



Key Plus Learning Community

Student Success, FA06-FA17

The Key Communities are highly diverse first- and second-year learning communities designed to help CSU achieve its student success goals. Key Communities were chosen to expand in order to influence overall rates, because [prior data](#) show that Key is an effective way to support graduation for all students but particularly among historically underserved populations. First-year Key students live together on designated residence hall floors, and enroll in 2 to 3 of their first semester courses with their cluster of students. Key students also have a Key Mentor to connect with, who provides information and resources, and serves as a guide throughout their first year on campus. Key Plus is an optional second year and continuing student program for students who have participated in the Key Communities or the Community for Excellence.

This report explores associations between participation in Key Plus and student success measures, including second spring end of term cumulative GPA, persistence to third fall, and four- and six-year graduation rates. Additionally, this report looks at the association between participation in Key Plus and student success only among students who participated in a first-year Key community. This second analysis explores the magnitude of Key Plus beyond the first-year Key experience.

Summary of Findings

Compared to statistically similar second year students, Key Plus participants earn a slightly higher end of term cumulative GPA in their second spring, persist to third fall at a higher rate, and have similar four- and six-year graduation rates. These same findings were observed when comparing Key Plus to students who participated in Key during their first year, but not their second. Key Plus is an important strategy in the University's goals to close achievement gaps among historically underrepresented populations.

A summary of findings are as follows:

- Key Plus students have a predicted¹ second year GPA that is about .15 grade points higher than the non-Key Plus students. Similarly, Key Plus students have a higher predicted second year GPA compared to first year Key students by about .13 grade points.
- Compared to non-Key Plus and first year Key only students, Key Plus participants have a higher predicted third fall persistence rate by about 3 percentage points (PP).
- The association of the Key program with persistence is slightly higher for students that have a higher probability of participating in Key Plus. For a student with a high likelihood of being Key Plus there is a 6.6 percentage point increase in predicted persistence to third fall.
- Though not statistically significant, predicted four and six-year graduation rates are slightly higher for Key Plus compared to both non-Key Plus and First Year Key Only. Key Plus students' predicted four-year graduation rate is about 4 PP higher and predicted six-year graduation is 3 PP higher compared non-Key Plus. Key Plus students' predicted four-year graduation is about 2.5 PP higher and predicted six-year graduation is about 3.5 PP higher than the predicted rates for first-year Key students.

¹ Predicted outcomes are based on weighting of non-Key Plus and first year Key only students so they are statistically similar to Key Plus, as well as controlling for demographic attributes and CDHE index in regression modeling.

Methodology

The intent of this study is to explore associations between Key Plus participation and success outcomes, in comparison to statistically similar second year students who did not participate in Key Plus. Associations are also explored among students who participated in Key their first year and Key Plus their second year to statistically similar second year students who only participated in Key their first year.

Population

The population includes all first-time, full-time students within the FA06-FA17 cohorts who persisted to the end of their second spring. The population is further defined by their participation in Key Communities during their first and/or second year. These groups include:

- No Key: No Key participation in their first or second year (91.5% of the population);
- First Year Key Only: participation in a Key Community during their first year, but not their second (7.2% of the population);
- First Year Key and Key Plus: participation in Key their first year and Key Plus during their second year (1.3% of the population).

Analytical Approach to Evaluate Key Plus Student Success

Inverse propensity weighting (IPW) is a type of propensity score analysis that weights individuals based on a set of characteristics that predict membership in the treatment (in this case, Key Plus) versus the control groups (no Key Plus participation, and no Key Plus among first-year Key participants) in order to describe the association between participating in Key Plus and the outcome variables. Theoretically, IPW is attempting to simulate random assignment by creating statistically comparable groups (based on the selected characteristics included in the model) across treatment status. In this case, the purpose of the IPW analysis is to make the non-Key Plus groups statistically similar to the Key Plus group in terms of characteristics known to impact student success and/or Key participation. The effectiveness of this IPW model in balancing the control group can be seen in Tables A-5 and A-11 of the appendix. Notably, the student characteristics (index, residency, racially minoritized status, Pell status, gender, first generation) that were significantly different prior to weighting are non-significant after the IPW procedure.

Student success is approximated in this study by the following variables: second spring end of term cumulative GPA, third fall persistence, four-year graduation, and six-year graduation. Using Key Plus as the treatment group and non-Key Plus as the control, each outcome is assessed by weighting regression models with the weight determined by the IPW analysis. Second spring end of term cumulative GPA is modeled using weighted least squares regression, while all other binary outcomes (i.e., persisted v. not persisted) are modeled using weighted logistic regression. The results from these weighted regression models, controlling again for the aforementioned characteristics (a "doubly robust" approach), can be interpreted as the association between Key Plus participation and student success.

Limitations

A major limitation of these analyses is Key Plus population size; thus, standard errors are very large and statistical power is significantly reduced making significant differences more difficult to identify and resulting in larger standard errors (more uncertainty in the statistics). In addition, outcomes are also averaged across time, and do not account for programmatic changes that may occur from term to term. Research indicates that a multitude of factors impact student success; this analysis is limited to those available in the system of record. It is possible that non-Key Plus students are involved in high-impact experiences that could be contributing to their

success. Therefore, due to missing variable bias (particularly in the psychosocial realm), results cannot be interpreted in a causal manner.

Key Plus Student Characteristics

Table 1 displays the unique headcount and demographics of students by Key Community participation among first-time, full-time FA06-FA17 cohorts as well as all second year students.

Table 1: Second Year Student Demographics by Key Community Participation, FA06-FA17 FTFT Cohorts¹

Key Participation	Headcount	% Racially Minoritized	% Female	% Pell Recipient	% Non-resident	% First Gen	Avg CDHE Index
No Key	38,631	15.4%	54.9%	16.5%	24.8%	20.8%	115.9
First Year Key Only	3,022	44.6%	61.9%	34.4%	19.3%	38.6%	111.8
First Year Key & Key Plus	569	67.8%	73.3%	59.2%	10.5%	55.5%	110.3
All Second Year Students	42,222	18.2%	55.7%	18.4%	24.2%	22.6%	115.5

¹Limited to students who persisted to the end of their second spring term.

Students who participate in any Key community are significantly more racially and ethnically diverse compared to students who do not participate (No Key) as well as second year students overall. Key students (First Year Key & Key Plus) also have a much larger proportion of females (+18 percentage points, or PP), Pell recipients (+41 PP), and first generation students (+35 PP), as well as a smaller proportion of nonresidents (-14 PP). These students tend to have a lower CDHE Index by approximately 5 points.

The majority of Key Plus students participate in a Key community during their first year (97%), with an even larger representation of the aforementioned demographic characteristics as compared to First Year Key Only students. Most notably, Key Plus students have a larger proportion of racially minoritized students by nearly 24 percentage points (PP), Pell recipients (+25 PP), first generation students (+18 PP), and females (+12 PP), in comparison to first year Key only students.

Demographics by Key Community participation and cohort term, including students who participated in Key Plus only (N=17) and Key Plus LEADS, a subgroup of Key Plus (N=81), can be found in Appendix A, Table A-1.

