Multiple Perspectives on Multiple Pathways

Preparing California's Youth for College, Career, and Civic Responsibility

Pipelines, Pathways, and Payoffs: Economic Challenges and Returns to Changing Demographics in California.

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California has benefited from its above-average concentration of highly educated people relative to other states. Well-educated residents pay more in taxes and consume less in state services, reducing the net tax burden for all residents providing the foundation for a more productive industrial structure. These concentrations of the highly educated result from both importation (the in-migration of skilled workers) and domestic production (the education and training of residents in California schools). Ongoing changes in both of those sources of human capital have eroded California's position, however, and projections suggest that declines may well continue.

This paper identifies California's demographic position with respect to observed historic trends and anticipated projections, discusses the very distinct economic consequences faced by residents with different educational backgrounds, and considers the impact of differing levels of educational attainment on the state's fiscal health. Responding to these changing demographic features to provide broad-based educational success for Californians presents a challenge. In this paper, we sketch out levels of educational attainment, the paths through which residents reach their educational goals, and factors associated with greater difficulties in education. We also discuss the unique context of California's demographic composition and its implications for educational infrastructure and strategies.

I. Educational Change in California's Demographic Context

California has historically been a magnet for migrants from other states and abroad who are drawn by the opportunities the "golden state" offers. The vigor and immense human resources brought by migrants has contributed to the dynamism of its economy and the diversity of its population. California also actively pursued the development of its own human resources by investing in a strong educational system at the primary, secondary and post-secondary levels. These educational investments paid off for California by creating a well-educated labor force and a healthy research infrastructure which attracted industrial development and supported its economy.

This combination of its attractiveness to well-educated and skilled migrants and its broad-based commitment to providing access to higher education for its residents once placed California in an advantaged position relative to other states. That advantage has eroded steadily over the last four decades, however, driven both by changes in migration flows and by the funding and quality of the public education system. These changes place at risk the gains previously brought by California's educational advantage.

Some indication of the impacts of these two sources of change -- migration and education -- is apparent when comparing the California of today with California in 1960. California's attraction for those born outside its borders is very evident in the changing demographic and ethnic origin of Californians. Forty-five years ago, the population was overwhelmingly native-born whites, although most natives had been born in states other than California. Census figures show that in 1960, 84% of the nearly 16 million residents of California were non-Hispanic white; another 9% were Hispanic, 6% were African Americans and only 2% were Asians. Although 92% percent of the population in 1960 was U.S. born, only 40% of residents had actually been born in California, and more than 16% of Californians had been living in a different state or abroad five years earlier.

Forty-five years later, California has more than doubled its population to 36 million, becoming a 'minority -majority' state in the process. In 2004, only 44% of Californians identified themselves as non-Hispanic whites[1]. During this period, Hispanics had grown to encompass 35% of the population and the percentage of Asian/Pacific Islanders had increased to 12%, while the fraction identified as African American has changed very little. During this period, the share of Californians who were U.S. born declined to 73%, but an increasing proportion -- 52% -- of the state's residents had been born within its borders and only 9% of its residents lived in other states or abroad five years earlier.[2] In short, migration has dramatically changed California's ethnic composition, with international migration assuming a steadily more important role relative to domestic migration. At the same time, however, steadily increasing fractions of the population are born and raised in the state.[3]

The post-war baby-boom also left its imprint on the age-structure of California in 1960. With more than a third of the population under age 18 and a huge growth forecast in college enrollments, California responded with a Master Plan for Higher Education

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[1] Changes in composition reflect changes in the questions used to elicit racial or ethnic identification as well as changes in race and ethnicity. In 1960, individuals could identify themselves with only a single racial identity, and "Spanish" ethnicity was attributed based upon lists of Spanish surnames. For 2000 and later, individuals who respond to the Census (or inter-censal surveys like the American Community Survey) may identify themselves with multiple races, and specify a detailed Hispanic ethnicity, as well. In addition, population estimates used from the 2004 ACS exclude the institutionalized population who comprise a little over 1% of California's total population.

[2] Because the ACS asks about residence in the prior year, the figure for residence five years earlier was drawn from the 2000 decennial census. The period covered by that question (1995 - 2000) was atypical of California's usual historical patterns of net migration.

[3] The 40% of the population born in California in 1960 is not a post WWII aberration. The fraction of the population born in the state has climbed steadily since 1930, when only a third of the resident population had been born in the state. The fraction of Californians who were born in the state is higher today than at any point in the last century.

and large investments in primary and secondary education as well. Increases in educational attainment reflect the success of these investments[4]. In 1960, nearly half (48.5%) of residents aged 25 and older had failed to complete four years of high school, and only 9.8% had attended four years of more of college. By 2004, 83% of adults aged 25 and older had completed four years of high school[5] and 29% held BAs or advanced degrees.

These gains in human capital are impressive, but California's *relative* educational advantage eroded badly during the same period. Compared to the national average in 1960, Californians were 25% more likely to have finished four years of high school and 25% more likely to have finished four years of college. Not coincidentally, the per capita income in California was 25% higher than the national average, as well. Forty years later the fraction of Californians with a high school diploma has fallen below the national average, the fraction with a BA or advanced degree is only slightly above the national average, and per capita income is only 6% above the national average.

This relative decline *largely* reflects changes in migration flows rather than simply failures in the public education system, but this erosion is troubling for (at least) three reasons. First, at the individual level, educational attainment is highly associated with personal income and, at the state level, educational composition is highly associated with per capita income. As a result, declines in education and consequent declines in relative per capita income will increase the average tax burden needed to fund a fixed set of services. Alternatively, the amount of services that can be funded from a fixed rate on

[4] Other factors include migration, mentioned previously, as well as mortality among older members of the population, who tended to have acquired their educations when high school completion was less common.
[5] A smaller fraction (80%) held high school degrees. We use the metric of four completed years of high school for purposes of comparability.

personal income decreases when per capita income decreases. Second, the demand for state-funded services, like poverty-related programs or incarceration, increases as the share of the more poorly-educated population rises. Together, these effects mean that declining levels of human capital push an increasing wedge between needs and resources by driving up the demand for state-funded services at the same time that tax revenues are being driven downwards[6]. Third, since student achievement is so strongly tied to the educational attainment of students' parents, the same migration trends associated with the changing educational mix of new entrants to the state may also result in student populations which present a challenge to the public education system, particularly at the primary and secondary levels. Unless the educational success of children in educationally disadvantaged families is improved and the linkage between low parental education and children's educational achievement is weakened, the initial impacts of relative declines in the educational attainment of adults exerts a secondary cost in the lives of their children.

The importance of these ongoing changes in California's educational mix, and their attendant consequences, is underscored by recent demographic and economic projections. These forecasts for California project increased demand for skilled and credentialed labor, continued increases in populations which have historically been educationally disadvantaged, and the passage of a baby boomlet - the Tidal Wave II generation - into young adulthood in the next decade. These developments present both a challenge and an opportunity for the state. Evaluating the extent of those challenges and

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[6] More specifically, personal income tax revenues would tend to decline with declining education, while spending for incarceration and health and human services would tend to increase. Personal income tax revenues are quite important in California and provided over half of the state general fund revenues in 2006-7. The importance of personal income tax revenues for the state general fund has increased over the last four decades, having risen from 22% of the revenues in 1966-67 to 54% in 2006-7.

the opportunities offered by successfully meeting the challenges are the subject of the remainder of this paper.

