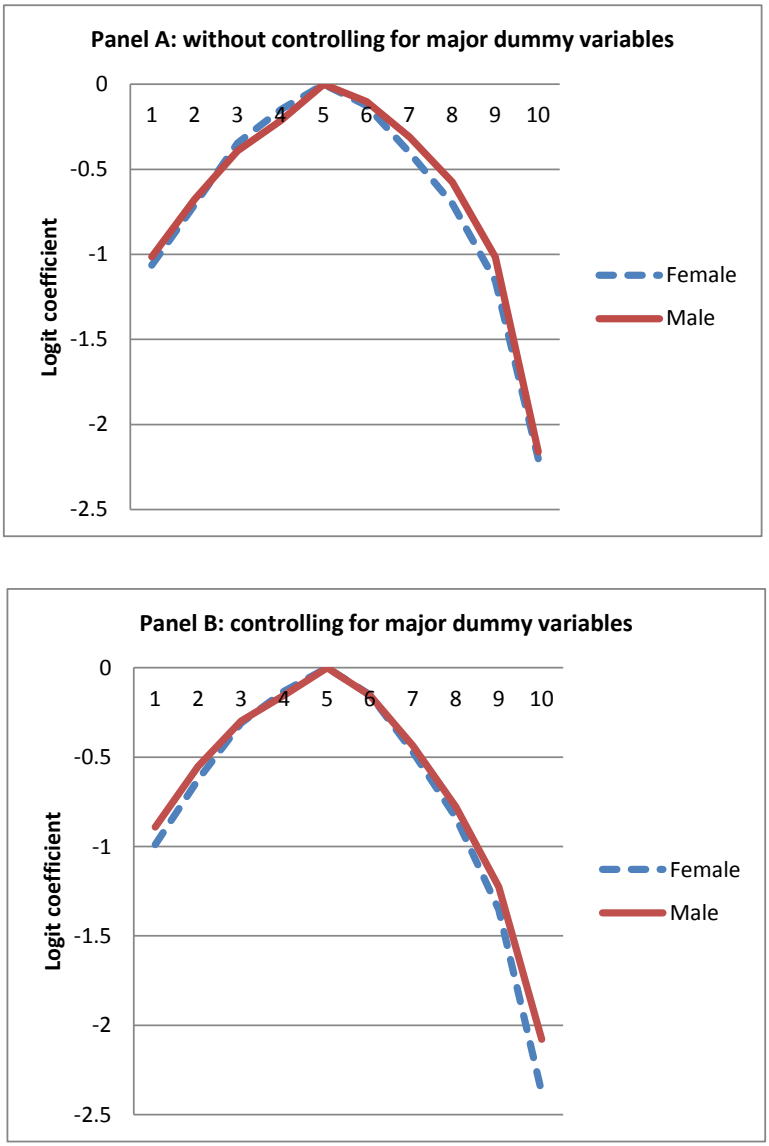

Figure C5. Multinomial preferences model: Effects of difficulty of being accepted on first choice and second choice, TAU. (*A*) First choice, controlling for major dummy variables. (*B*) Second choice, controlling for major dummy variables. (*C*) First and second choices, controlling for major dummy variables. Based on the results of Table C4.