Key Plus Student Success Outcomes

This section describes student success outcomes, to include second spring end of term GPA, third fall persistence, and four- and six- year graduation among students who persist to the end of their second spring term. Two sets of analyses are displayed for each outcome, the first comparing Key Plus to non-Key Plus students, and the second comparing First Year Key and Key Plus to First Year Key Only students. Given their small population size, Key Plus LEADS and Key Plus Only students are included within the larger Key Plus group for the first set of analyses. For the second set of analyses, the Key Plus group is comprised of students who participated in First Year Key and Key Plus, while the comparison group consists of First Year Key Only students.

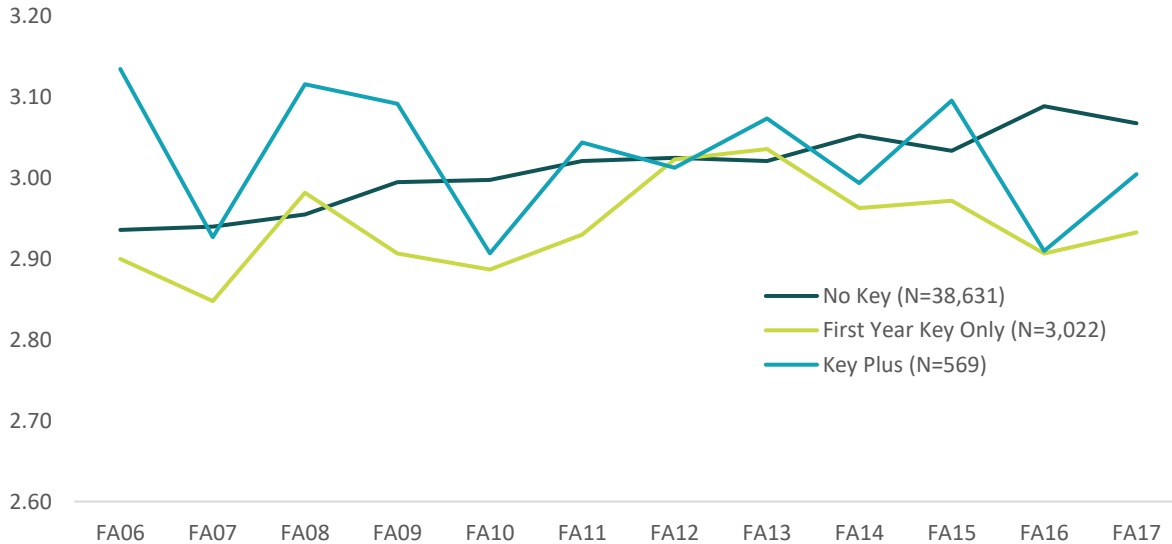
Success outcomes and headcounts by Key status and cohort term, and by Key status and historically underrepresented and intersecting identities can be found in Appendix Tables A-2 through A-4.

Second Spring End of Term Average Cumulative GPA

Observed GPA

Figure 1 displays the observed second spring end of term cumulative GPA by cohort term and Key participation status among students who persisted to the end of their second spring.

Figure 1: 2nd Spring End of Term Cumulative GPA, FA06-FA17 FTFT Cohorts



GPA has fluctuated over time for both First Year Key Only and Key Plus students; across all cohorts, Key Plus students tend to earn the same or higher GPA compared to First Year Key Only participants. Key Plus students in cohorts FA08 and FA15 had the largest positive gaps (0.16-0.18 grade points) compared to all other groups. Students who do not participate in Key exhibit a positive linear trend in that GPA increases incrementally over time. In recent cohort years, Key Plus students have earned a similar GPA compared to non-Key students, with the exception of the FA16 cohort. This Key Plus cohort’s average GPA was .2 grade points lower than non-Key.

Predicted GPA

Table 2 displays Key Plus and non-Key Plus observed and predicted GPA. Predicted values are based on IPW and weighted least squares regression, and GPA is averaged across time for each group. The predicted values in Table 2 assume non-Pell, continuing generation, non-racially minoritized, resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 2: Key Plus and Non-Key Plus Average 2nd Spring EOT Cumulative GPA, Observed vs. Predicted Values, FA06-FA17 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=569)	Non-Key Plus (N=41,652)	Difference	Key Plus	Non-Key Plus	Difference
Average 2nd Spring EOT Cumulative GPA	3.00	3.01	-0.01	3.08	2.92	0.15*

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. GPA is modeled using weighted least squares linear regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

Observed GPA is nearly equal among Key Plus and non-Key Plus. Once weighted and modeled, Key Plus students' predicted GPA is significantly higher than non-Key students by .15 grade points. However, the magnitude of this difference is small (see Appendix, Table A-7).²

Table 3 displays Key Plus and First Year Key Only observed and predicted GPA. Predicted values are based on IPW and weighted least squares regression, and GPA is averaged across time for each group. The predicted values assume non-Pell, continuing generation, non-racially minoritized, resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 3: Key Plus and First Year Key Only Average 2nd Spring EOT Cumulative GPA, Observed vs. Predicted Values, FA06-FA17 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=552)	First Year Key Only (N=3,022)	Difference	Key Plus	First Year Key Only	Difference
Average 2nd Spring EOT Cumulative GPA	3.01	2.94	0.07*	3.04	2.91	0.13*

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. GPA is modeled using weighted least squares linear regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

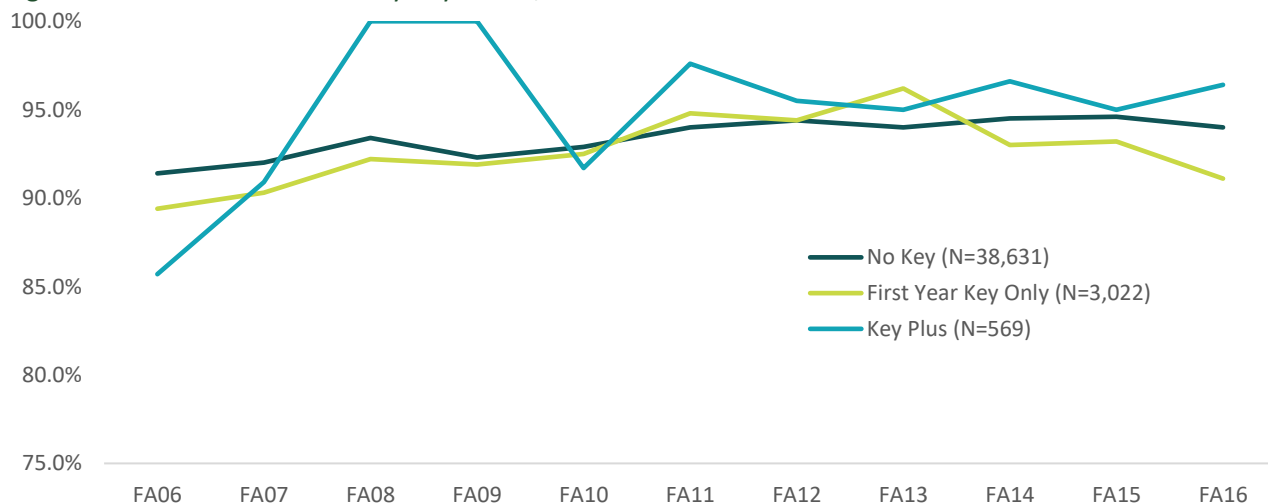
Key Plus students have a significantly higher observed second spring EOT cumulative GPA compared to First Year Key Only students. Once weighted and modeled, Key Plus students' GPA remains significantly higher, and the difference increases from .07 to .13 grade points. However, the magnitude of this difference is small (see Appendix, Table A-13).

