

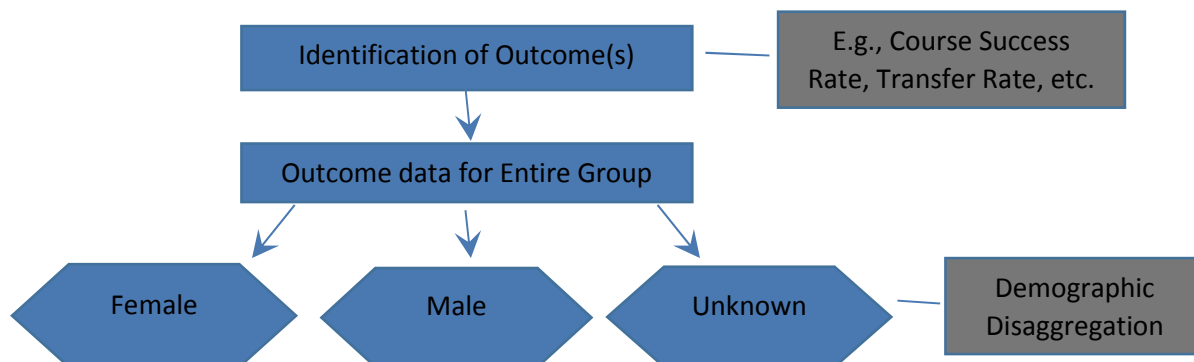
# Using Disproportionate Impact Methods to Identify Equity Gaps

## Overview of Data Disaggregation and Disproportionate Impact

One of the most significant challenges that colleges around the country face is how to achieve equity in educational outcomes, such as degree attainment, among various sub-populations of students (Bensimon, 2005). Indeed, a plethora of research studies point to gaps in educational outcomes, particularly among historically underrepresented groups (Harper, Patton, & Wooden, 2009; Lee, 2002; Ward, 2006). The first step to addressing equity gaps is to identify them. How do we know, with some degree of certainty, that one or more student groups on our campus are in particular need? In this paper, we will tackle this question by delving into the three methods typically used to identify equity gaps, and we will compare and contrast the benefits of each approach.

This paper offers readers a practical overview of three empirical methods to identifying possible equity gaps on their campus. While data and statistics are discussed, this review is intended for a general audience of educators and practitioners. The goal is to help readers garner the skills and knowledge that will facilitate dialogue concerning equity gaps.

When examining student data, one of the first things we may do is look at whether there are differences among student groups (such as males and females) on the basis one or more outcomes, such as access to support services or degree completion rates. The process of examining outcomes separately by student groups is known as data disaggregation. Figure 1 below illustrates the data disaggregation process. The first step is to identify an outcome of interest, such as course success rates. The average course success rate for all students is then calculated to provide a starting point for comparison. Finally, average course success rates are calculated for specific subgroups of students, such as males and females. By comparing success rates for the subgroups to the success rates for all students in aggregate, significant variations in success rates can be identified.



*Figure 1.* A depiction of the data disaggregation process as it pertains to examining differences between demographic groups. This allows one to identify potential group differences for each demographic characteristic (e.g., age, gender, or ethnicity).

When one subgroup of students attains an outcome such as degree completion at a rate that is substantially lower than the benchmark rate, that subgroup may be referred to as “disproportionately impacted”. According to the Chancellor’s Office, “disproportionate impact is a condition where some students’ access to key resources and supports and ultimately their academic success may be hampered by inequitable practices, policies and approaches to student support.” (California Community College Chancellor’s Office, 2013). Therefore, differences in access and/or completion rates between subgroups groups may suggest that one group has less access to support services and/or is in need of relatively greater student support services to attain outcomes at rates comparable to other groups (i.e., they are disproportionately impacted).

When examining student data for evidence of disproportionate impact (DI), one of the questions faced by colleges is how to measure it. There are three primary methods used: the 80% rule, the proportionality index, and the point-gap index. This paper offers readers an overview of each, as well as a variety of examples of actual data from colleges around the state.

