Learning Community as an Educational Intervention to Close the Gap in Retention Rates and GPA between First-Time Full-Time URM & Non-URM Students

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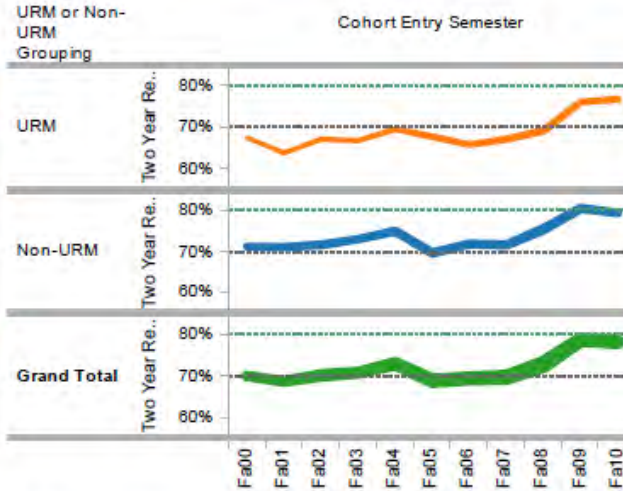Ed Sullivan   (esullivan@fullerton.edu)

Institutional Research and Analytical Studies
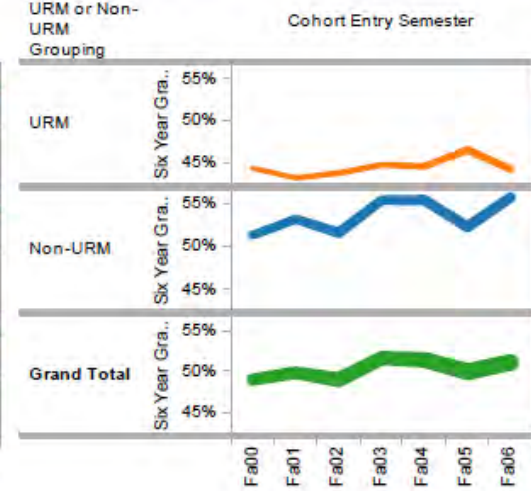California State University, Fullerton

Our Context

Trends in One-Year Return Rates of First-time Full-time Freshmen by URM/Non-URM Group
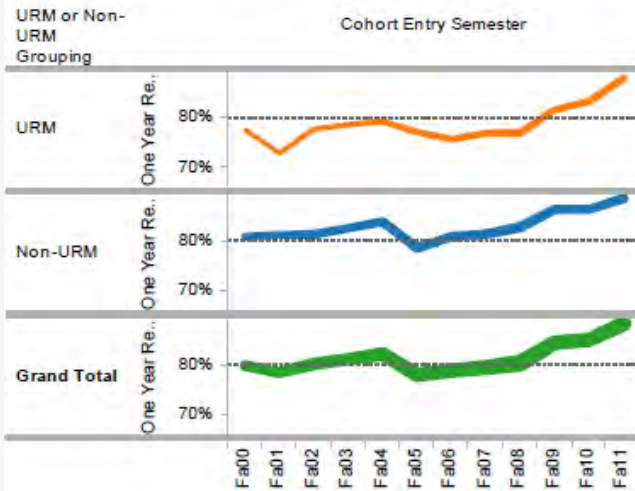
Trends in Two-Year Return Rates of First-time Full-time Freshmen by URM/Non-URM Group
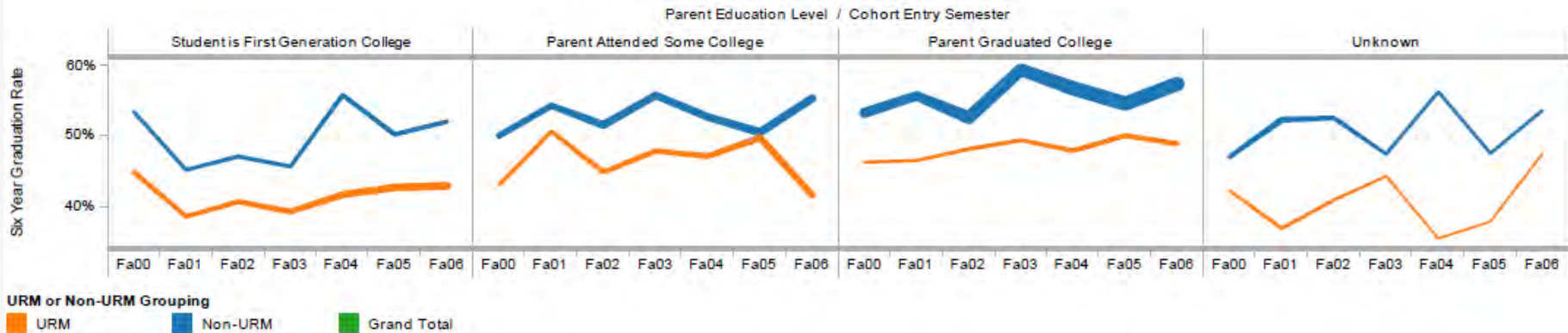
Trends in Six-Year Graduation Rates of First-time Full-time Freshmen by URM/Non-URM Group

Trends in Six-Year Graduation Rates of First-time Full-time Freshmen by URM/Non-URM Group by Parent Education Level

URM or Non-URM Grouping: URM, Non-URM, Grand Total

Our Context
Distribution of Parent Education Level by Eligibility Index by URM/Non-URM in the Cohort at Entry
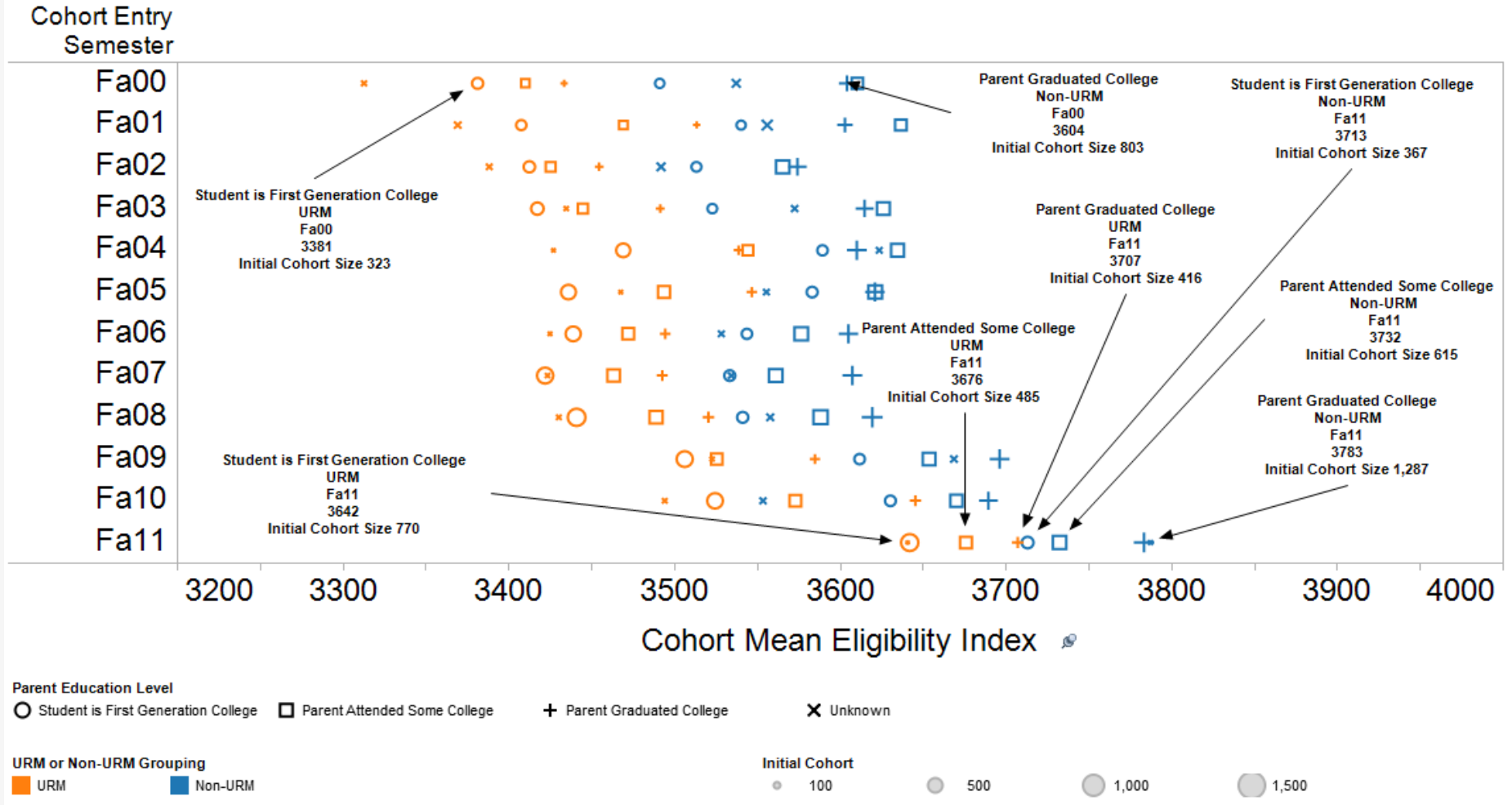
Our Context