As the following sections will detail, the demand for skilled and well-educated workers in California will increase, and that demand is unlikely to be met by the historically important in-migration of such workers. Meeting the demand will require improving the educational success of California's students at a number of points - in the public K-12 setting, in the transitions to post-secondary education, and in the continuance and completion of such education. Increasing success in high school will be particularly critical, since the secondary school setting serves as a transition point to the both the labor market and college, and attrition and failure in this setting are currently high and marked by large ethnic disparities. Strengthening secondary education to address current needs and weaknesses requires both providing solid academic preparation for college and meaningful technical and professional instruction tied to the skills required in California's evolving labor markets. The 'multiple pathways' approach attends to both of these missions while drawing upon a wider base of authentic work-based learning experiences to deepen students' acquisition, understanding and application of the skills and knowledge they will need in the decades ahead.

In the next section, we begin by discussing the consequences associated with different levels of education, both for individuals and the state. This discussion identifies some of the many outcomes at stake, since changing educational outcomes also changes the outcomes which depend on education: labor force participation, the kinds of jobs one finds, earnings, accumulation of assets, poverty, receipt of public assistance and support, and incarceration. In later sections, we turn to the questions of what obstacles exist to increasing educational attainment levels, and what state interests are in addressing those obstacles

II. Economic Consequences of Changing Educational Attainment

A. Consequences for Individuals

Individuals pursue education for a wide variety of reasons, not all of which are economic in nature. Regardless of whether economically motivated, however, success and persistence in schooling has a huge economic impact on our lives after school. The kinds of jobs we can find, the amount of money we earn for our efforts in the labor market, the housing conditions and lifestyle we can purchase with those earnings, the savings we accumulate for retirement, and the likelihood that we will live in poverty or need to rely on transfer payment for basic needs are only a few of the many outcomes which are tied to educational attainment.

Because most Californians will rely on work to provide the food, shelter, clothing, luxuries and savings they depend on[7], many of the quantifiable benefits of education can be tied to the labor market. As individuals pursue their schooling, they make investments in skills, knowledge and practices which become part of the "package" they sell in the labor market. If these skills are in demand by employers, more highly educated workers

[7] There are obvious exceptions to this, most based on particular stages in the life cycle. Children are dependent upon their parents' work efforts, the elderly rely more on the fruits of their past work, spouse's may rely on their husband's or wife's earnings while involved in unpaid home production, wealthy individuals and investors may reap their returns from the labors of others, and the poor or disabled may rely on public and private transfers to survive. Even in these cases, economic well-being is frequently tied to former labor and non-market labor agreements. For example, earnings in retirement and the ability to retire are quite dependent on prior labor force activity (Flippen and Tienda, 1999) and increasing marital homogamy in terms of education (Kalmijn, 1991;Schwarz and Mare,2005) tends to create the same kinds of income divides among non-employed spouses by education and ethnicity that are seen in the labor market.

are rewarded with employment and higher wages, while their employers gain from increased productivity and quality of work. Increased earnings subsequently translate, in combination with household structure and needs, to lower levels of poverty and fewer demands on means-tested public services. An individual's increased income can either be directly exchanged for goods – such as uncrowded living space or vehicle ownership – or accumulated as savings for retirement or additional investments in other more durable goods, such as homes or stocks.

Evidence from large surveys and censuses help quantify the impact that education has on each of these outcomes. Table 1 summarizes many of these effects.

Table 1 **Differences in selected lifetime outcomes by educational attainment for Californians, expressed relative to high school graduates**

Outcomes Relative to HS Graduate	Less than HS	HS Graduate	Some College	B.A.	Advanced Degree
Years in Labor Force	0.80	1.00	1.12	1.19	1.25
Years Employed	0.75	1.00	1.14	1.23	1.30
Occupation					
Professional	0.39	1.00	2.11	4.32	6.98
Managerial	0.32	1.00	1.51	2.56	1.89
Self-Employed	0.67	1.00	1.56	3.08	2.72
Routine White-Collar	0.48	1.00	1.04	0.66	0.27
Skilled Manual	1.14	1.00	0.61	0.23	0.10
Less Skilled Manual	1.89	1.00	0.60	0.23	0.09
Earnings	0.57	1.00	1.33	2.05	2.81
Income	0.59	1.00	1.32	2.02	2.78
Poverty : < 100%	2.13	1.00	0.64	0.38	0.38
Auto Ownership	0.93	1.00	1.03	1.04	1.05
Home Ownership	0.76	1.00	1.08	1.14	1.14
Value of Owned Home	0.78	1.00	1.18	1.60	1.87
Crowding : > 1.5 Persons/room	3.45	1.00	0.59	0.41	0.34
Welfare Use	1.85	1.00	0.61	0.22	0.19
SSI Use	1.85	1.00	0.61	0.26	0.19
Incarceration	1.14	1.00	0.50	0.13	0.09

Note: Outcomes compared are synthetic lifetime outcomes for Californians age 25-64, based on analyses of the 5% sample of public use microdata from the 2000 Decennial Census. Synthetic lifetime outcomes estimate the average effect across an individual's lifespan between ages 25 and 64. These differences were calculated separately by ethnicity and nativity, and results are weighted to represent the current ethnic composition of young adults in California.

The patterns shown in Table 1, expressed relative to high school graduates, reflect the differences that we would expect to see over the course of (most of) an individuals' lifetime if the age-specific differences we see today persist. Thus, the first row tells us that labor force participation (working or looking for a job) among Californians lacking a high school degree will average about 80% that of a high school educated Californian, averaged over their life after age 24 and before age 65, while that of college graduates will be about 25% higher than that of a Californian with only a high school degree. These relative differences help to pinpoint outcomes which are most strongly associated with education. Such outcomes include the kind of occupation individuals find employment in, lifetime earnings and income, poverty, crowding, use of welfare and likelihood of incarceration. Other outcomes, while still strongly affected by educational attainment, are less differentiated. For such outcomes, like labor force participation or the ownership of homes or autos, more highly educated individuals are still advantaged, but the differences are relatively smaller.

Instead of relative terms, we can also look at absolute differences. Among working-age adults, about 70% are in the labor force. Labor force participation increases steadily with education, climbing from 57% among those without a high school diploma to 86% of among those with an advanced degree. The benefits of education are even stronger if we look at, not just being in the labor force but actually holding a job. Less than half of the working-age population without a high school degree is employed, while the fraction of those with an advanced degree who are employed is virtually identical to the fraction in the labor force - 86%. Over the course of a lifetime, these differences indicate an increase from the equivalent of 21 full time years worked between the ages of 25 and 64 for those with less than a high school degree, to 35 years for those with advanced degrees.