Persistence to Third Fall

Observed Persistence

Figure 2 displays third fall persistence rates by cohort term and Key status among students who persisted to the end of their second spring.

Figure 2: Third Fall Persistence by Key Status, FA06-FA16 FTFT Cohorts



² In linear regression, effect size (i.e., magnitude) is approximated using standardized Beta weights. A standardized Beta weight of .10 is considered small, .30 medium, and .50 and above is large.

Key Plus students have very similar persistence rates compared to all other groups in recent years, with the exception of notably higher rates among the FA08 and FA09 cohorts (100%). Regardless of Key status, third fall persistence rates are extremely high for all groups (above 90%) because the data are limited to students that persist to the end of their second spring semester.

Predicted Persistence

Table 4 displays Key Plus and non-Key Plus observed and predicted persistence to third fall. The predicted value is based on IPW and weighted logistic regression; persistence is averaged across time for both groups. The predicted values in Table 4 assume non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 4: Key Plus and Non-Key Plus 3rd Fall Persistence, Observed vs. Predicted Values, FA06-FA16 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=493)	Non-Key Plus (N=37,871)	Difference	Key Plus	Non-Key Plus	Difference
3rd Fall Persistence	96.0%	93.0%	3.0*	96.5%	93.7%	2.9*

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Persistence is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

Key Plus participants have a significantly higher observed persistence rate compared to non-participants (96% compared to 93%). Once weighted and modeled, rates increased slightly for both groups, and the nearly 3 PP difference remains significant.

Table 5 displays Key Plus and first year Key only observed and predicted persistence to third fall. The predicted values are based on IPW and weighted logistic regression; persistence is averaged across time for both groups. The predicted value in Table 5 assumes non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 5: Key Plus and First Year Key Only 3rd Fall Persistence, Observed vs. Predicted Values, FA06-FA16 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=480)	First Year Key Only (N=2,677)	Difference	Key Plus	First Year Key Only	Difference
3rd Fall Persistence	96.0%	93.0%	3.0*	96.1%	93.3%	2.8*

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Persistence is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

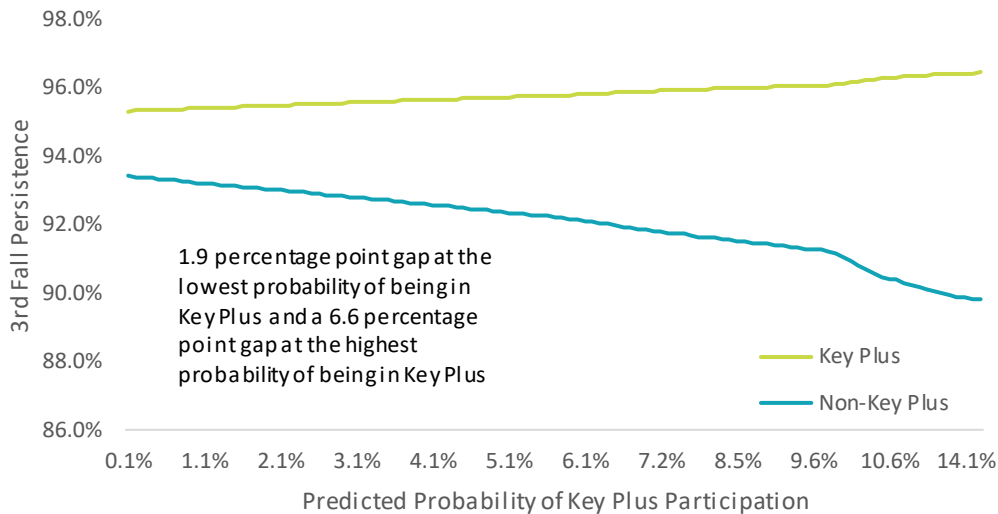
Key Plus participants persist to third fall at a significantly higher rate than first year Key only by 3 PP; once weighted and modeled, this difference decreases slightly but remains significant.

Differential Treatment Effect

The original purpose of Key Plus is to decrease the graduation rate gaps across demographic variables. Therefore, it is also important to assess whether the treatment effect of Key Plus varies based on a student's likelihood to be a Key Plus participant. Figure 3 displays predicted third fall persistence rates by the predicted

probability of being in Key Plus among second year students who persist to the end of their second spring. See Appendix A, Table A-17 for full model results.

Figure 3: Third Fall Persistence by Predicted Probability of Key Plus Participation, FA06-FA16 FTFT Cohorts



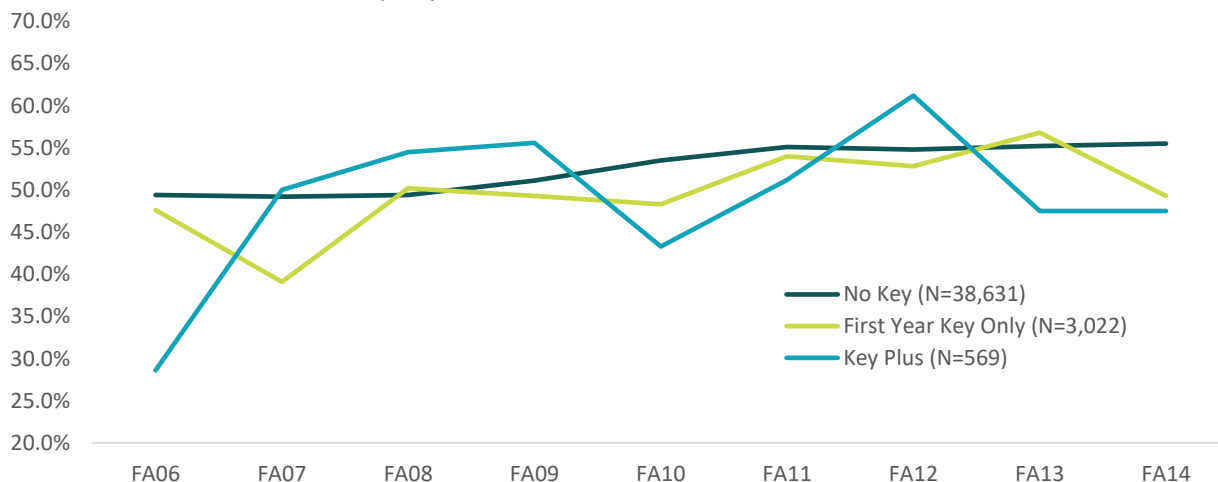
The association of the Key Plus program with persistence is slightly higher for students that have a higher probability of participating in Key Plus. In Figure 3, the x-axis shows the range of probabilities for the likelihood of being in Key Plus while the y-axis displays predicted third fall persistence. For students with a low probability of participating in Key Plus, the association with Key Plus is relatively small. Participation in Key Plus increases predicted persistence by about 2 percentage points. However, as a student’s probability of participation in Key Plus increases, so does the magnitude of the association. For a student with a high likelihood of being Key Plus (traditionally underserved populations) there is a 6.6 percentage point increase in predicted persistence to third fall.

