A decorative graphic on the left side of the slide. It features a diagonal line separating a dark blue upper section from a light yellow lower section. The dark blue section contains a cluster of yellow and orange stars of various sizes, some overlapping. The light yellow section contains the main text.

# Persistence Trajectories in Postsecondary Education: Implications for the Study of Beginning Community College Students



## The Study of Pathways in Community College Persistence:

‘Path’ and ‘pathways’ are frequently used terms in the study of higher education persistence

While the terms are used frequently, there has been little work done that explicitly characterized discrete pathways

There is a distinction between variables describing pathways and the path itself



## Persistence Typologies:

Adelman's (2005) identifies six populations: persistent with academic and occupational orientations; persistent with intermediate occupational goals; weak secondary school preparation that drops out; disappears at entry; temporary transfers; and reverse transfers

Goldrick-Rab (2006) defined pathways as four possible outcomes defined by the following pattern: continuous, single institution; continuous, multiple institutions; discontinuous, single institution; and discontinuous, multiple institutions.

Bailey, Alfonso, Scott, & Leinbach, 2004 (2004) and Alfonso (2006) coded pathway characteristics that consistently predicted attainment of educational goals in regression models as interrupted enrollment, full-time attendance, or delayed enrollment.



## Developing a typology of persistence pathways:

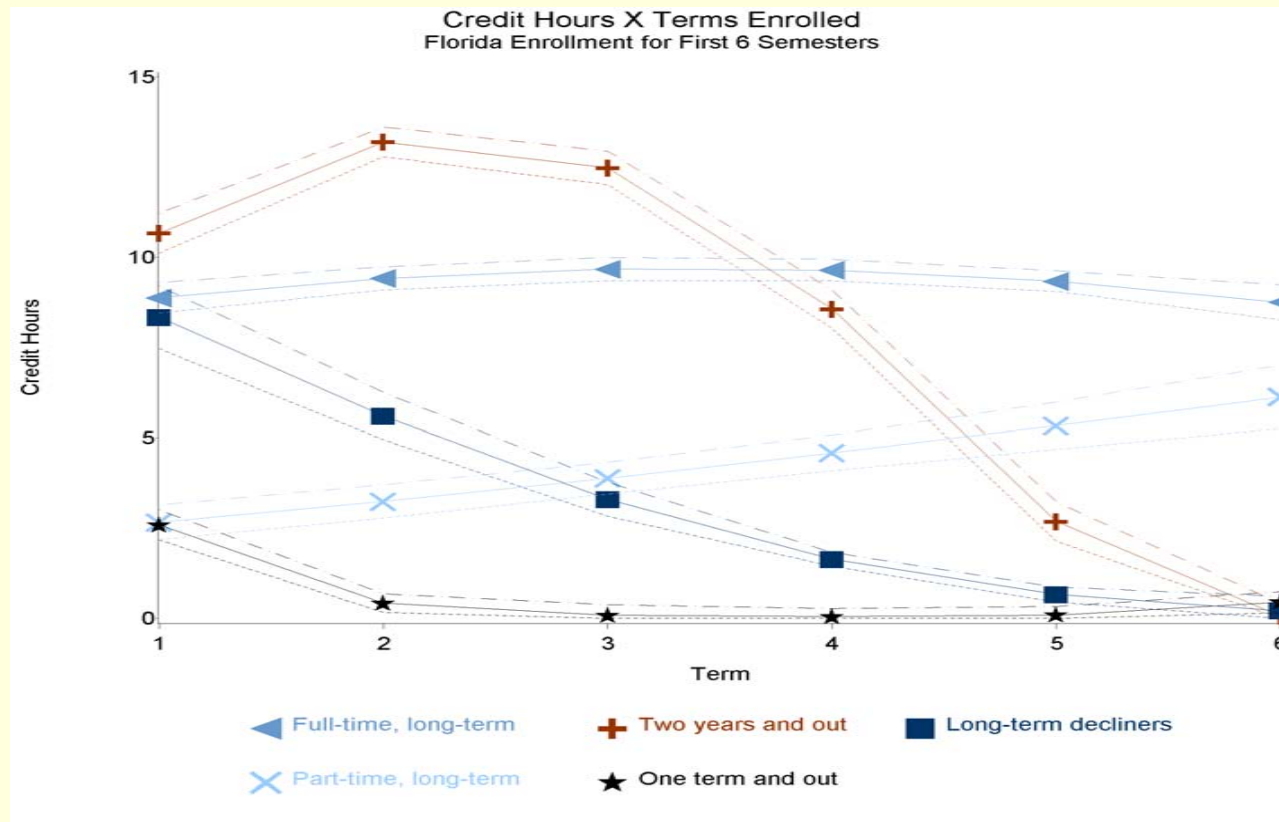
We must distinguish between the variables that describe pathway characteristics and the pathways themselves

The present study implements latent trajectory analysis to explicitly characterize postsecondary pathways

Latent trajectory analysis is a trend- or person-centered analysis (in contrast to variable-centered analyses)

