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# **Intervening Opportunities between Home and College: Students'**

## **Geographic Mobility by College Type**

This study compared the geographic mobility of community college students with that of students at other institutions of higher education. Using a sample of 7192 students at 39 institutions across the United States (13 community colleges, 14 public 4-year institutions, 12 private 4-year institutions), it employed the method of operationalizing geographic distance as the number of intervening opportunities between home and school. From normative life course theory, two main hypotheses were derived. Corroborating the first hypothesis, the catchment areas of the community colleges were found to be local and determined by proximity. Contrary to the second hypothesis, there was no interaction effect of gender and college type. Rather, women, on average, exhibited a lower degree of geographic mobility than did their male counterparts across all college types. Although there are certainly structural challenges inherent in the non-hegemonic life course strategy presented by community colleges, community colleges were found to fulfill their mission in terms of delivering an alternative to the hegemonic spatial element of expected geographic mobility in higher education.

Keywords: community colleges; intervening opportunities; geographical mobility; life course theory

# **Intervening Opportunities between Home and College: Students'**

## **Geographic Mobility by College Type**

Community colleges serve as a complement or, as we discuss in this article, an alternative to the hegemonic life course model of higher education. Underlying the organizational realities of institutions of higher education are cultural concepts of the normative life course, which, in the widest sense, are narratives of how life should proceed from birth to death so that it would be deemed successful. In a class society, the normative life course of the upper and middle classes constitutes part of their normative hegemony over society at large. Community colleges provide an alternative narrative of the life course that is grounded in different conceptualizations of social time and space: You do not have to be in your late teens to go to college. And you do not have to move to go to college. In this article, we focus on the second of these twin promises. Community college education is supposed to provide access to higher education for people in the community where they reside. To what extent is this empirically true? In this article, we investigate the catchment areas of 13 community colleges in the U.S. and explore if their students indeed come predominantly from the local area and choose a community college very close to where they live—as compared with the catchment areas of 26 non-community colleges (14 public; 12 private).

When researchers have tackled the issue of mobility in the context of higher education, they have predominantly understood it as *social* mobility—higher education functioning as an engine of upward social mobility. This function also makes access to higher education a prime focus of the discourse about social inequality. Whereas reams of social science literature have examined differences in access to higher education by socioeconomic and race/ethnic groups (see the pioneering study by Coleman et al., 1966, as well as the recent study by Moreno et al., 2021), and countless initiatives have been undertaken to alleviate these disparities under the banners of social justice, there has been less research on distance from home to college as

a factor for college attendance. Thus, we focus our work on the *geographic* mobility associated with accessing higher education.

López Turley (2009) bemoaned that many college-choice models ignore the geographic context and called attention to the "geography of opportunity" (López Turley, 2009; Martinez & Acevedo, 2021; Tate, 2008), a term originating from housing research (Galster & Killen, 1995), while others have examined geographic barriers to accessing higher education in "education deserts" (Hillman, 2016) or "college deserts" (Dache-Gerbino, 2018), as opposed to "college oases" (Dache-Gerbino, 2018).

The researchers studying college choice who took geographical location into account identified proximity as an important consideration in college choice (Do, 2004; Flint, 1992; Rouse, 1994, 1995; Smith & Bers, 1989; Somers et al., 2006; Weiler, 1994). The proximity of colleges was found to influence both college-entering students' intrastate mobility (Alm & Winters, 2009) and interstate mobility (Cooke & Boyle, 2011). Other research has found elevated geographical mobility as a consequence of college attendance (Andres & Licker, 2005; Domina, 2006).

A key point in this research, as we will elaborate below, is that the issues of social mobility and geographical mobility are intricately intertwined. The amount of college-related geographical mobility is positively associated, on the one hand, with students' social class and, on the other, with beneficial socioeconomic outcomes. These are precisely the empirical correlates of the hegemonic normative life course theory, which we use for our theoretical framework.

### ***Theoretical Framework***

Life course theory (Elder & Giele, 2009; Mannheim, 1952) is based on the empirical research of life stages but also has a normative edge in the sense of expected life courses (how people in a culture think life *should* progress from birth to death). Life course theory (both empirical and normative) can be usefully grounded in more general sociological theories of social time

and space. Social time was a somewhat neglected category in theoretical sociology aside from a few pioneering efforts, such as those by Hubert and Mauss (1909), Halbwachs (1925), and Sorokin and Merton (1937). A major advance was made through Merton's (1984) concept of socially expected duration, which he examined together with the concept of residential mobility worked out by Rossi (1955). Rossi had established a clear connection between the life course and residential mobility, which thus could be understood as socially expected mobility. These two concepts together (socially expected duration and socially expected mobility)—referring to time and space—can form a robust theoretical foundation of life course theory, which deals with both stages (in time) and locations (in space) of human lives.<sup>i</sup>

The variability of life course theories depends on the underlying societal complexity. Gramsci's (1971) theory of hegemony explains how normative life course theories function in differentiated societies. Western modern societies have, in otherwise divergent frames of reference (e.g., Marx & Engels, 2002; Weber, 1978), been consistently described as class societies. In the presence of hegemony, the lower classes are kept from rising in society not only through economic exploitation, or in extreme cases through discrimination and oppression, but also through the cultural hegemony of the definition of what is normal. Middle-class normative ideas (in our case, a normative life course theory) are projected into society at large and thus legitimize the dominance of the middle classes at the cultural level. This is done both by affording the middle classes a sense of norm fulfillment and thus normative superiority and, on the flip side, by introducing a sense of normative deficiency into how the lower classes perceive their actual life courses.

The normative connection of higher education with geographical mobility has culturally long been established, from the medieval "scholar vagus" (vagrant scholar; Irrgang, 2003) to the young gentlemen's "grand tour" of the 17th- through early 19th-centuries (Chaney, 2000). In the U.S., the existence of an extremely stratified system of higher education further serves as a structural determinant of desired geographical mobility, with

colleges' higher status in the hierarchy correlating with their students' higher mobility. The apex of the hierarchy is formed by a few highly competitive schools to which aspirants apply regardless of geographic proximity, driven by high hopes of economic, prestige, and self-actualizing benefits. These elite, top-tier U.S. colleges have even become increasingly international, as their catchment areas are not restricted to the U.S., but attract students from around the world.

