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## **A Review of Adverse Impact Measurement in Case Law**

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When analyzing the results of an employment decision for adverse impact, most analysts agree that it is imperative to look at both the statistical and practical significance of the disparity. The concern with using only a statistical test that assesses the role of chance is that the analysis could be trivial in cases that involve very small or large sample sizes. Further, a statistical significance test alone fails to identify the magnitude of the disparity. Therefore, a practical significance test is often useful in understanding whether a disparity is meaningful (Dunleavy, Morgan, & Clavette, 2010).

The Uniform Guidelines on Employee Selection Procedures (UGESP) have addressed the use of practical significance as a “rule of thumb” for enforcement agencies to utilize. However, little specific guidance is provided on what are reasonable practical significance measures, or what standards should be used to differentiate practically significant from trivial. Perhaps this is one reason why recent EEO enforcement has focused primarily on statistical significance tests and less so on practical measures. For example, OFCCP has used statistical significance tests as stand alone evidence of disparity in over 95% of recent settlements (Cohen & Dunleavy, 2009; Cohen & Dunleavy, 2010; Dunleavy & Gutman, 2010).

Given the importance surrounding the use of both statistical and practical significance for interpreting the meaning of a disparity, it may be useful to understand how courts have treated the measurement of adverse impact in litigation. Toward that end, this paper summarizes a review of some relevant case law. A general overview of the case law search is presented first, followed by a review of the adverse impact measurement results of interest. This paper ends with some conclusions regarding the courts’ stance on the role of statistical and practical significance for interpreting disparities.

## Cases that Included Practical and/or Significant Adverse Impact

Twenty-nine cases from 1974 to 2009 were coded for this research. This was based on an initial keyword search that began with the inclusion of either “adverse impact” or “disparate impact” and then refined with another keyword search to include “statistical significance” or “practical significance”. Only the cases in which we were able to code the following characteristics were included:

- year,
- circuit,
- district,
- state,
- judge,
- job description,
- protected group,
- employment decision,
- occupation,
- practical significance measure,
- statistical significance test,
- adverse impact results, and
- Judge’s ruling.

See Table 1 on page 8 for a detailed list of all included cases.

Of the 29 cases, eleven included only a practical significance measure to detect adverse impact (e.g., 4/5th rule, ‘naked eye’ comparison of the difference in subgroup selection rates, etc.). Of these, six (or about 55%) were successful in demonstrating a disparity. Three cases used only a statistical significance test as a measure of disparity (e.g., standard deviation), and of these two (or about 66%) were successful in supporting a disparity. The remaining fifteen cases used both a practical measure (e.g., 4/5th rule) and a statistical test (e.g., standard deviation). Eleven (or about 73%) of these cases demonstrated significant disparities when both measurement methods were used.

### Cases that used only a Practical Significance Measure

Of the twenty-nine cases that were reviewed, 37.9% used only a practical significance measure to illustrate a significant disparity. Of those cases, 54.5% identified a meaningful disparity. Interestingly, the Supreme Court ruling in both the earliest adverse impact case (*Griggs v. Duke Power Company*, 1971) as well as recent cases ruling (e.g., *Ricci v. DeStefano*, 2009), interpreted only a practical significance measure when a disparity was at the center of the case.

However, both of these cases were heterogeneous in the context of a typical litigated adverse impact case. For instance, *Griggs v. Duke Power Company* used a “naked eye test” as a test for practical significance before the UGESP was introduced. The plaintiffs showed that the

requirement to have a High School diploma would have allowed 34% of whites and 14% of Blacks to apply for a position within the Power Company, regardless of the Company's motivation to eliminate discrimination. Therefore, Black applicants would have passed that screen at a much lower rate, a difference of 20%. In *Ricci v. DeStefano*, a unique disparate treatment case, the plaintiffs were not the traditional disadvantaged minority group, but instead were White and Hispanic applicants who alleged discrimination after their employer eliminated all incumbent's scores on a promotion exam. The 4/5ths rule was used to determine whether the exam that was discarded had impact to begin with.

From a temporal perspective, it is important to note that, shortly after the EEOC's adoption of the UGESP in 1978, seven cases focused on only a practical significance measure. In four cases a practical significance measure was successful at identifying a meaningful disparity. In all seven cases, a simple rate comparison utilizing the 4/5th rule was used to establish a meaningful difference in selection rates. For example, in a well known 'step analysis' Supreme Court ruling in *Connecticut v. Teal* (1982), the defense did not contest a 4/5th violation in the pass rates between Black and White applicants on the written portion of the exam, but referenced the court to consider the overall 'bottom line' impact of the selection measure on Black applicants and not the specific steps involved. The court ruled in favor of the plaintiffs and concluded disparate impact from the written test under the UGESP's 4/5th rule.

