A Closer Look at Race, Ethnicity, and Gender Neutral Models

Kevin E. Cahill, PhD
ECONorthwest and
The Center on Aging & Work
at Boston College

Lawrence M. Spizman, PhD
State University of New York
at Oswego

Melissa Carson
ECONorthwest

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Abstract

Litigation cases involving the expected earnings of minor children provide an ideal environment to examine the implications of public policies that attempt to mitigate racial, ethnic, and gender discrimination in the calculation of economic damages. This paper extends the existing literature on the implications of race, ethnicity, and gender neutral models by evaluating both educational attainment probabilities and estimated lifetime earnings within educational attainment categories. Recent related studies have focused on the educational attainment portion of the calculation only. We perform thousands of simulations of a child's lifetime earnings using neutral estimations—a proxy for removing discrimination—and compare those estimates to ones in which race, ethnicity, and gender are taken into account. We find wide variation *within* racial and ethnic groups when earnings are incorporated into the analysis, consistent with prior research. Importantly, however, our findings pertain primarily to females, suggesting that interactions between gender and race and ethnicity are an added complexity. The practical implication of our findings is that neutral models can adversely impact individual members of protected groups. The result provides further guidance to policymakers who might be interested in the real-world outcomes associated with legislation that restricts how economists calculate economic damages.

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1 Introduction

Legislation adopted in California in 2020 restricts the calculation of economic damages in personal injury and wrongful death cases such that the amount cannot be "reduced" based on race, ethnicity, or gender.[1] The goal of the legislation, presumably, is to address perceived injustices in which economic damages for members of protected classes are suppressed when race, ethnicity, and gender are taken into account. In this paper, we address the extent to which race-neutral, ethnicity-neutral, and gender-neutral approaches ("neutral models" or "neutral approaches") correct for such injustices by yielding higher damages awards for members of protected classes. The analysis is critical from a public policy standpoint because some members of a protected class might be adversely impacted by legislation that is intended to protect their individual right to be made whole through a fair and accurate calculation of economic damages.

Litigation cases involving the expected earnings of minor children—where individual earnings have yet to be revealed—provide an ideal environment to examine the implications of public policies that attempt to mitigate racial, ethnic, and gender discrimination in the calculation of economic damages. We use these types of litigation cases to compare economic damage awards when race, ethnicity, and gender are taken into account and when race, ethnicity, and gender are not taken into account. The comparisons are done for specific types of individuals, based on demographic and economic attributes. The key questions then become: 1) are economic damages awards for members of protected classes (i.e., based on race, ethnicity, and gender)

[1] California Civil Code §3361(2020) states, "This bill would prohibit the estimation, measure, or calculation of past, present, or future damages for lost earnings or impaired earning capacity resulting from personal injury or wrongful death from being reduced based on race, ethnicity, or gender."

necessarily increased when race, ethnicity, and gender are removed from consideration, and 2) to the extent that awards are reduced, to what extent are individual members of protected classes adversely impacted by neutral approaches?

The underlying question from a public policy standpoint is then: if neutral modeling approaches are known to adversely impact *individual members* of protected classes, should such policies exist? The tradeoff is clear. Collectively, the members of protected classes might benefit from neutral modeling through an overall increase in economic damages awards. In exchange, some members of protected classes might have their *individual* economic damages awards reduced unjustifiably because of neutral modeling, thus arguably introducing a systemic injustice. Notably, this tradeoff extends beyond the issue of requiring an individual defendant to overcompensate an individual plaintiff to correct for a society-wide disparity, which raises the prospect of introducing another systemic injustice. This latter issue is not addressed in this paper.

Our paper is structured as follows. The next section, Section II, provides background on recent legislation related to the removal of considering race, ethnicity, and gender in the calculation of economic damages awards. Section III presents our data and methodology for calculating economic damages with and without consideration of race, ethnicity, and gender. Section IV presents our findings, and Section V provides a discussion and conclusions.