Four-Year Graduation

Observed 4-Year Graduation Rates

Figure 4 displays four-year graduation rates by cohort term and Key status among students who persisted to the end of their second spring.

Figure 4: 4-Year Graduation Rates by Key Status, FA06-FA14 FTFT Cohorts



Four-year graduation rates have fluctuated across time for Key Plus students, remaining within about 10 percentage points or less of the No Key average. Similar to third fall persistence and second spring end of term GPA, FA08 and FA09 cohorts’ average rates exceeded both comparison groups, with the FA10 cohort dropping below No Key and First Year Key Only. The FA12 cohort had the highest four-year graduation rate within this timeframe at 61%, exceeding all other groups. Rates have fallen below the No Key average (-7 PP) for the two most recent cohorts.

Predicted 4-Year Graduation Rates

Table 6 displays Key Plus and non-Key Plus observed and predicted four-year graduation rates. Predicted values are based on IPW and weighted logistic regression; graduation is averaged across time for both groups. The predicted values in Table 6 assumes non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 6: Key Plus and Non-Key Plus 4-Year Graduation Rates, Observed vs. Predicted Values, FA06-FA14 FTFT Cohorts¹

	Observed			Predicted (Weighted Model) ²		
	Key Plus (N=373)	Non-Key Plus (N=30,428)	Difference	Key Plus	Non-Key Plus	Difference
4-Year Graduation	51.0%	52.0%	-1.0	51.6%	47.3%	4.3

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Graduation is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

Key Plus participants have a similar observed four-year graduation rate compared to non-Key Plus students. Once weighted and modeled, the predicted rate for non-Key Plus students decreased, creating a predicted positive gap of 4.3 PP. This difference has practical importance even though it is not statistically significant (most likely due to there only being 373 Key Plus students who have had the opportunity to graduate within 4 years).

Table 7 displays Key Plus and First Year Key Only observed and predicted four-year graduation rates. Predicted values are based on IPW and weighted logistic regression; graduation is averaged across time for both groups. The predicted values assume non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 7: Key Plus and First Year Key Only 4-Year Graduation Rates, Observed vs. Predicted Values, FA06-FA14 FTFT Cohorts¹

	Observed			Predicted (Weighted Model) ²		
	Key Plus (N=365)	First Year Key Only (N=2,081)	Difference	Key Plus	First Year Key Only	Difference
4-Year Graduation	51.0%	50.0%	1.0	49.2%	46.8%	2.4

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Graduation is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

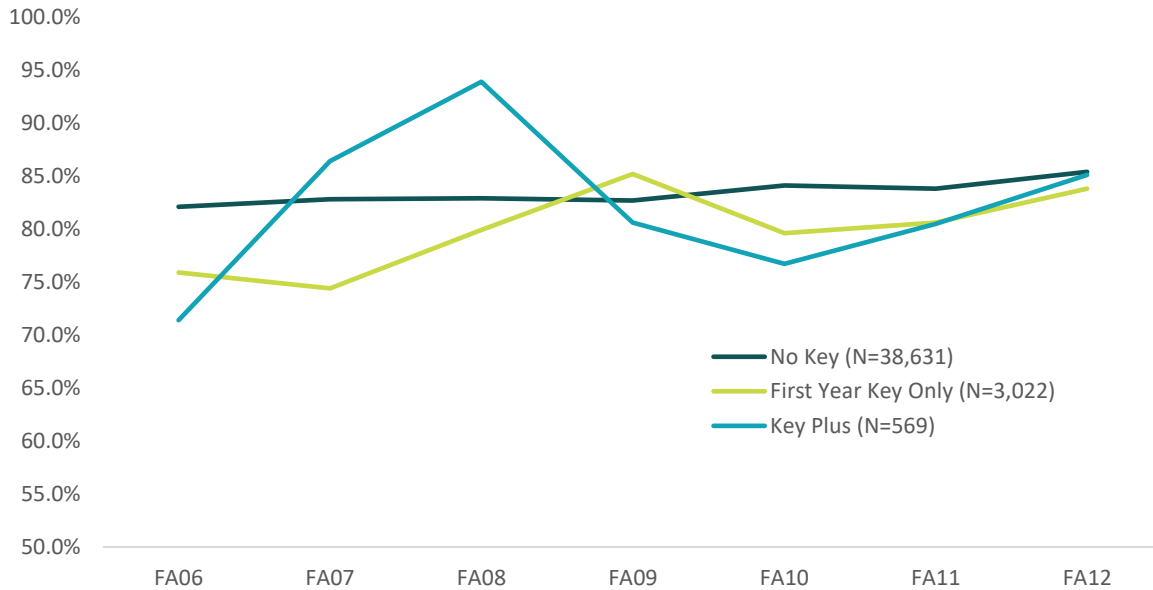
The observed four-year graduation rates for Key Plus and First Year Key Only students are nearly equal; once weighted and modeled, Key Plus students predicted rate exceeds First Year Key Only by 2.4 PP. Similar to Key Plus v. No Key Plus (Table 6), this difference is non-significant.

Six-Year Graduation

Observed Six-Year Graduation Rates

Figure 5 displays the observed six-year graduation rates by cohort term and Key status among students who persisted to the end of their second spring.

Figure 5: 6-Year Graduation Rates by Key Status, FA06-FA12 FTFT Cohorts



Key Plus six-year graduation rates peaked with the FA08 cohort, exceeding the No Key average by about 11 PP and the First Year Key Only average by about 14 PP. After falling below both comparison groups in cohorts FA09-FA11, the most recent Key Plus cohort’s graduation rate is nearly equal to the No Key and First Year Key Only averages.

Predicted Six-Year Graduation Rates

Table 8 displays Key Plus and non-Key Plus observed and predicted six-year graduation rates. Predicted values are based on IPW and weighted logistic regression; graduation is averaged across time for both groups. The predicted values assume non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 8: Key Plus and Non-Key Plus 6-Year Graduation Rates, Observed vs. Predicted Values, FA06-FA12 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=270)	Non-Key Plus (N=23,460)	Difference	Key Plus	Non-Key Plus	Difference
6-Year Graduation	83.0%	83.0%	0.0	86.0%	83.0%	3.0

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Graduation is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

While no difference exists between observed graduation rates, once modeled, the predicted rate for Key Plus students increases from 83% to 86%, 3 PP above the non-Key Plus predicted rate. Even though this predicted difference is not statistically significant, it is a substantial practical difference.