Education affects the *kind* of work one does, as well as the ease one has in finding work and the number of hours and years one works. Professional careers are heavily skewed toward those with advanced degrees, managerial work is dominated by those with a baccalaureate degree, and both those with BAs and advanced degrees are over-represented among the self-employed. In contrast, those with a high school diploma or some college are the most common levels of education found among routine white collar workers, and those with less than a high school degree are most dominant in less-skilled manual jobs and, to a lesser degree, in skilled manual occupations. As industrial and occupational structures change in the future, the association between specific jobs and education may change as well, but the broader patterns are likely to persist.

Although part of the payoff from education emerges simply from the greater likelihood that someone can find work, a more substantial boost comes from the difference in earning power among the employed. Those with less than a high school degree will earn just over a half-million dollars ($538,000) over the course of their working life. Simply earning a high school diploma is likely to yield an increase to $934,000, while those with a BA will earn almost 2 million dollars ($1,915,000) in the same period, and those with an advanced degree will earn 2.6 million dollars. Earning a high school diploma results in an average of $10,000 more each year, going onto college gains an additional $8,000 per year, finishing college with a BA yields yet another $17,000 per year, and going on to earn an advanced degree nets an additional gain of $18,000, for total annual gain of 54,000 (taxable) dollars over that of an individual who does not complete high school.

The relative benefits for total income (which adds transfer payments and investment income to earned income) are similar to those of earned income, but reflect increases from $770,000 to $3.6 million as education increases from less than high school to an advanced degree. The net average annual gain is slightly larger if one looks at total versus earned income, at $57,000 rather than $54,000, and is more likely to reflect additional income from investments rather than the fall-off in transfer payments.

An indication of the impact of education on transfer payments is shown on the following tables reflecting self-reported receipt of welfare and SSI income. The likelihood that someone will use these benefits nearly doubles if they haven't earned a high school diploma and, as education increases beyond high school, the likelihood of public assistance income continues to decrease sharply. Welfare use among those with a baccalaureate degree is a quarter of welfare use among those with a high school diploma, and eighth of the rate among those who failed to complete high school.

Taken together, the earnings and other income relative to family needs translate into large differences in poverty by education. Among adults, 22% of those with less than a high school degree live in poverty; only one in ten adults with a high school degree are in poverty, and less than one in twenty of those with a BA or more are in poverty.

These advantages translate to ownership of assets, as well. For most Californians, their home is their largest single asset and also represents the bulk of their total savings for retirement. While the relative differences in home ownership are more similar in size to employment or lifetime hours worked than to the huge differences in earnings or poverty, they are nonetheless substantial. Less than half of working age adults without a high school degree own their home, versus two-thirds of those with some college, and three-quarters of those with an advanced degree. Even more dramatic are the differences in the value of the homes afforded by those with varying levels of education: homes owned by Californians with high school degrees in 2000 averaged $220,000 in value, while homes owned by those lacking a diploma had a value 23% lower, and homes owned by those with a BA had a value 60% higher. Although the explosion in Californian home values since 2000 have driven up values for all owners, the association of home values with education remains.

Although it is always possible that differences by education could diminish in the future, historical trends of the last decades suggest the opposite: educational divides are widening, not narrowing. Table 2 illustrates the size and direction of this trend for one outcome, earnings during an individual's work-life. As with Table 1, these earnings are synthetic totals over an individual's life from age 25 to 64, and are represented relative to the same earnings for a high school graduate (the educational category omitted). They differ slightly in that they consider only the "work-life" -- periods in which individuals are employed and earning income. Including the zero-earnings periods when individuals are not employed would increase the educational differentiation even more.

Across ethnicities, the decline in the relative earnings for those with the least education is notable, and the gain among the most highly educated even more marked. In 1980, work-life earnings for those with a baccalaureate or more were roughly twice as high as for high school dropouts. By 1990, expected earning were 2 ½ times as great for baccalaureates and, by 2000, baccalaureates could expect to earn three times as much over the course of their work-life as those who failed to complete high school. Some variation is apparent in the level of difference by ethnicity, but increasing levels of differentiation are apparent for all groups.[8] These results suggest two things: first, that

[8] This increasing differentiation by education over time is apparent for each of the outcomes examined, and persists in multivariate models with controls for ethnicity, nativity and period effects. With such controls, the disadvantage faced by those lacking a high school diploma increases steadily in each decade: labor force participation dropping by 2.6 points, unemployment increasing by slightly under a percentage point, earnings and income declining an additional \$600- \$800 each decade, and poverty increasing by 1.6 points. During the same period, the relative premium for a BA has increased: labor force participation increases by slightly under 2 points per decade and unemployment rates drop by nearly 1 point, earnings and income are

estimates of lifetime impacts of education developed from cross-sections are likely to misstate the true level of effects and, second, if the past three decades are a reasonable guide, the direction of the resulting bias is downward, and education will have a much larger impact on residents in California's future than it did in the past.

Table 2 **Work-life earnings of Californians relative to high school graduates, in total and by ethnicity, 1980-2000**

Work-Life earnings relative to high school graduate				
		Less than HS	**Some College**	**BA or More**
All Ethnicities	1980	0.81	1.17	1.64
	1990	0.78	1.23	1.88
	2000	0.68	1.26	2.13
Non-Hispanic White	1980	0.90	1.16	1.63
	1990	0.91	1.19	1.83
	2000	0.79	1.20	2.03
Non-Hispanic Black	1980	0.86	1.14	1.60
	1990	0.78	1.21	1.80
	2000	0.82	1.19	1.90
Asian/Pacific Islander	1980	0.77	1.17	1.59
	1990	0.72	1.29	1.86
	2000	0.75	1.31	2.18
Hispanic	1980	0.77	1.17	1.52
	1990	0.72	1.26	1.79
	2000	0.73	1.27	1.90

Author's Calculations from: 1980, 1990, and 2000 PUMS for California.
Figures represent earnings relative to those of an individual with a high school degree.
(The census question on educational attainment changed between the 1980 and 1990 census, and complete comparability is not possible. In particular, holders of some vocational certificates from trade school may be classified as high school only in 1980, but having some college in later years. The ratios of "Less than HS" to "BA or more" will be unaffected by those changes in the question, and increase steadily from 2.02 in 1980 to 2.40 in 1990, and to 3.13 in 2000. All 1990 to 2000 comparisons are completely unaffected.)

All of these benefits are direct or indirect extensions of the knowledge, skills and practices acquired through education and rewarded in the labor market. An effective

sharply up by more than $5,000 per decade, poverty rates down by nearly 3 points, and rates of homeownership and home values increase substantially. See Stiles (2006) for more detailed results of these analyses.

multiple pathways approach in California's high schools, by strengthening the ties between education and the situated application of acquired skills and knowledge in settings like those of authentic workplace environments, would aid the transformation of acquired skills into gains in the labor market. It would do so by deepening students' understanding and practices of the things they learn, broadening the contexts and sources in which students apply their learning, and placing acquired skills more directly in the settings in which labor markets reward learning. The strengthening of such ties is a necessary and integral part of a public education system which can serve both students and employers in California's industries.

Although these benefits provide a strong motivation for individuals to continue their schooling, choices made by individuals about educational goals and investments are constrained and shaped by the state's own investment in infrastructure and support. The state, of course, faces its own constraints when deciding what kinds of infrastructure and support it can and should invest in. For this reason, it is reasonable to examine some of financial stakes the state has in a well-educated population.