California College and University
6 Year Graduation Rate Data for Cohort Entering Fall 2005
(IPEDS preliminary release data 11/2/2012)
Orange Triangles are CSU Fullerton Graduation Rates by Ethnic-Race and correspond with overall university rate of 50% shown on bottom axis
Circles are all Other California Colleges and Universities with Graduation Rate data for Fall 2005 cohort
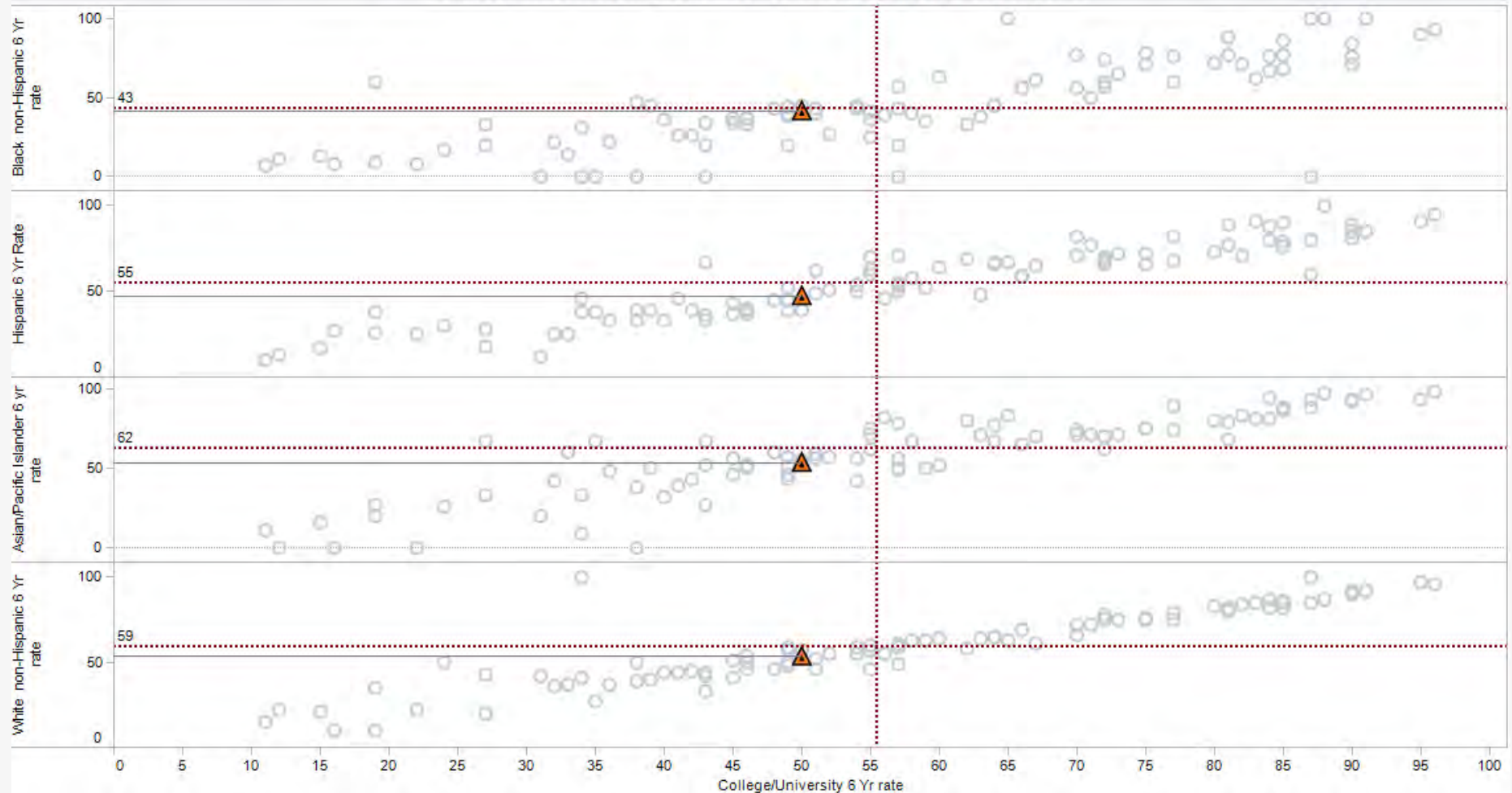
Retention / Graduation

▸ National Priority (http://www.whitehouse.gov/innovation/strategy/executive-summary)

  ◦ **"Strategy for American Innovation"**

  ◦ Restore America to first in the world in college attainment

  ◦ Improve America's science, technology, engineering & math (STEM) education

▸ System-Wide Priority

  ◦ The **"CSU Graduation Initiative"** Closing the Achievement Gap & Increasing Graduation Rates

▸ Institutional Priority

  ◦ **"Enhancing Student Success"**

  ◦ One of the most important Strategic Themes for University Planning

Theoretical Background of a Learning Community

▸ **Collaborative Learning Approach**
  ◦ Broad term describing various educational approaches grouping of students for achieving a shared academic goal (Goodsell, Maher, Tinto, Smith, & MacGregor, 1992)

  ◦ **Learning Community**
    • Students build academic and social connections
    • Active Learning Strategies (Tinto, 2008)

  ◦ **Supplemental Instruction**
    • Integrated support programs (Tinto, 2008)

Theoretical Background of a Learning Community

‣ Tinto's **Integration Model** (Tinto, 1997)
  ◦ **Social integration**
  ◦ **Academic integration**   } *retention and success*

‣ Astin's Model (Astin, Tinto, Cabrera, Bean, & Pascarella, 2005)
  ◦ "Input ➔ **Institution/Environment** ➔ Outcome"

‣ Cognitive & Affective Learning Outcomes

‣ Vygotsky's (1978) Zone of Proximal Development

‣ Collaborative setting -- Culturally-Sensitive Strategy

The Effects of Learning Community in Retention/Graduation Rates and GPA by Student Characteristics

▸ Data that we looked at:

◦ **1-Year Retention Rates & GPA** of FTF fall 2003 - fall 2011 cohorts

- 34,445 FTF (First-Time Full-Time) students entered
- 28,207 (**82%**) persisted for 1 yr & returned 2nd yr w/ Campus GPA of **2.79**

◦ **2-Year Retention Rates & GPA** of FTF fall 2003 - fall 2010 cohorts

- 30,354 FTF students entered
- 22,028 (**73%**) persisted for 2 yrs & returned 3rd yr w/ Campus GPA of **2.79**

◦ **6-year graduation rates & GPA** of FTF fall 2003 - fall 2005 cohorts

- 10,462 FTF students entered
- 5,333 (**51%**) graduated in six years or less w/ Campus GPA of **3.00**

◦ *See Appendix A thru D for more detail of historical trends*

% of Participants in FP: Gender x URM (fa03–fa11 cohorts)

See Appendix E for more detail
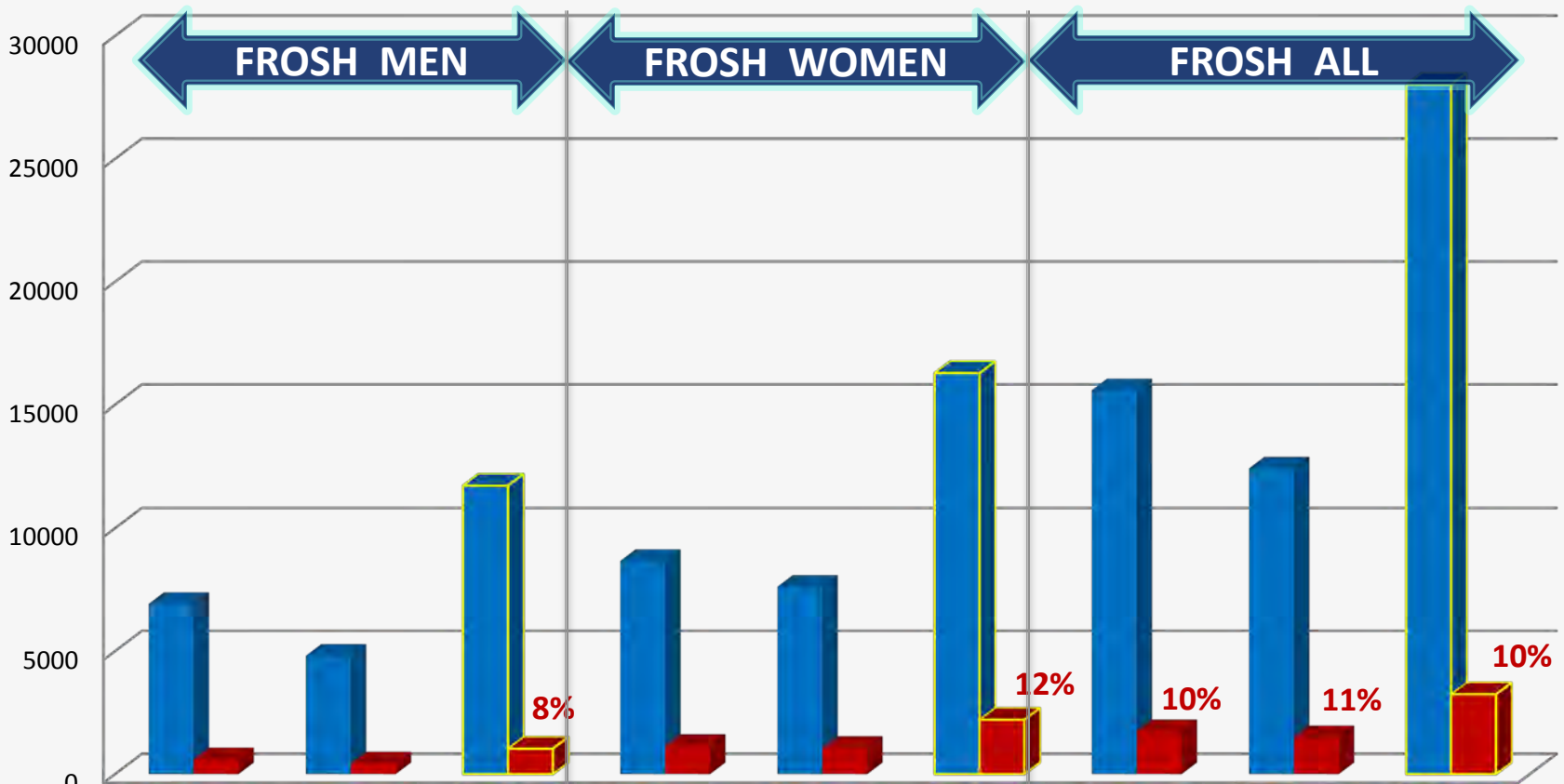
	Men			Women			Total		
	Non-URM	URM	Total	Non-URM	URM	Total	Non-URM	URM	Total
■ Non-Participant	6921	4810	11731	8667	7620	16287	15588	12430	28018
■ Participant	602	430	1032	1145	1067	2212	1747	1497	3244

Parent Education Level of FROSH: fa03–fa11 cohorts

Legend:
- URM (red)
- Non-URM (blue)