Table 9 displays Key Plus and First Year Key Only observed and predicted six-year graduation rates. Predicted values are based on IPW and weighted logistic regression; graduation is averaged across time for both groups. The model assumes non-Pell, continuing generation, non-racially minoritized, and resident status, with an average CDHE Index of 110. See Appendix A for complete model results.

Table 9: Key Plus and First Year Key Only 6-Year Graduation Rates, Observed vs. Predicted Values, FA06-FA12 FTFT Cohorts¹

	Observed			Predicted (Weighted Models) ²		
	Key Plus (N=266)	First Year Key Only (N=1,541)	Difference	Key Plus	First Year Key Only	Difference
6-Year Graduation	83.0%	80.0%	3.0	86.1%	82.7%	3.4

*p<.05

¹Limited to students who persisted to the end of their second spring term.

²Predicted values based on IPW-weighted regression models. Graduation is modeled using weighted logistic regression, controlling for CDHE Index, racially minoritized status, sex, Pell recipient status, nonresident status, and First Gen status.

The observed 6-year graduation rates for Key Plus students is 3 PP higher than First Year Key Only students. After weighting and modeling, graduation rates for both groups increased, increasing the positive percentage point gap for Key Plus students (3.4 PP). Neither the observed nor the predicted difference in graduation rates are statistically significant. However, it is practically significant.

Conclusions

Similar to the first year Key program, Key Plus serves a very diverse population with a large proportion of Colorado residents, Pell recipients, first generation, and female-identified students. Among participants who persist to the end of their second spring, the program has a small yet significant positive association on predicted end of term cumulative GPA and predicted persistence to third fall compared to a statistically similar population of non-Key Plus second year students. The probability of being in Key Plus is also positively associated with third fall persistence, meaning that as the likelihood of Key Plus participation increases, the larger the association between Key Plus and persistence to third fall. This finding suggests that Key Plus is positively associated with student success for the intended target population.

Similar to the relationship between Key Plus and no Key Plus, small yet positive associations were observed for second spring EOT GPA and third fall persistence when comparing Key Plus to statistically similar First Year Key Only students.

Despite lack of statistical significance, predicted four- and six-year graduation rates are slightly higher for Key Plus compared to both non-Key Plus and First Year Key Only. Key Plus is a promising strategy for improving overall success for historically underrepresented students.

Appendix A

Table A-1. Demographic Characteristics by Key Status and Cohort Term, FA06-FA17 FTFT Cohorts

		Headcount	% Pell Recipient	% Racially Minoritized	% Female	% Nonresident	% First Gen	Avg CDHE Index
FA06	No Key	2856	11.9%	11.9%	57.5%	18.4%	25.5%	114.1
	First Year Key Only	170	23.5%	38.8%	77.1%	22.9%	37.1%	111.3
	Key and Key Plus	7	57.1%	57.1%	85.7%	14.3%	28.6%	114.0
	Key Plus Only	0	.	.	.	.	.	.
	Key Plus LEADS	0	.	.	.	.	.	.
FA07	No Key	3075	12.7%	12.1%	54.1%	19.7%	22.7%	114.4
	First Year Key Only	216	20.8%	35.6%	64.4%	22.7%	28.7%	111.2
	Key and Key Plus	22	27.3%	45.5%	81.8%	4.5%	40.9%	110.1
	Key Plus Only	0	.	.	.	.	.	.
	Key Plus LEADS	0	.	.	.	.	.	.
FA08	No Key	3149	12.5%	10.4%	54.7%	19.2%	21.7%	114.3
	First Year Key Only	231	24.7%	35.1%	61.0%	20.3%	34.6%	111.8
	Key and Key Plus	33	45.5%	63.6%	69.7%	6.1%	45.5%	108.7
	Key Plus Only	1	0.0%	0.0%	0.0%	0.0%	0.0%	97.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA09	No Key	3104	15.6%	12.7%	55.5%	20.8%	21.6%	115.7
	First Year Key Only	223	34.1%	39.0%	61.0%	16.6%	38.1%	111.5
	Key and Key Plus	36	50.0%	63.9%	83.3%	8.3%	61.1%	109.1
	Key Plus Only	0	.	.	.	.	.	.
	Key Plus LEADS	0	.	.	.	.	.	.
FA10	No Key	3136	19.5%	12.6%	55.3%	19.7%	20.1%	115.6
	First Year Key Only	240	34.6%	44.2%	55.4%	18.8%	31.3%	112.1
	Key and Key Plus	60	66.7%	61.7%	78.3%	8.3%	53.3%	110.1
	Key Plus Only	1	0.0%	0.0%	100.0%	0.0%	0.0%	129.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA11	No Key	3244	20.8%	14.9%	55.4%	23.2%	21.1%	116.2
	First Year Key Only	248	40.3%	52.8%	62.1%	14.1%	44.8%	112.6
	Key and Key Plus	41	48.8%	68.3%	63.4%	14.6%	43.9%	112.5
	Key Plus Only	1	100.0%	100.0%	100.0%	0.0%	100.0%	103.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA12	No Key	3375	19.8%	16.3%	54.7%	25.1%	22.7%	115.9
	First Year Key Only	216	34.3%	42.1%	64.4%	14.8%	38.9%	113.0
	Key and Key Plus	67	47.8%	67.2%	70.1%	17.9%	49.3%	112.8
	Key Plus Only	1	0.0%	100.0%	0.0%	0.0%	0.0%	93.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA13	No Key	3246	17.7%	17.0%	54.1%	25.7%	20.1%	116.3
	First Year Key Only	266	42.5%	46.2%	67.7%	19.9%	39.1%	113.4
	Key and Key Plus	40	80.0%	65.0%	70.0%	5.0%	60.0%	107.8
	Key Plus Only	1	0.0%	0.0%	100.0%	0.0%	100.0%	108.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA14	No Key	3180	17.1%	16.8%	54.4%	27.1%	19.4%	116.5
	First Year Key Only	272	30.9%	41.9%	62.1%	22.1%	37.1%	111.9

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		Headcount	% Pell Recipient	% Racially Minoritized	% Female	% Nonresident	% First Gen	Avg CDHE Index
	Key and Key Plus	59	66.1%	71.2%	74.6%	11.9%	61.0%	109.5
	Key Plus Only	3	66.7%	33.3%	66.7%	33.3%	33.3%	104.0
	Key Plus LEADS	0	.	.	.	.	.	.
FA15	No Key	3422	17.0%	18.1%	52.5%	29.8%	22.2%	116.3
	First Year Key Only	281	34.9%	40.2%	58.0%	19.2%	39.5%	111.7
	Key and Key Plus	39	51.3%	51.3%	84.6%	20.5%	43.6%	113.2
	Key Plus Only	1	100.0%	0.0%	100.0%	0.0%	0.0%	102.0
	Key Plus LEADS	23	56.5%	56.5%	91.3%	21.7%	65.2%	110.2
FA16	No Key	3409	16.3%	19.9%	56.9%	32.1%	17.3%	117.6
	First Year Key Only	314	41.4%	53.8%	60.2%	21.0%	46.8%	110.6
	Key and Key Plus	21	76.2%	81.0%	66.7%	4.8%	76.2%	108.3
	Key Plus Only	1	0.0%	0.0%	0.0%	0.0%	0.0%	108.0
	Key Plus LEADS	35	62.9%	85.7%	71.4%	5.7%	54.3%	108.9
FA17	No Key	3435	16.2%	20.6%	54.5%	34.5%	16.4%	117.4
	First Year Key Only	345	40.6%	54.8%	56.8%	19.4%	41.2%	111.2
	Key and Key Plus	51	76.5%	86.3%	64.7%	5.9%	68.6%	110.3
	Key Plus Only	2	50.0%	100.0%	50.0%	50.0%	0.0%	110.0
	Key Plus LEADS	23	69.6%	91.3%	65.2%	0.0%	87.0%	109.4