B. Budget Consequences for the State

Changes in the level of human capital have important consequences for the state. A straightforward way to gauge some of the direct financial consequences is to consider how we would expect state revenues and expenditures to change if existing relationships between educational attainment and streams of revenues and expenditures were fixed, but the educational distributions changed. How much more or less might the state spend supporting education, jails and prisons, or poverty-related assistance programs? How might its tax revenues increase or decrease? Although a full and detailed accounting would be difficult both to compute and justify, a simple picture of the state costs of poverty-related spending[9], incarceration, and secondary and post-secondary spending can be weighed against changes in tax revenues resulting from increases or decreases in personal income.

These estimates of income and spending can be generated using some simplifying assumptions: the costs of poverty-related spending by educational group are considered to be proportional to the actual poverty rates for individuals over their adult lives, incarceration costs are considered to be proportional to rates of incarceration at each level of education, and educational costs are calculated using average state general fund expenditures per secondary student year, or per years of enrollment in the public post-secondary system[10]. Tax revenues are estimated at 7.5% of the average personal income for members of each educational stratum. For both costs and revenues, lifetime synthetic measures are used, consonant with the tables shown in the last section.

The resulting picture of costs and expenditures suggests the extent to which the state, as well as individuals, gains financially from investments in education. For every thousand 18 year-olds in California in 2005, increasing the number of high school graduates by 17 persons, increasing the number with some college short of a four year

[9] This includes the state share of costs for programs such as the California Work Opportunities and Responsibility to Kids Program (Cal Works), Supplementary Security Income (SSI) for elderly and disabled people and poverty-related supports like Medi-Cal, the program for health care and long-term care for low-income residents in California.

[10] Synthetic lifetime costs and revenues were estimated separately by ethnicity and nativity. For poverty- and incarceration related costs, state costs of $3,000 per person year in poverty and $25,000 per person year incarcerated were applied to ethnicity-specific synthetic lifetimes estimates of years in poverty and years incarcerated by educational attainment. Education costs were estimated based on state general fund expenditures per student year, applied to average years of school for each educational level. For those with post-secondary education, costs in each of the three public post-secondary systems were calculated and weighted by ethnic distributions of students across those systems. For details, see Brady, Hout, and Stiles, 2005.

degree by 10 persons, and increasing the number with BA's by 5 persons out of a thousand would yield an average savings to the state of around $1.6 million over the next 40 years of their lives. Like most investments, the costs are incurred early on and the returns are accrued more gradually, but the break-even point is fairly early -- at about age 35 -- and subsequent gains cost less and are steady[11]. The returns in the earliest years are more heavily affected by reductions in incarceration costs, while those in later years are driven more by the higher incomes of the better-educated.

Together, these patterns of benefits point out the critical importance of educational attainment at both the individual and state level and demonstrate the gains at stake in the decisions made about investments in California's educational infrastructure. The following sections build on these conclusions by addressing some broad questions: What educational demands in California's future labor markets can be expected? To what extent will meeting those demands rely on the educational trajectories of current and future students in California's schools? What characteristics of California's students present challenges and opportunities in achieving the educational goals needed at the state level? How can such challenges be met and opportunities taken advantage of?

[11] While the investments made by the state in education seem particularly attractive, they also pay back over a fairly long time frame. To adjust for the lag in time between when an investment is made and when it pays off, analysts usually discount the returns by a certain rate each year. Applying a discount rate to the stream of returns an investment earns over its lifetime, and summing those discounted returns less the investment, will yield the investments Net Present Value (NPV). Calculating a NPV requires selection of a discount rate, and for that rate an investment is considered "worth" it if the NPV exceeds zero. An alternative way of summarizing a return is to, rather than picking a discount rate, identify the discount rate which would tip the decision about making the investment from positive to negative. The rate at which the NPV for an investment is zero is the called the Internal Rate of Return (IRR). Traditionally, forensic economists who specialize in valuation of costs over an individual's life use a real discount rate between 1% and 3% per year. The NPV for this range of discounting is between 1.03 and 2.11, and the IRR calculated is 7.1. Assuming a 2% discount rate, in the middle of the range, we can ask a slightly different questions: "If the investment needed to get this same amount of return was larger -- if, for example, increasing progress for 'hard-to-reach' students was more expensive than we predict -- how much more expensive would it have to be before it no longer makes sense to invest in those students?" The results suggest that costs would need to increase by 2 ½ times before it would stop making sense (in this very narrow economic evaluation framework) to invest more in improving schooling outcomes.

III Educational Challenges for California

A. Increased Demand for Education

The benefits of having a well-educated population and labor force are not merely economic, but labor force demands do provide an important motivation for individuals to pursue schooling and for the state to support it. In this section, we consider recent forecasts of growth in demand for skilled labor in California, and consider what that implies about the level of student success and progression that is needed to support that demand. Since for any state or area, a well-educated population can be developed from within or imported, these demands are also placed in the context of historic rates of migration of the well-educated.

Two recent forecasts[12] of industrial change and educational demand indicate extensive growth in the demand for workers with baccalaureate and advanced degrees over the next two decades. Although both forecasts rely on projections of industrial change as their starting points, they use very different approaches for the conversion of these projections to implied demand for human capital. The estimate produced by Neumark of PPIC begins with the existing education composition of California industries, applies industry-specific rates of change for educational composition based on observed changes between 1992 and 2002, and then applies the time trend-adjusted educational composition in each industry to the anticipated industrial structure of 2020. The Fountain forecast bases estimates of increased demand for credentialed workers on BLS classifications of occupations into different credentialing categories which reflect

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[12] Neumark "California's Economic Future and Infrastructure Challenges" (2005) and Fountain "Economic Implications of California's Workforce and Educational Trends" (2006).

employers' responses to surveys of required and desired characteristics of entry-level employees by occupation. Those are then adjusted to fit existing industrial structures, and projected to anticipated industrial structures in 2022. Both of these estimates consider only credentials needed by the employed labor force - neither adjusts needs to account for credentials earned by those who may not be in the labor force in a particular month, quarter or year.

Although the metrics reported are different, both approaches agree that job growth will be skewed toward the most highly educated. Fountain places the growth rate of occupations requiring a high school diploma or less at 33%. Jobs in occupations requiring BAs are expected to increase by 46%, those requiring MAs or professional degrees will grow by 50%, and doctoral-level jobs should increase by 73%. Reporting expected changes in the share of workers by educational attainment over the 20 year period, Neumark forecasts a 31% decline in the share of employment held by workers with a high school degree or less, but 30% increase in the share of jobs held by baccalaureates, and a 32% increase in the share of employment held by those with advanced degrees.