Values:
- Non-Participant URM: 1.84
- Non-Participant Non-URM: 2.43
- Participant URM: 1.92
- Participant Non-URM: 2.527
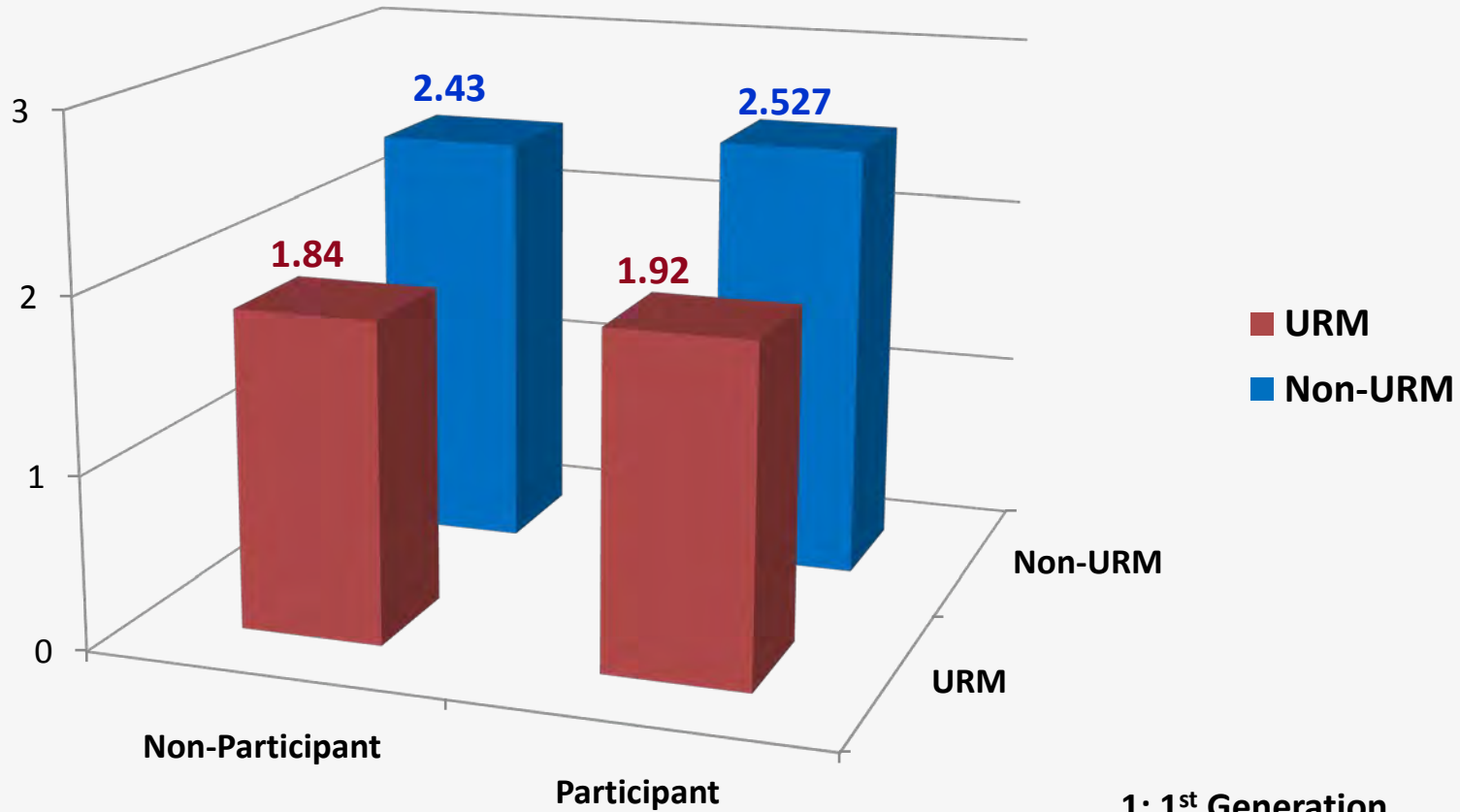
1: 1st Generation
2: Parents attended some college
3: Parent graduated 4-yr college

Phase 1. Persistence to Degree

1-yr Retention Rates

2-yr Retention Rates

6-yr Grad Rates

HS GPA

1st Generation

Ethnicity

Learning Community

Supplemental Instruction

PRE-COLLEGIATE → *OUTCOMES* ← *INSTITUTIONAL*
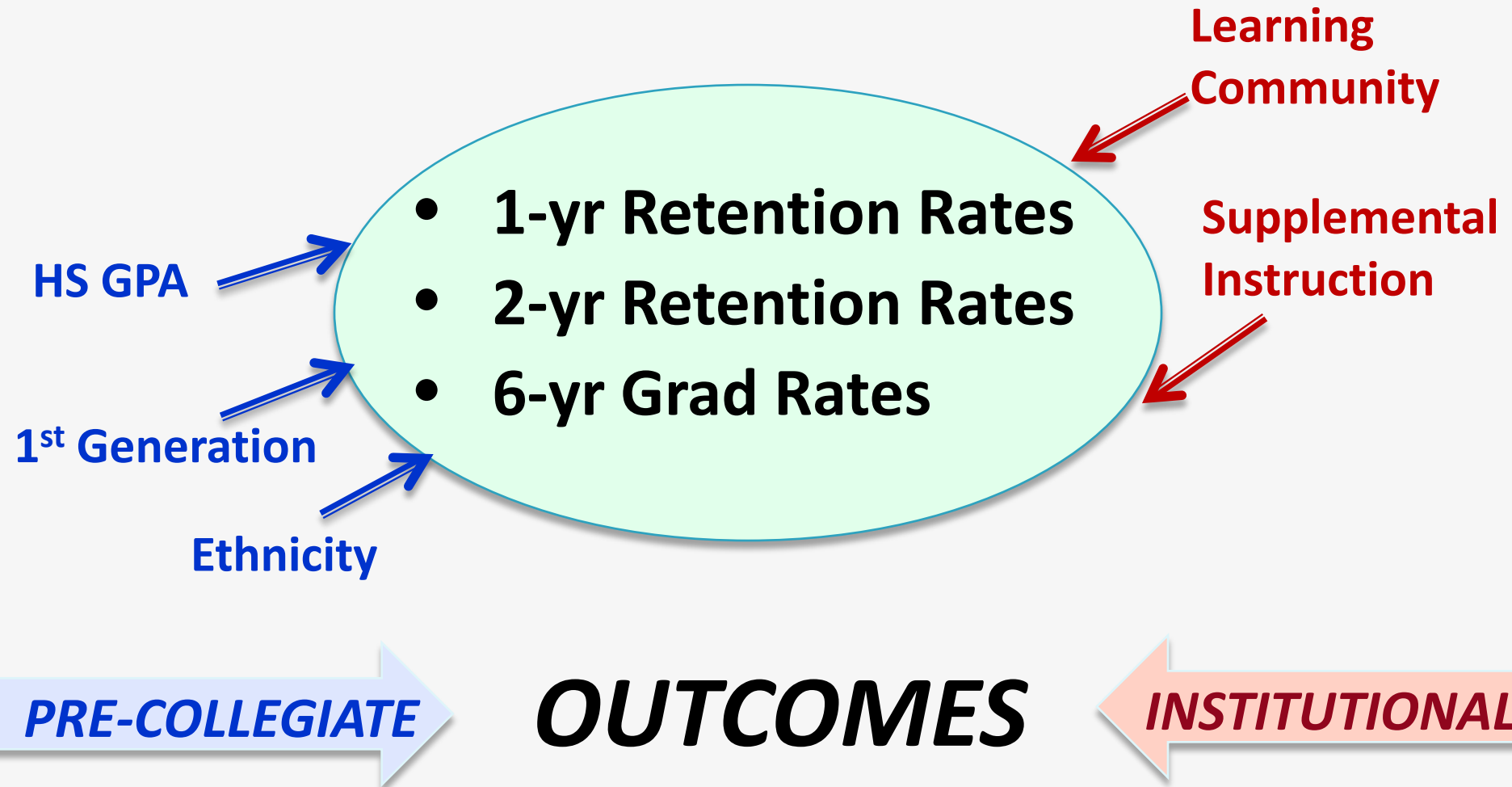
Analysis Model of 1yr, 2yr Retention, 6yr Graduation Rates

▸ **Logistic Regression** with Interaction terms (URM x FP Participation)

- ◦ **Outcome Variables**
  - • **1yr Retention**, **2-yr Retention**, **6-year Graduation** (Yes vs. No)

- ◦ **Independent Variables**
  - • **HS GPA**
  - • **Parents Education**
  - • **Freshmen Program** (Participated vs. Not-Participated)
  - • **URM** (URM vs. Non-URM)

- ◦ **Interaction**
  - • **URM x Freshmen Program**

Analysis Model of 1yr, 2yr Retention, & 6yr Graduation Rates

▸ **Logistic Regression (Male vs. Female)**

Effects	1yr Retention		2yr Retention		6yr Graduation	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
High School GPA	**	**	**	**	**	**
Parent Education	*	**	*	**	**	**
Freshmen Program		**	*	**		**
URM	**	**	**	**	**	**
Freshmen Program x URM	*					

*** p<.01 , *p< .05 , See Appendix F for more detail*

Analysis Model of 1-yr Retention Rates

▸ **URM x Freshmen Program Interaction**

Phase 2. Campus GPA

Learning Community

HS GPA

1st Generation

Ethnicity

- **1-yr GPA**
- **2-yr GPA**
- **6-yr Grad GPA**

Supplemental Instruction

PRE-COLLEGIATE *OUTCOMES* *INSTITUTIONAL*

Analysis Model of GPA @ 1yr, 2yr Retention, 6yr Graduation

▸ **2 x 2 Analysis of Covariance (ANCOVA)**

- **Outcome Variables**
  - **Campus GPA @ 1yr Retention, 2-yr Retention, 6-year Graduation**

- **Covariates**
  - **HS GPA**
  - **Parents Education**

- **Independent Variables**
  - **Freshmen Program** (Participated vs. Not-Participated)
  - **URM** (URM vs. Non-URM)