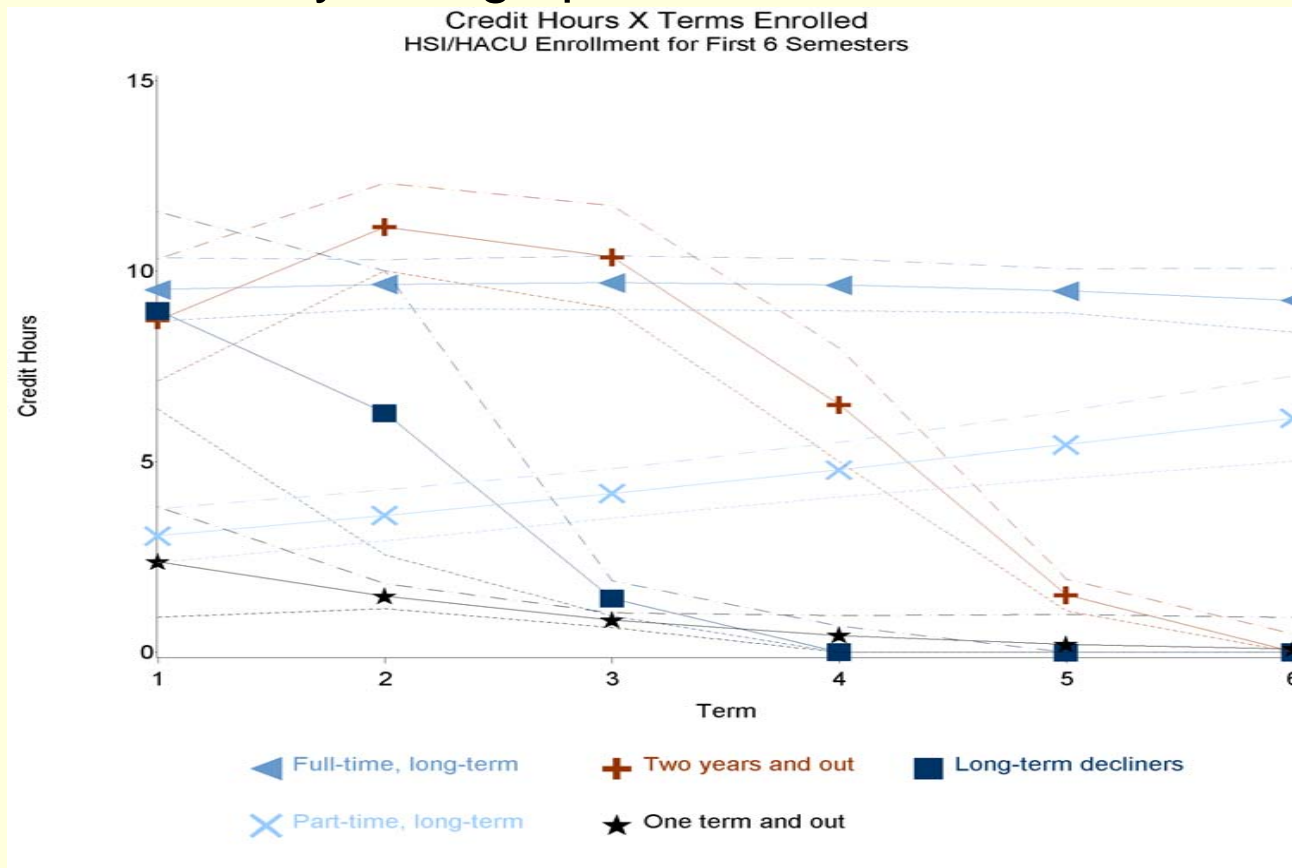


## Example of paths and pathway analyses in community college persistence:



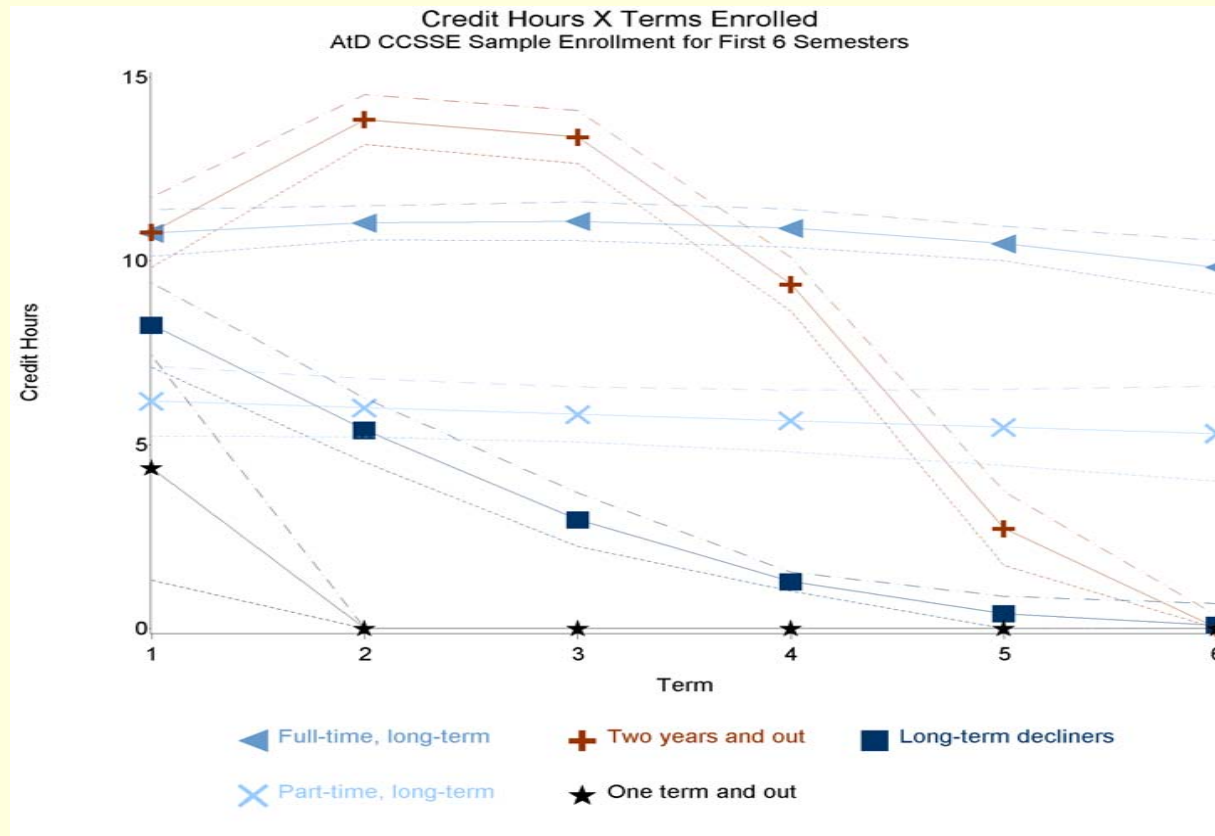


## Example of paths and pathway analyses in community college persistence:





## Example of paths and pathway analyses in community college persistence:





## Questions that emerged from the CCSSE trajectory models:

To what extent are models biased by sampling students already enrolled in college?

