

Appendix A

Predicting Graduation with Variables at Entry and First Semester (New York)

Variables	AA at entry Coefficients (SE)		BA at entry Coefficients (SE)	
	Entry variables	Entry + semester 1 variables	Entry variables	Entry + semester 1 variables
SAT quintiles (ref. = 3rd quintile)				
1st quintile (lowest)	-0.36*** (0.016)	0.052** (0.018)	-0.16*** (0.027)	-0.018 (0.029)
2nd quintile	-0.11*** (0.016)	0.071*** (0.018)	-0.032 (0.021)	0.031 (0.023)
4th quintile	0.019 (0.022)	-0.12*** (0.024)	0.028 (0.017)	0.0064 (0.018)
5th quintile (highest)	-0.074* (0.033)	-0.33*** (0.037)	0.15*** (0.017)	-0.0039 (0.018)
No SAT score	-0.62*** (0.014)	-0.27*** (0.016)	-0.20*** (0.028)	-0.12*** (0.030)
Workload semester 1 (ref. 12 to 13 credits)				
Less than 8 credits	-0.63*** (0.019)	-0.24*** (0.021)	-1.10*** (0.047)	-0.30*** (0.054)
8 to 11 credits	-0.38*** (0.016)	-0.14*** (0.017)	-0.57*** (0.042)	-0.20*** (0.045)
14 to 15 credits	0.16*** (0.0093)	0.10*** (0.011)	0.23*** (0.012)	-0.0065 (0.017)
16 to 17 credits	0.26*** (0.012)	0.088*** (0.014)	0.33*** (0.016)	-0.0042 (0.022)
18 to 19 credits	0.39*** (0.015)	0.12*** (0.017)	0.22*** (0.049)	-0.10 (0.059)
20 or more credits	0.73*** (0.016)	0.29*** (0.018)	0.071 (0.095)	0.059 (0.10)
Major selection at entry (ref. = declared major)				
Did not declare major	0.11** (0.039)	0.27*** (0.044)	0.032** (0.012)	0.011 (0.013)
Unclassified	0.032 (0.017)	-0.10*** (0.019)	0.33 (0.17)	0.23 (0.18)
HS GPA (ref. = C+ or less: 0-2.66)				
B-: 2.67-2.99	0.48*** (0.0098)	0.22*** (0.011)	0.50*** (0.026)	0.38*** (0.028)
B: 3.00-3.32	0.91*** (0.012)	0.45*** (0.014)	1.01*** (0.025)	0.72*** (0.027)

B+: 3.33 - 3.66	1.30*** (0.021)	0.69*** (0.023)	1.64*** (0.027)	1.04*** (0.029)
A-/A: 3.67-4.00	1.64*** (0.046)	0.91*** (0.051)	2.11*** (0.037)	1.24*** (0.040)
No HS GPA record	0.21*** (0.010)	0.11*** (0.011)	0.88*** (0.037)	0.48*** (0.040)
Age at entry (ref. = 19)				
18 or younger	0.21*** (0.012)	0.16*** (0.013)	0.10*** (0.013)	0.081*** (0.014)
20	-0.29*** (0.011)	-0.26*** (0.012)	-0.27*** (0.019)	-0.24*** (0.021)
21	-0.42*** (0.014)	-0.42*** (0.016)	-0.40*** (0.033)	-0.34*** (0.035)
22	-0.34*** (0.018)	-0.40*** (0.020)	-0.42*** (0.045)	-0.40*** (0.048)
23	-0.24*** (0.017)	-0.40*** (0.019)	-0.39*** (0.048)	-0.58*** (0.051)
24 or older	-0.021 (0.013)	-0.35*** (0.014)	-0.30*** (0.039)	-0.64*** (0.042)
Entry age missing	-2.84** (1.02)	-2.61* (1.04)	-1.39 (0.88)	-1.50 (0.98)
Parental adjusted gross income (ref. = bottom quartile)				
Parent AGI missing	-0.11*** (0.014)	-0.20*** (0.016)	-0.21*** (0.023)	-0.24*** (0.025)
2nd quartile	-0.015 (0.017)	-0.024 (0.019)	0.023 (0.025)	-0.011 (0.026)
3rd quartile	-0.16*** (0.017)	-0.20*** (0.019)	-0.030 (0.025)	-0.091*** (0.027)
Top quartile	-0.091*** (0.018)	-0.22*** (0.020)	0.11*** (0.023)	-0.0030 (0.025)
Parental AGI missing for cohort	-0.047*** (0.013)	-0.14*** (0.015)	0.21*** (0.020)	0.32*** (0.021)
Remedial requirement at entry (ref. = no remedial requirement)				
Remedial math required only	-0.073*** (0.011)			
Remedial reading required only	0.49*** (0.033)			
Remedial writing required only	0.28*** (0.013)			
2 or more remedial requirements	-0.21*** (0.0100)			
Remedial requirement unknown	0.028* (0.013)			