Converting between percentage growth or shares of employment to a number of jobs makes clear of the differences between the two methods used: the Neumark forecast would suggest an absolute increase of around 3.6 million jobs requiring a baccalaureate or more, while Fountain forecasts an increase of slightly over 1.5 million such jobs. These differences are primarily due to how much education different jobs are seen as requiring: the approach using the education of actual job occupants yields substantially higher estimates than those based on minimum requirements reported by employers. The latter approach, when applied to the California population, would suggest that current job-holders tend to be over-educated for their occupation: the percentage of the current California workforce requiring a degree (AA, BA or higher) using the employer criteria is 26.1%, the fraction of the workforce with those credentials is more than 50% larger, at 39.4% of the total workforce. Even in occupations classified as having low educational requirements, however, there is a steep earnings gradient associated with increasing educational attainment, suggesting that employers value and reward education even in occupations in which it is not a direct requirement. Maintaining the same ratios of education that is currently both acquired and rewarded, relative to that which is directly required for new job entrants, necessitates some upward revision of Fountain's forecast.

An absolute increase in the number of jobs held by workers with a particular level of education, such as a BA, does not mean that new demand is limited to that number. Over the course of twenty years, substantially more demand is generated by the retirement of current job-holders with those credentials. In addition, some credentials which are earned will be held by residents who are not in the labor force. Adjusting the Neumark and Fountain forecasts for these factors, and adjusting the Fountain forecast upward to maintain existing ratios of human capital to minimum requirements, yields a demand for new workforce occupants with BAs of 5.8 million and 5.4 million, respectively[13].

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[13] Levels of increased demand due to retirement and other workforce separations are explicitly estimated in Fountain's forecast. Those estimates are applied to Neumark's forecast of absolute workforce increases to account for new demand due to workforce separation. The results are subsequently adjusted upward to account for the fraction of the non-retired population aged 25-64 in each educational stratum who is not in the labor force. Finally, the Fountain forecast is adjusted upward by 50%, to maintain the same proportion of baccalaureates employed to baccalaureates required found in the labor force today.

While these forecasts suggest a hefty number of new degree holders will be needed in California over the next two decades, California will not have to produce all of them. Historically, California has benefited considerably from the "brain gain" due to domestic and international flows of migrants. A convenient framework for placing these new demands in the context of historical migration ranges is to consider the ratio of domestically produced baccalaureates to net flows of baccalaureates to California. Comparing these counts for the five year periods before the 1980, 1990 and 2000 censuses suggests that domestic production accounts for two-thirds to three-quarters of baccalaureate growth. More recent estimates from the 2005 ACS indicate that 77% of BAs added in 2004 were domestically produced. If California can continue to import to produce one-third of its new baccalaureates, between 3.5 million and 3.8 million new baccalaureates will need to be earned and bestowed by California universities over the next two decades. If California needed to satisfy three-quarters of the demand from domestic sources, between 4 million and 4.3 million new California baccalaureates would need to be produced. Although a part of this increase might be expected to emerge simply from the growth of the population aged 19-25, an additional annual growth rate of 2% beyond population growth would be needed to generate 3.5 million baccalaureates, and a 4% annual growth rates would be needed to generate 4 million new baccalaureates.

B. Divergent Educational Trajectories

The projections of educational demand indicate a need for substantial increases in educational attainment. This demand occurs at the same time that the growth in the school-age population is being fueled by increases in traditionally disadvantaged ethnic populations. This section addresses some of the challenges that accompany these two trends. First, we rely on the metaphor of the educational pipeline to describe how students progress through the educational system and to identify some points of concern. Second, we focus on differences in students' educational starting points and resources that help explain their differential progress and further illuminate the challenges.

1. Progress Through the Educational Pipeline

Formal education tends to be a structured process: elementary school precedes secondary school, high school precedes college; completion of one stage is both a requirement for and a transition point to the next stage. This structure makes it easy to compute students' school success rates since, if we start off with a thousand students who move through four or five transition points, we can calculate the rate at which they move from the first point to the last point by multiplying the rates at which they move through each transition point by one another. We can also calculate the amount of rate changes required at each transition point in order to achieve the overall success rate needed to meet a particular goal (such as fulfilling the demand for workers with college degrees). Earlier, we showed that the ranges for annual growth rates (after adjusting for population growth) in the fraction of students who need to earn baccalaureates have been estimated at between 2% and 4%. To achieve this goal[14] over the next fifteen years (the period for which these forecasts were generated), improvements in successful transitions at the four or five key points would need to increase the final net rate of college graduation between 33% and 80%. The necessary gains might be achieved by increasing high school

[14] The goal of increasing the number of baccalaureates to meet currently projected labor market demand is not meant to imply that a four-year degree is the sole criteria for gauging educational success, although it does provide a meaningful benchmark. Much demand for new job entrants will require advanced or professional degrees, and a significant but declining fraction will require a high school degree or less. An effective approach for meeting the full range of demand across educational levels will require a strong core in high school years to prepare for a variety of levels of postsecondary education, as well as the integration and application of knowledge and skills which may be more directly employed without postsecondary credentials.

graduation rates, by increasing the proportions of high school graduates who choose to enter college, by increasing the fraction of college entrants who remain in school and complete their degree, or some combination of those increases.[15]

These increases are unlikely to come easily, given the current rates of successful transitions through high school and, into and through, college. Although the exact rates are a matter of dispute, the lower rates of successful transition among the fastest growing segments of the population are not.

Some recent estimates place the four year graduation rate in high schools as low as 71%[16], while other official estimates place the rate 15 percentage points higher[17] A third estimate, based on the number of all adults age 19-21 who report having at least a high school degree, and who 1) were present in California as 14-16 year olds; 2) entered high school (had at least a 9th grade education), and; 3) were no longer in high school as 19-21 year olds, places the graduation rate at 79%, midway between the extremes. Nevertheless, each of the methods reveals sharp divides in high school success by ethnicity, with non-Hispanic Whites and Asians graduating at rates up to 28 percentage points higher than Hispanics and Blacks. Total college-going rates are also subject to variations in estimates,[18] but also uniformly reflect wide ethnic disparities, and these disparities persist in rates of college completion. Tables 3 and 4 identify rates of high

[15] For example, if the high school graduation rate is 80%, the college-going rate among high school graduates is 60%, and 50% of college entrants complete at least a BA, the total success rate is 24%. To increase that rate by 33% (from 24% to 32%), we could increase the high school graduation rate by 10% (to 88%), college going rates by 10% (to 66%), and increase college completion rates by 10% (to 55%). If high school graduation rates and college-going rates remained unchanged, however, the entire increase would need to come from improving college completion rates by 33% (from 50% to 67%).

[16] Harvard Civil Rights Project.

[17] California Department of Education NCLB calculations.

[18] Published college-going rate estimates for California range from around 50% to 66%.

school graduation, college entry and college completion for California drawing upon a variety of sources and methods.