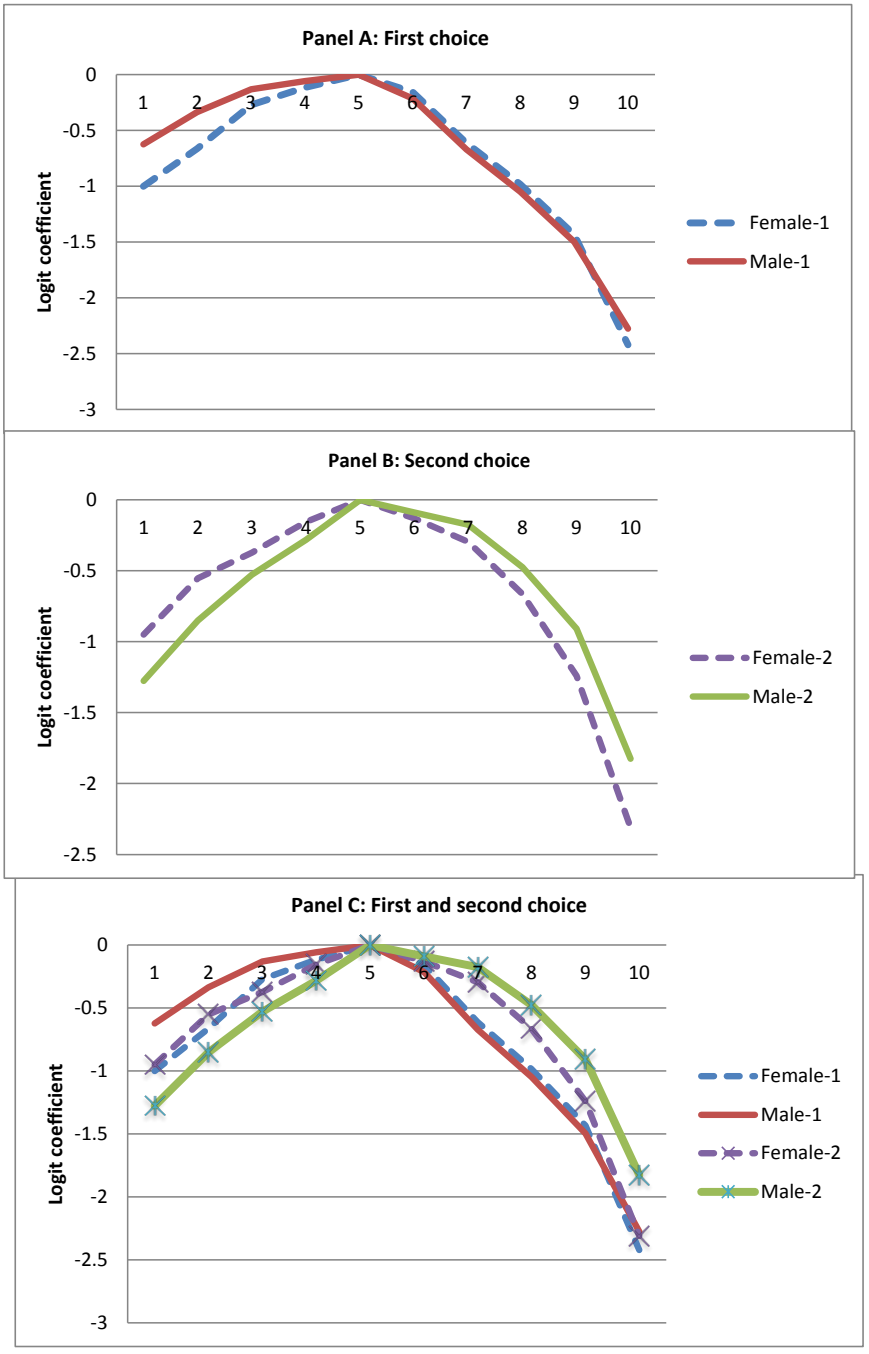

Table C1. Fields of Study and Selected Characteristics, TAU, 1997 to 2008

Major #	Major	Share of Students	% Women (Admits)	Academic Threshold (P25 Admits)	Expected Monthly Salary (NIS)[a]
7	Biology	16.2%	67%	612	5,615
9	Electrical_Eng	9.9%	16%	672	20,296
5	Math	9.3%	31%	650	11,920
6	Computer_Sciences	9.1%	27%	685	17,608
11	Mechanical_Eng	6.6%	17%	608	12,169
3	Chemistry	5.8%	67%	599	6,893
2	Physics_and_science	5.7%	21%	637	12,598
8	Indust_and_Mngmnt_Eng	5.4%	43%	672	15,091
22	Comp_Sci_and_Non_STEM	4.5%	32%	692	17,608
13	Bio_Med_Eng	3.8%	52%	685	8,892
10	Computer_Eng	3.8%	21%	702	17,608
4	Stat_and_Perform	3.0%	48%	603	9,766
18	Elec_Eng_and_Physics	2.7%	13%	691	20,296
19	GeoPhysics	2.2%	37%	577	12,598
20	BioInformatics	1.8%	46%	708	17,608
16	Chem_and_Bio	1.8%	66%	639	6,893
12	Life_and_Med_Science	1.7%	77%	677	5,615
17	BioTech	1.6%	62%	671	5,615
14	Math_Physics	1.5%	20%	651	12,598
15	Chem_and_Comp	1.4%	61%	599	17,608
21	Brain_sci	1.2%	78%	693	5,615
1	Science_general	0.9%	42%	550	14,725

Note: Sorted by the share of students. Life_and_Med_Science started in 2000; Bio_Med_Eng in 2001; Bioinformatics in 2001; Brain_sci in 2002; BioTech in 2002; Chem_and_Bio in 2006; Chem_and_Comp terminated in 2007; Science_general in 2006.