**GPA semester 1 (ref. = D-/F:
<1.00)**

D: 1.00-1.32	0.28*** (0.030)	0.28*** (0.077)
D+: 1.33-1.66	0.31*** (0.029)	0.53*** (0.070)
C-: 1.67-1.99	0.47*** (0.029)	0.77*** (0.068)
C: 2.00-2.32	0.70*** (0.026)	0.96*** (0.066)
C+: 2.33-2.66	0.86*** (0.027)	1.20*** (0.066)
B-: 2.67-2.99	1.03*** (0.026)	1.39*** (0.066)
B: 3.00-3.32	1.25*** (0.025)	1.63*** (0.065)
B+: 3.33 - 3.66	1.53*** (0.028)	1.92*** (0.066)
A-/A: 3.67-4.00	1.71*** (0.026)	2.20*** (0.066)
No GPA record	0.99*** (0.024)	1.08*** (0.085)

**Credits earned semester 1 (ref. =
12 to 13 credits)**

0 credits	-1.79*** (0.034)	-1.66*** (0.090)
1 to 3 credits	-1.31*** (0.019)	-1.27*** (0.053)
4 to 7 credits	-0.83*** (0.016)	-0.83*** (0.027)
8 to 11 credits	-0.38*** (0.015)	-0.38*** (0.017)
14 to 15 credits	0.24*** (0.024)	0.31*** (0.020)
16 to 17 credits	0.45*** (0.039)	0.52*** (0.029)
18 to 19 credits	0.72*** (0.061)	0.39** (0.12)
20 or more credits	0.85*** (0.089)	0.69 (0.54)

**Remedial math semester 1 (ref. =
not required, not taken)**

Required, not taken	-0.44*** (0.016)	
Passed all	0.029**	

		(0.010)		
Failed/withdrew one or more		-0.54***		
		(0.013)		
Remedial reading semester 1 (ref. = not required, not taken)				
Required, not taken		0.13***		
		(0.022)		
Passed all		0.27***		
		(0.013)		
Failed/withdrew one or more		-0.30***		
		(0.023)		
Remedial writing semester 1 (ref. = not required, not taken)				
Required, not taken		0.17***		
		(0.014)		
Passed all		0.14***		
		(0.011)		
Failed/withdrew one or more		-0.26***		
		(0.015)		
Constant	-0.36***	-0.33***	-1.25***	-2.01***
	(0.019)	(0.033)	(0.033)	(0.073)
Observations	357,836	357,836	153,795	153,795

*** p<0.001, ** p<0.01, * p<0.05

Appendix B

Predicting Graduation with Variables at Entry and First Semester (Texas)

Variables	AA at entry Odds Ratios (SE)		BA at entry Odds Ratios (SE)	
	Entry variables	Entry + semester 1 variables	Entry variables	Entry + semester 1 variables
TAKS-reading quintiles (ref. = 3rd quintile)				
1st quintile	0.858*** (0.030)	0.902** (0.033)		
2nd quintile	0.950 (0.031)	0.968 (0.033)		
4th quintile	1.089* (0.040)	1.048 (0.041)		
5th quintile (highest)	1.158*** (0.049)	1.067 (0.048)		
No TAKS-reading score	0.927 (0.070)	0.849* (0.070)		
TAKS-math quintiles (ref. = 1st quintile)				
1st quintile	0.706*** (0.024)	0.807*** (0.029)		
2nd quintile	0.901* (0.029)	0.945 (0.032)		
4th quintile	1.186*** (0.042)	1.107** (0.041)		
5th quintile (highest)	1.349*** (0.060)	1.153** (0.054)		
No TAKS-math score	0.967 (0.074)	0.969 (0.080)		
SAT quintiles (ref. = 1st quintile)				
2nd quintile			1.368*** (0.053)	1.198*** (0.051)
3rd quintile			1.646*** (0.066)	1.252*** (0.057)
4th quintile			1.863*** (0.075)	1.284*** (0.059)
5th quintile (highest)			2.408*** (0.103)	1.382*** (0.067)
No SAT score			0.902* (0.045)	0.689*** (0.039)