### *Overview of Three DI Approaches*

#### The 80% Rule

The 80% Rule helps answer the question, “Do any subgroup(s) achieve the desired outcome less than 80% of the time the highest achieving (reference) subgroup successfully achieves that outcome?” The 80% criterion is drawn from the guidelines codified in the [1978 Uniform Guidelines on Employee Selection Procedures](#).

Table 1. Example of the 80% Rule

<i>Course Success Rates by Ethnicity with 80% Rule Indices</i>				
Ethnic Group	Cohort Count	Outcome Count	Success Rate	80% Index
<b>African American</b>	2,547	1,388	54.5%	<b>74.8%</b>
American Indian	213	144	67.6%	92.8%
Asian	9,834	7,166	72.9%	100%
Hispanic	35,055	22,304	63.6%	87.3%
Multi Ethnic	2,261	1,468	64.9%	89.1%
<b>Pacific Islander</b>	286	153	53.5%	<b>73.4%</b>
White	16,696	11,878	71.1%	97.6%
Unknown	2,508	1,509	60.2%	82.6%
Total	69,400	46,010	66.3%	

Source: Fullerton College’s 2014-2015 Student Equity Plan.

Table 1 illustrates the course success rates across ethnic groups reported by Fullerton College as part of their [2014-2015 Student Equity Plan](#). For each ethnic group, the total number of students in the cohort is identified (i.e., all students who took a graded class), along with the number of students achieving a successful course outcome (grade C or better). The success rates (successful outcomes/total cohort count) are illustrated in the adjacent column.

To calculate the 80% index, first identify the group with the highest rate of success. In this case, Asian students represent the reference group with an average success rate of 73%. The next step is to divide the success rate of each ethnic group by that of the reference group (i.e., Asian students); thus, this method can be defined as follows:

$$80\% \text{ Index} = \text{Selected Group Rate} \div \text{Reference Group Rate}$$

Where the *selected group rate* refers to the success rate of the group being examined (e.g., African American students) and the *reference group rate* refers to that of group earning the highest success rate (i.e., Asian students). As illustrated in the column labeled *80% Index*, the majority of ethnic groups achieved success rates that were within 80% of the rate achieved by Asian students. However, two groups – African American students and Pacific Islander students – had success rates that were less than 80% of the reference group’s success rate, indicating that the African American and Pacific Islander students were disproportionately impacted. As a result, Fullerton College identified activities designed to address these equity gaps in their student equity plan.

#### The Proportionality Index (PI)

The proportionality index helps answer the question, “If a subgroup of students represents 45% of the student body, does that same subgroup also represent at least 45% of the students who achieve the desired outcome?” Representation in the outcome group at a rate lower than their representation in the general student body may indicate disproportionate impact, depending on how large the observed difference is.

In contrast to the 80% approach, there is not a consensus regarding one particular cut-off value that would definitively indicate disproportionate impact. The author reviewed 28 haphazardly selected student equity plans from around the state and found that 14 of the colleges utilized the PI index to help identify disproportionate impact. The cut-off value used to identify disproportionate impact varied by college. The lowest employed cut-off value was 0.69 (one college) and the highest was 0.89 (three colleges). Four colleges employed a cut-off value of 0.76 or less and six colleges employed a cut-off value between 0.80 and 0.85. In our example (Table 2), a PI cut-off of 0.85 would identify the same groups as the 80% rule. In addition, Bensimon and Malcolm-Piqueux (as cited in California Community College Chancellor’s Office, 2015), recommended a cut-off value of 0.85.

Table 2. Example of Proportionality Index

<i>Course Success Rates by Ethnicity and Proportionality Indices</i>					
Ethnicity	Proportion of Cohort		Proportion of Successful Outcomes		Proportionality Index
	Count	Percent	Count	Percent	
<b>African American</b>	2,547	3.67%	1,388	3.02%	<b>0.82</b>
American Indian	213	0.31%	144	0.31%	1.02
Asian	9,834	14.17%	7,166	15.57%	1.10
Hispanic	35,055	50.51%	22,304	48.48%	0.96
Multi Ethnic	2,261	3.26%	1,468	3.19%	0.98
<b>Pacific Islander</b>	286	0.41%	153	0.33%	<b>0.81</b>
White	16,696	24.06%	11,878	25.82%	1.07
Unknown	2,508	3.61%	1,509	3.28%	0.91
Total	69,400	100%	46,010	100%	1.00

Source: Fullerton College's 2014-2015 Student Equity Plan.