This establishes a key component of the normative middle-class life course in which "moving to college" is expected for the young after graduating from high school. The expected social durations are from 14-18 years of age for high school, and from 18-22 for college—typically somewhere else—with either further education or a white-collar profession to follow. In the hegemonic life course of American culture, the concept of an elongated bipartite life stage of adolescence has become ingrained, with a sharp dividing line drawn by the expected geographic mobility of going to college, which, in terms of age, is fairly close to 18 years, coinciding with the legal age of adulthood in the U.S. The late portion of adolescence ("the college years" or "emerging adulthood") supports an extended psychosocial moratorium (Arnett, 2000; Erikson, 1968), in which students not only learn the knowledge and skills of an academic major but also some general adult behavior patterns and living independently from their parents. In the hegemonic life course, the ultimate purpose of college is most extremely expressed in the concept of a "liberal arts" education, which rests on the continental ideas of *Bildung* (Paulsen, 1906). Hence the expected geographic mobility of leaving close parental supervision for a college community is supposed to provide all kinds of avenues to experimentation, personal growth, and self-actualization, with the move to college thus initiating an extended and hypertrophic rite of passage (van Gennep, 1960).<sup>ii</sup>

All these bets are off when it comes to community colleges. The concept of the community college is an egalitarian alternative about access to higher education for people to whom the normative life course is unavailable or unattainable, with the intention of

democratizing higher education (Rhoads & Valadez, 2016). From their inception in the late 19<sup>th</sup> century (Drury, 2003; Kane & Rouse, 1999), community colleges have played various roles, shaped by public debate, and influenced by multiple political and social pressures (Nix et al., 2020). Yet two main functions have remained in the foreground: qualification for mid-level jobs and articulation to the other institutions of higher education (with the goal of transfer into 4-year colleges) – with potentially problematic trade-offs between the two functions (Dougherty, 2018; Rouse, 1995). First, community colleges provide training for employment in the local labor market and offer job-related credentials (Belfield & Bailey, 2011; Rephann, 2007; Reyes et al., 2019; Rios-Aguilar et al., 2018). In this respect, the job-focused purpose of a community college education is the diametrical opposite to that provided by the "liberal arts college." Second, community colleges provide an on-ramp to more advanced levels of higher education (Taylor & Jain, 2017). Previous research has found that a majority of students enter community college intending eventually to transfer to a 4-year institution; however, only about a third eventually follow through with the plan (Ortagus & Hu, 2019).

The key feature of community colleges is open access in several dimensions. First, in contrast with the hierarchical and partly meritocratic "assortative mating" system of college admission and enrollment, in which prospective students pick colleges, and vice versa (Dillon & Smith, 2013), everyone is welcome to sign up at community colleges. This is an opportunity to remedy problematic prior educational careers (though it comes with problems in preparation and persistence; Liao et al., 2014). Second, it is more financially affordable and thus provides opportunities for individuals and families at the lower end of the economic spectrum. For those students who see themselves progressing to a 4-year college or university, two years of taking introductory coursework at a community college can help make the dream of a bachelor's degree attainable.

Most pertinent to this article, the community college concept expands access in both the time and space dimensions of the hegemonic life course. It rejects the idea of a prescribed standard life period for college education (ages 18-22); people of any age are welcome to attend. In addition, the socially expected duration has become much more flexible, owing to part-time study being a common feature. Part-time study accommodates the need to work full-time and permits meeting family-related obligations, such as childcare and eldercare (Deil-Amen, 2011), which have separated females, in particular, from the normative life course. According to Hu and Ortagus (2019) and Lovell and Lockhart (2021), community colleges have the potential to contribute to the closing of the STEM gender gap. Finally, the community college concept rejects the idea of expected geographic mobility; it affords people the opportunity to go to college where they live. Proximity considerations are paramount and constitute an egalitarian alternative to hierarchical considerations about attending higher education.

Finally, gender differences in normative ideas about geographic mobility should be noted. General, deep-rooted cultural patterns have associated females with a relative lack of geographic mobility. In her extensive review of the literature about gender and mobility, Hanson (2010, p. 9) summarized: "... mobility/immobility stand at the core of traditional gender ideologies, which are infused with notions of space, place and mobility. These ideologies echo the familiar dualism that on one side equates women and femininity with the home, the private, with domestic spaces and restricted movement (which translates into interactions that are routine, quotidian, familiar), and on the other, equates men and masculinity with the not-home, the public, with urban spaces and expansive movement (which translates into interactions that bring excitement, challenges, new experiences, encounters with the unknown)."



## *Empirical Findings*

Empirical studies have found societal reality to correspond with the hegemonic normative life course regarding higher education in two expected ways. First, geographic mobility for higher education is more widespread among the middle classes. Geographical mobility in moving to an institution of higher education was found to be connected to high social status and white racial status (Mulder & Clark, 2002; Niu, 2015; Sandefur et al., 2006; Shaw et al., 2009). Middle-class families tend to have both the financial means and attitudinal inclination to send their offspring to a "good college" even if it involves the children moving far away. This is less likely among the working class, let alone the poor or otherwise marginalized. Focus group studies found that location (i.e., proximity) was most salient among the pragmatic and convenience considerations for choosing a community college (Bers & Smith, 1987; Somers et al., 2006). Consequently, proximity to college has been found to be particularly advantageous for underprivileged groups (Briscoe & Oliver, 2006; Card, 1993; Griffith & Rothstein, 2007; López Turley, 2009).

Second, geographic mobility to attend college is associated with benefits later on, as it ties in with the hierarchical structure of American higher education, thus perpetuating socioeconomic status advantages. Young adults who leave home to attend school have been found to experience higher educational attainment (White & Lacy, 1997). However, White and Lacy (1997) also found that leaving home for other non-family-related reasons than attending college (e.g., residential independence from parents or military) could result in a higher level of education as well – compared to those who stay with their parents. In accordance with classic human capital theory (Becker, 1964), it has typically been found that higher education is associated with higher geographic mobility afterward (e.g., Malamud & Wozniak, 2021), and higher geographic mobility is associated with higher employment returns (e.g., Rodgers & Rodgers, 2000).

Research on gender differences in geographic mobility has been selective. Gender differences in the geographic mobility of scientists and academics, in particular, have received a good deal of attention (Shauman & Xie, 1996; Sonnert & Holton, 1995a, 1995b; Zippel, 2017). In line with cultural expectations, gender differences in mobility intentions were found among college students (Frieze et al., 2006). In this study, a larger percentage of male than female psychology students at the University of Pittsburgh wanted to leave the Pittsburgh region *after* college graduation. Yet there is a lacuna of research about *gender differences* in the geographic mobility to *enter* higher education. The few studies that do address the issue report that women are more likely than men to attend colleges close to their home (Jepsen & Montgomery, 2009; Zarifa et al., 2018).

### ***Method of Distance Measurement***

The most common method to measure the distance between students' home and college is the distance in miles, based on zip codes of both the students' home and their college (e.g., Griffith & Rothstein, 2007; Hirschl & Smith, 2020; Mattern & Wyatt, 2009; Nelson et al., 2016; Philippe & Sullivan, 2005; R. J. Rossi & Bower, 2018). However, a measurement of distance in miles does not take into account that colleges are not equally distributed across space and that population density varies considerably between states and regions. For instance, in the population centers of the Eastern states and on the West Coast, there is a higher density of colleges than in the Southern states (Hillman, 2016; Long & Kurlaender, 2009; López Turley, 2009). Using distance as the predictor of college application, López Turley (2009) found that "each additional college in proximity is associated with a small but significant increase in the odds of applying to college," but this study did not provide any information about whether the nearest college was chosen, or how many were skipped.

Although geographic approaches to college proximity have typically used distance in miles as a proximity measure, the concept of intervening opportunities appears as an attractive alternative measure for its real-life relevance, when college mobility is viewed from a students' choice perspective. The intervening opportunities approach has been pioneered by Stouffer (1940, p. 846), who proposed "that the number of persons going a given distance is directly proportional to the percentage increase in opportunities at that distance." When considering the catchment area sizes of colleges, this means that not simply the distance between the college and students' homes, but rather the existence of other colleges as intervening opportunities between the college and students' homes is crucial. Intervening opportunities can be operationalized as the total number of opportunities between college and student's home (Liu & Yan, 2020). The non-hegemonic life course theory would expect that community colleges attract students because of their proximity so that there would be few intervening opportunities, i.e., no, or only a few, alternative colleges that would be closer to the students' home than was the chosen college (Akwawua & Pooler, 2001). Because community colleges are not geographically equally distributed, the measurement of intervening opportunities (instead of distance) offers the advantage that this variable is less affected by fundamental differences in the geographical pattern of community school locations, or by variations in population density.