The Civil Rights Act of 1991 further supported this notion by explicitly defining adverse impact at any stage of the selection process and not just at the bottom line analysis for the overall selection procedure. The amendments did not explicitly infer adverse impact based on practical significance alone, but this issue is still often considered by judges. For example, in *Ogletree v. City of Auburn* (2009), the judge found that the plaintiff's attempt to establish a prime facie case using only a practical significance test (4/5th) was unavailing since sample sizes was too small. In addition to the small sample size, the judge contended that the use of a 4/5th test was designed as a rule of thumb and must be used in conjunction with statistical evidence. This suggests that a statistical significance test may be a precursor before interpreting practical significance.

### **Cases that used only a Statistical Significance Test**

Of the twenty-nine coded cases, only 10.3% used a statistical significance test alone to establish adverse impact. Two cases relied on using an availability comparison to establish a significant disparity in the selection of Blacks versus Whites for teacher positions (*Hazelwood School District v. United States*, 1977). An availability comparison allows plaintiffs to demonstrate a disparity by comparing the minority rate of an organization's selection to the availability rate of the minority group within a feasible recruiting area.

While *Hazelwood* is considered one of the benchmark cases for the use of statistics in litigation (pattern/practice cases), the availability comparison is less used than analyses of actual applicant flow data, likely because applicant flow actually captures the decisions made by an employer. For example, applicant flow data were analyzed in *Green v. USX* (1988), where plaintiffs compared the ratio of Black hires and applicants with the ratio of white hires and

applicants over an eleven year period. Results for each year showed that the disparities were not due to chance (i.e., were statistically significant at 5 SDs). The court ruled that the defendant's hiring system had a statistically significant disparity and thus meaningful adverse impact on Blacks.

As mention above, it may be difficult to interpret disparities when only a statistical significance test is used. Both the EEO doctrine and the quantitative community have emphasized that a statistical disparity should also be assessed using practical significance measures to verify that a non-chance occurrence is also large in magnitude from a practical perspective. Specifically, if a statistical disparity is found in a large population or several aggregated samples, this disparity may not be meaningful if it is found not to be practically significant, regardless of statistical significance. This issue has only become more important in the internet age, where very large applicant pools are common.

### **Cases that used both a Practical and a Significance Test**

In 51.7% of the cases both a practical measure and a significance test was used to establish significant disparities. It is intuitive that multiple disparity measures would be used given the ease in which statistical significance tests and practical significance measures can be produced with computers. However, case law from the last five years demonstrates that practical and statistical measures have not both been considered together in some cases. For those sixteen cases that did use both measures, five found that both the practical and statistical tests were significant, allowing the courts to rule unconditionally in favor of the plaintiff for establishing a prime facie case. For example, in *Guardians of New York v. Civil Service Exam* (1980), the plaintiffs established a significant disparity in the selection rates comparing White and Black applicants and White and Hispanic applicants. A statistical test showed that the disparity represented 39 standard deviations, confirming that the disparity was not a chance occurrence. With a large sample size of over 36,000 applicants, the plaintiffs supported practical significance with a 4/5th measure for both Black and Hispanic applicants when compared to White applicants. Blacks were found to be selected at a rate of 36.9% compared to Whites and Hispanics were selected at a rate of 44.6% compared to Whites. These combination of these measures signified that the pass rate differences of the Civil Service Exam could not be attributed to a chance occurrence, and were practically meaningful. The judge agreed with the plaintiffs and ruled accordingly.

In eleven cases where both practical measure and significance test were used, the court's ruling was dependent on either a practical measure or a significance test supported as being significant, but not both. For example, in *Contreras v. City of Los Angeles* (1981), the court did not support the practical significance of a 29.45% pass rate for Spanish surnamed individuals in the auditor position, compared to a pass rate of 55.0% for whites, when the standard deviation was not significant at the .05 level and only three Spanish surnamed individuals needed to pass the selection exam in order to be "sufficiently" close to the passing rate of Whites. In *Waisome v. Port Authority* (1991), the Appeals Court supported the District Court's ruling that the written portion of a promotion exam did not have a disparate impact. The District Court judge found that

a statistical disparity of 2.68 standard deviations was not practically meaningful, because the pass rate of Blacks was 87.2 percent of that of Whites (and thus the 4/5th rule was not violated). The judge also noted that the results would not have been statistically important had two more Black candidates passed the written test. It was on this basis that the district court decided that the results of the written examination failed to show a disparity sufficiently substantial to state a Title VII violation.

## **Conclusion**

Once again, it is important to note temporal trends in adverse impact analyses. For example, shortly after UGESP were published, courts favored the 4/5th rule. However, given the court's stance on statistical significance since *Hazelwood School District v. United States*, as well as the availability of computers, there may have been a shift towards the inclusion of statistical significance test as a supplement (or even substitution for) to practical significance measures (Zedeck, 2010; Esson & Haunstein, 2006). Surprisingly, in less than 28% of coded cases, the judge did not require the use of both a statistical test and a practical significance measure before making a ruling on the meaningfulness of a disparity.

This current trend could set scientifically questionable precedent within the legal realm, particularly in situations where sample sizes are very small or very large. Therefore, we recommend that organizations take the time to understand the different statistical and practical measures available when analyzing adverse impact. Familiarity with these methodologies could mean the difference between establishing a significant disparity and the organization's ability to successfully explain that disparity.