How would these models differ if the data were multi-institutional?

What is the impact of setting the starting point as the first enrolled date?

What is the impact of the three-year time frame on the model?



## Applications of Latent Trajectory Analysis:

Used extensively in the study of heterogeneous behaviors

Examples include:

- **substance use**
- **antisocial developmental behaviors**
- **depression**

In each of the above examples, the putative behavior being studied evolved over time and there were widely divergent paths



## Growth Curve analyses:

Hierarchical Linear Models

Latent growth curve analyses in the structural equation modeling framework

General latent modeling framework (GLMF)

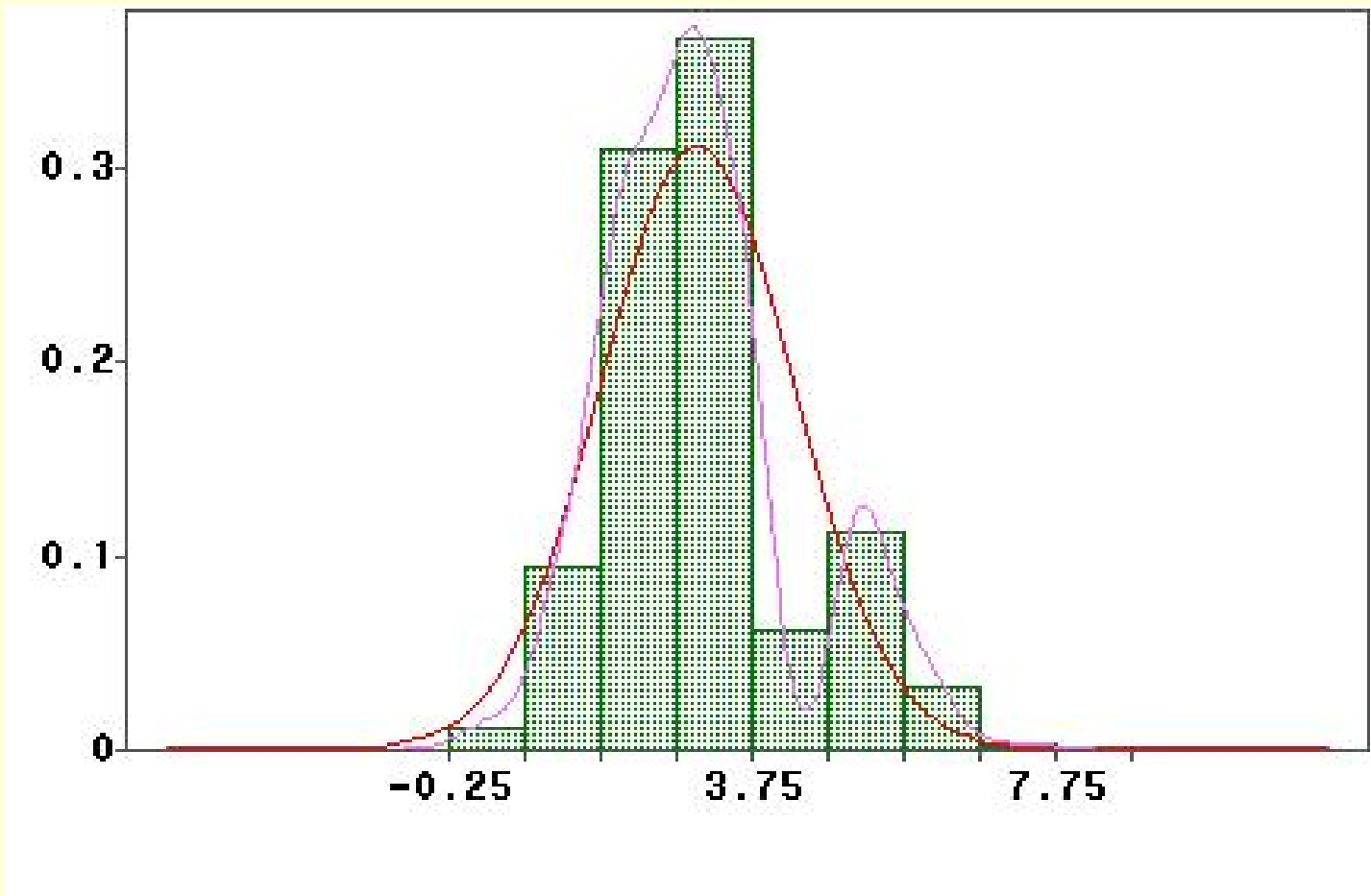


## Mixture Models:

Used in situations where frequency distributions are not well approximated by conventional probability distributions (normal, binomial, etc.)

Unobservable heterogeneity

Units belong to a set of classes that are not directly observable





## Controversies in Latent Class Growth Trajectories:

Two purposes (Bauer & Curran, 2003)

- **Identify qualitative distinct classes of people**
- **Intractable or complex distributions composed of a small number of simpler distributions**

Fit statistics don't discriminate between these possibilities

# Results

Nagin and Tremblay (2005) identify three potential problems with this a priori classifications:

- (1) groups are assumed a priori and therefore analyses do not test for the presence or absence of a group
- (2) Data can be over- or under-fit through identifying random variation or by missing rare but real patterns
- (3) There is no basis for calibrating the precision of a classification scheme



## The complexity of the defining pathways:

Before we begin plotting postsecondary pathways, we need to define some parameters

What is the start point?

What is the time frame?

Are pathways within or across institutions?