Table 2 illustrates the same data from Fullerton College's student equity plan. However, this table compares the percentage of students in a subgroup of all the students at the college (i.e., cohort percentage) to the percentage of students in a subgroup achieving a successful course outcome. This comparison can be defined as follows:

$$\text{Proportionality Index} = \text{Proportion in cohort} \div \text{Proportion in outcome group}$$

Where the proportion in the cohort reflects the relative representation of a given subgroup across an entire student body and the proportion in the outcome group reflects the representation of that same subgroup among students achieving a successful educational outcome. A proportionality index of 1.00 indicates that a group's representation among those achieving an outcome is identical to that same group's representation across the entire college; meanwhile, a value less than one is indicative of possible disproportionate impact. As illustrated in Table 2, proportionality indices are greater than 0.90 for all groups, except two: African American (0.82) and Pacific Islander students (0.81). I.e. although African American students make up 3.67% of the overall student population, they are successful only 3.02% of the time. This suggests, as Fullerton College concluded, that these two groups may be considered to be disproportionately impacted.

### The Percentage Point Gap Index

The percentage point gap approach reflects the difference in percentage points between a given demographic group and the observed overall average (or mean) across all demographic groups (California Community Chancellor’s Office, 2015). The larger the difference, the more likely that such a difference is reflective of disproportionate impact. For instance, if 10% of one subgroup of students placed into transfer level math, but 20% of all students placed into transfer level math, then the point gap value for subgroup in question would be negative ten (-10).

As with the proportionality index, there is not a consensus with regards to the magnitude of point gap values necessary to indicate disproportionate impact. In practice, point gap values of even three points may be considered to be indicative of disproportionate impact (California Community College Chancellor’s Office, 2015). Colleges should consider their local populations and circumstances in identifying critical point gap values. Additionally, small point gap values may reflect meaningful group differences when subgroup group values are tightly clustered around the mean. For instance, if all but one of the subgroups is within two points of the overall average, then the one subgroup that is three points below may be disproportionately impacted. Similarly, larger cut-off values (seven or above) may be warranted in cases where there is a great deal of variability between the subgroups; a three point difference may not be indicative of significant DI when there is a 30 point range between the highest and lowest subgroup scores.

Table 3 illustrates the same course success rate by ethnicity from Fullerton College. In fact, except for the final two columns on the right, it is identical to Table 1. The second column from the right, labeled *Success Rate (Overall)*, indicates the overall success rate observed all the ethnic groups (this is why it is the same value for each group). The final column on the right, *Point Gap Value*, reflects the difference between the group specific course success rate and the overall course success rate. The positive sign in front of a point gap value indicates that a group’s course success rate is higher than the observed overall success rate, while a negative sign reflects a lower success rate in the corresponding group.

Table 3. Example of the Percentage Point Gap

<i>Course Success Rates by Ethnicity and Point Gap Value</i>					
Ethnic Group	Cohort Count	Outcome Count	Success Rate (Per Group)	Success Rate (Overall)	Point Gap Value
<b>African American</b>	2,547	1,388	54.50%	66.30%	<b>-11.8</b>
American Indian	213	144	67.61%	66.30%	+1.3
Asian	9,834	7,166	72.87%	66.30%	+6.6
Hispanic	35,055	22,304	63.63%	66.30%	-2.7
Multi Ethnic	2,261	1,468	64.93%	66.30%	+1.4

<b>Pacific Islander</b>	286	153	53.50%	66.30%	<b>-12.8</b>
White	16,696	11,878	71.14%	66.30%	+4.8
Unknown	2,508	1,509	60.17%	66.30%	-6.1
<b>Total</b>	<b>69,400</b>	<b>100%</b>	<b>66.30%</b>		
Source: Fullerton College's 2014-2015 Student Equity Plan.					

Findings indicate point gap values exceeding negative ten for the two groups identified via the 80% rule, namely African American students (-11.8 points) and Pacific Islander students (-12.8 points). Thus, findings stemming from the use of this approach points to those groups as being disproportionately impacted and the groups for which institutional developed strategies should be implemented.