Workload semester 1 (ref. 12 to 13 credits)

Less than 8 credits	0.631*** (0.013)	0.951 (0.028)	0.790*** (0.045)	1.281** (0.105)
8 to 11 credits	0.871*** (0.019)	1.008 (0.024)	0.575*** (0.039)	0.766*** (0.060)
14 to 15 credits	1.121*** (0.031)	0.984 (0.032)	1.307*** (0.030)	0.977 (0.036)
16 to 17 credits	1.138*** (0.043)	0.925 (0.042)	1.436*** (0.044)	0.852** (0.044)
18 to 19 credits	1.279*** (0.058)	1.015 (0.054)	1.607*** (0.148)	0.790 (0.105)
20 or more credits	1.317*** (0.049)	1.052 (0.057)	2.054*** (0.240)	0.781 (0.161)

Major selection at entry (ref. = Declared major)

Did not declare major	1.052*** (0.016)	1.077*** (0.017)	0.809*** (0.018)	0.865*** (0.021)
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HS class rank by quartile (ref. = 3rd quartile)

1 st quartile (highest)	0.606*** (0.041)	0.562*** (0.038)	3.200*** (0.088)	2.345*** (0.071)
2 nd quartile	0.777*** (0.041)	0.746*** (0.039)	1.922*** (0.047)	1.568*** (0.042)
4 th quartile (lowest)	0.608*** (0.012)	0.742*** (0.015)	0.790** (0.061)	0.846* (0.072)

Age at entry (ref. = 19)

18 or younger	1.154*** (0.028)	1.126*** (0.028)	1.171*** (0.043)	1.153*** (0.047)
20	0.956 (0.040)	0.977 (0.041)	0.601*** (0.076)	0.648** (0.090)
21	0.920 (0.046)	0.917 (0.047)	0.672* (0.115)	0.716 (0.134)
22	1.078 (0.057)	1.044 (0.056)	1.140 (0.218)	1.053 (0.222)
23	1.075 (0.062)	1.013 (0.060)	1.151 (0.237)	0.961 (0.219)
24	1.051 (0.063)	0.974 (0.059)	1.512 (0.355)	1.214 (0.324)
25 or older	1.290*** (0.041)	1.148*** (0.038)	1.018 (0.115)	0.813 (0.101)

Parental adjusted gross income (ref. = bottom quartile)

Parent AGI missing	1.024 (0.024)	0.944* (0.023)	1.301*** (0.069)	0.966 (0.056)
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2nd quartile	1.116*** (0.028)	1.051 (0.027)	1.179*** (0.047)	1.163*** (0.051)
3rd quartile	1.177*** (0.031)	1.056* (0.028)	1.354*** (0.051)	1.292*** (0.053)
Top quartile	0.987 (0.029)	0.866*** (0.025)	2.085*** (0.072)	1.853*** (0.070)
Remedial requirement at entry (ref. = no remedial requirement)				
Remedial math required only	0.901*** (0.019)	0.993 (0.028)	0.662*** (0.035)	0.818** (0.055)
Remedial reading required only	1.046 (0.049)	1.109 (0.062)	0.761** (0.072)	0.801 (0.106)
Remedial writing required only	0.947 (0.052)	1.082 (0.067)	0.642*** (0.063)	0.687** (0.092)
2 or more remedial requirements	0.646*** (0.013)	0.903** (0.036)	0.536*** (0.024)	0.598*** (0.073)
GPA semester 1 (ref. = D-/F: <1.00)				
D: 1.00-1.32		1.640*** (0.080)		2.647*** (0.220)
D+: 1.33-1.66		1.983*** (0.094)		3.764*** (0.281)
C-: 1.67-1.99		2.429*** (0.149)		4.892*** (0.364)
C: 2.00-2.32		2.407*** (0.092)		7.175*** (0.481)
C+: 2.33-2.66		2.756*** (0.108)		10.175*** (0.675)
B-: 2.67-2.99		2.945*** (0.146)		12.651*** (0.864)
B: 3.00-3.32		2.880*** (0.102)		16.925*** (1.112)
B+: 3.33 - 3.66		3.010*** (0.119)		21.728*** (1.476)
A+/A: 3.67-4.00		3.133*** (0.114)		25.308*** (1.760)
Credits earned semester 1 (ref. = 4 to 7 credits)				
0 credits		1.336*** (0.055)		2.174*** (0.387)
1 to 3 credits		0.733*** (0.020)		0.515*** (0.054)
8 to 11 credits		1.290*** (0.034)		1.842*** (0.119)
12 to 13 credits		1.515***		2.802***