## References

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## Cases

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- Bazile v. City of Houston (2008) H-08-2404.
- Bernard v. Gulf Oil (1989) 890 F.2d 735.
- Bew v. City of Chicago (2001) 252 F.3d 891.
- Bouman v. Block (1991) 940 F.2d 1211.
- Bradley v. City of Lynn (2006) 443 F. Supp. 2d 145.
- Bridgeport Guardians v. City of Bridgeport (1991) 933 F.2d 1140.
- Connecticut v. Teal (1982) 457 U.S. 440.
- Contreras v. City of Los Angeles (1981) 656 F.2d 1267.

Delgado v. Ashcroft (2004) 368 F.Supp.2d 3.

Deshields v. Baltimore City Fire Dept. (1989) 884 F.2d 1387.

Green v. USX (1988) 843 F.2d 1511.

Griggs v. Duke Power Company (1971) 401 U.S. 424.

Groves v. Alabama State Board of Education (1991) 776 F.Supp. 1518.

Guardians of NY v. Civil Service (1980) 484 F. Supp. 785.

Hazelwood School District v. United States (1977) 433 U.S. 299.

Isabel v. City of Memphis (2005) 404 F.3d 404.

M.O.C.H.A. Society v. City of Buffalo (2009) 199 F.Supp.2d 40.

Moon v. Cook County (1988) 86 C 0466.

Moore v. Southwestern Bell (1979) 593 F.2d 607.

Oakley v. City of Memphis (2009) 129 S.Ct. 2860.

Ogletree, v. City of Auburn (2009) 619 F.Supp.2d 1152.

OFCCP v. TNT Crust (2007) 2004-OFC-3.

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United States v. City of Buffalo (1978) 457 F.Supp. 612.

U.S.A. v. City of NY Fire Department (2009) 07-cv-02067 (NGG) (RLM).

U.S. v. Commonwealth of Virginia (1978) 454 F.Supp. 1077.

Waisome v. Port Authority (1991) 948 F.2d 1370.

Watson v. Fort Worth Bank and Trust (1988) 487 U.S. 977.

Table 1

**Case Law Search Results**

Case Name	Year	Decision	Occupation	Protected Group	Significance Measure	AI Supported
Griggs v. Duke Power Company	1971	Selection	Laborer	Race	Practical	Yes
Albemarle Paper Co. v. Moody	1975	Selection	Laborer	Race	Practical	Yes
Hazelwood School District v. United States	1977	Selection	Teacher	Race	Statistical	No
United States v. City of Buffalo	1978	Selection	Police & Firefighter	Race	Practical	Yes
U.S. v. Commonwealth of Virginia	1978	Selection	Police	Race	Practical & Statistical	Yes
Moore v. Southwestern Bell	1979	Promotion	Clerk	Race	Practical	No
Guardians of NY v. Civil Service	1980	Selection	Police	Race	Practical & Statistical	Yes
Contreras v. City of Los Angeles	1981	Selection	Accountant	National Origin	Practical & Statistical	No
Connecticut v. Teal	1982	Promotion	Laborer	Race	Practical	Yes
Watson v. Fort Worth Bank and Trust	1988	Promotion	Bank	Race	Statistical	Yes
Green v. USX	1988	Selection	Laborer	Race	Statistical	Yes
Moon v. Cook County	1988	Promotion	Corrections	Race	Practical & Statistical	Yes
Deshields v. Baltimore City Fire Dept	1989	Promotion	Firefighter	Race	Practical & Statistical	No
Bernard v. Golf Oil	1989	Promotion	Laborer	Race	Practical	No
Bouman v. Block	1991	Promotion	Police	Sex	Practical & Statistical	Yes
Waisome v. Port Authority	1991	Promotion	Police	Race	Practical & Statistical	No
Bridgeport Guardians v. City of Bridgeport	1991	Promotion	Police	Race	Practical	Yes
Groves v. Alabama Board of Education	1991	Selection	Teacher	Race	Practical & Statistical	Yes
Bew v. City of Chicago	2001	Selection	Police	Race	Practical & Statistical	No
Delgado v. Ashcroft	2004	Selection	FBI Agent	Race	Practical & Statistical	Yes
Isabel v. City of Memphis	2005	Promotion	Police	Race	Practical & Statistical	Yes
Bradley v. City of Lynn	2006	Selection	Firefighter	Race	Practical & Statistical	Yes
OFCCP v. TNT Crust	2007	Selection	Laborer	National Origin	Practical & Statistical	Yes
Bazile v. City of Houston	2008	Promotion	Firefighter	Race	Practical	Yes
Oakley v. City of Memphis	2009	Promotion	Police	Race & Sex	Practical	No
Ogletree v. City of Auburn	2009	Promotion	Firefighter	Race	Practical	No
M.O.C.H.A. Society v. City of Buffalo	2009	Promotion	Firefighter	Race	Practical & Statistical	Yes
Ricci v. DeStefano	2009	Promotion	Firefighter	Race	Practical	No
USA v. City of NY Fire Department	2009	Selection	Firefighter	Race	Practical & Statistical	Yes