- **Interaction**
  - **URM x Freshmen Program**

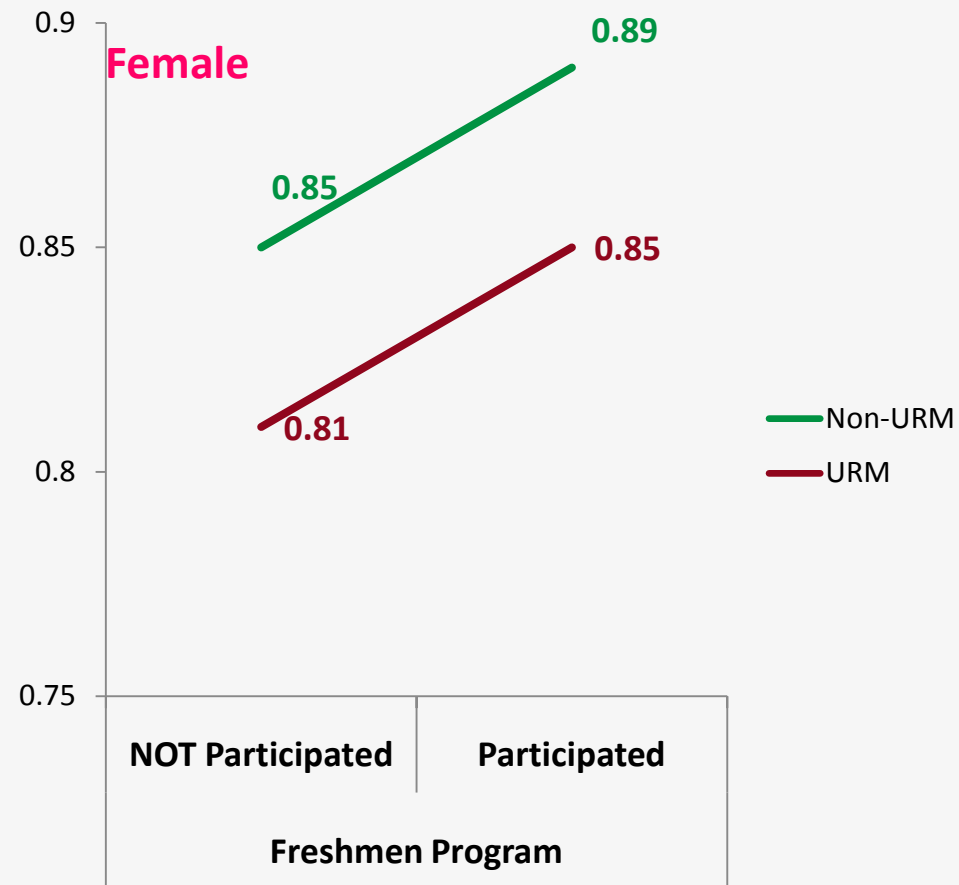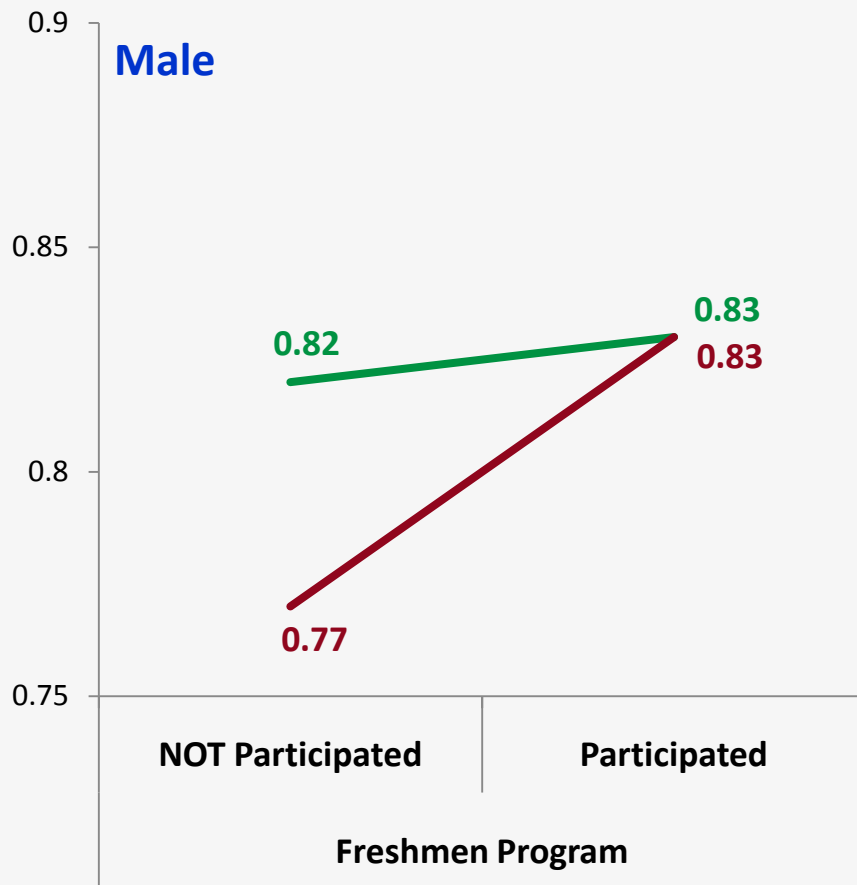# Analysis Model of GPA @ 1yr, 2yr Retention, 6yr Graduation

▸ ANCOVA (Male vs. Female)

Effects	GPA @ 1yr Retention		GPA @ 2yr Retention		GPA @ 6yr Graduation	
	Male	**Female**	Male	**Female**	**Male**	**Female**
High School GPA	**	**	**	**	**	**
Parent Education	**	**	**	**	**	**
Freshmen Program	**	**	*	**		**
URM	**	**	**	**	*	*
Freshmen Program x URM		**		**		*

*** p<.01 , *p< .05 , See Appendix F for more detail*

Analysis Model of GPA @ 6-yr Graduation

▶ **URM x Freshmen Program Interaction (Male vs. Female)**
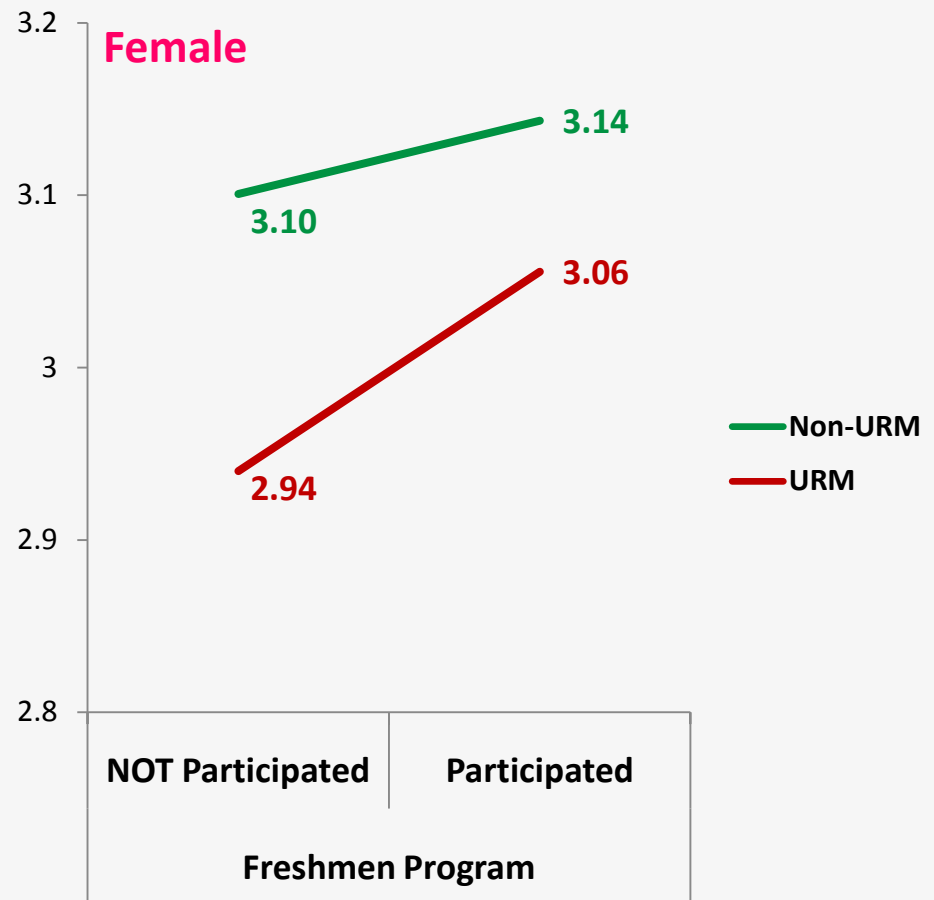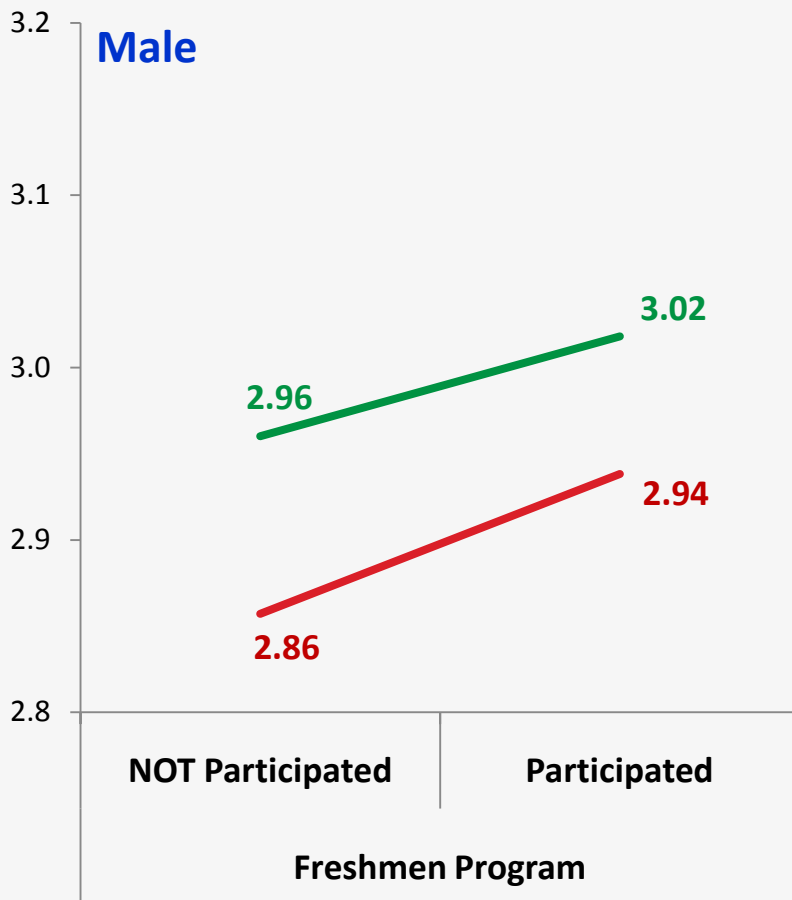
Male

- 2.96 → 3.02 (Non-URM, green)
- 2.86 → 2.94 (URM, red)

NOT Participated | Participated

Freshmen Program

Female

- 3.10 → 3.14 (Non-URM, green)
- 2.94 → 3.06 (URM, red)

NOT Participated | Participated

Freshmen Program

Legend: Non-URM (green), URM (red)