### ***Research Aim and Hypotheses***

The mission of community colleges is to provide higher education in the vicinity of where people live, regardless of who these people are. In this concept, which lies at the core of the non-hegemonic life course theory, geographical proximity rather than hierarchical differentiation is the organizing principle of higher education.

Our hypotheses cover effects of both students' personal characteristics (i.e., gender, parental education, SAT scores) and institutional characteristics (i.e., college type, selectivity). Whereas this article focuses on college type and gender (Hypotheses 1 and 2), we

added two ancillary hypotheses addressing the potential effects of important control variables (Hypotheses 3 and 4). The hypotheses are:

1. Community college students skip fewer intervening opportunities than do students of other institutions. Thus, the catchment areas of community colleges are smaller than those of other colleges or universities.
2. Female community college students do not skip fewer intervening opportunities than do male community college students (because, for all genders, close proximity is expected to be the paramount consideration for attending community colleges). However, female students skip fewer intervening opportunities than do their male counterparts when they attend non-community colleges. Put in statistical jargon, we hypothesize an interaction effect between gender and college type.
3. Higher SAT scores and higher parental education is associated with higher geographic mobility for college attendance.
4. Higher intervening opportunities are related to higher college's state population density and higher selectivity of colleges.

## **Method**

### ***Sample***

This study uses data from the project *Persistence Research in Science and Engineering* (PRiSE), collected in the fall semester of 2007. It provides a nationally representative, randomly drawn sample of colleges and universities. Questionnaire data were obtained from  $N = 7,485$  students in compulsory English classes at 39 institutions across the United States. Two hundred and ninety-three students (3.9% of the sample) did not provide their home location or zip code and were removed from the effective sample ( $N = 7,192$ ). The effective sample consisted of  $N = 2708$  students from 13 two-year community colleges,

$N = 859$  students from 12 four-year private colleges, and  $N = 3625$  from 14 four-year public colleges.

## ***Variables***

### *Dependent Variable*

As discussed above, the distance between home and college—which, in aggregate, serves as an indicator of the size of the college catchment areas—was operationalized as the number of intervening opportunities between home and college. For determining intervening opportunities, we used the 3-digit zip codes of all colleges and universities on the one hand and the students' 3-digit home zip codes on the other hand. Students' home zip codes were taken from the student's questionnaires. College and university zip codes were taken from a list issued by the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Educational Data System (IPEDS 2014). There were 854 3-digit zip codes with colleges and/or universities available<sup>iii</sup>.

A list with all 3-digit zip codes featuring colleges and/or universities was used alongside a list of all 3-digit zip codes referencing the student's pre-college home to create the intervening opportunity variable, as follows: Longitude and latitude information was added to all 3-digit zip codes of the students' pre-college home and all 3-digit zip codes of the colleges/universities. For each student, we then calculated the distances between their home and all colleges/universities and sorted the colleges/universities by distance. We then compared, for each student, the ranked distances of all the colleges/universities with the distance of the chosen institution. If no other 3-digit college/university zip code was closer to the student's home than was the 3-digit zip code of the chosen college, then the count of intervening opportunities was 0; if one college/university zip code was closer, the count was 1; and so on. The resulting counts of intervening opportunities were merged back into the original data file including students' and colleges' zip codes and all other variables.

### *Independent Variables*

At level 1, the student level, we measured student achievement in high school by their Scholastic Aptitude Test (SAT) score. In the absence of an SAT score, the American College Testing (ACT) score was used and mapped onto the SAT scale, using the College Board (1999) concordance. A separate variable—Took SAT—indicated if a student had provided any of the SAT or ACT score (0 = did not provide; 1 = provided). Furthermore, we included the following variables: having parents with at least one bachelor's degree or higher as a rough indicator of socioeconomic status, as well as gender.<sup>iv</sup>

As level 2-predictors, the following college characteristics were used: college status (community vs. private vs. public)<sup>v</sup>, and the population density (people per square mile) of the college's state in 2013 because this might have impacted the geographic distribution of colleges. College selectivity was operationalized as the inverse of college acceptance rate in 2007 (from U.S. News & World Report, 2021). This is equivalent to the ratio of the number of applicants vs. the number of admitted. The lowest value of selectivity is 1 (100% acceptance rate); higher values indicate that the school is more selective. Descriptives of student- and school-level variables are displayed in Table 1. From these statistics, it is immediately obvious that the community college students, on average, had a weaker academic preparation, as measured by both SAT/ACT participation and score, than did the students of the other institutions. Whereas only 52% of the community college students took the SAT/ACT, 85% of the private college students and 87% of the public college students did so; and the average SAT/ACT score of community college students was about 100 points lower than that of the other students. Their average socioeconomic status, as indicated by parental education, was also lower. 34% of the community college students had at least one parent who had a bachelor's degree, compared with 53% for private college students and 62% for public college students. In accordance with their open-access mission, nearly all community

colleges had selectivity = 1, only one community college had selectivity slightly above 1 (1.07). Thus the selectivity variation among community colleges was near zero.

**Table 1**

*Descriptive Statistics by School Types.*

	School Type		
	<u>Community</u>	<u>Private</u>	<u>Public</u>
<i>Student Level</i>			
Took SAT	52% <sup>**</sup>	85% <sup>+</sup>	87%
SAT Score	979.99 <sup>**</sup> (191.56)	1073.60 <sup>+</sup> (192.33)	1093.74 (177.58)
Gender (Male = 1, Female = 0)	43% <sup>**</sup>	37% <sup>+</sup>	52%
At Least One Parent has a Bachelor's Degree	34% <sup>**</sup>	53% <sup>+</sup>	62%
<i>School Level</i>			
College's State Population Density (People per Square Mile)	216.22 <sup>**</sup> (305.77)	415.09 <sup>+</sup> (454.42)	136.70 (134.03)
Selectivity	1.00 <sup>**</sup> (0.01)	1.83 <sup>+</sup> (0.44)	1.59 (0.71)
Number of Students	2708	859	3625
Number of Schools	13	12	14

*Note.* \* < .05 compared to private, + < .05 compared to public. Percentage comparison used Chi-square test. Mean comparison used t-test.

## ***Data Analysis***

The dependent variable (intervening opportunities) was positively skewed (skewness = 3.72, kurtosis = 17.06), exhibiting a negative binomial distribution. This distribution was taken into account by conducting negative binomial two-level analyses. All analyses were performed with the software R version 3.6.3 (R Core Team, 2019), using the R package lme4 (Bates et al., 2015). First, we ran an unconditional model. Variance at the college level was measured by negative binomial ICCs. In a second step, we included all level 1- and level 2-predictors. We first specified a model without controlling for selectivity, because selectivity had strong collinearity with school type (all community colleges had selectivity near 1); we then included selectivity in our second model, which would help us compare the net effect of school type at selectivity = 1. We report unstandardized estimates after standardizing continuous predictors, as recommended by Hayes (2018). Missing values were deleted listwise.