## Steps for creating latent trajectory groups:

Latent class growth analysis conducted on models ranging from 1 to 8 latent classes

Linear and quadratic terms considered

Bayesian Information criterion (BIC) and significance of time coefficients used to determine model with optimal number of latent classes



## Characteristics of the National Education Longitudinal Study and the Postsecondary Education Transcript Study Longitudinal Data:

Complete transcript data

Credit totals were derived for fall and spring terms

Models were based on the first sixteen fall and spring terms



## Models Based on the PETS Data:

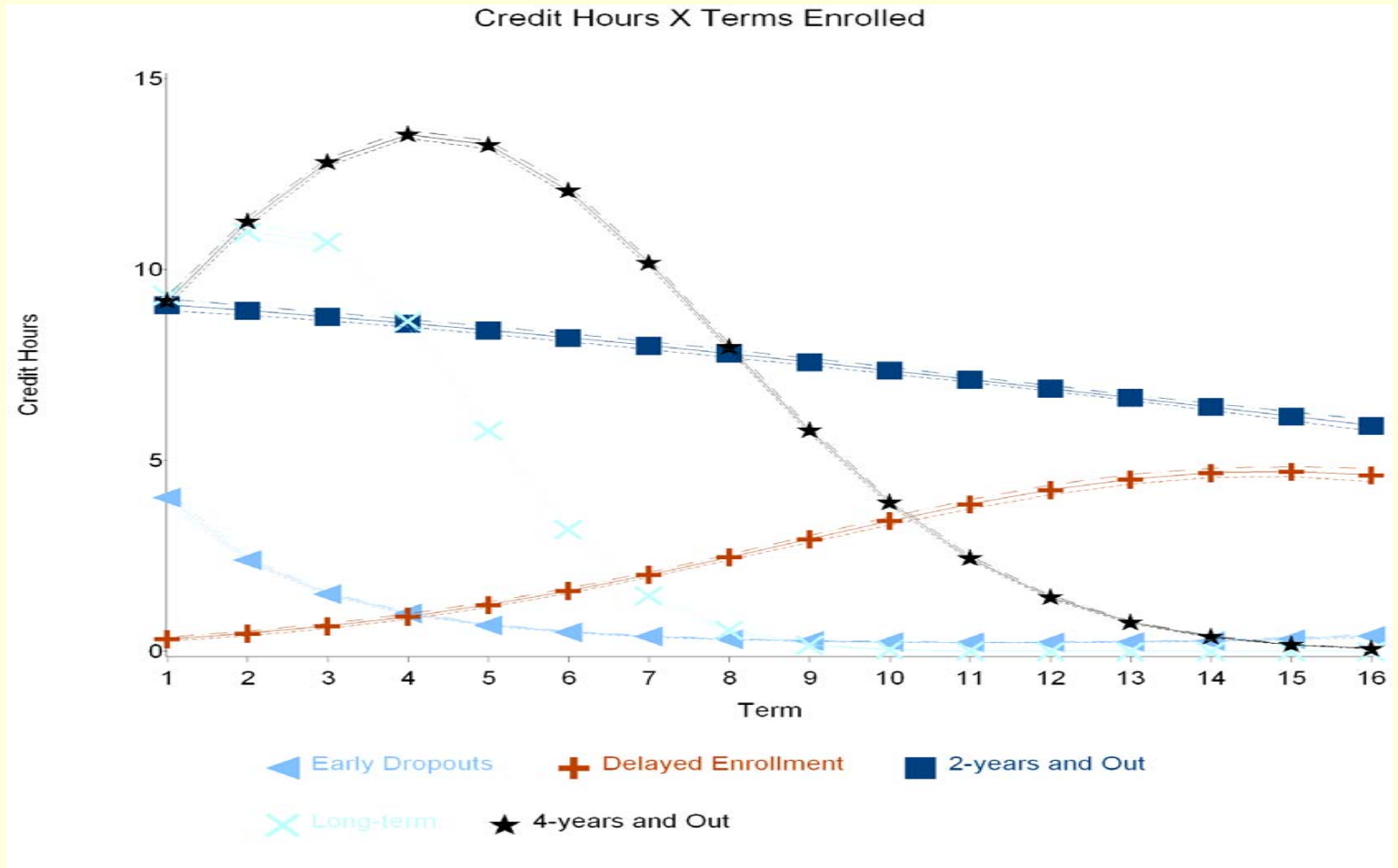
Compared traditional start point with first entry in college models

Traditional start point models defined the first term as the first fall term following high school graduation or expected high school graduation

First entry models defined the start point as the first fall or spring term that a student enrolled in college.