Table 3 Progression in Secondary School, 2000-2002

		Proportion Advancing				
		To 10th	to 11th	to 12th	Graduate	Completion Rate
California Department of Education	NH White	.99	.99	.98	.97	.93
	NH Black	.95	.95	.95	.94	.81
	NH API	.99	.99	.99	.98	.94
	Hispanic	.97	.97	.96	.95	.86
	Total	*.98*	*.98*	*.97*	*.96*	*.89*
Cumulative Promotion Index[19]	NH White	.97	.95	.93	.91	.79
	NH Black	.91	.90	.90	.83	.60
	NH API	1.00	.99	.96	.93	.88
	Hispanic	.91	.89	.87	.86	.60
	Total	*.94*	*.93*	*.91*	*.89*	*.71*
Decennial Census-Based	NH White	.99	.98	.95	.95	.88
	NH Black	.99	.97	.90	.89	.75
	NH API	.99	.99	.98	.96	.91
	Hispanic	.96	.94	.90	.88	.65
	Total	*.98*	*.96*	*.92*	*.92*	*.79*

The California Department of Education (CDE) rates reflect non-dropouts in each grade and the four-year derived rate based on the pre-NCLB formula. CPI rates based on authors' calculations from statewide enrollments and graduations from the California Basic Educational Data System (CBEDS). Census-based estimates are calculated by looking at the number adults age 19-21 residing in California during the census, then removing all those who indicate they were living in some other state or country in 1995. Of the remaining, the graduation rate is calculated by determining the fraction of those who indicate their current level of educational attainment as a high school graduate or higher, divided by the number with at least a 9th grade education. The assumption is that if these adults were present in California as 14-16 year-olds, and they had entered high school, then both their high school experience and graduation are in and from California schools. Graduation rates calculated for adults who resided in other states five years prior tend to be 4-10 percentage points higher, reflecting in-migration of more highly-educated adults, while similar calculations for those who lived in another country are substantially lower.

Table 4 Educational Progression in Public Post-Secondary Settings

[19] Counts by grade-specific enrollments by ethnicity were determined from school level figures from Section B of the School Information Form (SIF) available from California's Basic Educational Data System (CBEDS), and aggregated to the state level. Recently, the Harvard Civil Rights Project (HCRP) used this approach to estimate ethnicity-specific graduation rates in California. Although our total estimates are identical, their ethnicity-specific estimates differ slightly from our own. These differences arise because the HCRP builds statewide rates from the district-level up, top-codes individual grade promotion rates at the district level, and limits their universe to large stable districts. We topcode only at the state level and make no restriction on our enrollment universe.

Relative to 18 year old population	Asian/PI	Black	Hispanic	NH White	Total
Public High School Graduates	87.00%	63.50%	55.30%	77.50%	65.60%
Go to College (CCC, CSU or UC)	**78.65%**	**44.51%**	**33.07%**	**49.14%**	**45.26%**
To CCC	42.1%	34.4%	25.7%	35.5%	32.1%
Go directly to a CSU or UC	**36.54%**	**10.16%**	**7.41%**	**13.64%**	**13.19%**
To UC	20.88%	2.48%	2.27%	5.81%	5.64%
To CSU	15.66%	7.68%	5.14%	7.83%	7.54%
Go to CCC then transfer to a CSU or UC	**24.36%**	**8.64%**	**7.91%**	**14.57%**	**14.17%**
To UC	7.40%	1.02%	1.16%	3.10%	2.76%
To CSU	16.97%	7.62%	6.75%	11.47%	11.41%
Eventually go onto a CSU or UC	**60.90%**	**18.80%**	**15.32%**	**28.21%**	**27.36%**
To UC	28.28%	3.49%	3.43%	8.91%	8.40%
To CSU	32.63%	15.30%	11.89%	19.30%	18.96%
Graduate with a BA	**42.53%**	**9.34%**	**9.58%**	**19.61%**	**20.45%**
From UC	22.55%	2.23%	2.46%	6.85%	6.61%
Directly	*16.70%*	*1.56%*	*1.59%*	*4.65%*	4.46%
As Transfer	*5.84%*	*0.67%*	*0.87%*	*2.20%*	*2.15%*
From CSU	19.98%	7.11%	7.12%	12.76%	13.84%
Directly	*8.61%*	*2.69%*	*2.47%*	*4.38%*	*3.92%*
As Transfer	*11.37%*	*4.42%*	*4.66%*	*8.37%*	*9.92%*

The transition rates suggested by these tables, in combination with the increase in rates indicated by forecast demands for skilled labor, argue for the need of improvement at multiple points. Greater success at any one point would be insufficient. Increasing high school graduation rates alone simply cannot increase the pool of potential college-goers enough to meet even the lower-bound estimates needed to raise college completion rates to desired levels. Increased rates of college-going could meet much of the need by itself, but would require college-going rates to reach unrealistically high (at or near 100%) levels to meet estimates near the upper bounds of demand. Moreover, if this were to be the case, much of such growth would need to be accommodated in the California Community College (CCC) system, since California's Master Plan for Higher Education limits direct enrollments in the public four-year systems. The situation is similar for increasing college completions. Because such a large fraction of California's initial college-going rate is to and through the CCC system, most of the growth would have to occur through substantially increased rates of transfer from those institutions.[20]

To this point, a great deal of reliance has been placed on the analytic imagery of the educational pipeline. The pipeline-- with one point of origin, one point of destination, and one route linking the two -- implies a systematic progression of largely uniform students from a common origin toward a single common goal. Although this metaphor powerfully captures a great deal about educational progress and supports analysis of transitions in the educational system, the shortcomings of this metaphor are obvious in California. In contrast, the imagery of Multiple Pathways can be reasonably stretched to encompass some very different views of how students engage and persevere in their educational careers, and helps to delineate some of the great variations in students' characteristics and options.

2. Differential Resources for Educational Progress

Across the diversity of California's population, some commonalities are plain: earned credentials and acquired skills pay off for the students who continue in their educations. Those benefits are evident across boundaries formed by nativity, gender and ethnicity. Nonetheless, those same boundaries sharply divide students in terms of the educational attainment they will finally achieve. As we explore here, these differences

[20] Completion rates in the UCs are already quite high (at around 80%), and the growth in these rates are limited. Completion rates of directly admitted freshmen at CSUs are much lower, but such admits comprise only half of baccalaureates granted in that system, and a much smaller fraction of total baccalaureates granted by public and private California institutions.

are clearly related to differences in students' starting points along the educational pipeline.

Some of the ways that starting points differ are in terms of national origins, ethnic origin, and personal and parental resources. Tables 5 and 6 identify for the school age population in California how those origins differed in 2000. Nearly half of primary school aged children are immigrants or the children of immigrants, and among those that are secondary school age, first and second generation youth outnumber those who are third generation. Immigration plays a particularly strong role in the generational composition of Asian and Hispanic students, among whom 85% and 70% of primary school aged children are first or (more often) second generation immigrants. Older school-aged Asians and Hispanics are similarly dominated by the first and second generations, but have much higher representations of the first generation than do younger children.

Table 5 Generational composition of school-aged Californians by Race/Ethnicity, 2000.

Generation in 2000	Non-Hispanic White	Non-Hispanic Black	Asian/ PI	Hispanic	All Ethnic Groups
Primary SchoolAge (5-12)					
Foreign-born	2.5%	1.3%	17.0%	12.8%	8.5%
Second Generation	11.6%	7.9%	68.0%	58.0%	37.8%
Third+ Generation	82.9%	80.4%	13.0%	24.7%	49.5%
Second+ Gen/ No Parents	3.0%	10.4%	2.1%	4.5%	4.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Secondary School-Age (13-19)					
Foreign-born	4.5%	2.8%	36.9%	30.5%	18.8%
Second Generation	8.6%	5.6%	46.4%	39.3%	25.4%
Third+ Generation	74.5%	71.7%	9.7%	21.6%	44.9%
Second+ Gen/ No Parents	12.4%	19.9%	6.9%	8.7%	10.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table 6 Selected Limitations in Resources by Generation and Race/Ethnicity among Primary School-Aged Californians, 2000.