## **Results**

### ***Home-School Distance***

**Table 2**

*Metrics for Home-School Distance by School Type.*

School Type	Mean Intervening Opportunity	Median Intervening Opportunity	Went to the Nearest College	Mean Distance (Miles)	Median Distance (Miles)
Community	14.72**	0**	64% **	58.29**	10.37**
Private	118.15 <sup>+</sup>	12 <sup>+</sup>	21% <sup>+</sup>	203.46 <sup>+</sup>	41.66 <sup>+</sup>
Public	60.48	8	27%	164.83	74.37



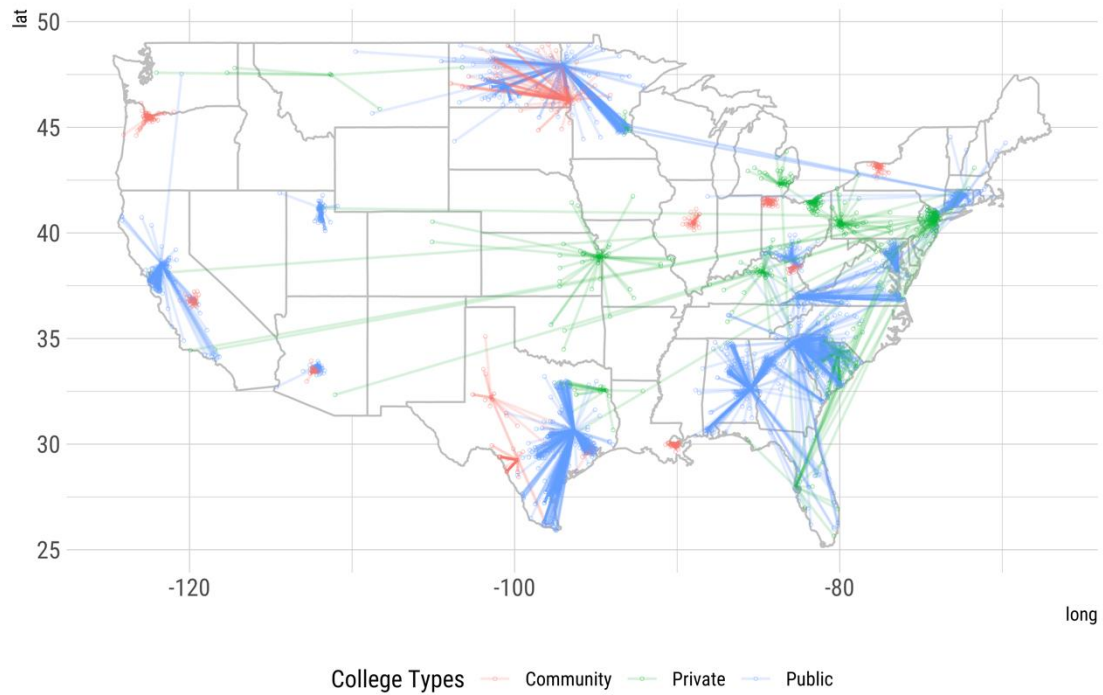
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*Note.* \* < .05 compared to private, + < .05 compared to public. Median comparison used Mood's median test. Percentage comparison used Chi-square test. Mean comparison used t-test.

Table 2 shows home-school distance comparisons (using different metrics) by school type. The average distance between student's home and the college they attended was 58.29 miles ( $Md = 10.37$ ) for community colleges, 203.46 miles ( $Md = 41.66$ ) for private colleges, and 164.83 miles ( $Md = 74.37$ ) for public colleges. The average intervening opportunities were 14.72 for community colleges ( $Md = 0$ ), 118.15 for private colleges ( $Md = 12$ ), and 60.48 for public colleges ( $Md = 8$ ). 64% of the community college attendees went to the nearest college from home, whereas only 21% of the private and 27% of the public college attendees did so<sup>vi</sup>. Figure 1 displays the school-home distance (separating school types by colors) of the 80% nearest students for each school (the other 20% crisscrossed the map—such as from coast to coast—and would disrupt the display of the salient clusters). It becomes immediately apparent that community colleges had smaller catchment areas than did the private and public colleges. However, the size of catchment areas differed between different states, with small catchment areas concentrated in regions of high population density.

**Figure 1**

*School-Home Distance of the Nearest 80% Students.*



***Multilevel Analyses***

We tested the amount of college-level variance in intervening opportunities: The unconditional model revealed a negative binomial intra-class correlation (ICC) of .10; this corresponds to a design effect of 19.61 (Hox & Maas, 2001). This indicated there is substantial variance at college level. When we added all level 1- and level 2-predictors, the ICC was .05 (design effect of 10.31).

**Table 3***Models Predicting Intervening Opportunities*

<i>Dependent Variable: Log of Intervening Opportunities</i>				
	Model 1		Model 2	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Student Level Predictors:</i>				
Took SAT	-0.17*	0.08	-0.17*	0.08
SAT Score (Standardized)	0.12***	0.04	0.12***	0.04
At Least One Parent has a Bachelor's Degree	0.26***	0.06	0.26***	0.07
Gender (Male = 1, Female = 0)	0.15*	0.06	0.15*	0.06
<i>College Level Predictors:</i>				
Private vs. Community	1.57***	0.31	1.36*	0.33
Public vs. Community	1.19***	0.28	0.94*	0.31
College's State Population Density (Standardized)	-0.14	0.11	0.07*	0.11
Selectivity			0.42*	0.19
Intercept	2.51***	0.21	2.01***	0.30
Random Intercept Variance	0.46		0.39	
Observations	6,213		6,213	
Log Likelihood	-21,418.20		-21,415.50	
Akaike Information Criterion	42,856.50		42,853.10	
Bayesian Information Criterion	42,923.80		42,831.10	
ICC	0.06		0.05	

*Note:* \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; *B* = standardized coefficient; *SE* = standard error.

Table 3 presents the results of the hierarchical negative binomial models that predicted the intervening opportunities. Model 1 contains the key predictors and the control variables; Model 2 adds the college selectivity as an additional control variable.

First, looking at Model 1, we found that students who attended private ( $B = 1.57$ ,  $SE = 0.31$ ,  $p < .001$ ,  $\exp(B) = 4.80$ ) or public ( $B = 1.19$ ,  $SE = 0.28$ ,  $p < .001$ ,  $\exp(B) = 3.28$ ) colleges skipped over more intervening opportunities, compared with students who attended community colleges, which confirmed Hypothesis 1. These coefficients indicate that the log of expected counts of intervening opportunities for students who attended private colleges was 1.57 higher than that of those who attended community colleges; those who attended public colleges had a 1.19 higher log count of intervening opportunities than did those who attended community colleges. A post-hoc test showed that there was no statistically significant difference between private and public college attendees. This indicated that community colleges have smaller catchment areas than do private and public colleges, whereas private and public colleges do not differ in their catchment area sizes. To translate these effects into count ratios (equivalent, in the negative binomial framework, to odds ratios in logistic regression), we exponentiated the coefficients. We found that, on average, private college attendees' intervening opportunities were 4.80 times as numerous as those of community college attendees, and that, for public college attendees' that corresponding ratio was 3.28.