### **Broad Considerations When Employing Disproportionate Impact Approaches**

There are some considerations when working with any of the disproportionate impact approaches (California Community College Chancellor's Office, 2015). First, one should consider the number of students belonging to a group identified as disproportionately impacted. Disproportionate impact findings based upon a small number of students (e.g., fewer than 50) should be examined with caution as such findings are subject to greater variability than seen with larger groups. That is, when examined in the future, the percentages observed for such small groups may fluctuate greatly, calling into question the reliability of the findings. It is for this reason that colleges may consider establishing a higher threshold (e.g., point gap greater than ten points) for establishing disproportionate impact with smaller groups and a smaller threshold (e.g., point gap value greater than five points) for establishing disproportionate impact in larger groups. Disproportionate impact findings stemming from fewer than 30 students should be viewed with great caution. Additional data collection or combining multiple years of data is recommended to increase confidence in the reliability of the finding.

A second consideration applies specifically to the percentage point gap approach. The point gap approach is founded upon the notion of generating an overall benchmark value based upon all the demographic groups in aggregate. This means that demographic groups with the highest number of students will tend to have values that are close to the overall average value, resulting in relatively low observed point gap differences for the largest groups. The Chancellor's Office recommends that colleges consider comparing the performance of such groups to the same demographic groups at other comparable colleges (California Community Colleges Chancellor's Office, 2015). In addition, it is recommended that colleges consider comparing larger demographic groups to an aggregate value that does not include the demographic group in question. For instance, if Hispanic students represent 50% of students at

your campus, then a comparison of success rates using the percentage point gap method may yield a small point gap difference; however, using the aforementioned approach, one would include data for all non-Hispanic ethnic groups to calculate the aggregate value. This approach highlights any difference between Hispanic students (or any highly represented group at your college) and the remainder of the student population.

One final point to make is that institutional history and local conditions should also be considered in the process of identifying disproportionate impact. Such considerations may further help to narrow which disaggregated subgroups should be considered disproportionately impacted.

Comparison of Disproportionate Impact Methods		
	Advantages	Disadvantages
80% Rule	<ul style="list-style-type: none"> <li>- Clearly establishes 80% cutoff</li> <li>- Effective method for comparing between subgroups</li> </ul>	<ul style="list-style-type: none"> <li>- Rigid 80% cutoff can curtail discussion</li> <li>- May be subject to sampling size error if sample size very small</li> </ul>
Proportionality Index	<ul style="list-style-type: none"> <li>- Effective method for assessing equitable group representation</li> <li>- Prompts rich discussion about disproportionate impact</li> </ul>	<ul style="list-style-type: none"> <li>- No agreed upon benchmark for DI</li> <li>- May be more conservative than the 80% Rule</li> </ul>
Percentage Gap	<ul style="list-style-type: none"> <li>- Easy to calculate</li> <li>- Prompts rich discussion about disproportionate impact</li> </ul>	<ul style="list-style-type: none"> <li>- DI of most well-represented group may be obscured</li> <li>- No agreed upon benchmark for DI</li> </ul>

### Case Study 1: Identifying Disproportionate Impact among Students Applying but not Enrolling

The first case study addresses potential disproportionate impact among students applying to a community college, but not enrolling for any classes. Are certain subgroups more likely than others to apply but then not enroll? And which aspect of the matriculation process, appears to present the largest obstacle? The data for the case study come from the fall 2016 semester at Crafton Hills College in Yucaipa, California. A key question the college sought to answer was whether disproportionate impact existed with respect to the percentage of students that participated in the college's student orientation. Such findings would shed light on the demographic groups that might need additional outreach and education so as to complete a key step in the matriculation process.

Table 4 illustrates the orientation rates observed by age groups among Crafton Hills applicants that did not enroll in any classes; additionally, the table illustrates findings on the basis of the three aforementioned disproportionate impact indices.