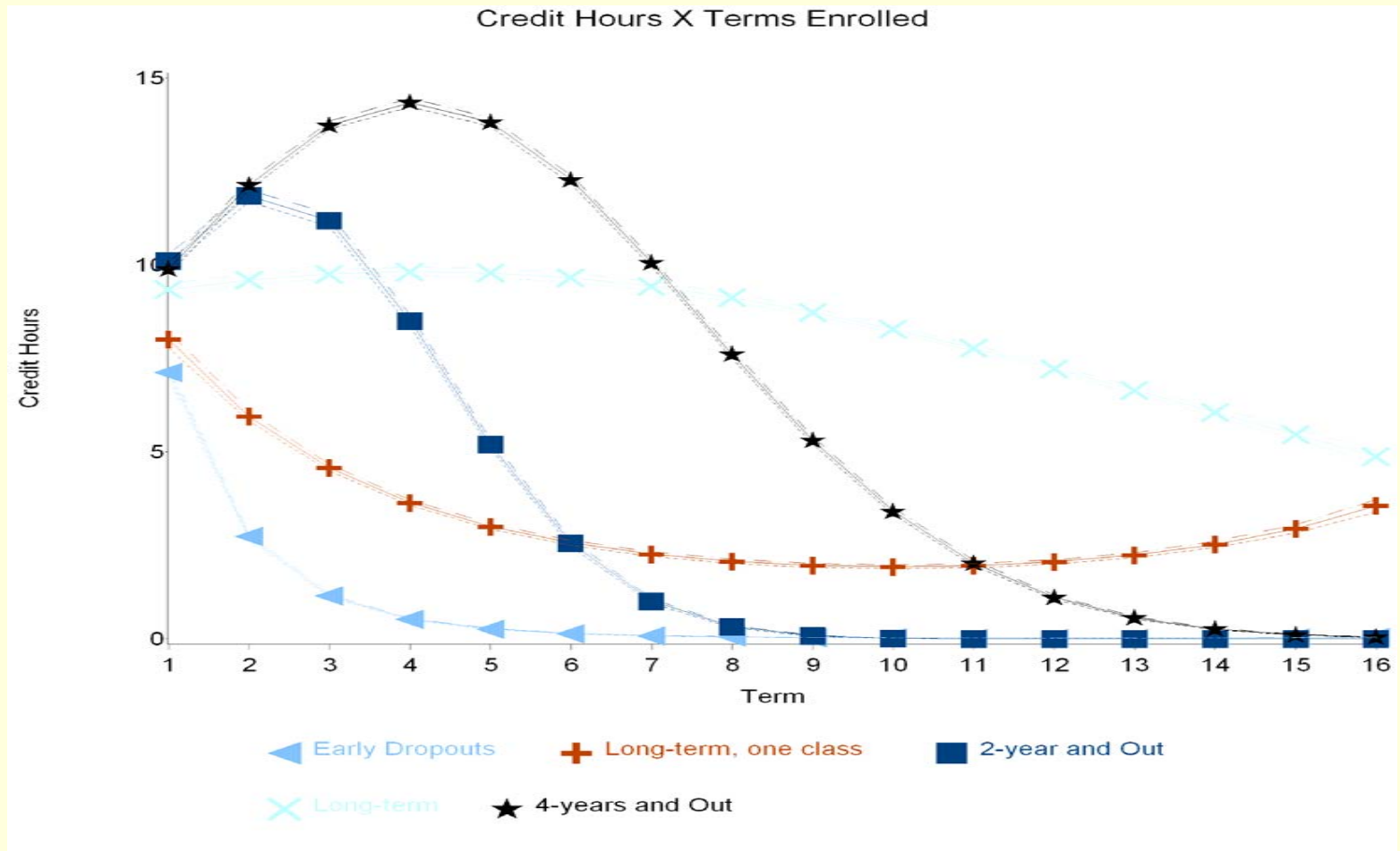


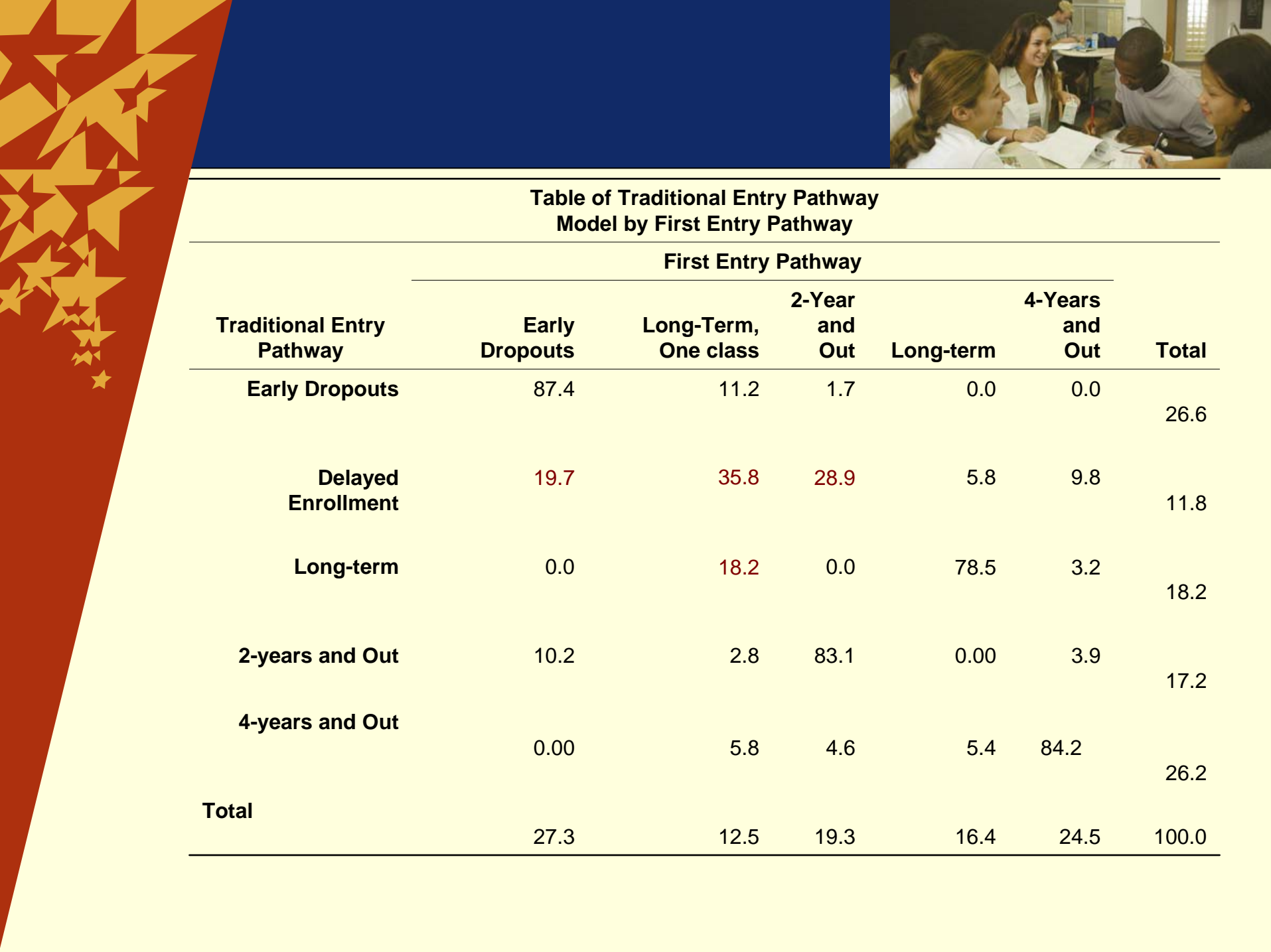
## PETS Traditional Entry Pathway Model:





## PETS First Entry Pathway Model:





**Table of Traditional Entry Pathway Model by First Entry Pathway**

Traditional Entry Pathway	First Entry Pathway					Total
	Early Dropouts	Long-Term, One class	2-Year and Out	Long-term	4-Years and Out	
Early Dropouts	87.4	11.2	1.7	0.0	0.0	26.6
Delayed Enrollment	19.7	35.8	28.9	5.8	9.8	11.8
Long-term	0.0	18.2	0.0	78.5	3.2	18.2
2-years and Out	10.2	2.8	83.1	0.00	3.9	17.2
4-years and Out	0.00	5.8	4.6	5.4	84.2	26.2
<b>Total</b>	27.3	12.5	19.3	16.4	24.5	100.0



## Characteristics of PETS Pathways:

Three groups emerge consistently regardless of start point in model

- **Four-year-and-out group**
- **Two-year and out**
- **Early dropouts**

Two groups in the Traditional Entry model have divergent patterns in the First Entry model

- **Long-term enrollment**
  - Largely consistent, but ~20% are classified as long-term decliners in First Entry model
- **Delayed enrollment**
  - ~20% are one-term and out
  - ~36% are long-term decliners
  - ~30% are two-year and out



	None	Certificate	Associate's degree	Bachelor's degree	Total
<b>Early Dropouts</b>	79.9	15.3	3.8	0.9	26.6
<b>Delayed Enrollment</b>	67.8	6.3	15.3	0.6	11.8
<b>Long-term</b>	43.2	6.5	30.6	19.7	18.2
<b>2-years and Out</b>	54.6	14.6	25.7	4.6	17.2
<b>4-years and Out</b>	20.9	5.3	28.1	45.2	26.2
<b>Total</b>	52.0	11.1	20.2	16.5	100.00



## Example of Variables that Distinguish PETS Pathways:

Have any children of his/her own

Amount expect to spend teens education next year

Date of receiving HS diploma/equivalent

Current marital status

How far in school father wants respondent to go

How far in school respondent thinks he will get

How important are specific courses



## Graduation Rates and Pathways:

Four-year and out groups is most likely to obtain bachelor's degree

Associate's degree not very predictive



Long-term students do complete degrees; this degree completion is outside of the official graduation data



## Conclusions Regarding Pathways:

There is little impact of start point, with the exception of delayed enrollment

The time frame matters



## Characteristics of the Beginning Postsecondary Student Survey's Longitudinal Data:

Derived from monthly enrollment codes for each month from May 1996 to June 2001

Coded as: not enrolled, enrolled full-time, enrolled part-time, mixed part- and full-time enrollment, post-baccalaureate enrollment, or don't know/refused.

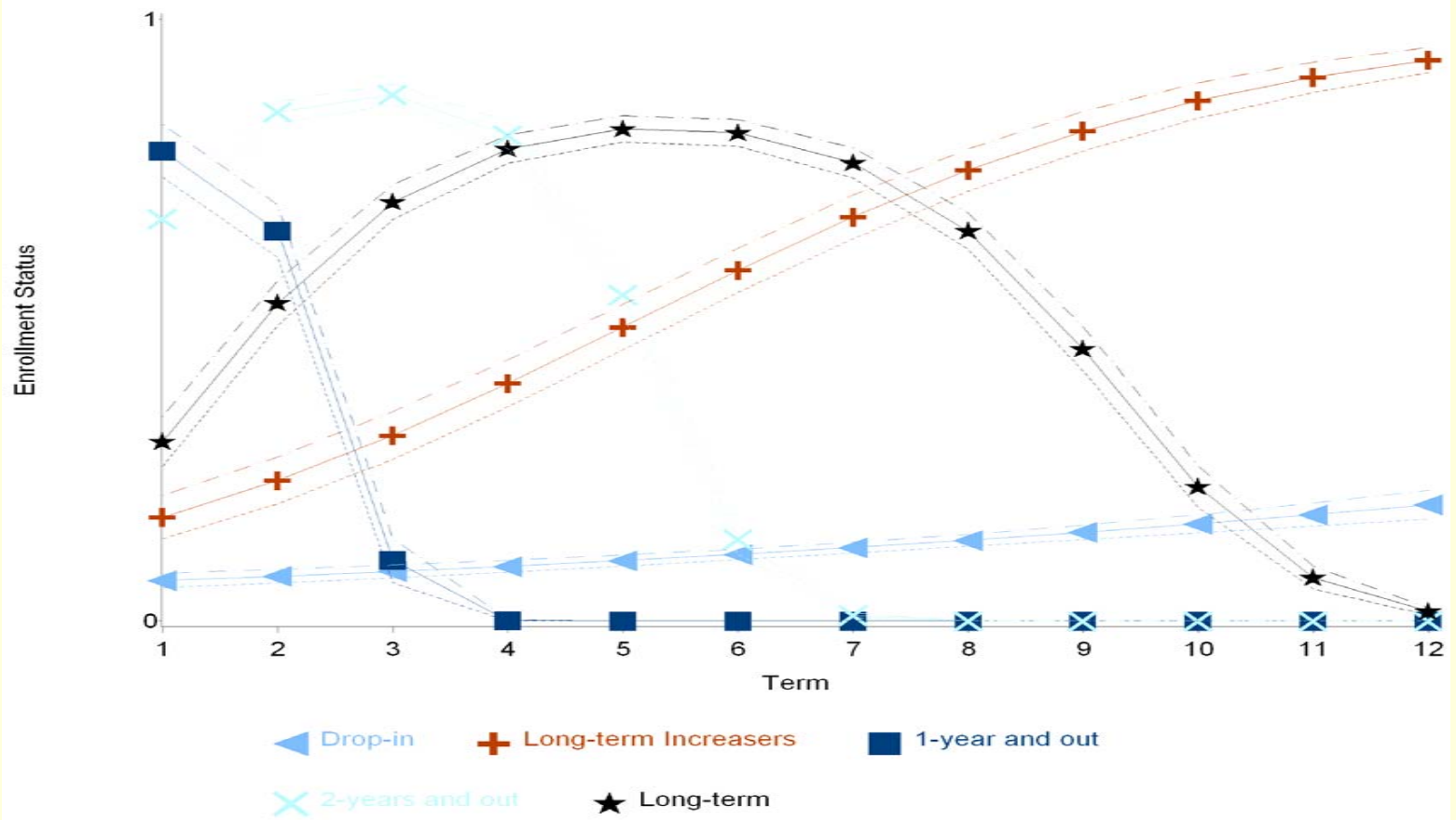
Fall term enrollment: two or more fall months (September, October, November, and December)