We found a significant main effect for gender indicating that male students tend to skip more intervening opportunities than do female students ( $B = 0.15$ ,  $SE = 0.06$ ,  $p < .05$ ,  $\exp(B) = 1.16$ ). In terms of count ratio, male college attendees' number of intervening opportunities was 1.16 times that of the female college attendees. Confirming Hypothesis 3, we also found a positive association of students' SAT scores ( $B = 0.12$ ,  $SE = 0.04$ ,  $p < .001$ ,  $\exp(B) = 1.13$ ) and parental education ( $B = 0.26$ ,  $SE = 0.06$ ,  $p < .001$ ,  $\exp(B) = 1.30$ ) with the log count of intervening opportunities. We ran additional analyses to check interaction effects

between any of the covariates and the school types. There were no interaction effects, indicating that the differences in gender, SAT score, and parental education were independent of college type. In respect to gender, this finding refuted Hypothesis 2.

In Model 2, we further controlled for college selectivity (standardized), which had a positive association with the log count of intervening opportunities ( $B = 0.42$ ,  $SE = 0.19$ ,  $p < .05$ ,  $\exp(B) = 1.52$ ). As one might expect with the addition of a somewhat collinear predictor, the effect of school type attenuated, but it remained statistically significant at the level of 0.01. This result indicated that even if we were comparing between community colleges and public/private colleges that all had selectivity near 1, community colleges still had significantly fewer intervening opportunities. For public and private colleges, as their selectivity increased, the associated intervening opportunities also increased. Note that there was no selectivity effect for community colleges because there was near zero variation in selectivity among community colleges in our sample. In Model 2, we also found a significant effect of state population density ( $B = 0.07$ ,  $SE = 0.11$ ,  $p < .05$ ,  $\exp(B) = 1.07$ ). As one might expect, students in states with higher population densities skipped more intervening opportunities than did those in states with lower population densities. The effects of the covariates remained nearly identical.

## **Discussion**

At the center of this study was the community college concept to afford people the opportunity to go to college where they live. Analyses were conducted on a broad geographical scope with a nationally representative sample. Using the count of intervening opportunities as a measure for community colleges' catchment area size, we found that students of community colleges indeed came predominantly from the local area— corroborating Hypothesis 1.

Contrary to Hypothesis 2, there was no interaction effect of gender and college type. Rather, women, on average, exhibited a lower degree of geographic mobility than did their male counterparts across all college types. However, regarding SAT score and parental education, results were in line with Hypothesis 3: on average, students with higher SAT scores and higher parental education indeed traveled further away to college.

It was also shown in the analyses for hypothesis 4 that population density is relevant for intervening opportunities: Where more people live, there are also more colleges nearby. Thus, differences in catchment areas across states could be identified. Furthermore, the hierarchical nature of the American system of higher education manifested itself in the effect of college selectivity on intervening opportunities, with greater selectivity enlarging college catchment areas. Importantly, however, this effect of selectivity was confined to public and private 4-year colleges because there was virtually no variation in selectivity among community colleges (they were all non-selective).

In the following, we discuss (a) the approach of intervening opportunities and what our results show about the fulfillment of the open-access mission of community colleges, and (b) the limitations of this article and future directions of research that can be derived from it.

### ***Intervening Opportunities and the Open Access Mission of Community Colleges***

Our results have shown that community colleges indeed tend to attract a large fraction of their students from close proximity. This was indicated by low numbers of intervening opportunities. At the median, there is no intervening opportunity between the community college and students' home, yet some students came from further away. Such greater distances may be partly explained by both methodological artifacts and certain individual reasons of geographic mobility. First, regarding methodology, not only community colleges, but all colleges and universities were counted as available intervening opportunities. This includes highly prestigious and competitive institutions that might not constitute realistic intervening opportunities for many of the students. Second, individual reasons for greater

geographic distances probably include a substantial number of geographical moves that were unrelated to college choice. Especially because community colleges also relax the normative life course in terms of when college attendance is socially expected to occur, there may be a sizable number of "mature" individuals among the community college population, for whom a substantial hiatus exists between high school and college, and who therefore have a higher likelihood of having moved in the interim for reasons that had nothing to do with college. Both considerations suggest that our results are biased toward *overestimating* the size of the catchment areas, which makes our finding that community colleges tend to draw from their immediate surroundings even stronger.

Our data reflected the deep-rooted cultural pattern of reduced geographic mobility among females vis-à-vis males. Surprisingly, this pattern was found to be similar across college types, refuting our expectation that no gender differences in mobility should exist for community colleges. Even within the close proximity regime of community colleges, women, on average, skipped fewer intervening opportunities. This highlights the importance of the geographic location of community colleges, especially for female accessibility.

There is evidence that community colleges are not located arbitrarily or in a purely geographical coverage pattern; rather, their locations are determined by history and the spatial dimension of the hegemonic life course (Reyes et al., 2019). In our sample, the finding that community colleges reach students in a proximity pattern is a positive sign that community colleges are alleviating the space dimension of the hegemonic life course and contribute to the democratization of higher education (Rhoads & Valadez, 2016). The results of our study suggest that community colleges, on the whole, fulfill their mission of providing proximal access to postsecondary education. Nevertheless, future studies should analyze in more detail whether content, geographic, and sociodemographic profiles of community colleges can be identified.

### *Limitations and Further Study*

The relatively complex calculation of intervening opportunities requires great effort and has therefore mainly been realized in single-case studies and not for nationwide samples (for exceptions see Chun, 2008 and Liu & Yan, 2020; we are not aware of any examples from the field of college education).

Whereas this study demonstrated the usefulness of intervening opportunities for measuring catchment area sizes of colleges, certain limitations of this study have to be mentioned: First, we could not take into account if students chose a college due to its proximity to other locations, such as workplaces (Reyes et al., 2019).

Second, why the students in our sample decided to attend a particular college was out of the scope of this study. It seems promising to transfer the approach of intervening opportunities to research about college application and enrollment. Comparative studies of more comprehensive institutional samples may find that intervening opportunities explain systematically differing portions of the variance in students' application and enrollment – reflecting the highly hierarchical nature of the U.S. system of higher education. The proportions may be smallest for prestigious 4-year colleges and universities, which may be expected to attract students from much farther away, students drawn by hierarchical prestige-seeking rather than spatial proximity motives. However, even this approach will not be able to answer the question of the causality between intervening opportunities and college application, as was mentioned in previous work (López Turley, 2009). As in other studies, the question of the "geography of opportunity," of the extent to which residential location determines educational opportunities, remains (Galster & Killen, 1995; López Turley, 2009). We argue that geographic location in general and intervening opportunities in particular matter and should be taken into account in education policy (Allen & Roberts, 2019).

Third, to advance empirical research on life course theory and Perna's (2006) conceptual model of student college choice, further research, linking data about state policy to



institutional and individual data, may help to understand how policy influences why students choose a community college close to their home, or not (Goldrick-Rab et al., 2007; Perna, 2006). While proximity considerations are paramount, there are indications that the "quality" of the school also plays a role in community college choice (Smith & Bers, 1989). If such a trend intensifies, it may portend a systemic shift toward individual community colleges competing with, and differentiating themselves from, each other—and away from the geographic proximity principle.