Other Related Findings for
Supplemental Instruction for 2 STEM Gateway Courses

▸ **Effects of SI (Supplemental Instruction) Participation on <u>MATH150A</u>**

Course Grades
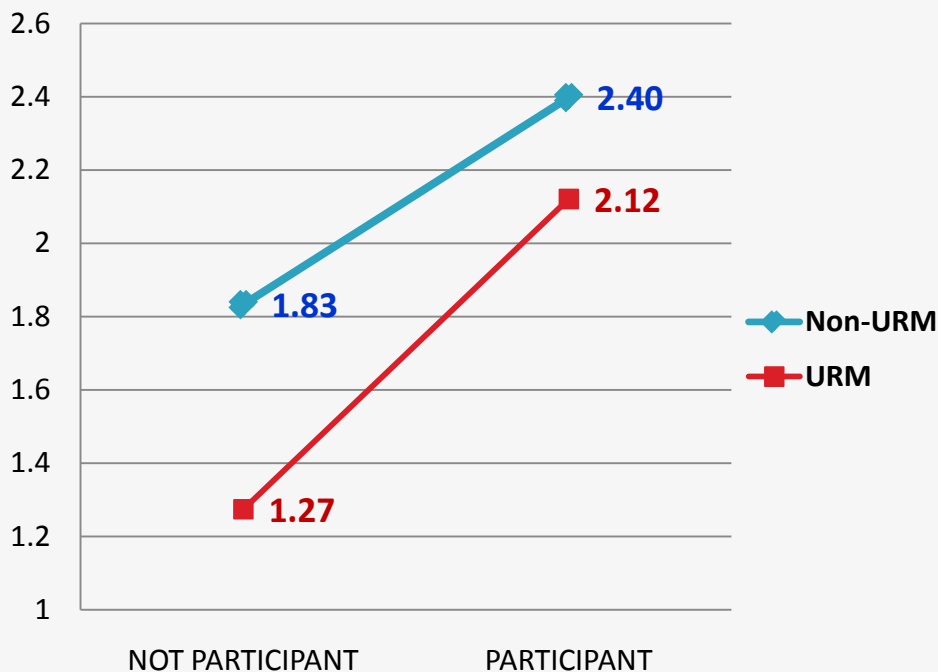
ANCOVA

Effect	F ratio	P
High School GPA	26.189	<0.001
SI Participation	27.519	<0.001
URM	14.545	<0.001
SI Participation * URM	0.931	0.335

Other Related Findings for
Supplemental Instruction for 2 STEM Gateway Courses

▸ **Effects of SI (Supplemental Instruction) Participation on <u>BIOL171</u>**

Course Grade

Effect	F ratio	P
ANCOVA		
High School GPA	**62.349**	**<0.001**
SI Participation	**102.227**	**<0.001**
URM	**18.461**	**<0.001**
SI Participation * URM	**1.206**	**0.272**

Conclusion

▸ Positive Effects of Collaborative Learning Approaches as Educational Support Enhancing Student Success (on retention/graduation/GPA)

◦ **Freshmen Program**

- HS GPA, Parent Education, URM
- More effective for raising URM GPA, and WOMEN

◦ **Supplemental Instruction**

- HS GPA, URM
- Stronger effects on STEM course grade than HS GPA

Conclusion

▸ ***"Creating Conditions of Student Success"***

- Tinto, 2008 -

- ◦ "Students will get more involved in learning, spend more time learning, and in turn learn more when they are placed in ***supportive educational settings***"

- ◦ "Strategies of Student Success"
  - • **Advising/Mentoring of Frosh**
  - • **Learning Community**

Conclusion

▸ *"Enhancing Student Success"* President Mildred García -- 2012 CSU Fullerton Convocation Address

*Without a doubt, **enhancing student success has been, and will continue to be our most important institutional priority**. It is evident that the Cal State Fullerton community is dedicated to student success. One alumnus survey response stated, "CSU Fullerton is an institution with the most engaged faculty that I have met. The faculty truly cares about their students and work with their students when issues arise. The staff is just as caring and understanding. They make life easier when you are trying to negotiate the academic road."*

Our student body comes from everywhere; we mirror the country's changing demographics – we are an educational laboratory where students from different cultural and educational backgrounds and all walks of life are embraced as we pledge to see them succeed.

*Enhancing student success begins when we recruit our students and continue until they graduate. **Every step along the way, we are all engaged in helping students achieve their educational goals**. National studies on drop out and retention highlight that a large percentage of students drop out not because of academic failure, in fact many are in good academic standing, and leave because of other factors. **We should know what those reasons are for the students that are leaving Cal State Fullerton.***

*Within our Strategic Plan goals, we proclaim that we will be the premier comprehensive public university in the state, and I will say, in the nation. **To reach that goal, we must address our retention and graduation rates as well as document and provide evidence as to the quality of our student learning.** As the largest CSU in the system, with a diverse student body and a faculty and staff second to none, we can be that model comprehensive premier institution that others look at in order to learn about our success with our diverse student body— especially when it comes to student learning, retention and graduation.*

Next Steps

2010
- Factors affecting 6-Year Grad Rates (pre-college variables)

2011
- Supplemental Instruction Enhancing Student Success in STEM Courses
- Cognitive Student Learning Outcomes (college variable)

2012
- Learning Community Improving Retention/Graduation/GPA
- Cognitive Student Learning Outcomes (college variable)

2013 ??
- Values, attitudes, satisfaction w/college, educational experience
- NSSE survey data for those who persisted and graduated
- Affective Learning Outcomes

Questions?

▸ Presentation available on our website at:

www.fullerton.edu/analyticalstudies/planning/avp/cair2012_LC.pdf

Appendix A.

Historical Trend of 1- & 2-Year Retention Rates

1- & 2-Year Retention: fa03–fa11 Cohorts

Retention Rates

	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011
First-Time Full-Time Frosh	100%	100%	100%	100%	100%	100%	100%	100%	100%
1-year Retention	81%	82%	78%	79%	79%	80%	84%	85%	88%
2-year Retention	71%	73%	69%	69%	70%	73%	79%	78%	
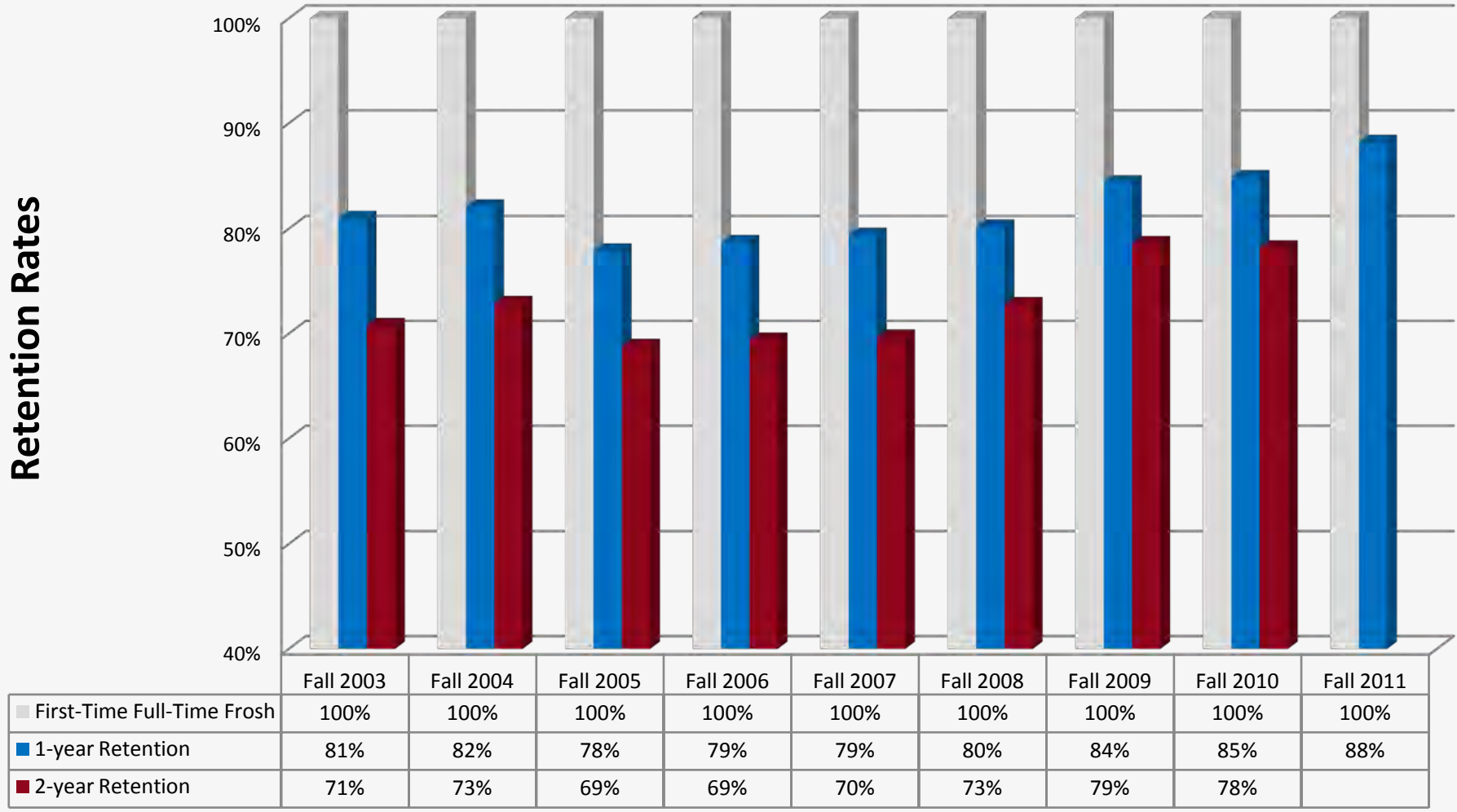
Appendix B.