Table A-2. Student Success Outcomes by Key Status and Cohort Year, FA06-FA17 FTFT Cohorts

		Headcount	Avg 2nd Spring Cum GPA	% 3rd Fall Persist	% 4 Yr Grad	% 6 Yr Grad
FA06	No Key	2856	2.94	91.4%	49.4%	82.1%
	First Year Key Only	170	2.90	89.4%	47.6%	75.9%
	Key and Key Plus	7	3.14	85.7%	28.6%	71.4%
	Key Plus Only	0	.	.	.	.
	Key Plus LEADS	0	.	.	.	.
FA07	No Key	3075	2.94	92.0%	49.2%	82.8%
	First Year Key Only	216	2.85	90.3%	39.1%	74.4%
	Key and Key Plus	22	2.93	90.9%	50.0%	86.4%
	Key Plus Only	0	.	.	.	.
	Key Plus LEADS	0	.	.	.	.
FA08	No Key	3149	2.96	93.4%	49.4%	82.9%
	First Year Key Only	231	2.98	92.2%	50.2%	79.9%
	Key and Key Plus	33	3.12	100.0%	54.5%	93.9%
	Key Plus Only	1	2.98	100.0%	100.0%	100.0%
	Key Plus LEADS	0	.	.	.	.
FA09	No Key	3104	3.00	92.3%	51.1%	82.7%
	First Year Key Only	223	2.91	91.9%	49.3%	85.2%
	Key and Key Plus	36	3.09	100.0%	55.6%	80.6%
	Key Plus Only	0	.	.	.	.
	Key Plus LEADS	0	.	.	.	.
FA10	No Key	3136	3.00	92.9%	53.5%	84.1%
	First Year Key Only	240	2.89	92.5%	48.3%	79.6%
	Key and Key Plus	60	2.91	91.7%	43.3%	76.7%
	Key Plus Only	1	2.79	100.0%	100.0%	100.0%
	Key Plus LEADS	0	.	.	.	.
FA11	No Key	3244	3.02	94.0%	55.1%	83.8%
	First Year Key Only	248	2.93	94.8%	54.0%	80.6%
	Key and Key Plus	41	3.04	97.6%	51.2%	80.5%
	Key Plus Only	1	2.82	100.0%	100.0%	100.0%
	Key Plus LEADS	0	.	.	.	.
FA12	No Key	3375	3.02	94.4%	54.8%	85.4%
	First Year Key Only	216	3.02	94.4%	52.8%	83.8%
	Key and Key Plus	67	3.01	95.5%	61.2%	85.1%
	Key Plus Only	1	3.10	100.0%	100.0%	100.0%
	Key Plus LEADS	0	.	.	.	.
FA13	No Key	3246	3.02	94.0%	55.2%	.
	First Year Key Only	266	3.04	96.2%	56.8%	.
	Key and Key Plus	40	3.07	95.0%	47.5%	.
	Key Plus Only	1	2.24	100.0%	0.0%	.
	Key Plus LEADS	0	.	.	.	.
FA14	No Key	3180	3.05	94.5%	55.5%	.
	First Year Key Only	272	2.96	93.0%	49.3%	.
	Key and Key Plus	59	2.99	96.6%	47.5%	.
	Key Plus Only	3	2.96	100.0%	66.7%	.

		Headcount	Avg 2nd Spring Cum GPA	% 3rd Fall Persist	% 4 Yr Grad	% 6 Yr Grad
	Key Plus LEADS	0	.	.	.	.
FA15	No Key	3422	3.03	94.6%	.	.
	First Year Key Only	281	2.97	93.2%	.	.
	Key and Key Plus	39	3.06	94.9%	.	.
	Key Plus Only	1	3.12	100.0%	.	.
	Key Plus LEADS	23	3.10	95.7%	.	.
FA16	No Key	3409	3.09	94.0%	.	.
	First Year Key Only	314	2.91	91.1%	.	.
	Key and Key Plus	21	2.98	100.0%	.	.
	Key Plus Only	1	3.28	100.0%	.	.
	Key Plus LEADS	35	2.84	94.3%	.	.
FA17	No Key	3435	3.07	.	.	.
	First Year Key Only	345	2.93	.	.	.
	Key and Key Plus	51	3.04	.	.	.
	Key Plus Only	2	1.92	.	.	.
	Key Plus LEADS	23	2.91	.	.	.

Table A-3. Aggregated Student Success Outcomes by Historically Underrepresented Attributes and Key Status, FA06-FA17 FTFT Cohorts

		Headcount	Avg 2nd Spring Cum GPA	% 3rd Fall Persist	% 4 Yr Grad	% 6 Yr Grad
Racially Minoritized	No Key	3,731	2.96	92.3%	49.5%	79.4%
	First Year Key Only	518	2.87	91.6%	49.9%	83.8%
	Key and Key Plus	93	3.02	96.7%	56.0%	86.5%
	Key Plus Only	2	1.87	100.0%	100.0%	100.0%
	Key Plus LEADS	7	3.16	100.0%	.	.
Cohort Pell Recipient	No Key	4,405	2.97	92.1%	47.2%	80.2%
	First Year Key Only	419	2.89	93.2%	44.0%	76.9%
	Key and Key Plus	97	3.05	96.6%	46.8%	86.9%
	Key Plus Only	3	3.21	100.0%	100.0%	.
	Key Plus LEADS	12	3.06	100.0%	.	.
First Generation	No Key	11,646	2.89	91.3%	46.8%	78.5%
	First Year Key Only	1,355	2.85	91.3%	45.3%	76.0%
	Key and Key Plus	320	2.93	93.3%	39.7%	74.5%
	Key Plus Only	3	2.45	100.0%	66.7%	100.0%
	Key Plus LEADS	54	2.89	91.2%	.	.