Table 4. Orientation Rates by Age Groups

<i>Orientation Rates by Age Groups Among Students Applying but Not Enrolling at Crafton Hills College</i>						
Age Group	Cohort Count	Outcome Count	Orientation Rate (Per Group)	80% Index	Point Gap Index	Proportion Index
19 or younger	957	322	33.65%	100%	6.66	1.25
20 – 24	562	130	23.13%	<b>68.74%</b>	<b>-3.86</b>	0.86
25+	574	113	19.69%	<b>58.51%</b>	<b>-7.30</b>	<b>0.73</b>
Total	2,093	565	26.99%			

Source: Crafton Hills College.

**80% Index.** The orientation rates of the two older age groups were divided by that of the youngest age group (19 or younger) as they had the highest orientation rate and were therefore the reference group. This approach found that the two older age groups were disproportionately impacted: 20-24 year olds (68.74%) and 25 or older (58.51%) students.

**Point Gap Index.** The purpose here is to take the difference between the orientation rate for all 2,093 applicants in the cohort and each individual age group. Given the orientation rate of 26.99% across all 2,093 students in the cohort, and bearing in mind the recommendation that a three point gap may in certain circumstances constitute a meaningful difference, both 20-24 year olds (-3.86) and those 25 or older (-7.30) were found to be disproportionately impacted.

**Proportionality Index.** The proportionality index compares a demographic group's representation across the college to the same demographic group's representation among those achieving an outcome across the college. In the current example, the first step is to divide the number of individuals in an age group that participated in orientation by the total number of individuals that participated in orientation. For instance, we would divide the number of individuals participating in orientation that were 25 or older by the total number of individuals participating in orientation ( $113/565 = 0.20$ ). The second step is to divide the total number of individuals in the same age group by the total number of individuals in the entire cohort ( $574/2,093 = 0.27$ ). The final step is to divide those resulting ratios ( $0.20/0.27 = 0.73$ ). On the basis of this finding, and using the 0.85 cutoff described earlier, those 25 or older are disproportionately impacted. No other age group is disproportionately impacted.

Given the evidence generated using the three disproportionate impact methods, it appears that two groups are disproportionately impacted: Applicants between the ages of 20 and 24 and those 25 or older. Such a finding suggests that the institution should prioritize developing and implementing strategies designed to mitigate (or eliminate) disproportionate impact that

older applicants are experiencing by exploring, perhaps via survey or focus groups, why those groups

### Case Study 2: Investigating Disproportionate Impact in the Context of Course Placements

Our second case study addresses possible disproportionate impact among ethnic groups in the context of course placements. In this case, we will examine Fall 2015 data submitted by Riverside Community College District as part of their participation in the California Acceleration Project.

Table 5 illustrates the placement rates into a transfer-level English by ethnic group. In addition, the table illustrates the findings stemming from the use of the three disproportionate impact indices. Due to small number of records for several ethnic groups, we will focus on only four groups: (a) African American, (b) Asian, (c) Hispanic, and (d) White

Table 5. Course Placement Rates in Math by Ethnicity with Disproportionate Impact Indices

<i>Course Placement Rates in Transfer-Level English At Riverside Community College by Ethnicity and the Three Disproportionate Impact Indices</i>						
Ethnic Group	Cohort Count	Outcome Count	Placement Rate (Per Group)	80% Index	Point Gap	P.I.
African-American	335	38	11.34%	<b>39.94%</b>	<b>-6.46</b>	<b>0.64</b>
Asian	141	30	21.28%	<b>73.08%</b>	<b>3.48</b>	1.20
Hispanic	2310	357	15.45%	<b>53.06%</b>	-2.35	0.87
White	625	182	29.12%	100.00%	11.32	1.64
Total	3,411	607	17.80%			
Source: Riverside Community College.						

**80% Index.** With White students serving as the reference group, the placement rates of the remaining groups were divided by that of White students. Based on this approach, the three remaining groups are disproportionately impacted: African American (39.94%), Asian (73.08%), and Hispanic (53.06%) students.

**Point Gap Index.** The aim here is to take the difference between the placement rate for all 3,411 students in the cohort and each individual ethnic group. Given the overall placement rate of 17.80% across all 3,411 students in the cohort, African American students were found to be disproportionately impacted (-6.46 point gap). In addition, using a three-point cut-off value, Asian students (-3.48) were also disproportionately impacted.