Fourth, while including a high number of students, in terms of the number of colleges our sample was not large (39 institutions), larger samples may find differences between public and private 4-year colleges (e.g., owing to reduced in-state tuition for public institutions) and perhaps an interaction effect of gender and college type. The selectivity effect could also become more pronounced when prestigious, top-tier universities are included in the analyses.

Fifth, besides the advantages of a nationally representative sample for quantitative analyses, some research questions call for qualitative or mixed-methods designs: One starting point might be qualitative case studies of particular colleges that stand out in terms of some of the variables applied in the present study. This could help to identify those community colleges' strategies of how they attract young people to study at a specific institution. Lessons learned from these cases could be useful for school administrators and policymakers when they consider the geographic context of college choice.

## **Conclusion**

This study explored intervening opportunities between students' colleges and their pre-college home addresses. The first main hypothesis derived from normative life course theory was supported. In general, the catchment areas of the community colleges were found to be local and determined by proximity, compared with those of public and private colleges. Contrary to the second hypothesis, there was no interaction effect of gender and college type, but we

found a gender difference in intervening opportunities for all college attendees—males exhibited higher mobility than did their female counterparts. Furthermore, the method of using intervening opportunities as a distance measure proved successful and might be considered in further work. Although there are certainly structural challenges inherent in the non-hegemonic life course strategy presented by community colleges (e.g., related to insufficient student preparation), community colleges were found to fulfill their mission in terms of delivering an alternative to the hegemonic spatial element of expected geographic mobility in higher education. Community colleges indeed mostly provide education to local members of the community.

## References

- Akwawua, S., & Pooler, J. A. (2001). The development of an intervening opportunities model with spatial dominance effects. *Journal of Geographical Systems*, 3(1), 69–86.  
<https://doi.org/10.1007/PL00011468>
- Allen, A., & Roberts, K. J. (2019). Space and place in rural program implementation: A look at two early college programs in Ohio. *The Rural Educator, Journal of the National Rural Education Association*, 40(1), 29–44. <https://doi.org/10.35608/ruraled.v40i1.531>
- Alm, J., & Winters, J. V. (2009). Distance and intrastate college student migration. *Economics of Education Review*, 28(6), 728–738.  
<https://doi.org/10.1016/j.econedurev.2009.06.008>
- Andres, L., & Licker, A. (2005). Beyond brain drain: The dynamics of geographic mobility and educational attainment of BC young women and men. *Canadian Journal of Higher Education*, 35(1), 1–36.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. <https://doi.org/10.1037//0003-066X.55.5.469>

- Bates, D., Mächler, M., Bolker, B. M., & Walker, S. C. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48.  
<https://doi.org/10.18637/jss.v067.i01>
- Becker, G. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. NBER.
- Belfield, C. R., & Bailey, T. (2011). The benefits of attending community college: A review of the evidence. *Community College Review*, 39(1), 46–68.  
<https://doi.org/10.1177/0091552110395575>
- Bers, T. H., & Smith, K. (1987). College choice and the nontraditional student. *Community College Review*, 15(1), 39–45. <https://doi.org/10.1177/009155218701500106>
- Briscoe, F. M., & Oliver, M. de (2006). Access to higher education. *Education and Urban Society*, 38(2), 204–227. <https://doi.org/10.1177/0013124505282604>
- Card, D. (1993). *Using geographic variation in college proximity to estimate the return to schooling* (Working Paper No. 4483). National Bureau of Economic Research.  
<https://doi.org/10.3386/w4483>
- Chaney, E. (2000). 1900-2000: A century of British and American books on the evolution of the Grand Tour. *The British Art Journal*, 2(1), 98–102.
- Chun, Y. (2008). Modeling network autocorrelation within migration flows by eigenvector spatial filtering. *Journal of Geographical Systems*, 10(4), 317–344.  
<https://doi.org/10.1007/s10109-008-0068-2>
- Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*. U.S. Government Printing Office.
- Cooke, T. J., & Boyle, P. (2011). The migration of high school graduates to college. *Educational Evaluation and Policy Analysis*, 33(2), 202-213.  
<https://doi.org/10.3102/0162373711399092>

- Dache-Gerbino, A. (2018). College desert and oasis: A critical geographic analysis of local college access. *Journal of Diversity in Higher Education*, 11(2), 97–116.  
<https://doi.org/10.1037/dhe0000050>
- Deil-Amen, R. (2011). Socio-academic integrative moments: Rethinking academic and social integration among two-year college students in career-related programs. *The Journal of Higher Education*, 82(1), 54–91. <https://doi.org/10.1080/00221546.2011.11779085>
- Dillon, E. W., & Smith, J. A. (2013). *The determinants of mismatch between students and colleges* (Working Paper No. 19286). National Bureau of Economic Research.  
<https://doi.org/10.3386/w19286>
- Do, C. (2004). The effects of local colleges on the quality of college attended. *Economics of Education Review*, 23(3), 249–257. <https://doi.org/10.1016/j.econedurev.2003.05.001>
- Domina, T. (2006). What Clean Break? Education and nonmetropolitan migration patterns, 1989-2004. *Rural Sociology*, 71(3), 373–398.  
<https://doi.org/10.1526/003601106778070626>
- Dougherty, K. (2018). *Higher education choice-making in the united states: Freedom, inequality, legitimation* (Working Paper No. 35). Centre for Global Higher Education.  
<https://doi.org/10.7916/D8N31DDP>
- Drury, R. L. (2003). Community colleges in America: A historical perspective. *Inquiry*, 8(1).
- Elder, G. H., & Giele, J. Z. (2009). Life course studies: An evolving field. In G. H. Elder & J. Z. Giele (Eds.), *The craft of life course research* (pp. 1–28). Guilford Press.
- Erikson, E. H. (1968). *Identity, youth and crisis*. Norton.
- Flint, T. A. (1992). Parental and planning influences on the formation of student college choice sets. *Research in Higher Education*, 33(6), 689–708.  
<https://doi.org/10.1007/BF00992054>

- Frieze, I. H., Hansen, S. B., & Boneva, B. (2006). The migrant personality and college students' plans for geographic mobility. *Journal of Environmental Psychology, 26*(2), 170–177. <https://doi.org/10.1016/j.jenvp.2006.05.001>
- Galster, G. C., & Killen, S. P. (1995). The geography of metropolitan opportunity: A renaissance and conceptual framework. *Housing Policy Debate, 6*(1), 7–43. <https://doi.org/10.1080/10511482.1995.9521180>
- Goldrick-Rab, S., Carter, D. F., & Wagner, R. W. (2007). What higher education has to say about the transition to college. *Teachers College Record, 109*(10), 2444–2481.
- Gramsci, A. (1971). *Selections from the prison notebooks*. (Q. Hoare, & G. Nowell-Smith, Trans.). International Publishers.
- Griffith, A. L., & Rothstein, D. S. (2007). *Can't get here from there: The decision to apply to a selective institution* (Working Paper No. 3-2007). Cornell University ILR School.
- Hadley, J., Mitchell, J. M., & Mandelblatt, J. (2001). Medicare fees and small area variations in breast-conserving surgery among elderly women. *Medical Care Research and Review, 58*(3), 334–360. <https://doi.org/10.1177/107755870105800303>
- Halbwachs, M. (1925). *Les cadres sociaux de la mémoire* [The social framework of memory]. F. Alcan. <https://doi.org/10.1522/cla.ham.cad>
- Hanson, S. (2010). Gender and mobility: New approaches for informing sustainability. *Gender, Place & Culture, 17*(1), 5–23.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). The Guilford Press.
- Hillman, N. W. (2016). Geography of college opportunity: The case of education deserts. *American Educational Research Journal, 53*(4), 987–1021. <https://doi.org/10.3102/0002831216653204>