		(0.050)		(0.185)
14 to 15 credits		1.540***		3.404***
		(0.077)		(0.253)
16 to 17 credits		1.474***		3.889***
		(0.099)		(0.346)
18 to 19 credits		1.492***		4.469***
		(0.116)		(0.839)
20 or more credits		1.347***		5.381***
		(0.102)		(1.352)
Remedial math semester 1 (ref. = not required, not taken)				
Required, not taken		0.896***		0.931
		(0.029)		(0.072)
Passed all		1.297***		1.108*
		(0.032)		(0.050)
Failed/withdrew one or more		0.775***		0.669***
		(0.026)		(0.042)
Remedial reading semester 1 (ref. = not required, not taken)				
Required, not taken		0.960		1.105
		(0.038)		(0.128)
Passed all		1.250***		1.175
		(0.041)		(0.106)
Failed/withdrew one or more		0.612***		0.584**
		(0.036)		(0.102)
Remedial writing semester 1 (ref. = not required, not taken)				
Required, not taken		0.877***		1.104
		(0.032)		(0.124)
Passed all		1.230***		1.288**
		(0.037)		(0.112)
Failed/withdrew one or more		0.677***		0.780
		(0.037)		(0.118)
Constant	0.443***	0.141***	0.276***	0.021***
	(0.020)	(0.008)	(0.015)	(0.002)
Observations	107,983	107,983	48,783	48,783

*** p<0.001, ** p<0.01, * p<0.05

Appendix C

Predicting Graduation with Variables at Entry and First Semester (Virginia)

Variables	Entry variables	Entry + semester 1 variables	Entry variables	Entry + semester 1 variables
SAT quintiles (ref. = 1st quintile)				
2nd quintile (2nd lowest)	0.866 (0.112)	0.915 (0.131)	1.121*** (0.017)	1.142*** (0.019)
3rd quintile	0.733 (0.127)	0.791 (0.152)	1.252*** (0.020)	1.228*** (0.021)
4th quintile	0.481** (0.118)	0.506* (0.136)	1.389*** (0.024)	1.280*** (0.024)
5th quintile (highest)	1.506 (0.690)	1.681 (0.874)	1.947*** (0.039)	1.479*** (0.031)
No SAT score	0.752*** (0.043)	0.564*** (0.035)	0.816*** (0.014)	0.829*** (0.015)
Workload semester 1 (ref. = less than 8 credits)				
8 to 11 credits	1.864*** (0.024)	1.112*** (0.023)	1.535*** (0.108)	0.891 (0.067)
12 to 13 credits	2.977*** (0.044)	1.296*** (0.034)	2.457 (0.157)	0.883 (0.062)
14 to 15 credits	4.659*** (0.085)	1.583*** (0.051)	3.657*** (0.233)	0.947 (0.066)
16 to 17 credits	5.803*** (0.139)	1.441*** (0.063)	3.965*** (0.253)	0.830** (0.059)
18 to 19 credits	1.127*** (0.094)	1.515*** (0.129)	3.617*** (0.257)	0.617*** (0.053)
20 or more credits	6.769*** (0.350)	0.884 (0.220)	2.939*** (0.352)	0.781 (0.135)
Missing	0.766*** (0.018)	0.517*** (0.025)	2.522*** (0.240)	2.316*** (0.235)
Major selection at entry (ref. = declared major)				
Did not declare major	2.472*** (0.350)	2.834*** (0.428)	1.017 (0.010)	1.050*** (0.011)
HS GPA (ref. = C+)				
B-	1.376*** (0.075)	1.182** (0.069)	1.346*** (0.033)	1.191*** (0.032)
B	1.987*** (0.112)	1.396*** (0.085)	2.127*** (0.049)	1.620*** (0.041)
B+	2.965*** (0.200)	1.743*** (0.127)	3.394*** (0.080)	2.156*** (0.055)