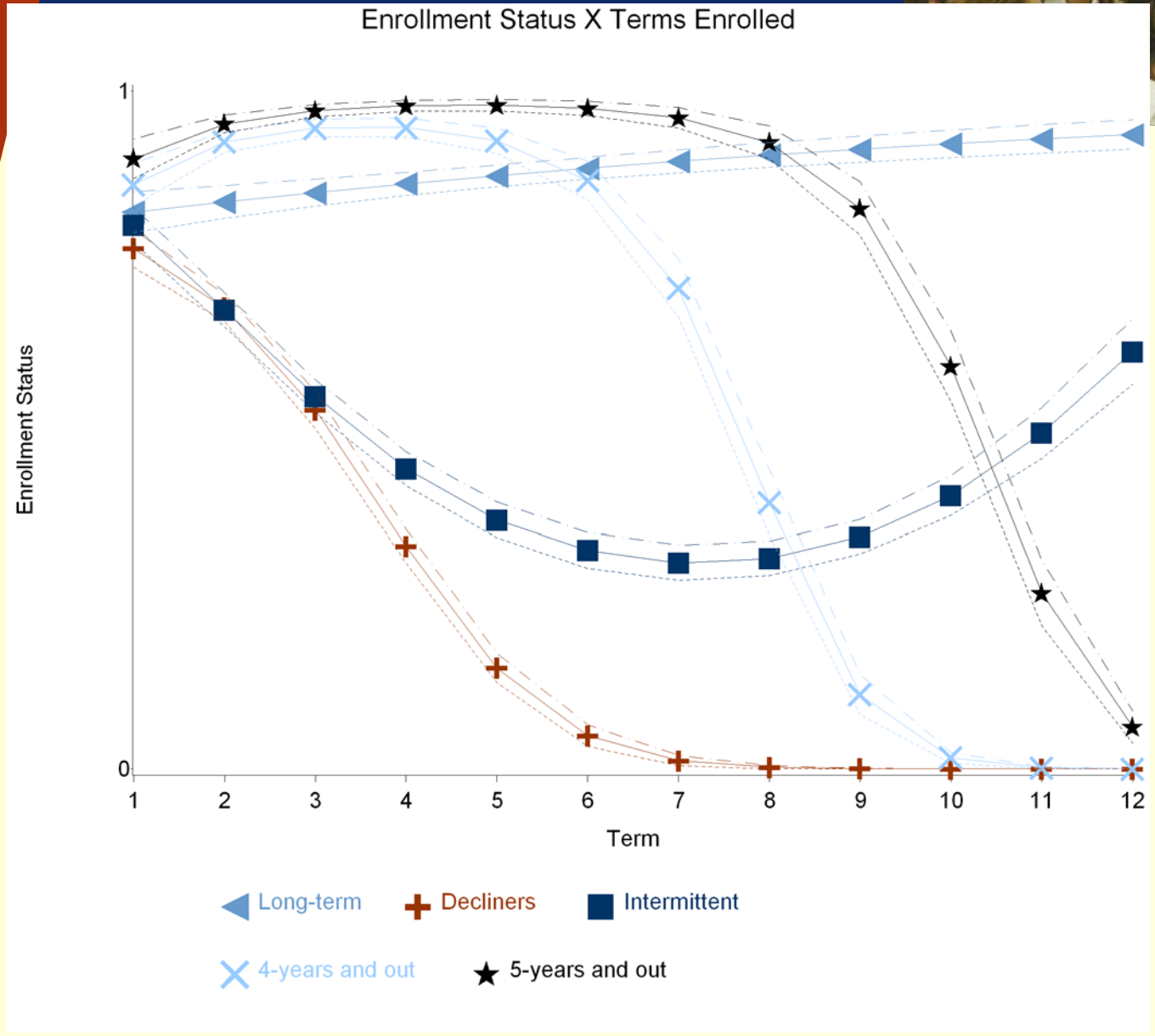
Spring term enrollment: two or more spring months as spring semester enrollment (January, February, March, April)