- Hirschl, N., & Smith, C. M. (2020). Well-Placed: The geography of opportunity and high school effects on college attendance. *Research in Higher Education*, 61(5), 567–587. <https://doi.org/10.1007/s11162-020-09599-4>
- Hox, J. J., & Maas, C. J. M. (2001). The accuracy of multilevel structural equation modeling with pseudobalanced groups and small samples. *Structural Equation Modeling*, 8(2), 157–174. [https://doi.org/10.1207/S15328007SEM0802\\_1](https://doi.org/10.1207/S15328007SEM0802_1)
- Hu, X., & Ortagus, J. C. (2019). A national study of the influence of the community college pathway on female students' STEM baccalaureate success. *Community College Review*, 47(3), 242–273. <https://doi.org/10.1177/0091552119850321>
- Hubert, H., & Mauss, M. (1909). *Mélanges d'histoire des religions* [Mixed history of religions]. F. Alcan.
- Irrgang, S. (2003). Scholar vagus, goliardus, ioculator: Zur Rezeption des “fahrenden Scholaren” im Mittelalter [Scholar vagus, goliardus, ioculator: On the reception of the "travelling scholar" in the middle ages]. *Jahrbuch Für Universitätsgeschichte*, 6, 51–68.
- Jepsen, C., & Montgomery, M. (2009). Miles to go before I learn: The effect of travel distance on the mature person's choice of a community college. *Journal of Urban Economics*, 65(1), 64–73. <https://doi.org/10.1016/j.jue.2008.08.004>
- Kane, T. J., & Rouse, C. E. (1999). The community college: educating students at the margin between college and work. *Journal of Economic Perspectives*, 13(1), 63–84. <https://doi.org/10.1257/jep.13.1.63>
- Liao, H.-A., Edlin, M., & Ferdenzi, A. C. (2014). Persistence at an urban community college: The implications of self-efficacy and motivation. *Community College Journal of Research and Practice*, 38(7), 595–611. <https://doi.org/10.1080/10668926.2012.676499>

- Liu, E.-J., & Yan, X.-Y. (2020). A universal opportunity model for human mobility. *Scientific Reports*, 10(4657). <https://doi.org/10.1038/s41598-020-61613-y>
- Long, B. T., & Kurlaender, M. (2009). Do community colleges provide a viable pathway to a baccalaureate degree? *Educational Evaluation and Policy Analysis*, 31(1), 30–53. <https://doi.org/10.3102/0162373708327756>
- López Turley, R. N. (2009). College proximity: Mapping access to opportunity. *Sociology of Education*, 82(2), 126–146. <https://doi.org/10.1177/003804070908200202>
- Lovell, E. D., & Lockhart, M. (2021). Female community college STEM student-parent-researchers living in poverty: Fear, fulfillment, and family. *Community College Journal of Research and Practice*, 1–4. <https://doi.org/10.1080/10668926.2021.1873873>
- Malamud, O., & Wozniak, A. (2021). The impact of college on migration: Evidence from the Vietnam generation. *Journal of Human Resources*, 47(4), 913–950.
- Mannheim, K. (1952). The problem of generations. In P. Kecskemeti (Ed.), *Karl Mannheim: Essays* (pp. 276–322). Routledge.
- Martinez, E., & Acevedo, N. (2021). Access to What? Geography of Opportunity and Baccalaureate degree-granting community colleges in California. *Community College Journal of Research and Practice*, 1–6.
- Marx, K., & Engels, F. (2002). *The communist manifesto*. Penguin.
- Mattern, K., & Wyatt, J. (2009). Student choice of college: How far do students go for an education? *Journal of College Admission*, 203, 18–29.
- Merton, R. K. (1984). Socially expected durations: A case study of concept formation in sociology. In W. W. Powell & R. Robbins (Eds.), *Conflict and consensus: A festschrift in honor of Lewis A. Coser* (pp. 262–283). Free Press.
- Moreno, M., McKinney, L., Burrige, A., Rangel, V. S., & Carales, V. D. (2021). Access for whom? The impact of dual enrollment on college matriculation among underserved

- student populations in Texas. *Community College Journal of Research and Practice*, 45(4), 255–272. <https://doi.org/10.1080/10668926.2019.1688734>
- Mulder, C. H., & Clark, W. A. V. (2002). Leaving home for college and gaining independence. *Environment and Planning a: Economy and Space*, 34(6), 981–999. <https://doi.org/10.1068/a34149>
- Nelson, D., Misra, K., Sype, G. E., & Mackie, W. (2016). An analysis of the relationship between distance from campus and GPA of commuter students. *Journal of International Education Research*, 12(1), 37–46. <https://doi.org/10.19030/jier.v12i1.9565>
- Niu, S. X. (2015). Leaving home state for college: Differences by race/ethnicity and parental education. *Research in Higher Education*, 56(4), 325–359. <https://doi.org/10.1007/s11162-014-9350-y>
- Nix, A. N., Jones, T. B., Brower, R. L., & Hu, S. (2020). Equality, efficiency, and developmental education reform: The impact of SB 1720 on the mission of the Florida college system. *Community College Review*, 48(1), 55–76. <https://doi.org/10.1177/0091552119876327>
- Office of Research and Development. (1999). *Concordance between SAT® I and ACT™ scores for individual students* (Report RN-07, June 1999). College Entrance Examination Board.
- Ortagus, J. C., & Hu, X. (2019). Does the community college pathway influence the selectivity of students' destination 4-year institution? *Community College Review*, 47(4), 434–461. <https://doi.org/10.1177/0091552119867126>
- Paulsen, F. (1906). *Das deutsche Bildungswesen in seiner geschichtlichen Entwicklung* [The german education system in its historical development]. B.G. Teubner.
- Perna, L. W. (2006). Studying college access and choice: A proposed conceptual model. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research*. Higher



- education: Handbook of theory and research* (Vol. 21, pp. 99–157). Springer.  
[https://doi.org/10.1007/1-4020-4512-3\\_3](https://doi.org/10.1007/1-4020-4512-3_3)
- Philippe, K. A., & Sullivan, L. G. (2005). *National profile of community colleges: Trends and statistics* (4th ed.). American Association of Community Colleges.
- R Core Team. (2019). *R: A language and environment for statistical computing* [Computer software]. R Foundation for Statistical Computing. Vienna, Austria. <https://www.R-project.org/>
- Rephann, T. J. (2007). Community college growth opportunities: Untapped potential in America's heartland? *Growth and Change*, 38(3), 443–459.  
<https://doi.org/10.1111/j.1468-2257.2007.00378.x>
- Reyes, M., Dache-Gerbino, A., Rios-Aguilar, C., Gonzalez-Canche, M., & Deil-Amen, R. (2019). The “geography of opportunity” in community colleges: The role of the local labor market in students’ decisions to persist and succeed. *Community College Review*, 47(1), 31–52. <https://doi.org/10.1177/0091552118818321>
- Rhoads, R. A., & Valadez, J. R. (2016). *Democracy, multiculturalism, and the community college: A critical perspective. Critical education practice*. Routledge.
- Rios-Aguilar, C., Wells, R., Bills, D., & Lopez, D. D. (2018). The (mis)match between sub-baccalaureate credentials and middle-skill jobs: A community college spatial research agenda. *New Directions for Institutional Research*, 2018(180), 39–58.  
<https://doi.org/10.1002/ir.20285>
- Rodgers, J. R., & Rodgers, J. L. (2000). The effect of geographic mobility on male labor-force participants in the United States. *Journal of Labor Research*, 21(1), 117–132.
- Rossi, P. H. (1955). *Why families move: A study in the social psychology of urban residential mobility*. Free Press.