[a]Based on averages of graduates between 2000 and 2003.

corr matrix :	% Women	Acd. Thrshld.	Exp. Salary
% Women (students)	1		
Academic threshold (P25 admits)	−0.3151	1	
Expected monthly salary (NIS)	−0.8368	0.551	1

Table C2. Mean Score for the Individual–Major Match by Decile, TAU

Decile	TAU
1	−143.39
2	−80.03
3	−49.90
4	−27.78
5	−9.39
6	7.83
7	26.14
8	47.96
9	75.47
10	121.55

Note: Deciles calculated as the distance between the applicant's academic score and the major's academic threshold (P25) in the previous year.
Category 1 indicates ind. below major's threshold—most risky application choice.
Category 10 indicates ind. above major's threshold—least risky application choice.
"Perfect match" is category 5.

Table C3. Effects of Expected Wage and Difficulty of Being Accepted, by Gender on the Ranked Choice, TAU

	Without Controlling for Major Dummy Variables		Controlling for Major Dummy Variables	
	F	M	F	M
	(1)	(2)	(3)	(4)
Decile 1	−1.064*	−1.015*	−0.989*	−0.891*
	(0.0534)	(0.0380)	(0.0884)	(0.0609)
Decile 2	−0.707*	−0.676*	−0.625*	−0.551*
	(0.0418)	(0.0301)	(0.0594)	(0.0413)
Decile 3	−0.345*	−0.392*	−0.310*	−0.299*
	(0.0367)	(0.0263)	(0.0450)	(0.0311)
Decile 4	−0.150*	−0.214*	−0.131*	−0.153*
	(0.0345)	(0.0241)	(0.0373)	(0.0256)
Decile 6	−0.126*	−0.101*	−0.151*	−0.155*
	(0.0334)	(0.0231)	(0.0358)	(0.0245)
Decile 7	−0.402*	−0.310*	−0.472*	−0.437*
	(0.0351)	(0.0246)	(0.0417)	(0.0287)
Decile 8	−0.703*	−0.576*	−0.838*	−0.779*
	(0.0375)	(0.0269)	(0.0511)	(0.0356)
Decile 9	−1.154*	−1.016*	−1.353*	−1.226*
	(0.0416)	(0.0311)	(0.0658)	(0.0465)
Decile 10	−2.200*	−2.160*	−2.377*	−2.079*
	(0.0590)	(0.0442)	(0.0949)	(0.0681)
Wage	−0.126*	0.0806*		
	(0.00189)	(0.00147)		
Observations	134,572	251,103	134,572	251,103

Note: Standard errors in parentheses.
*$p < 0.01$, †$p < 0.05$, ‡$p < 0.1$.

Table C4. Effects of Expected Wage and Difficulty of Being Accepted, by Gender, on the First and Second Choice, TAU

	First Choice				Second Choice			
	First Choice, without Controlling for Major Dummy Variables		First Choice, Controlling for Major Dummy Variables		Second Choice, without Controlling for Major Dummy Variables		Second Choice, Controlling for Major Dummy Variables	
	F	M	F	M	F	M	F	M
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Decile 1	−1.057*	−0.911*	−1.000*	−0.623*	−1.067*	−1.139*	−0.949*	-1.277*
	(0.0706)	(0.0516)	(0.119)	(0.0819)	(0.0819)	(0.0566)	(0.133)	(0.0923)
Decile 2	−0.745*	−0.571*	−0.662*	−0.335*	−0.653*	−0.801*	−0.552*	-0.851*
	(0.0555)	(0.0405)	(0.0796)	(0.0553)	(0.0640)	(0.0453)	(0.0898)	(0.0627)
Decile 3	−0.291*	−0.290*	−0.270*	−0.130*	−0.427*	−0.516*	−0.372*	-0.528*
	(0.0473)	(0.0350)	(0.0595)	(0.0415)	(0.0587)	(0.0400)	(0.0700)	(0.0475)
Decile 4	−0.128*	−0.146*	−0.116†	−0.0570‡	−0.182*	−0.297*	−0.155*	-0.282*
	(0.0447)	(0.0320)	(0.0491)	(0.0340)	(0.0548)	(0.0370)	(0.0583)	(0.0395)
Decile 6	−0.153*	−0.139*	−0.157*	−0.213*	−0.0907‡	−0.0620‡	−0.130†	-0.0895†
	(0.0437)	(0.0311)	(0.0474)	(0.0329)	(0.0524)	(0.0349)	(0.0555)	(0.0374)
Decile 7	−0.570*	−0.503*	−0.612*	−0.670*	−0.197*	−0.106*	−0.296*	-0.175*
	(0.0476)	(0.0342)	(0.0568)	(0.0396)	(0.0528)	(0.0357)	(0.0624)	(0.0425)
Decile 8	−0.889*	−0.773*	−0.983*	−1.048*	−0.487*	−0.375*	−0.665*	-0.475*
	(0.0513)	(0.0379)	(0.0694)	(0.0492)	(0.0559)	(0.0387)	(0.0765)	(0.0527)
Decile 9	−1.314*	−1.168*	−1.434*	−1.497*	−0.969*	−0.864*	−1.241*	-0.908*
	(0.0569)	(0.0436)	(0.0888)	(0.0639)	(0.0621)	(0.0447)	(0.0991)	(0.0690)
Decile 10	−2.354*	−2.210*	−2.420*	−2.275*	−2.031*	−2.129*	−2.310*	-1.825*
	(0.0810)	(0.0595)	(0.128)	(0.0917)	(0.0869)	(0.0663)	(0.142)	(0.102)
Wage	−0.137*	0.0785*			−0.112*	0.0834*		
	(0.00254)	(0.00199)			(0.00287)	(0.00219)		
Observations	134,572	251,103	134,572	251,103	104,078	215,642	104,078	215,642