Primary School-Age (Ages 5-12)	Non-Hispanic White	Non-Hispanic Black	Asian/ PI	Hispanic	All Ethnic Groups
Percent In Poverty					
Foreign-born	28.9%		23.7%	41.0%	35.8%
Second Generation	9.8%		15.0%	28.5%	23.5%
Third+ Generation	8.7%	30.0%	7.1%	21.1%	14.5%
Second+ Gen/ No Parents	43.6%	52.7%	36.3%	47.5%	47.0%
All Generations	10.3%	31.3%	15.9%	29.1%	21.0%
Without both Parents					
Foreign-born	14.3%		20.9%	31.9%	27.7%
Second Generation	12.1%		14.7%	23.0%	20.2%
Third+ Generation	26.0%	62.1%	26.9%	46.2%	35.7%
Second+ Gen/ No Parents	100.0%	100.0%	100.0%	100.0%	100.0%
All Generations	26.3%	63.1%	19.1%	33.3%	31.9%
Parent Did Not Complete HS					
Foreign-born	15.1%		25.2%	61.9%	48.3%
Second Generation	12.4%		20.8%	60.0%	46.0%
Third+ Generation	6.1%	15.7%	6.0%	20.5%	10.6%
Second+ Gen/ No Parents	--	--	--	--	--
All Generations	6.9%	14.2%	19.2%	47.8%	26.8%
Linguistically Isolated					
Foreign-born	34.5%		39.3%	44.2%	41.7%
Second Generation	8.7%		26.9%	32.9%	28.5%
Third+ Generation	0.1%	0.2%	0.8%	2.3%	0.6%
Second+ Gen/ No Parents	0.0%	0.0%	0.0%	0.0%	0.0%
All Generations	1.9%	1.0%	25.1%	25.3%	14.6%

National origin is not the only source of significant differentiation among school-aged children: Table 6 shows rates of poverty, fractions of children living with only one parent, proportions of children whose parent failed to complete high school, and shares of children living in linguistically isolated households, in total and by ethnic origin and immigrant generation. These are key measures of the resources and supports children have available to them, and they cover the range from economic circumstances to the availability of adults, and from familial educational history to isolation from the state's predominant language. Poverty rates among primary school-aged children range from a low of less than 7% among third generation Asians to a high of 41% among foreign-born Hispanic children. Among children whose generation could not be determined because they did not live in the same household as their parent, poverty rates averaged 47%, and exceeded 50% for Black children in such households.

The absence of one or more parents from a child's household occurs for nearly a third of children, but is especially common for Black children and third-generation Hispanics. This absence can directly limit adult supports and interventions with children, as well as placing them at greater risk for poverty. Although children in the first and second generations are less likely to have an absent parent, children in these generations are much more likely to live in linguistically isolated households. More than 40% of foreign-born Asian and Hispanic children in the primary school-ages live in linguistically isolated households, and between a quarter and a third of such second generation children are similarly isolated.

One of the strongest and most consistent predictors of children's educational success is the educational attainment of their parents. The familiar divides by ethnicity and immigrant generation are apparent here, as well. More than a quarter of all children in this age group have a parent who did not complete high school, but more than 60% of first and second generation Hispanic children fall into this group. Although differences in parental education is most strongly tied to immigrant generation, ethnic differences in the third generation are also clear, with third-generation Hispanics most likely and Asians and Whites least likely to have parents who did not complete high school.

The influence of these differences in origins becomes evident in rates of dropping out among high school aged youth. Table 7 shows the fraction of youth aged 16-19 who have neither completed high school nor are currently enrolled, but who have been present in California for at least five years and potentially enrolled, for at least a while, in California secondary schools. Higher dropout rates for the foreign-born and Hispanics are clear, but trends in rates of dropouts have declined substantially for these groups since 1980. Overall, rates declined by nearly half during the period. Table 8 shows similar patterns for older teens, with a great deal of the total improvement in retention and completion resulting from gains among Hispanics[21].

Together, these results point out the size of the challenge in elementary and secondary schools, but also provide the basis for a reasonable belief that the challenge can be met in these settings. The beginning of students' educational trajectories varies a great deal - students come from different places linguistically, geographically, socially, culturally and economically - and their educational success varies widely, as well. Students also enter their educational paths in California at different times in their life, and many do not come to California until later in their lives. For those with a reasonable

[21] Multivariate analyses which include parental education, poverty, presence of two parents and facility with English suggest these gains come from true reductions in rates of dropout within these groups irrespective of these risk factors.

level of exposure to the U.S. and California, however, dropout rates have decreased markedly, and those declines are particularly large among Hispanics.

The primary and secondary school settings are quite heterogeneous, but the level of differentiation in post-secondary systems is even larger, and large survey samples provide much less information on the social and familial origins of students in various post-secondary settings. However, the available evidence, summarized in earlier tables, suggests that the ethnic differentials found in high school completions are replicated in post-secondary entry and persistence. In some sense, the different starting places we note in primary and secondary school are translated to different postsecondary school settings and systems. We can speculate, then, that gains made in high school retention and completion will, in turn, increase the load particularly in the community colleges where students with greater risks for dropping out are concentrated.

III. Challenges in Context

California has benefited a great deal from the selective migration of the well-educated and from its past investments in public education. However, the same demographic factors which have supported high levels of human capital now bring strong challenges to the state’s educational infrastructure and its economic development. As we described earlier, the benefits from educational investments are clear, both for individuals and for the state. Because future demands for highly educated workers may outstrip California's abilities to produce those workers, a substantial increase in educational success will likely be necessary. This success, in order to continue to reap the labor market rewards of education, must entail improvements in continuation and completion rates as well as the situated integration of curriculum with the knowledge and practices of

California's evolving industries. To be broadly effective, education must be relevant to student aspirations and industry needs, and provide a solid academic foundation for students to continue their educations in subsequent settings. Within these broad constraints, however, an overemphasis on a single discipline, instructional setting, style of learning, set of instructional supports or academic level is unlikely to address the varied needs of California's diverse student populations.

Gains in educational success will have to be distributed across the primary, secondary and postsecondary settings. In the postsecondary setting, meeting the increased demands for highly educated workers will require gains in college entry, persistence and completion, and those gains will place heavy demands on the community colleges to increase both college-going rates and transfer rates. Success in the post-secondary setting, however, necessarily relies on ample supplies of students who want to and are able to enter, and on the solid preparation of those students for college.