Historical Trend of Campus GPA at
1-Year Retention, 2-Year Retention, & 6-Year Graduation

GPA @1yr, 2yr Retention, and 6yr Graduation

Campus GPA

	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011
■ Campus GPA - after 1yr Retention	2.7	2.73	2.74	2.74	2.74	2.8	2.86	2.87	2.86
■ Campus GPA - after 2yr Retention	2.73	2.76	2.73	2.72	2.78	2.81	2.86	2.86	
■ Campus GPA - after 6yr Graduation	2.95	2.99	2.99						
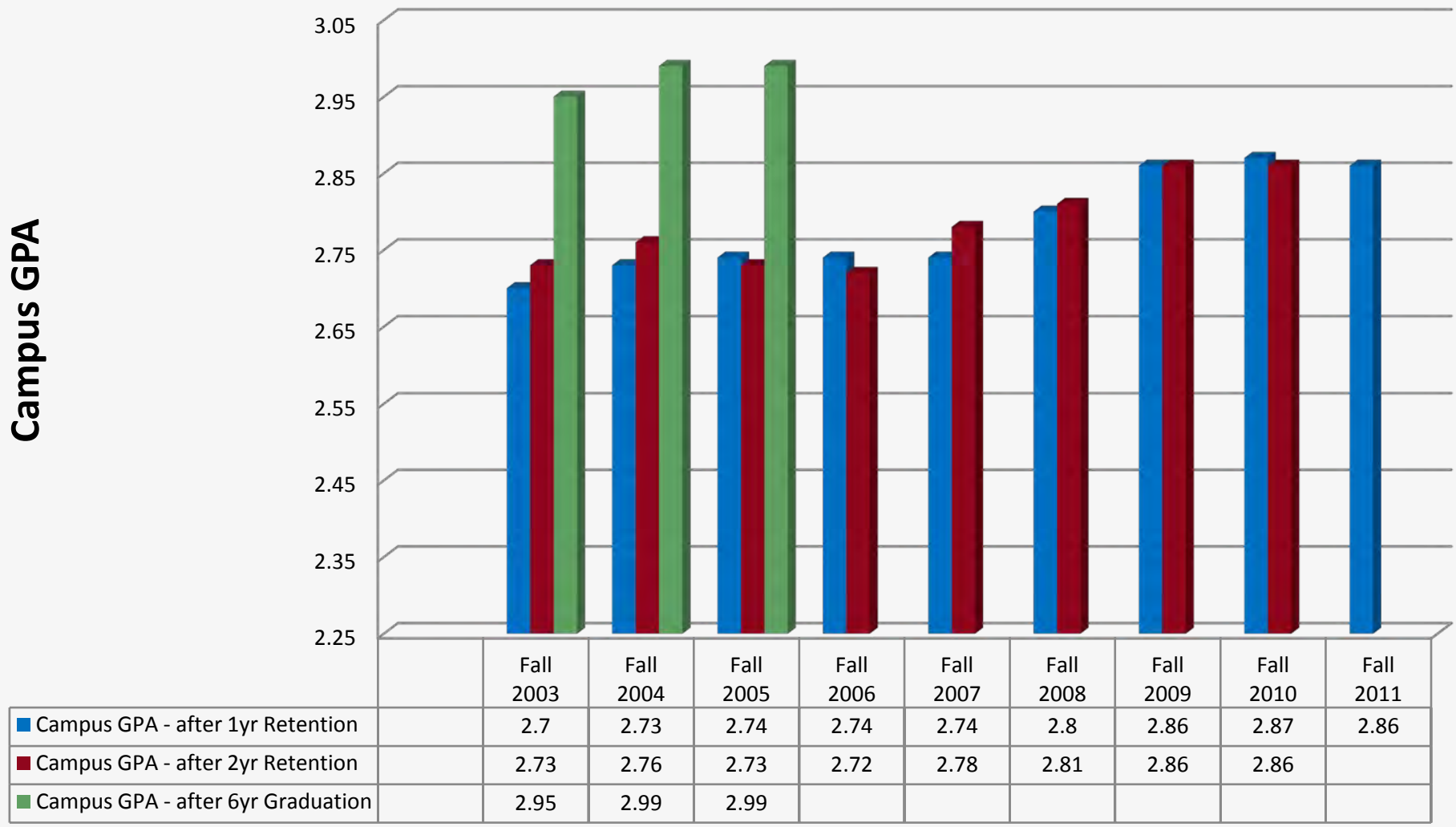
Appendix C.

Historical Trend of Retention and Graduation Rates at College of Engineering & Computer Science (ECS)

Progression toward Graduation at *ECS*

Cumulative Graduation Rates and Continuation Rates

Cohort Year	Total HC	Cont'd to 2nd Yr	Cont'd to 3rd Yr	Cont'd to 4th Yr	Grad. in 4yrs	Cont'd to 5th Yr	Grad. in 5yrs	Cont'd to 6th Yr	Grad. in 6yrs	Cont'd to 7th Yr	Grad. in 7yrs	Grad. in 8yrs
Fall 2002	216	57%	36%	25%	2%	17%	6%	12%	**11%**	5%	16%	16%
Fall 2003	248	60%	37%	27%	2%	20%	9%	10%	**15%**	4%	17%	17%
Fall 2004	274	55%	39%	31%	2%	23%	11%	13%	**14%**	5%	18%	
Fall 2005	328	50%	29%	22%	2%	16%	7%	10%	**11%**	4%		
Fall 2006	305	50%	33%	24%	1%	21%	9%	11%				
Fall 2007	325	52%	34%	27%	1%	23%						
Fall 2008	353	52%	40%	32%								
Fall 2009	318	69%	49%	41%								
Fall 2010	331	69%	51%									
Fall 2011	344	71%										

Appendix D.

Effects of Freshmen Program on Students in College of Engineering & Computer Science

(ECS Scholar Program)

Progression toward Graduation of ECS Scholars

Cohort Year (Fall)	# of ECS Scholars	1-year Retention	2-year Retention
2007	60	48 (80%)	40 (67%)
2008	45	37 (82%)	33 (73%)
2009*	n/a	n/a	n/a
2010	28	23 (82%)	21 (75%)
Total	133	108 (81%)	94 (71%)

* ECS (Engineering & Computer Science Scholar) Program was not available for 2009 Cohort

Appendix E.

Demographics of Fall 2003 – Fall 2011 Freshmen Cohorts & Freshmen Program Participation
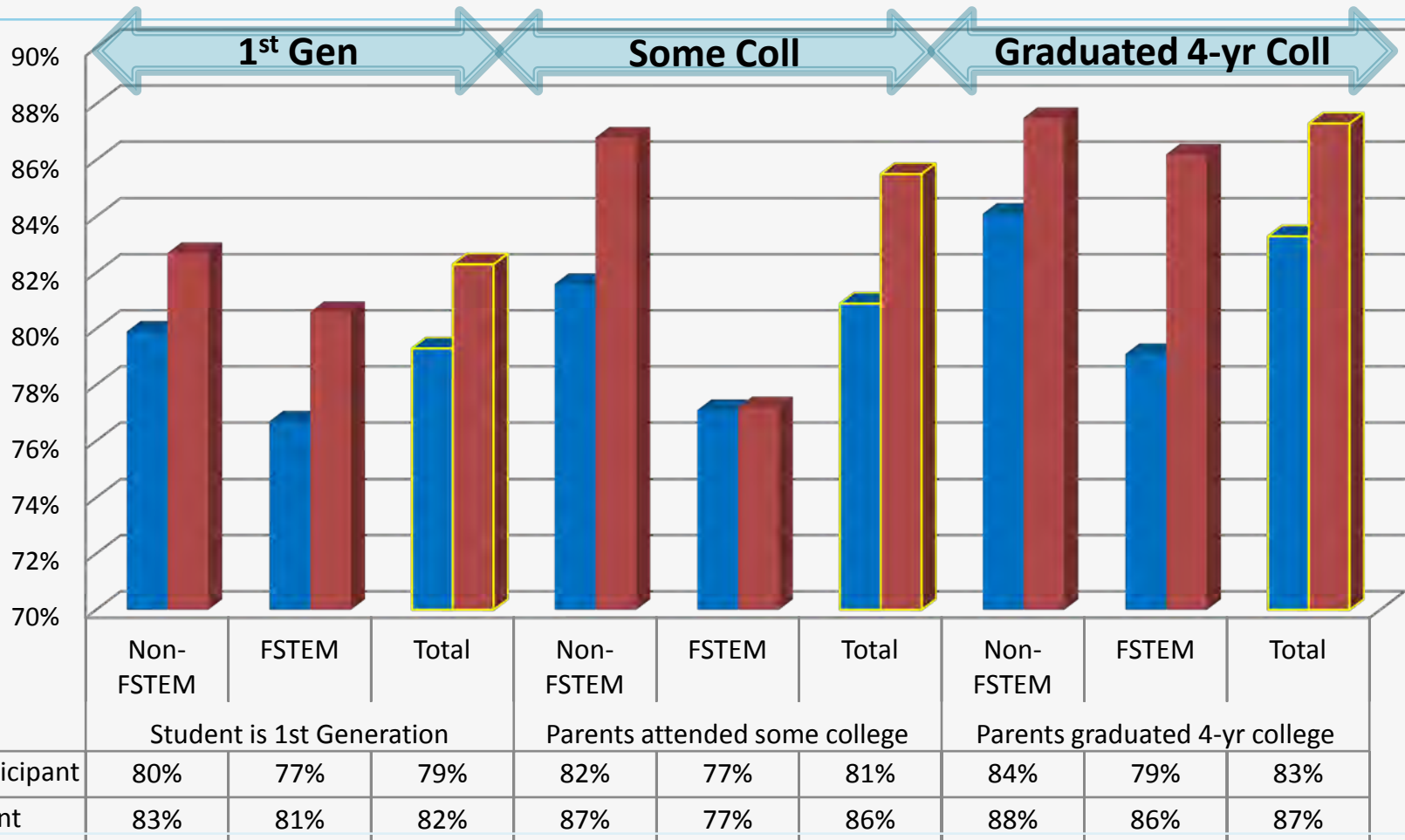
Participants in Freshmen Program : Gender x Ethnicity (fa03 – fa11 cohorts)

SEX	Freshmen Program	Ethnicity								Total
		AM IND	BLACK	HISPANIC	ASIAN	WHITE	UNKNOWN	NONRES	MULTI RACE	
Men	Non-Participant	47	483	4280	3279	3642	704	331	188	12954
	Participant	4	53	373	223	379	76	19	15	1142
	Total	51	536	4653	3502	4021	780	350	203	14096
Women	Non-Participant	83	802	6735	3750	4917	1002	372	293	17954
	Participant	16	130	921	381	764	118	28	37	2395
	Total	99	932	7656	4131	5681	1120	400	330	20349
Total	Non-Participant	130	1285	11015	7029	8559	1706	703	481	30908
	Participant	20	183	1294	604	1143	194	47	52	3537
	Total	150	1468	12309	7633	9702	1900	750	533	34445

Appendix F.