Table A-4. Aggregated Student Success Outcomes by Number of Historically Underrepresented Attributes¹ and Key Status, FA06-FA17 FTFT Cohorts

		Headcount	Avg 2nd Spring Cum GPA	% 3rd Fall Persist	% 4 Yr Grad	% 6 Yr Grad
0 Attributes	No Key	32,992	3.04	93.3%	52.3%	84.5%
	First Year Key Only	1,289	3.05	91.6%	51.4%	79.9%
	Key and Key Plus	100	3.30	97.9%	64.3%	91.8%
	Key Plus Only	4	3.09	100.0%	66.7%	100.0%
	Key Plus LEADS	8	2.86	100.0%	.	.
1 Attribute	No Key	13,708	2.95	91.9%	49.2%	80.1%
	First Year Key Only	1,011	2.93	92.0%	50.6%	83.1%
	Key and Key Plus	160	3.05	96.8%	54.5%	83.6%
	Key Plus Only	5	2.48	100.0%	66.7%	100.0%
	Key Plus LEADS	15	2.97	85.7%	.	.
2 or More Attributes ²	No Key	6,074	2.85	91.1%	43.2%	76.5%
	First Year Key Only	1,281	2.81	91.4%	42.3%	73.5%
	Key and Key Plus	350	2.94	93.5%	39.0%	77.1%
	Key Plus Only	3	2.77	100.0%	100.0%	100.0%
	Key Plus LEADS	58	2.94	97.3%	.	.

¹Attributes include racially minoritized status, cohort Pell recipient status, and first generation status.

²Includes all second year students who persisted to the end of their second spring with any combination of two or more attributes.

Table A-5. Second Year Key Plus and Non-Key Plus Student Demographics, Observed and with Inverse Propensity Weighting (IPW)

	Observed		With IPW	
	Non-Key Plus (N=41163)	Key Plus (N=568)	Non-Key Plus (N=565)	Key Plus (N=568)
CDHE Index (SE)	115.6 (0.06)	110.3 (0.41)*	110.3 (0.41)	110.3 (0.41)
Racially Minoritized (SE)	0.18 (0.00)	0.68 (0.02)*	0.68 (0.02)	0.68 (0.02)
Female (SE)	0.55 (0.00)	0.73 (0.02)*	0.73 (0.02)	0.73 (0.02)
Cohort Pell Recipient (SE)	0.18 (0.00)	0.59 (0.02)*	0.59 (0.02)	0.59 (0.02)
First generation (SE)	0.22 (0.00)	0.56 (0.02)*	0.55 (0.02)	0.56 (0.02)
Nonresident (SE)	0.24 (0.00)	0.11 (0.01)*	0.10 (0.01)	0.11 (0.01)
CDHE Index ² (SE)	13496.2 (13.2)	12254.2 (92.4)*	12250.4 (92.4)	12254.2 (92.4)

*p < .05

Table A-6. Propensity Model Predicting Key Plus Membership Among All Second Year Students¹

	B	S.E.	Wald	df	Sig.	Odds Ratio
CDHE Index	0.25	0.08	9.8	1	.002	1.29
Racially Minoritized	1.74	0.10	315.5	1	.000	5.67
Female	0.71	0.10	52.4	1	.000	2.02
Cohort Pell Recipient	1.08	0.10	123.7	1	.000	2.94
First Generation	0.46	0.10	23.4	1	.000	1.59
Nonresident	-0.53	0.14	14.1	1	.000	0.59
CDHE Index ²	0.00	0.00	11.7	1	.001	1.00
Constant	-18.67	4.53	17.0	1		

¹Limited to those students who persisted to the end of their second spring term.

Table A-7. Weighted Least Squares Regression Model Predicting 2nd Spring EOT Cumulative GPA for 2nd Year Key Plus Students

	B	SE	Beta	t	Sig.	95% CI for B	
						Lower	Upper
Intercept	0.49	0.03		16.29			
Key Plus	0.15	0.01	0.14	30.93	.000	0.15	0.16
CDHE Index	0.02	0.00	0.38	82.70	.000	0.02	0.02
Racially Minoritized	-0.08	0.01	-0.07	-14.18	.000	-0.09	-0.07
Female	0.13	0.01	0.11	23.60	.000	0.12	0.15
Cohort Pell Recipient	-0.02	0.01	-0.02	-3.00	.003	-0.03	-0.01
First Generation	-0.08	0.01	-0.07	-13.57	.000	-0.09	-0.07
Nonresident	-0.15	0.01	-0.08	-17.28	.000	-0.16	-0.13

Weighted N=40027

F(7,40020)=1456.5

Adjusted R²=0.203

Table A-8. Weighted Logistic Regression Model Predicting 3rd Fall Persistence for 2nd Year Key Plus Students

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-1.17	1.05	-3.23	0.90	-1.11	36456				
Key Plus	0.63	0.23	0.19	1.08	2.77	36456	.006	1.88	1.20	2.94
CDHE Index	0.04	0.01	0.02	0.05	3.73	36456	.000	1.04	1.02	1.05
Racially Minoritized	0.25	0.22	-0.18	0.67	1.14	36456	.255	1.28	0.84	1.95
Female	0.22	0.20	-0.17	0.61	1.11	36456	.266	1.25	0.84	1.85
Cohort Pell Recipient	-0.16	0.18	-0.52	0.20	-0.88	36456	.377	0.85	0.59	1.22
First Generation	-0.40	0.19	-0.78	-0.02	-2.06	36456	.039	0.67	0.46	0.98
Nonresident	-0.81	0.25	-1.29	-0.32	-3.27	36456	.001	0.45	0.28	0.72

Weighted N=1017

Pseudo R²=0.044

Table A-9. Weighted Logistic Regression Model Predicting 4 Year Graduation, Key Plus v. Non-Key Plus Students

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-2.65	0.63	-3.89	-1.42	-4.21	29390				
Key Plus	0.17	0.11	-0.04	0.39	1.58	29390	.114	1.19	0.96	1.48
CDHE Index	0.02	0.01	0.01	0.03	4.12	29390	.000	1.02	1.01	1.03
Racially Minoritized	-0.18	0.12	-0.41	0.05	-1.55	29390	.122	0.83	0.66	1.05
Female	0.73	0.12	0.49	0.98	5.90	29390	.000	2.08	1.63	2.65
Cohort Pell Recipient	-0.39	0.12	-0.62	-0.16	-3.32	29390	.001	0.68	0.54	0.85
First Generation	-0.24	0.12	-0.46	-0.01	-2.04	29390	.041	0.79	0.63	0.99
Nonresident	-0.36	0.18	-0.70	-0.02	-2.05	29390	.041	0.70	0.50	0.99

Weighted N=769

Pseudo R²=0.079

Table A-10. Weighted Logistic Regression Model Predicting 6 Year Graduation, Key Plus Students v. Non-Key Plus

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-1.62	0.89	-3.37	0.13	-1.82	22738				
Key Plus	0.23	0.17	-0.10	0.56	1.37	22738	.172	1.26	0.90	1.76
CDHE Index	0.03	0.01	0.01	0.05	3.75	22738	.000	1.03	1.01	1.05
Racially Minoritized	-0.07	0.17	-0.39	0.26	-0.40	22738	.691	0.94	0.68	1.30
Female	0.26	0.17	-0.06	0.58	1.58	22738	.114	1.30	0.94	1.79
Cohort Pell Recipient	-0.22	0.16	-0.54	0.09	-1.38	22738	.169	0.80	0.59	1.10
First Generation	-0.48	0.17	-0.80	-0.15	-2.88	22738	.004	0.62	0.45	0.86
Nonresident	-0.38	0.23	-0.83	0.06	-1.69	22738	.091	0.68	0.44	1.06