2 Background

Prior to the introduction or adoption of any law dealing with discrimination in litigation, *The Washington Post* (Soffen, 2016) published a series of articles stating that a male child will receive a bigger award than a female child with the same injury. As proof, the *Post* offered several anecdotes of verdict outcomes for children. The focus of the *Pos*t article was on children because children lack earnings histories; therefore, the forensic economist must use general

statistical data to determine economic damages. Only anecdotes were provided in the article, and no empirical evidence was given to support the assertion that discrimination exists in the outcome of litigation. The *Post* articles assumed that the disparity in awards by gender was the product of gender discrimination embedded in historical data sources.[2]

Shortly after the *Post* articles, the House of Representatives and Senate introduced the Fair Calculation in Civil Damages Act on December 1, 2016.[3] A flurry of press releases that followed, several citing the *Post*'s articles, indicated the political importance of the issue. Senators Cory Booker (D-NJ) and Kirsten Gillibrand (D-NY), co-sponsors of the Senate version, justified the legislation stating, "troubling recent academic studies and news reports have revealed that in state and federal courtrooms across the United States, race, ethnicity and gender are used to calculate damages in civil court cases," and that, "white and male plaintiffs often receive larger compensatory awards than plaintiffs who are minorities or women."[4] The sponsors' statements about "troubling recent academic studies" made no mention of what those academic studies are. The news reports were presumably referring to the *Post* articles.

The House bill sponsored by Joe Kennedy III (D-MA) and Mia Love (R-UT) also included a press release on December 1, 2016.[5] The press release referenced a 2009 survey by the National Association of Forensic Economics (NAFE)[6] and claimed that, "44 percent of those

[2] We note that discrimination is almost certainly embedded in historical datasets, and that the use of such datasets can perpetuate past discrimination. While this argument is valid, the statistical data used in estimating the earnings of a child are typically not based on historical data, but rather current estimates.

[3] Bill H.R. 6417 and S.3489 died in the 114th Congress.

[4] Kennedy, Love, Booker, and Gillibrand introduced the bill to address discriminatory legal practices. . See https://kennedy.house.gov/media/press-releases/kennedy-love-booker-gillibrand-introduce-bill-to-address-discriminatory-legal.

[5] Ibid.

[6] Brookshire, Luthy & Slesnick. (2009). A 2009 Survey of Forensic Economists: Their Methods, Estimates, and Perspectives. *Journal of Forensic Economics 21*(1), 5-34, http://www.jstor.org/stable/42756122.

responding reported they considered race and 92 percent consider gender when calculating potential lost earnings for injured children." [7] Neither the House or Senate bills passed and, following the failed attempt to address disparities at the national level, California passed §3361 and the bill became law on January 1, 2020.

Washington, D.C. also attempted to address the disparity of earnings due to perceived discrimination with Bill 23-087. This bill was named the "Stormiyah Denson-Jackson Race and Gender Economic Damages Equality Amendment Act of 2020." The language of the D.C. bill was similar to that of California §3361. In particular, the bill stated that its purpose is to "amend Title 16 of the District of Columbia Code in actions for personal injury or death caused by wrongful act, neglect, or default, to provide that estimations, measures, or calculations of past, present, or future damages for lost earnings or impaired earning capacity may not be reduced based on race, ethnicity, or gender." Bill 23-087 was not considered by legislators and was agendized.

Perhaps the most important issue in these legislative initiatives is that legislators, taken at their word, believe that racial, ethnic, and gender discrimination exists in economic damages awards made in civil litigation, and that the law should provide a remedy for the discrimination. Spizman, Cahill and Kane (2021) addressed this topic by examining the extent to which race- and ethnicity-neutral models benefit individuals in protected classes. In particular, the authors examined earnings losses for a minor child by removing race and ethnicity from the ordered

[7] These percentages were also reported in *The Washington Post* article by Kim Soffen on October 25, 2016. The conclusion from the NAFE 2009 survey is as follows: "44.8 percent of respondents would use both race and gender-specific data and 42.4 percent would use only gender specific data and only .6 percent would use race-specific data" (Brookshire, Luthy & Slesnick (2009)). Nowhere in the NAFE survey is there a statement that claims 92 percent of responding forensic economists used gender in calculating potential lost earnings for injured children. Further, less than one percent of forensic economists reported using race only.

probit educational attainment model for the minor child. The race- and ethnicity-neutral model was then compared to the ordered probit educational attainment model of a minor child that included race and ethnicity. The authors found that lifetime earnings under the race-neutral and ethnicity-neutral models were not exclusively higher or lower than the models that took race into account.