Why was the point gap value for Hispanic (-2.35) students much smaller? As noted earlier, one drawback of using the point gap method is that individual demographic groups with the highest number of students will have outcomes that are highly correlated with the observed aggregate value, resulting in relatively low observed point gap differences. This is certainly the case with Hispanic students since they represent 59% of all placements. It is not surprising, therefore, that there is little difference in the placement rate for Hispanic students and the overall placement rate. Removing all Hispanic students from the computation of the overall placement rate results in a larger point gap value (-7.25) that is consistent with disproportionate impact

**Proportionality Index.** The proportionality index compares a demographic group's representation across the college to the same demographic group's representation among those achieving an outcome across the college. In the current context, this method entails dividing a group's representation among students being placed into a course one level below transfer math by that same ethnic group's representation among all students assessing being placed. Using this approach, along with the aforementioned recommendation for identifying meaningful proportionality indices, African American students ( $.062 \div .098 = 0.64$ ) were identified as being disproportionately impacted.

Given the evidence generated using the three disproportionate impact methods, it appears that at least one group – African American students -- is disproportionately impacted. Moreover, Asian students were found to be disproportionately impacted on two of the three methods, suggesting that they too are disproportionately impacted. Such a finding suggests that the institution should prioritize developing and implementing strategies designed to ameliorate, if not eliminate, the disproportionate impact that African American and Asian students are experiencing. Hispanic students, on balance, do not appear to be disproportionately impacted because only one of the three methods indicated DI.

### **Case Study 3: Investigating Disproportionate Impact among Assessment Test Takers – An Example of a Multivariate Approach (Advanced Topic)**

In this section, we will further explore disproportionate impact using actual statewide data from the Chancellor Office's Management Information System (MIS). Up to this point, we have been examining disproportionate impact in the context of a single outcome and a single demographic characteristic – we have, for instance, focused on identifying difference in performance among students of different age group or ethnic groups. Now, however, we will be examining disproportionate impact for student groups defined by two characteristics simultaneously. A multivariate approach entails looking at two or more characteristics at the same time. Such approach can answer the following question: Do observed age group differences

depend upon a student's ethnic group? So while you may not find differences between males and females, when you explore potential gender differences by ethnic group status, you find that African American males are indeed disproportionately impacted while all remaining gender and ethnic group pairings (e.g., White females, Hispanic males) are not. When it is found that differences between gender groups depend upon one's ethnic group status, one concludes that a multivariate relationship (or an interaction) exists.

In the present case study, we will examine the potential combined relationship between two characteristics: (a) age group and (b) the number of assessment test attempts (1 versus 2 or more) on the outcome of interest. The outcome upon which we will compare these characteristics is with respect to the likelihood to enroll in classes. So the research question is the following: Do both age and assessment attempts jointly influence the likelihood to enroll in classes? Here is another way of thinking about it: How does age impact that the number of attempts to enroll in a class?

The present findings were obtained from a recent Research and Planning Group for California Community College's (RP Group) report documenting the impact of assessment retesting on enrollment behavior (RP Group, 2016). Specifically, the author examined the enrollment behavior of a cohort of individuals based upon whether they completed an Accuplacer test a single time or more than once between 6/1/2011 and 5/31/2012. One of the outcomes the author examined was the enrollment rate<sup>1</sup> by testing status (i.e., single-test takers and multi-test takers).

As Table 6 illustrates, the author's findings indicated that, on average, 80% of those electing to retest (i.e., multiple test takers) enrolled in a corresponding course as compared to 47% of those testing a single time. Unsurprisingly, this large difference was identified as statistically significant; the findings indicated that completing the assessment test at least two times was linked to an increased likelihood to enroll. But the question the author sought to examine was **whether the impact that multiple test taking had on enrollment rates depended upon the age of the test taker**. Did younger test takers benefit more from multiple tests than did older test takers?