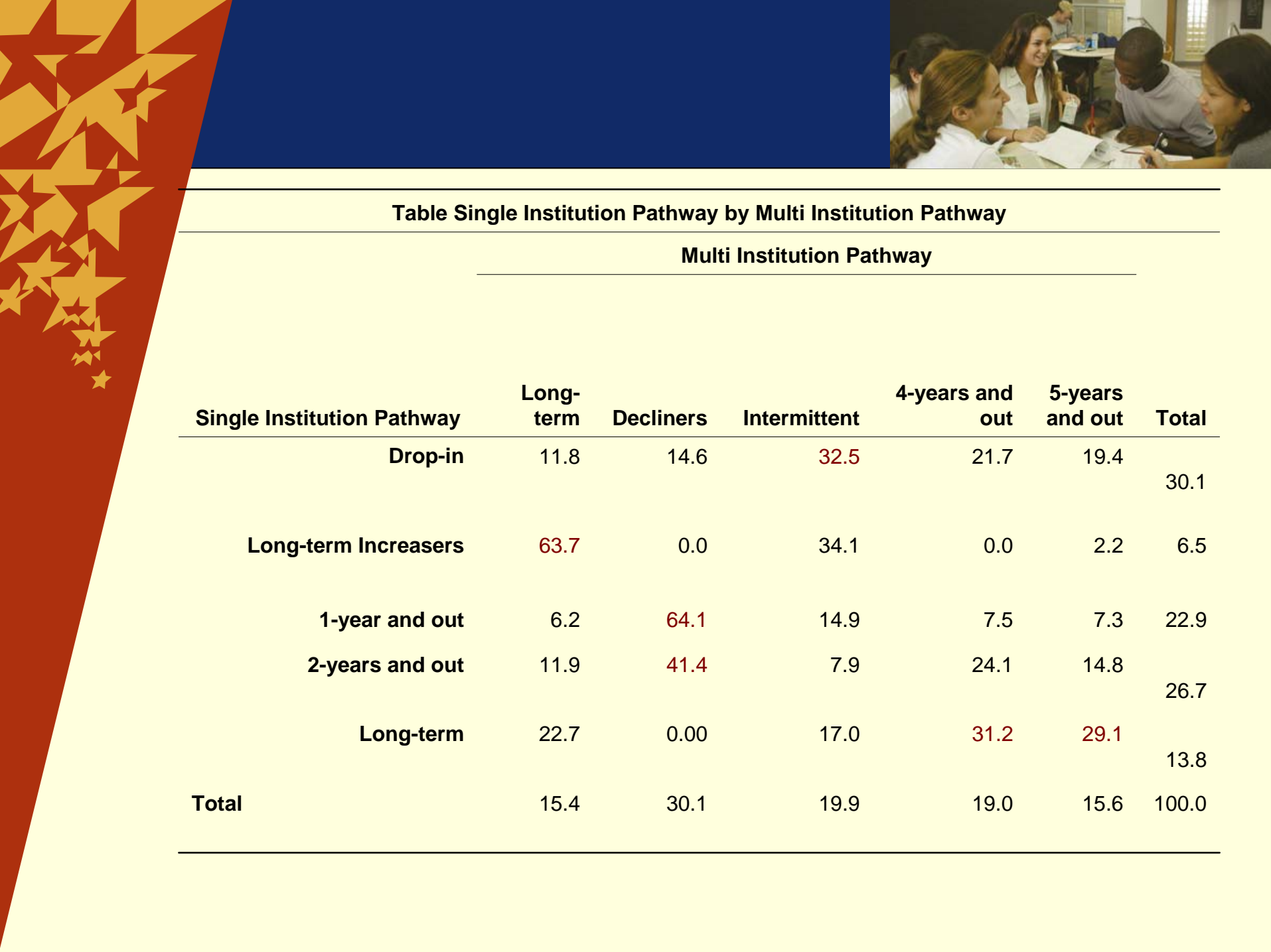


# BPS Single Institution Pathway Model:

Enrollment Status X Terms Enrolled







**Table Single Institution Pathway by Multi Institution Pathway**

**Multi Institution Pathway**

<b>Single Institution Pathway</b>	<b>Long-term</b>	<b>Decliners</b>	<b>Intermittent</b>	<b>4-years and out</b>	<b>5-years and out</b>	<b>Total</b>
<b>Drop-in</b>	11.8	14.6	32.5	21.7	19.4	30.1
<b>Long-term Increaseers</b>	63.7	0.0	34.1	0.0	2.2	6.5
<b>1-year and out</b>	6.2	64.1	14.9	7.5	7.3	22.9
<b>2-years and out</b>	11.9	41.4	7.9	24.1	14.8	26.7
<b>Long-term</b>	22.7	0.00	17.0	31.2	29.1	13.8
<b>Total</b>	15.4	30.1	19.9	19.0	15.6	100.0



## BPS Summary:

No 2-year and out group in multi-institution model

Poor cross-classification: single institution data not informative of long-term pathway

Many long-term students are enrolled long-term at community colleges



**Table of Multi-Institution Group by Degree Earned**

Multi-Institution Group	Earned associate degree		Total	Earned bachelor's degree		Total
	No	Yes		No	Yes	
<b>Long-term</b>	71.4	28.6	15.4	94.7	5.3	15.4
<b>Decliners</b>	85.9	14.1	30.1	99.7	0.4	30.1
<b>Intermittent</b>	86.4	13.6	19.9	98.6	1.4	19.9
<b>4-years and out</b>	72.8	27.2	19.0	67.0	33.0	19.0
<b>5-years and out</b>	68.3	31.7	15.6	45.1	54.9	15.6
<b>Total</b>	78.53	21.47	100.00	83.9	16.0	100.0



## Example of Variables that Distinguish BPS Pathways:

Degree expected at 1st inst 95-96

Attend-Num of cost reasons 95-96

Attend-Num of location reasons 95-96

Climate-Academic integration 1995-96

Climate-Social integration 1995-96



## Graduation Rates and Pathways:

Four- and five-year and out groups is most likely to obtain bachelor's degree

Associate's degree not very predictive

Long-term students do complete degrees; this degree completion is outside of the official graduation data



## Conclusions Regarding Pathways:

There are substantial differences when we cross-classify single- and multiple institution data

The two-year and out group is not homogenous; only some are traditional transfers

Binary data produces similar patterns as does credit hour accumulation



## General Conclusions:

Delayed entry pathways are unlikely to accumulate substantial postsecondary credits

One-term enrollees follow a wide variety of multi-institutional paths

Two-year and out students are approximately equally likely to not continue their education as to be on a four-year degree pathway

~40% of students that attend a community college as some point are on a pathway that would viably result in a 4-year degree

Nearly 20% of students in the data modeled are on a steady full-time enrollment pattern at the end of the study period



## Policy Conclusions:

There are successful student pathways that are not captured by 3-year graduation rate

Colleges should consider alternatives to graduation

- **College readiness**
- **Transfer readiness**

Multi-institutional data is essential for understanding college success



## Latent Trajectory Modeling in Institutional Research:

The complexity of community college enrollment is too often used to sidestep accountability and student success issues

The models presented herein illustrate the inadequacy of data available to institutional researchers

The models show that there are viable pathways that are not captured by three-year graduation rates

The models also show there are large numbers of students that are not meeting their goals



## Future Directions:

Continue to explore student behaviors that are related to pathways

Synthesis across models

The research has guided the development of the Student Engagement Survey of Student Engagement (SENSE)