This paper extends the research by Spizman, Cahill and Kane (2021) by considering the impact of race, ethnicity, and gender in the estimation of earnings, in addition to the calculation of expected educational attainment. Gender is of particular interest because of the well-documented gender wage gap. Blau and Kahn (2017) provide a comprehensive review of the literature on the gender wage gap, and the extent to which the gap reflects discrimination on the basis of gender. Recent studies have furthered the state of the literature by focusing on how the gender wage gap has changed over time and across cohorts. Blau, Kahn, Boboshko and Comey (2020) document a substantial convergence in gender wage gap between 1981 and 2015, with a portion of the gap still unexplained by observable factors. Even and Macpherson (2020) examine whether differences in gender earnings are due to gender discrimination in labor markets or gender differences in preferences, and find that most of the gender wage gap among recent cohorts can be explained by observable factors.

Using a different approach Cortés and Pan (2020) explore the impact of having children on females' earnings relative to those of men, known as the "child penalty." Cortés and Pan (2020) find that the child penalty five to ten years after the birth of a first child can be as high as 40 percent. More generally, Barroso and Brown (2021) discuss how mothers are twice as likely as fathers to experience negative impacts on their jobs and careers because they must take time off after the birth of a child. While these types of studies potentially identify a factor that

explains gender differences in earnings, the research does not address whether discrimination might be embedded in family decisions or societal structures surrounding child rearing.

This research on the gender wage gap provides a strong justification to extend the work by Spizman, Cahill and Kane (2021) to include gender-neutral models, and to examine differences in earnings as well as educational attainment probabilities. We do so in this paper.

3 Data and Methods

Our estimation procedure for the calculation of lifetime earnings consists of two steps: 1) estimating educational attainment probabilities, and 2) estimating expected lifetime earnings for each educational attainment level. Both steps are done with and without taking into account race, ethnicity, or gender. Regarding the first step, estimated educational attainment is based on the Spizman-Kane model (2020), a widely-used approach to predict the probabilities of alternative levels of educational attainment for a minor child. The 2020 version of the Spizman-Kane model takes into account race, ethnicity, and gender as well as data from the most recent wave of the National Longitudinal Survey of Youth (NLSY). For the neutral model, we use a version of the Spizman-Kane model from Spizman, Cahill and Kane (2021). The 2021 version of the model differs from the original Spizman-Kane ordered probit model in that it provides estimates that exclude race and ethnicity (race/ethnicity-neutral model), with gender as a dichotomous independent variable. In both models, the levels of educational attainment are as follows: 1) less than high school diploma, 2) GED, 3) high school Diploma, 4) associate degree, 5) BA or BS degree, 6) master's degree, and 7) PhD degree or professional degree.

The next step in the calculation is to estimate expected lifetime earnings by race, ethnicity, and gender for each of the educational attainment categories in the Spizman-Kane model. We obtain data on earnings from the 5-year Public Use Microdata Sample (PUMS) of the

American Community Survey (ACS), a dataset containing information on approximately a five percent sample of the total United States population. We use the ACS data to calculate earnings in 2019 (a one percent sample) by gender (male, female), race (Black, White, Other), and ethnicity (Hispanic, Not Hispanic), for a total of 12 combinations. For each combination, we estimate earnings for each educational attainment level (specified above) by ten-year age categories (18-24, 25-34, 35-44, 45-54, 65-74, 75-84). We then conduct a linear extrapolation between each of the age categories to obtain an estimate of earnings at each age. Estimated lifetime earnings for each level of educational attainment is therefore the summation of earnings through worklife expectancy.

We make two important notes about the calculation of lifetime earnings. First, by summing across all ages we implicitly assume a zero net discount rate. This approach provides a straightforward way to estimate lifetime earnings for each educational attainment level by race, ethnicity, and gender categories. We also do not adjust earnings by a scaling factor to account for fringe benefits. While such adjustments are necessary and no doubt important in practice when quantifying economic damages for an individual, a more sophisticated approach involving a wage growth rate and discount rate or a precise fringe benefit rate would be unlikely to impact our conclusions in any meaningful way. The reason is that earnings under both the neutral and non-neutral models would be subject to the same adjustments, and a comparison between the two models is the focus of this paper.