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<sup>1</sup> Enrollment rate was defined as enrollment in a course with a Top Code corresponding to the completed test. If, for example, an individual completed Accuplacer's reading comprehension test, then the author determined whether the individual enrolled in an English course (i.e., Top Code = 1501). The identified Top Codes were identical to the ones used by the California Community Colleges Chancellor's Office (CCCCO) to examine the basic skills completion rate as part of the Student Success Scorecard. As a result, the following Top Codes were included as part of the analysis: (a) 1501 (English), (b) 1701 (Math), (c) 4930.84 (ESL), (d) 4930.85 (ESL), (e) 4930.86 (ESL), (f) and 4930.87 (ESL).

Table 6. Enrollment Rates of Students Assessing Once of Students Completing the Test More than Once

<i>Enrollment Rates of Students Completing the Accuplacer Test a Single Time and Students Completing the Test More than Once</i>				
	Total Sample Size	Single Test Takers (Mean)	Multiple Test Takers (Mean)	Statistically Significant?
Course Enrollment (%)	260,203	46.71	80.38	Yes

As illustrated in Table 7, the author found that while all age groups testing more than once had higher enrollment rates than did those testing a single time, not all age groups benefitted equally. The next step is to use the disproportionate impact approaches we have learned about to identify which specific groups may benefit most (and least).

Table 7. Enrollment Rates by Age Group and Testing Status

<i>Enrollment Rates by Age Group and Testing Status</i>					
Age Group	Single Test Takers Enrollment Rate	Multiple Test Takers Enrollment Rate	Difference	80% Index	Point Gap Index
19 or Younger	43.38%	82.57%	39.19%	100%	5.52
20	51.94%	84.52%	32.58%	83.13%	-1.09
21-23	52.46%	81.11%	28.65%	<b>73.10%</b>	<b>-5.02</b>
24+	42.73%	74.06%	31.33%	<b>79.94%</b>	-2.34
Overall	46.71%	80.38%	33.67%		

Note: The age groups were defined on the basis of quartiles; 25% of students were 19 or younger, 25% were age 20, and so on.

The column labeled *Difference* contains the difference in enrollment rates between single test takers and multiple-test takers for each age group – this is the data point upon which all the age groups are compared.

**80% Index.** Test takers aged 19 or younger serve as the reference group because the difference for that group (39.19%) is larger than that of the other age groups. So the *Difference* values obtained for each group need to be divided by that of the 19 or younger group to obtain corresponding 80% indices. Based on this approach, there are two disproportionately impacted age groups: 21-23 (73.10%) and 24+ (79.94%). As such, the findings indicate that while all age

groups benefit from completing the test two or more times, those in the aforementioned age groups benefit significantly less than do younger test takers.

**Point Gap Index.** The aim here is to compare the *Difference* scores of each group to that of all groups combined (33.67%). Only those 19 or younger have a Difference score that is higher than the collective average ( $39.19 - 33.67 = 5.52$  point gap). Using the aforementioned cutoff score of three points as our benchmark for identifying disproportionate impact, we find that only those between 21 and 23 are disproportionately impacted ( $28.65 - 33.67 = -5.02$  point gap). Thus, using the point gap index to identify disproportionate impact, we find that the 21-23 age group benefits significantly less from retesting than do the other age groups.

## Conclusions

Data disaggregation is a first step to identifying potential equity gaps across an array of academic outcomes. With the disaggregated data it is possible to complete the critical step conducting disproportionate impact analyses. Disproportionate impact analyses help us understand the extent to which one or more demographic groups is potentially disadvantaged. There are various approaches to disproportionate impact, each of which offers us certain advantages and disadvantages. It is for this reason that it is recommended that colleges consider using more than one method to identify disproportionate impact; in doing so, colleges can be more certain that the groups they identify as disproportionately impacted are indeed in need of additional support. One comprehensive approach, for instance, is to apply all three disproportionate impact methods described in this paper and identify equity gaps only in cases for which at least two of the methods point to disproportionate impact.

Finally, while this paper has focused on methodological and statistical methods underlying disproportionate impact, readers are urged to consider that the most important step in the process is the resulting institutional dialogue leading to substantive change. Upon the identification of likely equity gaps, it is incumbent upon colleges to develop and implement a plan for how to potentially ameliorate the obstacles faced by disproportionately impacted groups. Objective evidence that does not lead to informed dialogue and planning will do little to close existing equity gaps.

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