A/A+	4.389*** (0.380)	2.031*** (0.188)	6.810*** (0.163)	3.344*** (0.088)
Missing	1.244*** (0.049)	1.147*** (0.049)	2.793*** (0.069)	1.748*** (0.047)
Age at entry (ref. = 18 or younger)				
19	0.800*** (0.010)	0.804*** (0.011)	0.938*** (0.012)	0.933*** (0.013)
20	0.663*** (0.014)	0.631*** (0.015)	0.593*** (0.026)	0.587*** (0.028)
21	0.626*** (0.018)	0.546*** (0.017)	0.546*** (0.041)	0.521*** (0.043)
22	0.655*** (0.021)	0.518*** (0.018)	0.415*** (0.040)	0.378*** (0.039)
23	0.691*** (0.024)	0.525*** (0.019)	0.525*** (0.061)	0.453*** (0.056)
24	0.667*** (0.024)	0.478*** (0.018)	0.447*** (0.058)	0.392*** (0.055)
25 or older	0.721*** (0.011)	0.488* (0.008)	0.523*** (0.037)	0.425*** (0.032)
Parental adjusted gross income (ref. = bottom quartile)				
Parent AGI missing	1.389*** (0.019)	1.235*** (0.018)	1.879*** (0.034)	1.735*** (0.034)
2nd quartile	1.432*** (0.023)	1.223*** (0.021)	1.164*** (0.023)	1.099*** (0.024)
3rd quartile	1.793*** (0.031)	1.360*** (0.026)	1.406*** (0.026)	1.309*** (0.026)
Top quartile	1.972*** (0.050)	1.498*** (0.042)	1.910*** (0.036)	1.727*** (0.035)
Remedial courses taken at entry (ref. = none taken)				
Remedial math only	1.213*** (0.016)	0.869*** (0.016)	1.187* (0.104)	1.615*** (0.171)
Remedial English only	1.293*** (0.020)	0.882*** (0.019)	1.308 (0.198)	2.325*** (0.450)
2 or more remedial classes	1.231*** (0.019)	0.880*** (0.019)	1.380 (0.420)	2.486** (0.842)
GPA semester 1 (ref. = D-/F: <1.00)				
D		1.086 (0.054)		1.617*** (0.091)
D+		1.399*** (0.050)		1.902*** (0.093)
C-		1.743*** (0.054)		2.509*** (0.116)

C		1.989*** (0.071)		3.306*** (0.153)
C+		2.421*** (0.076)		4.390*** (0.201)
B-		3.025*** (0.089)		5.650*** (0.258)
B		3.864*** (0.126)		7.542*** (0.349)
B+		4.669*** (0.145)		8.751*** (0.410)
A+/A		5.503*** (0.157)		10.421*** (0.498)
No GPA record		2.479*** (0.097)		3.802*** (0.274)
Credits earned semester 1 (ref. = 4 to 7 credits)				
0 credits		0.357*** (0.014)		0.866 (0.064)
1 to 3 credits		0.515*** (0.009)		0.541*** (0.033)
8 to 11 credits		1.659*** (0.034)		1.795*** (0.058)
12 to 13 credits		2.536*** (0.070)		2.973*** (0.097)
14 to 15 credits		3.249*** (0.118)		4.110*** (0.140)
16 to 17 credits		4.279*** (0.224)		4.909*** (0.183)
18 to 19 credits		4.262*** (0.484)		6.167*** (0.471)
20 or more credits		2.955*** (0.841)		2.486*** (0.544)
Remedial semester 1 (ref. = none taken)				
Failed/Withdrawn		0.751*** (0.019)		0.480*** (0.076)
Passed		2.093** (0.037)		0.890 (0.091)
Constant	0.173*** (0.011)	0.155*** (0.012)	0.141*** (0.010)	0.057*** (0.005)
Observations	263,857	263,857	277,915	277,915

Standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

Appendix D

Predicting Graduation with Variables at Entry and First Semester (Illinois)

Variables	AA at entry	
	Odds Ratios	
	Entry variables	Entry + semester 1 variables
ACT score (ref. = 17-24)		
	0.709	1.208
ACT score 1-8	(0.337)	(0.623)
ACT score 9-16	0.764***	0.862***
	(0.028)	(0.038)
ACT score 25-30	0.792	0.711*
	(0.115)	(0.120)
ACT score 31-36	0.458***	0.610***
	(0.022)	(0.033)
Unknown	0.534***	0.594***
	(0.020)	(0.026)
Workload semester 1 (ref. 12 to 13 credits)		
Less than 8 credits	0.206***	1.015
	(0.031)	(0.167)
8 to 11 credits	0.397***	0.908
	(0.028)	(0.071)
14 to 15 credits	1.524***	1.084**
	(0.027)	(0.033)
16 to 17 credits	2.197***	1.133***
	(0.051)	(0.044)
18 to 19 credits	2.436***	0.935
	(0.100)	(0.067)
20 or more credits	2.689***	0.919
	(0.161)	(0.107)
Major selection at entry (ref. = liberal arts)		
General studies – AA		0.746***
		(0.021)
		1.042
General studies – AS		(0.025)
Others		0.860***
		(0.019)
HS GPA percentile (ref. = 0 percentile rank)		
25% or less	1.069	1.150**
	(0.046)	(0.058)

26-50%	1.298*** (0.052)	1.172*** (0.053)
51-75%	1.375*** (0.056)	1.154** (0.053)
76-100%	1.271*** (0.056)	1.086 (0.056)
Unknown	1.068 (0.037)	1.052 (0.041)
Age at entry (ref. = 19)		
18 or younger	1.488*** (0.037)	1.293*** (0.037)
20	0.858*** (0.040)	0.895* (0.047)
21	0.750*** (0.046)	0.710*** (0.048)
22	0.860* (0.059)	0.695*** (0.053)
23	1.029 (0.072)	0.749*** (0.059)
24	0.914 (0.072)	0.626*** (0.055)
25 or older	1.164*** (0.043)	0.723*** (0.030)
Economic disadvantage status (ref. = no)		
Yes	0.823*** (0.014)	0.851*** (0.016)
Remedial requirement at entry (ref. = no remedial requirement)		
Remedial math required only	0.675*** (0.012)	
Remedial reading required only	0.529*** (0.029)	
Remedial writing required only	0.599*** (0.026)	
2 or more remedial requirements	0.379*** (0.009)	
GPA semester 1 (ref. = D-/F: <1.00)		
D: 1.00-1.32		1.325*** (0.107)
D+: 1.33-1.66		1.717*** (0.124)
C-: 1.67-1.99		3.489*** (0.214)
C: 2.00-2.32		2.602***

	(0.176)
	5.622***
C+: 2.33-2.66	(0.342)
B-: 2.67-2.99	10.300***
	(0.620)
B: 3.00-3.32	8.629***
	(0.528)
B+: 3.33 - 3.66	15.318***
	(0.957)
A+/A: 3.67-4.00	18.125***
	(1.140)

**Credits earned semester 1 (ref. =
12 to 13 credits)**

0 credits	0.338***
	(0.025)
1 to 3 credits	0.246***
	(0.018)
4 to 7 credits	0.390***
	(0.017)
8 to 11 credits	0.603***
	(0.017)
14 to 15 credits	1.294***
	(0.046)
16 to 17 credits	1.767***
	(0.083)
18 to 19 credits	2.101***
	(0.190)
20 or more credits	1.875***
	(0.264)

**Remedial math semester 1 (ref. =
not required, not taken)**

Required, not taken	1.003
	(0.022)
Passed all	1.432***
	(0.040)
Failed/withdrew one or more	1.444***
	(0.080)

**Remedial English semester 1 (ref.
= not required, not taken)**

Required, not taken	1.005
	(0.078)
Passed all	1.415***
	(0.029)
Failed/withdrew one or more	0.884**
	(0.041)

Constant	0.736*** (0.038)	0.124*** (0.010)
Observations	81,600	81,600

*** p<0.001, ** p<0.01, * p<0.05