Weighted N=565

Pseudo R²=0.052

Table A-11. First Year Key Only and Key Plus Student Demographics, Observed and with Inverse Propensity Weighting (IPW)

	Observed		With IPW	
	First Year Key Only (N=3013)	Key Plus (N=551)	Non-Key Plus (N=548)	Key Plus (N=551)
CDHE Index (SE)	111.8 (0.19)	110.4 (0.42)*	110.4 (0.42)	110.4 (0.42)
Racially Minoritized (SE)	0.45 (0.01)	0.68 (0.02)*	0.69 (0.02)	0.68 (0.02)
Female (SE)	0.62 (0.01)	0.74 (0.02)*	0.74 (0.02)	0.74 (0.02)
Cohort Pell Recipient (SE)	0.34 (0.01)	0.59 (0.02)*	0.60 (0.02)	0.59 (0.02)
First generation (SE)	0.39 (0.01)	0.56 (0.02)*	0.56 (0.02)	0.56 (0.02)
Nonresident (SE)	0.19 (0.01)	0.11 (0.01)*	0.10 (0.01)	0.11 (0.01)
CDHE Index ² (SE)	12609.8(41.9)	12284.2 (93.8)*	12294.6 (94.4)	12284.2 (93.8)

*p < .05

Table A-12. Propensity Model Predicting Key Plus Participation Among First Year Key Students¹

	B	S.E.	Wald	df	Sig.	Odds Ratio
CDHE Index	0.01	0.09	0.01	1	.943	1.01
Racially Minoritized	0.66	0.11	35.68	1	.000	1.93
Female	0.51	0.11	22.82	1	.000	1.67
Cohort Pell Recipient	0.67	0.11	38.36	1	.000	1.95
First Generation	0.17	0.11	2.46	1	.116	1.18
Nonresident	-0.36	0.15	5.59	1	.018	0.70
CDHE Index ²	0.00	0.00	0.01	1	.930	1.00
Constant	-3.06	5.23	0.34	1		

¹Limited to those students who persisted to the end of their second spring term.

Table A-13. Weighted Least Squares Regression Model Predicting 2nd Spring EOT Cumulative GPA, Key Plus v. First Year Key Only Students

	B	SE	Beta	t	Sig.	95% CI for B	
						Lower	Upper
Intercept	0.48	0.10		4.70			
Key Plus	0.13	0.02	0.11	7.52	.000	0.09	0.16
CDHE Index	0.02	0.00	0.39	25.29	.000	0.02	0.02
Racially Minoritized	-0.09	0.02	-0.08	-4.64	.000	-0.13	-0.05
Female	0.14	0.02	0.11	7.12	.000	0.10	0.17
Cohort Pell Recipient	-0.02	0.02	-0.01	-0.85	.393	-0.05	0.02
First Generation	-0.08	0.02	-0.07	-4.26	.000	-0.12	-0.04
Nonresident	-0.13	0.03	-0.07	-4.74	.000	-0.19	-0.08

Weighted N=3,500

F(7,3493)=139.1

Adjusted R²=0.216

Table A-14. Weighted Logistic Regression Model Predicting 3rd Fall Persistence, Key Plus v. First Year Key Only

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-1.23	1.27	-3.72	1.25	-0.97	3090				
Key Plus	0.58	0.24	0.11	1.05	2.41	3090	.016	2.03	1.39	2.96
CDHE Index	0.04	0.01	0.01	0.06	3.15	3090	.002	1.03	1.02	1.05
Racially Minoritized	0.43	0.25	-0.07	0.93	1.69	3090	.091	1.37	0.95	1.99
Female	0.12	0.24	-0.36	0.60	0.50	3090	.616	1.33	0.95	1.87
Cohort Pell Recipient	-0.14	0.22	-0.57	0.29	-0.63	3090	.527	1.11	0.79	1.57
First Generation	-0.49	0.23	-0.95	-0.03	-2.09	3090	.037	0.58	0.40	0.84
Nonresident	-0.74	0.30	-1.32	-0.15	-2.47	3090	.014	0.48	0.31	0.75

Weighted N=958

Pseudo R²=0.047

Table A-15. Weighted Logistic Regression Model Predicting 4 Year Graduation, Key Plus v. First Year Key Only

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-3.00	0.74	-4.45	-1.56	-4.07	2391	.000			
Key Plus	0.10	0.12	-0.14	0.34	0.81	2391	.415	1.15	0.91	1.46
CDHE Index	0.03	0.01	0.01	0.04	4.09	2391	.000	1.03	1.01	1.04
Racially Minoritized	-0.12	0.14	-0.39	0.14	-0.91	2391	.364	0.88	0.68	1.14
Female	0.73	0.14	0.46	1.01	5.18	2391	.000	2.06	1.57	2.71
Cohort Pell Recipient	-0.38	0.14	-0.64	-0.12	-2.83	2391	.005	0.73	0.56	0.95
First Generation	-0.26	0.13	-0.52	0.00	-1.96	2391	.051	0.76	0.59	0.98
Nonresident	-0.32	0.19	-0.70	0.06	-1.67	2391	.095	0.70	0.48	1.01

Weighted N=756

Pseudo R²=0.079

Table A-16. Weighted Logistic Regression Model Predicting 6 Year Graduation, Key Plus V. First Year Key Only

	B	SE	95% CI		t	df	Sig.	Odds Ratio	95% CI	
			Lower	Upper					Lower	Upper
Intercept	-2.53	1.09	-4.66	-0.39	-2.32	1774				
Key Plus	0.26	0.18	-0.10	0.62	1.42	1774	.157	1.07	0.76	1.50
CDHE Index	0.04	0.01	0.02	0.06	3.86	1774	.000	1.03	1.02	1.05
Racially Minoritized	0.13	0.20	-0.26	0.52	0.66	1774	.507	1.12	0.77	1.63
Female	0.14	0.20	-0.25	0.53	0.71	1774	.480	1.11	0.77	1.62
Cohort Pell Recipient	-0.27	0.19	-0.64	0.11	-1.40	1774	.162	0.89	0.62	1.29
First Generation	-0.41	0.19	-0.78	-0.03	-2.12	1774	.034	0.64	0.44	0.93
Nonresident	-0.14	0.28	-0.69	0.41	-0.51	1774	.611	0.86	0.50	1.45

Weighted N=539

Pseudo R²=0.042

Table A-17. Logistic Regression Model Predicting 3rd Fall Persistence by Probability of Key Plus Participation, Key Plus v. No Key Plus

	B	SE	Wald	df	Sig.	Odds Ratio
Key Plus	0.32	0.32	0.98	1	.324	1.37
Predicted probability of Key Plus participation	-3.19	0.76	17.72	1	.000	0.04
Predicted probability*Key Plus	5.10	4.12	1.53	1	.216	164.23
Constant	2.68	0.02	12462.74	1		

N=36,457

$\chi^2(3)=21.79, p < .05$

Pseudo R²=0.002