Note: Standard errors in parentheses.

*$p < 0.01$, †$p < 0.05$, ‡$p < 0.1$.

Table C5. Measures of the Impact of Gender Composition in the Major on the Pattern of Applications, TAU

		Percentage Female in Major	
	Index of Dissimilarity	Coeff.	*SE*
Unidimensional preference model	0.466	0.011	(0.00066)
Multinomial preferences model			
First choice of all alternatives	0.482	0.013	(0.00090)
Second choice of remaining alternatives	0.404	0.0081	(0.00099)

Note: The coefficient for percentage female in major is from the model estimated on female applicants only.

Table C6. Effects of Difficulty of Being Accepted, by Gender, on Considered Choice Set, TAU

	Considered Choice Set		First Choice, Given the Considered Choice Set	
	F	M	F	M
	(5)	(6)	(7)	(8)
Decile 1	−0.723*	−0.541*	0.583*	1.053*
	(0.0832)	(0.0579)	(0.190)	(0.131)
Decile 2	−0.467*	−0.346*	0.303†	0.811*
	(0.0580)	(0.0404)	(0.130)	(0.0894)
Decile 3	−0.226*	−0.190*	0.372*	0.573*
	(0.0457)	(0.0318)	(0.0983)	(0.0667)
Decile 4	−0.0948†	−0.110*	0.151‡	0.298*
	(0.0394)	(0.0273)	(0.0792)	(0.0533)
Decile 6	−0.195*	−0.225*	−0.223*	−0.214*
	(0.0382)	(0.0264)	(0.0747)	(0.0503)
Decile 7	−0.578*	−0.573*	−0.666*	−0.704*
	(0.0433)	(0.0299)	(0.0889)	(0.0601)
Decile 8	−1.047*	−1.018*	−0.958*	−0.923*
	(0.0513)	(0.0356)	(0.110)	(0.0751)
Decile 9	−1.686*	−1.610*	−1.111*	−1.155*
	(0.0641)	(0.0451)	(0.143)	(0.100)
Decile 10	−2.871*	−2.671*	−1.481*	−1.277*
	(0.0918)	(0.0653)	(0.202)	(0.144)
Observations	134,572	251,103	12,358	26,095

Note: Controlling for dummy variables. Majors 11 (Economic and Management Science) and 8 (Industrial and Management Engineering) were set to zero to identify the model. Standard errors are in parentheses.
*$p < 0.01$, †$p < 0.05$, ‡$p < 0.1$.

Table C7. Measures of the Impact of Gender Composition in the Major on the Pattern of Applications, TAU

	Index of Dissimilarity	Percentage Female in Major	
		Coeff.	*SE*
Unidimensional preference model	0.466	0.011	(0.00066)
Multinomial preferences model			
First choice of all alternatives	0.482	0.013	(0.00090)
Second choice of remaining alternatives	0.404	0.0081	(0.00099)
Considered options model	0.492	0.012	(0.00069)
First choice, conditional on considered options		0.0038	(0.0019)

Note: The coefficient for percentage female in major is from the model estimated on female applicants only.