Second, estimated lifetime earnings are calculated using worklife expectancy (Skoog, Ciecka, and Krueger, 2019). Worklife expectancy is available by educational attainment levels and by gender, but not by race or ethnicity. As such, we do not have race- or ethnicity-adjusted worklife expectancies; instead, we use gender-specific worklife expectancies for each

educational attainment category. Unlike the net discount rate and fringe benefit issues identified above, the inability to adjust worklife expectancy by race and ethnicity could potentially impact the conclusions of our analysis. The reason is that the race-neutral model would presumably produce higher estimated lifetime earnings amounts than the race-specific earnings amounts. The discrepancy between the two would be a function of how large the worklife expectancy gap is by race and ethnicity.

Total estimated lifetime earnings is calculated by summing the estimated lifetime earnings amounts for each educational attainment category by the probability of achieving that level of educational attainment. We perform this calculation for the 12 combinations of gender, race, and ethnicity using both the neutral and non-neutral models. We then compare the estimated lifetime earning amounts under the neutral model and the non-neutral model. We do this calculation for different combinations of the right-hand side variables in the Spizman-Kane (2020) model: region (urban, rural), parent's educational attainment, both biological parents in household, mother's age at first birth, religion (raised), number of siblings, and family income. In total, we examine approximately 3,000 combinations of right-hand side variables for females, with more than 1,000 each for White, Black, and Hispanic individuals. We then run the same number of calculations for males.

Finally, we assess whether excluding race, ethnicity, and gender results in a gain or loss in estimated lifetime earnings. A gain in estimated lifetime earnings implies that the neutral model yields a higher amount than the non-neutral model that includes, race, ethnicity, and gender. A loss implies the opposite. In additional to various combinations of the categorical right-hand side variables (e.g., region, parents education, religion) we also examine specific

values of the continuous variables (e.g., family income of $45,000, mother's educational attainment of 12 years).

4 Results

The results of our calculations with and without race and ethnicity included in the model are shown in Tables 1 and 2.[8] The two tables are analogous to each other, with Table 1 providing additional combinations of explanatory variables. In each table we present 1,599 combinations of the explanatory variables—533 each for White, Hispanic, and Black individuals—for each gender and each model (Model 1 includes the income to poverty ratio; Model 2 does not). Observations are approximately evenly distributed in both Tables 1 and 2. Table 1 uses the following values for the explanatory variables: region (urban, rural, neither), family income ($45,000 and $95,000), mother's and father's educational attainment (11 years, 11 years), (12 years, 12 years), (14 years 16 years), (16 years 12 years), mother's age at first birth (age 19, age 28), and two parents at home. For simplicity, all observations have one sibling, two parents at home, and combinations of religion designated as Baptist, Catholic, Jewish and none.

The results in Table 2 are based on the following values for three of the explanatory variables: family income ($75,000 and $125,000), mother's and father's educational attainment (12 years, 16 years), (14 years, 14 years), (16 years 14 years), (16 years 16 years), and mother's

[8] We note that the values in Tables 1 and 2 represent counts and therefore, implicitly assume an equal weight for each right-hand side combination. We did not weigh each of the combinations in such a way as to represent the underlying population. Such a weighting process presents a challenge empirically, because of small sample sizes within many of the cells (i.e., combinations that represent a relatively small fraction of the population). As a result, we acknowledge that the counts shown in the table are not nationally representative, but rather exemplify how variations within protected groups can lead to unintended consequences. Upon request we will provide to an interested reader the breakdown of the combinations of the right-hand side variables that make up the counts in Tables 1 and 2.

age at first birth (age 22, age 25). The purpose of Table 2 is to provide additional combinations to assess how lifetime earnings vary with a race-, ethnicity-, and gender-neutral approach.

The numbers in each cell of Tables 1 and 2 correspond to the number of combinations where the difference in lifetime earnings between the two models falls into that difference in lifetime earnings category. For example, row 1 in Table 1 contains the results for White males using Model 1. Instances where the difference in lifetime earnings is less than 0.1 percent (i.e., the absolute value of the difference in lifetime earnings between the neutral model is less than one tenth of one percent of lifetime earnings under the non-neutral model) are shown in the "Neutral" column. Then gains and losses in lifetime earnings are shown in increments: 0.1% to 0.9%, 1.0% to 2.9%, 3.0% to 4.9%, 5.0 to 9.9%, and 10% or higher.