Analysis Model of
1-yr, 2-yr Retention, & 6-yr Graduation Rates

1-Year Retention: The Effects of Freshmen Program x Parents Education x STEM

	1st Gen			Some Coll			Graduated 4-yr Coll		
	Non-FSTEM	FSTEM	Total	Non-FSTEM	FSTEM	Total	Non-FSTEM	FSTEM	Total
	Student is 1st Generation			Parents attended some college			Parents graduated 4-yr college		
■ Non-Participant	80%	77%	79%	82%	77%	81%	84%	79%	83%
■ Participant	83%	81%	82%	87%	77%	86%	88%	86%	87%

Analysis Model of 1-yr Retention Rates

▸ **Logistic Regression (Male vs. Female)**

Effects	Coefficient (B)		Wald χ^2		P		Odds ratio	
	Male	Female	Male	Female	Male	Female	Male	Female
High School GPA	.835	.940	190.714	297.366	.000*	.000*	2.304	2.561
Parent Education	.075	.117	6.210	19.417	.013*	.000*	1.078	1.124
Freshmen Program	.060	.334	.276	11.572	.599	.001*	1.061	1.396
URM	-.283	-.145	32.337	10.468	.000*	.001*	.753	.865
Freshmen Program x URM	.356	-.075	4.097	.311	.043*	.577	1.428	.928

Analysis Model of 2-yr Retention Rates

▸ **Logistic Regression** **(Male vs. Female)**

Effects	Coefficient (B)		Wald χ^2		P		Odds ratio	
	Male	Female	Male	Female	Male	Female	Male	Female
High School GPA	.740	.838	176.304	293.378	.000*	.000*	2.095	2.311
Parent Education	.058	.108	4.172	19.588	.041*	.000*	1.060	1.114
Freshmen Program	.219	.248	4.126	8.578	.042*	.003*	1.245	1.282
URM	-.280	-.117	35.879	8.225	.000*	.004*	.755	.889
Freshmen Program x URM	.171	.052	1.098	.191	.295	.662	1.187	1.054

Analysis Model of 2-yr Retention Rates
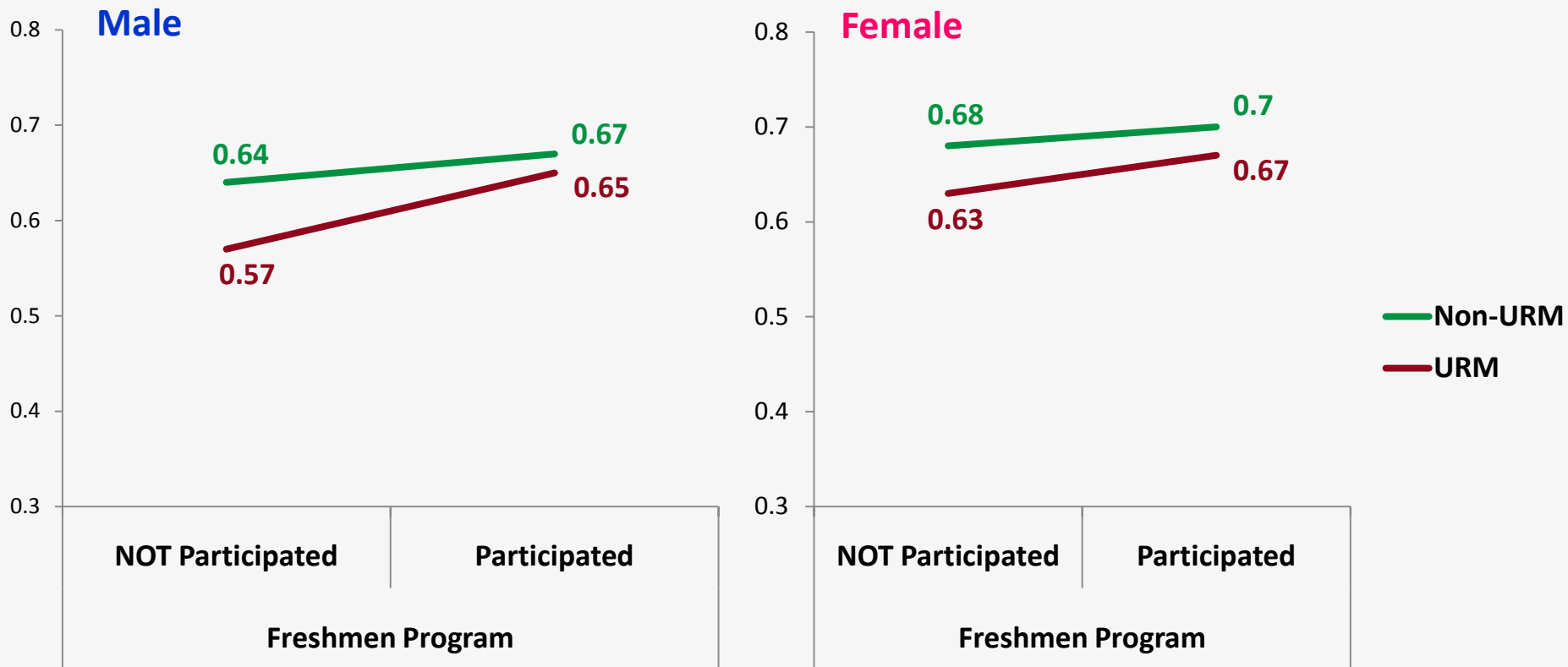
▸ **URM x Freshmen Program Interaction (Male vs. Female)**

Analysis Model of 6-yr Graduation Rates

▸ **Logistic Regression (Male vs. Female)**

Effects	Coefficient (B)		Wald χ^2		P		Odds ratio	
	Male	Female	Male	Female	Male	Female	Male	Female
High School GPA	.873	.965	99.965	173.310	.000*	.000*	2.393	2.625
Parent Education	.139	.165	9.051	19.728	.003*	.000*	1.150	1.179
Freshmen Program	.196	.474	1.876	16.428	.171	.000*	1.217	1.606
URM	-.349	-.251	20.731	16.210	.000*	.000*	.705	.778
Freshmen Program x URM	.446	-.103	3.318	.348	.069	.555	1.563	.902

Analysis Model of 6-yr Graduation Rates

▸ URM x Freshmen Program Interaction (Male vs. Female)
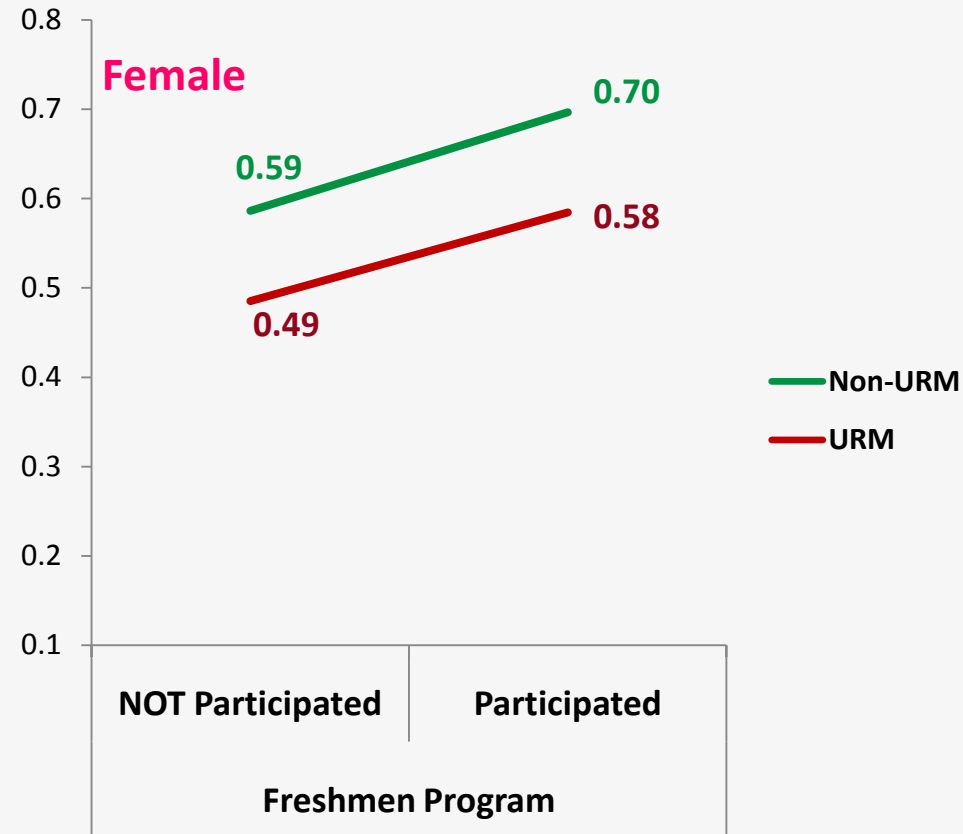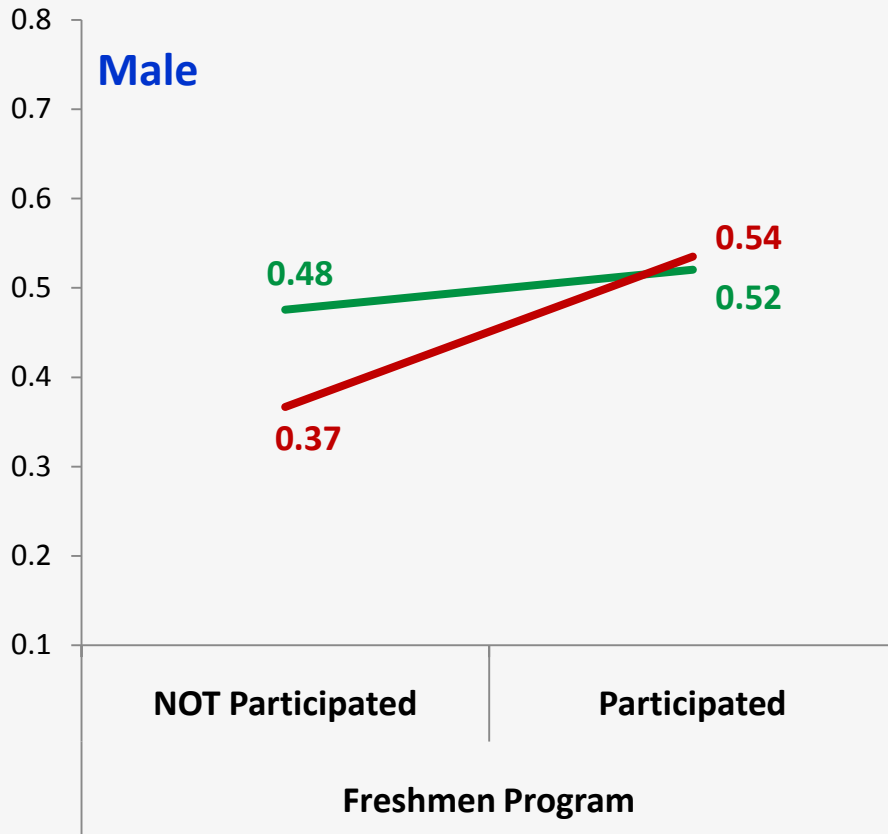
Appendix G.