- Rossi, R. J., & Bower, C. B. (2018). Passed to fail? Predicting the college enrollment of GED® passers. *Adult Education Quarterly*, 68(1), 3–23.  
<https://doi.org/10.1177/0741713617721970>
- Rouse, C. E. (1994). What to do after high school? The two-year vs. four-year college enrollment decision. In R. G. Ehrenberg (Ed.), *Choices and Consequences: Contemporary Policy Issues in Education* (pp. 59–88). ILR Press.
- Rouse, C. E. (1995). Democratization or diversion? The effect of community colleges on educational Attainment. *Journal of Business and Economic Statistics*, 13(2), 217–224.  
<https://doi.org/10.2307/1392376>
- Sandefur, G. D., Meier, A. M., & Campbell, M. E. (2006). Family resources, social capital, and college attendance. *Social Science Research*, 35(2), 525–553.  
<https://doi.org/10.1016/j.ssresearch.2004.11.003>
- Shauman, K., & Xie, Y. (1996). Geographic mobility of scientists: Sex differences and family constraints. *Demography*, 33(4), 455–468.
- Shaw, E. J., Kobrin, J. L., Packman, S. F., & Schmidt, A. E. (2009). Describing students involved in the search phase of the college choice process: A cluster analysis study. *Journal of Advanced Academics*, 20(4), 662–700.  
<https://doi.org/10.1177/1932202X0902000405>
- Smith, K. E., & Bers, T. H. (1989). Parents and the college choice decisions of community college students. *College and University*, 64(4), 335–348.
- Somers, P., Haines, K., Keene, B., Bauer, J., Pfeiffer, M., McCluskey, J., Settle, J., & Sparks, B. (2006). Towards a theory of choice for community college students. *Community College Journal of Research and Practice*, 30(1), 53–67.  
<https://doi.org/10.1080/10668920500248886>
- Sonnert, G., & Holton, G. (1995a). *Gender differences in science careers: The Project Access study*. Rutgers University Press.

- Sonnert, G., & Holton, G. (1995b). *Who succeeds in science? The gender dimension*. Rutgers University Press.
- Sorokin, P. A., & Merton, R. K. (1937). Social time: A methodological and functional analysis. *American Journal of Sociology*, *42*(5), 615–629.  
<https://doi.org/10.1086/217540>
- Stange, K. (2012). Ability sorting and the importance of college quality to student achievement: Evidence from community colleges. *Education Finance and Policy*, *7*(1), 74–105. [https://doi.org/10.1162/EDFP\\_a\\_00054](https://doi.org/10.1162/EDFP_a_00054)
- Stouffer, S. A. (1940). Intervening opportunities: A theory relating mobility and distance. *American Sociological Review*, *5*(6), 845–867. <https://doi.org/10.2307/2084520>
- Tate, W. F. (2008). “Geography of opportunity”: Poverty, place, and educational outcomes. *Educational Researcher*, *37*(7), 397–411. <https://doi.org/10.3102/0013189X08326409>
- Taylor, J. L., & Jain, D. (2017). The multiple dimensions of transfer: Examining the transfer function in American higher education. *Community College Review*, *45*(4), 273–293.  
<https://doi.org/10.1177/0091552117725177>
- U.S. Department of Education. (2014). *Integrated Postsecondary System (IPEDS): Institutional characteristics surveys*. Data files. National Center for Education Statistics.
- U.S. News & World Report. (2021). *U.S. news college compass*.  
[https://www.usnews.com/usnews/store/college\\_compass?src=web:col\\_compass:na:BC\\_homepage\\_headerpromo\\_CTA:20190418](https://www.usnews.com/usnews/store/college_compass?src=web:col_compass:na:BC_homepage_headerpromo_CTA:20190418)
- van Gennep, A. (1960). *The rites of passage*. University of Chicago Press.
- Wade, C. H., Cimbricz, S. K., Sonnert, G., Gruver, M., & Sadler, P. M. (2018). The secondary-tertiary transition in mathematics: What high school teachers do to prepare students for future success in college-level Calculus. *Journal of Mathematics Education at Teachers College*, *9*(2), 1–14.

- Weber, M. (1978). *Economy and society: An outline of interpretive sociology*. University of California Press.
- Weiler, W. C. (1994). Transition from consideration of a college to the decision to apply. *Research in Higher Education*, 35(6), 631–646. <https://doi.org/10.1007/BF02497079>
- White, L., & Lacy, N. (1997). The effects of age at home leaving and pathways from home on educational attainment. *Journal of Marriage and the Family*, 59(4), 982–995. <https://doi.org/10.2307/353797>
- Zarifa, D., Hango, D., & Pizarro Milian, R. (2018). Proximity, prosperity, and participation: Examining access to postsecondary education among youth in Canada's provincial north. *Rural Sociology*, 83(2), 270–314. <https://doi.org/10.1111/ruso.12183>
- Zippel, K. (2017). *Woman in global science: Advancing academic careers through international collaboration*. Stanford University Press.

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<sup>i</sup> Normative life course theory also complements Perna's (2006) widely-used conceptual model of student college choice, specifying a concrete link between "location" in Layer 3 (higher education context) and "cultural capital" in Layer 1 (habitus), in that educational geographic mobility is embedded in the cultural capital of the hegemonic life course.

<sup>ii</sup> It is of course also possible to identify much shorter rites of passage at the beginning and the end of college (see Wade et al., 2018).

<sup>iii</sup> For distance measurement, researchers have used the first three digits of the five-digit zip code (Hadley et al., 2001; Stange, 2012) to make the calculations manageable, because there would have been too many possible combinations with 5-digits zip codes.

<sup>iv</sup> Contrary to usual practice, no race/ethnicity variable was included. The reason is that, owing to the irregular and clustered race/ethnicity distribution in the U.S., our research design renders conclusions about the relationship of race/ethnicity with home/college distance spurious. We did conduct a parallel series of analyses that included race/ethnicity and found virtually identical results for the variables of interest.

<sup>v</sup> Most of the two-year colleges were counted as community colleges. The exception was a two-year women's college, which was added to the private college group.

<sup>vi</sup> The rank reversal between public and private institutions when alternating between mean and median measures of central tendency suggests a relative prevalence, among private college students, of extremely far travels to college. For public colleges, state boundaries and their tuition implications may curb the incidence of such extremely long distances.