In the primary and secondary settings, members of different ethnic groups and immigrant generations face very different challenges and experience very different levels of success. Improvements in the K-12 setting are especially critical, however, because enrollment is mandatory and broad, attrition is currently substantial, and the knowledge and skills acquired in this setting are fundamental to subsequent success in college and the workplace. Countering attrition is likely to entail the provision of supportive services tailored to the specific needs of students laboring under the disadvantages of poverty, limited English skills, and parental supports which may be restricted as a result of parents' own limited educations or single parenthood. Because students' own motivations are essential in their educational success, the integration of professional and technicallyrelated training which provides clear context and relevance of the knowledge they learn in school is equally important, both in countering attrition and solidifying their new skills. The multiple pathways approach, with its emphasis on strong academic preparation that is situated and contextualized in a variety of career-oriented paths, promises to improve students' completion and readiness for the challenges they will meet after high school. Despite current disparities and levels of attrition, the trends we observe in students’ persistence and completion suggest that these challenges can be successfully faced.

Table 7 School Enrollment/Completion status of "non-recent" Californian residents age 16-19 by ethnicity and year, 1980-2000.

Status	At least 1 Parent Present			No Parent Present		
	Foreign born	Second Generation	Third+ Generation	Foreign - born	Second+ Gen/ No Parents	Total
Not Enrolled/ No Degree: 1980						
Non-Hispanic White	8%	7%	8%	29%	22%	11%
Non-Hispanic Black			10%		19%	11%
Asian/ PI	3%	4%	2%	13%	11%	5%
Hispanic	22%	12%	15%	61%	39%	22%
Total	**17%**	**9%**	**9%**	**50%**	**25%**	**13%**
Not Enrolled/ No Degree: 1990						
Non-Hispanic White	6%	4%	7%	14%	15%	8%
Non-Hispanic Black			11%		21%	13%
Asian/ PI	4%	3%	6%	11%	5%	5%
Hispanic	19%	10%	12%	52%	27%	19%
Total	**13%**	**7%**	**8%**	**42%**	**18%**	**12%**
Not Enrolled/ No Degree: 2000						
Non-Hispanic White	4%	3%	4%	11%	9%	5%
Non-Hispanic Black			7%		13%	8%
Asian/ PI	3%	2%	3%	8%	4%	3%
Hispanic	13%	8%	7%	43%	23%	13%
Total	**9%**	**6%**	**5%**	**34%**	**13%**	**8%**

Source: Author's calculations from 5% IPUMS sample for California for 1980, 1990 and 2000.
Universe: California residents age 16-19 present in California in both the decennial census year and five years prior. This population has been present in the state since age 11-14, ages for which enrollment is virtually universal.
Note: Generation attributed based on co-residing parents' nativity. Native-born teens not living with either parent are classified as "Second+ Generation". The fraction of teens who are neither enrolled nor completed high school is a gauge of rates of incompletion for secondary school, but not a precise one. Some youth who are neither enrolled nor degree holders will eventually earn a diploma, and many who are currently enrolled will subsequently fail to complete high school. Using distributions for parental education for 2000 in conjunction with the educational inheritance matrix of Chapter 1 make it possible to predict eventual dropout rates for each of the generations with a parent in the household. These predictions suggest that anticipated dropout rates for the first and second generations will be roughly double the rate of non-enrollment/completion shown in these tables, and one-third to one-half higher for the third generation. The predicted rates correlate well by ethnicity and generation with the non-completion rates shown.

Table 8 School Enrollment/Completion status of "non-recent" Californian residents age 19-20 by ethnicity and year, 1980-2000.

Status	Foreign-born	Native born	Total
Not Enrolled/ No Degree: 1980			
Non-Hispanic White	18%	15%	15%
Non-Hispanic Black		18%	18%
Asian/ PI	10%	6%	7%
Hispanic	48%	28%	34%
Total	**37%**	**17%**	**19%**
Not Enrolled/ No Degree: 1990			
Non-Hispanic White	9%	12%	12%
Non-Hispanic Black		18%	18%
Asian/ PI	7%	5%	7%
Hispanic	45%	23%	32%
Total	**32%**	**15%**	**18%**
Not Enrolled/ No Degree: 2000			
Non-Hispanic White	7%	9%	9%
Non-Hispanic Black		18%	17%
Asian/ PI	5%	5%	5%
Hispanic	33%	21%	24%
Total	**22%**	**14%**	**15%**

Source: Author's calculations from the 5% IPUMS sample for California for 1980, 1990 and 2000.
Universe: California residents age 19-20 present in California in both the decennial census year and five years prior. This population has been present in the state since age 14-15. Alternative specifications limiting the foreign-born population to those present since age 13 showed only small declines in the fraction lacking a diploma. Teens who are neither enrolled nor completed high school in this age group are a strong proxy for dropout rates, since those who are not enrolled at this age face strong institutional barriers to re-entry and completion.

References

Brady, Henry, Michael Hout and Jon Stiles*, Return on Investment: Educational Choices and Demographic Change in California's Future, .* (The Campaign, Oakland, California) November, 2005

Cheeseman Day, Jennifer, and Eric C. Newburger, " The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings" *Special Studies, Current Population Reports*, (P23-210), Bureau of the Census, July 2002.

California Postsecondary Education Commission, "Student Profiles, 2003", Report 03-9, Sacramento, CA, November 2003.

California Postsecondary Education Commission , "Fiscal Profiles, 2004", Report 04-20, December 2004.

California Postsecondary Education Commission, "University Preparedness of Public High School Graduates", Commission Report 05-05, Sacramento, CA, March 2005.

Flippen, Chenoa and Marta Tienda."Pathways to Retirement: Patterns of Labor Force Participation and Labor Market Exit among the Pre-Retirement Population by Race, Hispanic Origin, and Sex", *Office of Population Research Working Paper*, Princeton, N.J., 1999.

Fountain, Robert and Marcia Cosgrove, *Keeping California's Edge: The Growing Demand for Highly Educated Workers*. (The Campaign, Oakland, California) April 2006.

Kalmijn, Matthijs. 1991. "Status Homogamy in the United States." American Journal of Sociology 97:496-523.

Krop, Richard A., *The Social Returns to Increased Investment in Education: Measuring the Effect of Education on the Cost of Social Programs*, RAND Graduate School Dissertation, Santa Monica, CA: RAND, RGSD-138, 1998.

Myers, Dowell, John Pitkin, and Julie Park, *California Demographic Futures: Projections to 2030, by Immigrant Generations, Nativity, and Time of Arrival in U.S.*, School of Policy, Planning, and Development, University of Southern California, Los Angeles, California, 2005.

Neumark, David, *California's Economic Future and Infrastructure Challenges*, Occasional Paper, Public Policy Institute of California, San Francisco, California, 2005.

Schwartz, C. and Mare, R. (2005), 'Trends in Educational Assortive Marriage from 1940 to 2003', *Demography*, **42**, 621–46.

Stiles, Jon, *The Demographics of Change: Migration, Fertility and the Inheritance of, Progression in and Returns to Education in California, 1980-2030*. [Dissertation, University of California, Berkeley] (August, 2006).

The Civil Rights Project, Harvard University, "Confronting the Graduation Rate Crisis in California," 2005.

University of California Office of the President, "Information Digest: A Reference Guide on Student Access & Performance at the University of California, 2003", Oakland CA, 2003.

Warren, John Robert, "State-Level High School Completion Rates: Concepts, Measures, and Trends", Paper prepared for the ASA Annual Meeting, Atlanta, GA, 2003.