Analysis Model of Campus GPA @ 1-yr, 2-yr Retention, & 6-yr Graduation

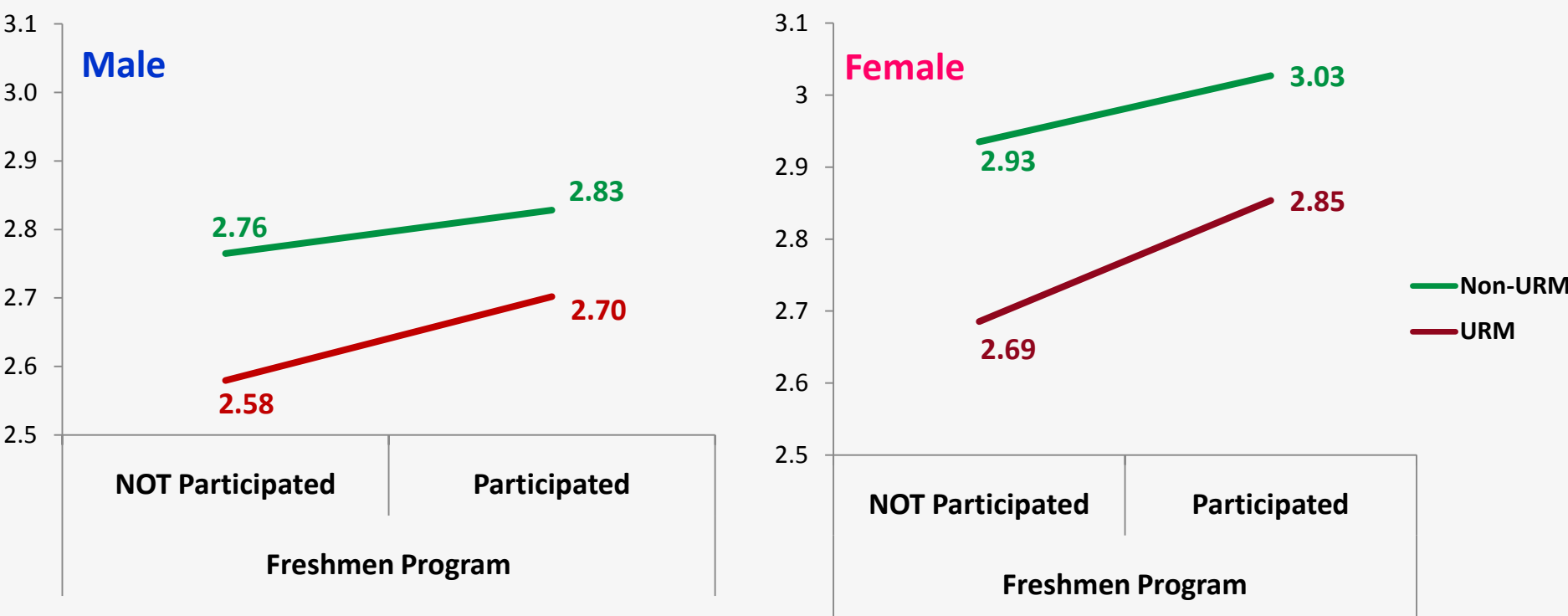# Analysis Model of GPA @ 1-yr Retention

▸ **ANCOVA (Male vs. Female)**

Effects	F ratio		P	
	Male	Female	Male	Female
High School GPA	1691.979	3119.101	.000*	.000*
Parent Education	44.334	179.644	.000*	.000*
Freshmen Program	19.299	64.451	.000*	.000*
URM	34.101	71.992	.000*	.000*
Freshmen Program x URM	.614	7.279	.433	.007*

Analysis Model of GPA @ 1-yr Retention

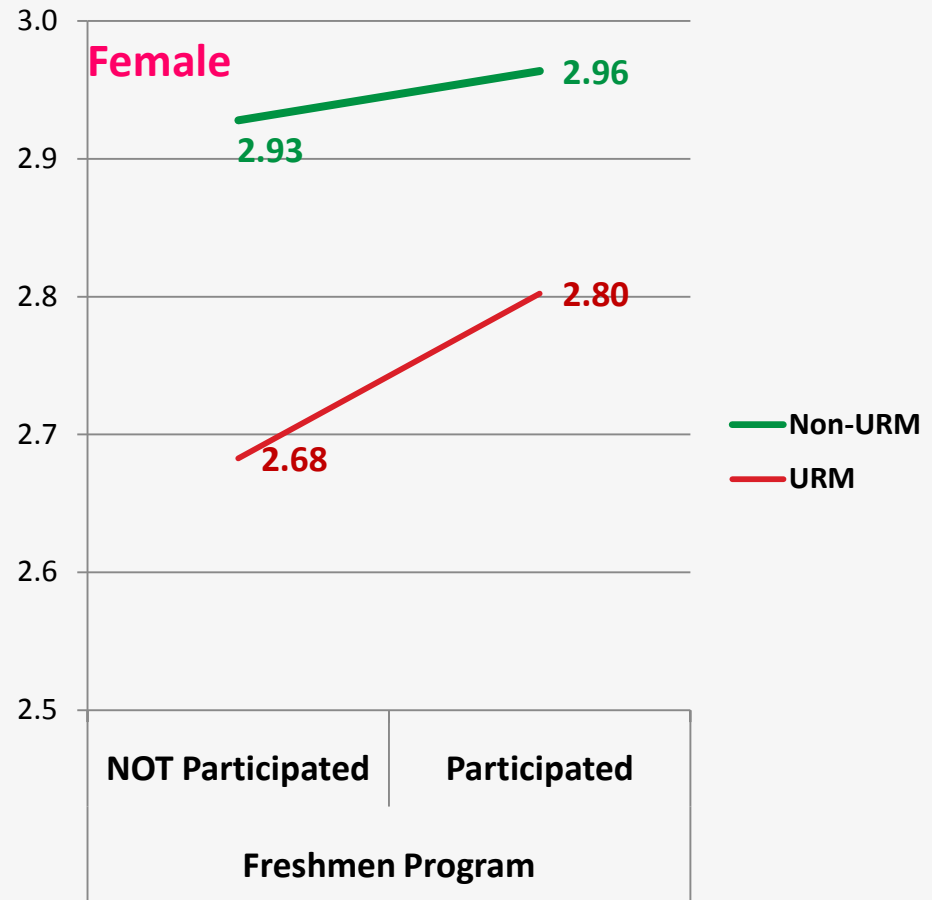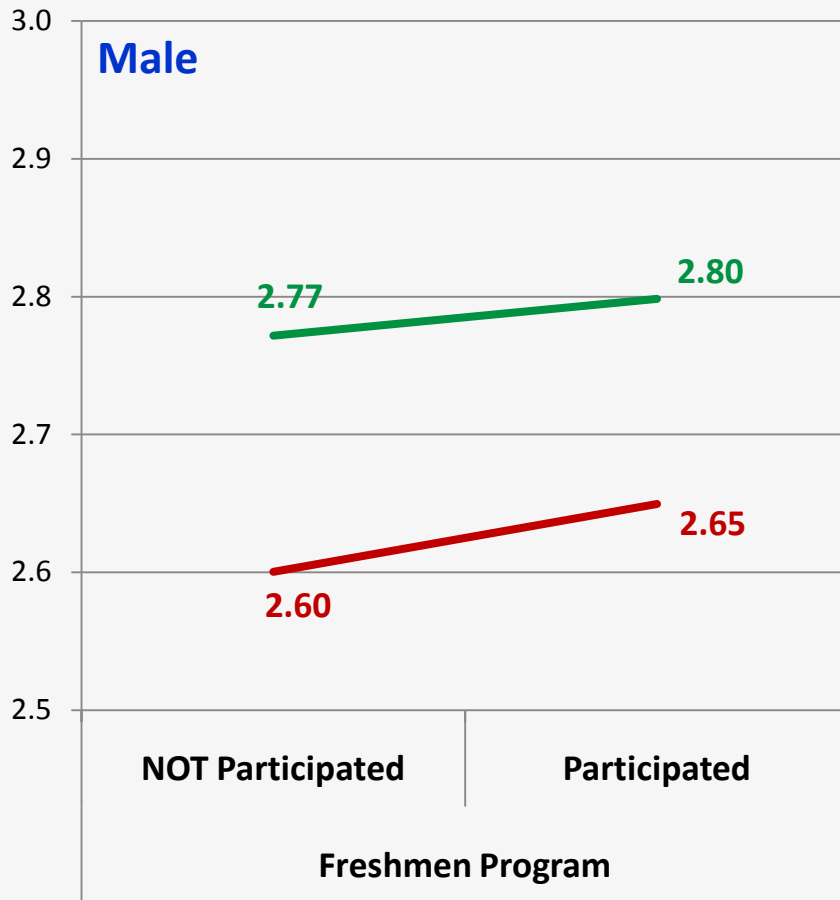▸ **URM x Freshmen Program Interaction (Male vs. Female)**

Analysis Model of GPA @ 2-yr Retention

▸ **ANCOVA** **(Male vs. Female)**

Effects	F ratio		P	
	Male	Female	Male	Female
High School GPA	1578.340	3123.945	.000*	.000*
Parent Education	38.591	160.591	.000*	.000*
Freshmen Program	4.546	22.529	.033*	.000*
URM	34.507	71.953	.000*	.000*
Freshmen Program x URM	.291	8.644	.590	.003*

Analysis Model of GPA @ 2-yr Retention

‣ **URM x Freshmen Program Interaction (Male vs. Female)**

Analysis Model of GPA @ 6-yr Graduation

▶ **ANCOVA** (Male vs. Female)

Effects	F ratio		P	
	Male	Female	Male	Female
High School GPA	391.183	904.109	.000*	.000*
Parent Education	19.787	48.987	.000*	.000*
Freshmen Program	3.291	15.242	.070	.000*
URM	4.581	6.579	.032*	.010*
Freshmen Program x URM	.034	4.070	.854	.044*