Among females in Table 1, lifetime earnings under the neutral model are not exclusively higher or exclusively lower than that of the non-neutral model, with the exception of White Hispanic females, who by and large experience a gain under the neutral approach. For example, among White non-Hispanic females using Model 1, the use of the neutral model lowers lifetime earnings for 56 percent (=298/533) of the combinations and increases lifetime earnings for 41 percent (=219/533) (Table 1). When Model 2 is used, the corresponding percentages are nearly the same (53% and 44%, respectively).

Among Black non-Hispanic females, the use of the neutral model lowers lifetime earnings for 75 percent (=402/533) of the combinations and among Black Hispanic females the use of the neutral model lowers lifetime earnings for *all* of the combinations in both Model 1 and Model 2. This finding for Black females is a result of the large positive coefficient on the Black variable in the race/ethnicity-based Spizman-Kane model for females (see Spizman and Kane (2020)). Therefore, the use of a neutral model benefits White females for roughly one half of the

combinations, reduces estimated lifetime earnings for Black non-Hispanic females for roughly three-quarters of the combinations, and reduces estimated lifetime earnings for Black Hispanic females for all of the combinations.

The results are quite different for males. Most notably, for White males, the use of the neutral model results in a reduction in lifetime earnings for all combinations. For Hispanic and Black males the neutral models results in in an increase in lifetime earnings for nearly all combinations. Therefore, for the men, the findings suggest that the use of neutral model appears to be in line with the objective of the policy.

5 Discussion

Presumably, the goal of policy initiatives to remove race, ethnicity, and gender from consideration in the calculation of lifetime earnings is to increase the fairness of damages awards (i.e., prevent a reduction in damages awards on the basis of membership in a protected class). Our analyses show that removing race, ethnicity, and gender from consideration does not fulfill this policy goal for females. In many instances, members of protected classes would receive lower damages awards and in other instances members of non-protected class would receive higher damages awards if neutral modeling is used. The reason behind this result has to do with the fact that individuals within protected classes (and non-protected classes, too) are diverse, exhibiting differences in family composition, income, parental educational attainment, urban or rural location, religious preference, and other factors.

In contrast to the findings for females, the neutral models do, for the right-hand side combinations considered in this analysis, uniformly reduce damages awards for White, non-Hispanic males and uniformly increase damages awards for Black males, both Hispanic and non-Hispanic. Therefore, the issue of unintended consequences that we found among females does

not appear to be the case among men. We note that this finding differs from Spizman, Cahill, and Kane (2021) which focused on educational attainment probabilities only. Therefore, incorporating race, ethnicity, and gender-specific earnings estimates in addition to the calculation of expected educational attainment probabilities matters to the calculation.

As to the general public policy issues that motivate this study, one clear implication of the analysis is that, among females, members of protected classes will likely experience a decline in economic damages if neutral models are used instead of non-neutral models that take into account race, ethnicity, and gender. For females in particular, the legislation designed to protect members of the class to which they belong adversely impacts the individual, and necessarily prevents the individual from being made whole, for the sole reason that the individual is a member of a protected class. Viewed this way, requirements for neutral modeling appear to introduce another injustice.

We note that the purpose of our analysis is to examine whether individual members of a protected class might be adversely impacted by neutral models. We, therefore, do not comment on perhaps a larger public policy issue associated with restricted economic damages calculations to neutral models only. To the extent that disparities by race, ethnicity, and gender are not due to society-wide discrimination, failure to take such differences into account can lead to over and undercompensating individual plaintiffs and can lead to over and under compensation by individual defendants. As such, requiring the use of neutral models only—i.e., forcing economists to *not* consider non-neutral models—a new set of systemic injustices would be introduced into economic damages calculations. The empirical challenge then becomes whether the new systemic injustices outweigh past systemic injustices on a societal level. The challenge is much deeper than empirical as well, and involves ethical and moral judgements about the

extent to which individuals, through no fault of their own, are adversely impacted because of their membership in a favored or unfavored societal group.

We note that cross examination during the litigation process can expose injustices stemming from a calculation of economic damages that is discriminatory. It is against this benchmark—in which discrimination can be exposed through the litigation process—that policymakers should consider any uniform policy that restricts how economic damages calculations are conducted, and the potential for adverse impacts to individual members of protected groups, as documented in this paper.

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