Do State Laws Protecting Older Workers from Discrimination Reduce Age Discrimination in Hiring? Evidence from a Field Experiment*

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Abstract

We conduct a resume field experiment in all U.S. states to study how state laws protecting older workers from age discrimination affect age discrimination in hiring for retail sales jobs. We relate the difference in callback rates between old and young applicants to state variation in age and disability discrimination laws. These laws could boost hiring of older applicants, although they could have the unintended consequence of deterring hiring if they increase termination costs. In our preferred estimates that are weighted to be representative of the workforce, we find evidence that there is less discrimination against older men and women in states where age discrimination law allows larger damages, and more limited evidence that there is lower discrimination against older women in states where disability discrimination law allows larger damages. Our clearest result is that these laws do not have the unintended consequence of lowering callbacks for older workers.

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Introduction

In the face of population aging in the United States and other countries, policymakers have focused on efforts to boost the labor supply of older workers, mainly through public pension reforms. However, several studies suggest that older workers face age discrimination in hiring.[1] Although discrimination in hiring may not seem closely related to encouraging older people to work longer, it may actually be essential to significantly lengthen work lives, because many seniors transition to part-time or shorter-term "partial retirement" or "bridge jobs" at the end of their careers (Cahill et al., 2006; Johnson, Kawachi, and Lewis, 2014), or return to work after a period of retirement (Maestas, 2010).

In this paper, we study the effects of stronger or broader laws protecting older workers from discrimination in hiring. Stronger laws include harsher penalties for being found guilty of discriminating, and broader laws extend coverage to more employers or workers. We conduct a resume correspondence study in all 50 states, and use the results, combined with coding of state laws, to estimate how stronger or broader anti-discrimination laws affect the callback rates of older and younger job applicants, from which we draw inferences about discrimination in hiring.

We consider disability discrimination laws as well as age discrimination laws. Although the latter are of course directly based on age, numerous studies argue that disability discrimination laws may be important in protecting older workers, in particular, from discrimination.[2] Disabilities that can limit work, and hence also likely limit major life activities and trigger protection by disability discrimination laws, rise steeply with age, especially past age 50 or so (e.g., Rowe and Kahn, 1997); correspondingly, employer expectations that a worker will develop a disability in the near future – posing future accommodation costs – should also rise steeply with age. Indeed, disability discrimination laws may do more to protect many older workers than do age discrimination laws. Many ailments associated with

[1] See Bendick, Jackson, and Romero (1997); Bendick, Brown, and Wall (1999); Riach and Rich (2010); Lahey (2008a); Farber, Silverman, and von Wachter (2017); Baert et al. (2016), and Neumark, Burn, and Button (2019). For the most recent evidence, see Neumark et al. (2019), as well as the studies reviewed there, in Neumark (2018), and in Baert et al. (2016).

[2] See Stock and Beegle (2004), Neumark, Song, and Button (2017), and Button and Khan (2018).

aging have become classified as disabilities (Sterns and Miklos, 1995). These ailments can give some older workers an option of pursuing discrimination claims under either the Age Discrimination in Employment Act (ADEA) or the Americans with Disabilities Act (ADA) – or the corresponding state laws. Potential coverage under both age and disability discrimination laws may increase protections. For example, the ADA does more to limit defenses against discrimination claims.[3] A disability discrimination claim does require proving a disability, but, as we explain below, doing so can be substantially easier under some state disability discrimination laws than under the ADA.

There is existing non-experimental on the effects of anti-discrimination laws. Earlier research found that the adoption of age discrimination laws increased employment rates of older workers, possibly in part through reducing terminations (Adams, 2004, Neumark and Stock, 1999). More recent research finds that larger damages under state age discrimination laws boosted employment of workers incentivized to work past age 65 by Social Security reforms in the 2000s (Neumark and Song, 2013). In research on disability discrimination laws some studies find negative effects on employment (DeLeire 2000; Acemoglu and Angrist, 2001; Jolls and Prescott, 2004; Bell and Heitmueller, 2009), and some find no effects (Houtenville and Burkhauser, 2004; Hotchkiss, 2004; Stock and Beegle, 2004), but more recent studies point to positive effects (Kruse and Schur, 2003; Button, 2018; Ameri et al., 2018; Armour, Button, and Hollands, 2018). However, with the exception of Ameri et al. (2018), none of these studies of either age discrimination laws or disability discrimination laws use direct measures of discrimination to ask whether these laws reduce discrimination.

In contrast, to garner evidence on whether stronger age and disability discrimination laws are likely to increase hiring of older workers, we conduct a large-scale resume correspondence study covering all 50 states. The correspondence study provides direct measures of discrimination in hiring by state – as

[3] Unlike the ADEA, the ADA does not include an exception for bona fide occupational qualifications (BFOQs). BFOQ exceptions arise when age is strongly associated with other factors that pose legitimate business or safety concerns (e.g., Stock and Beegle, 2004; Posner, 1995; Starkman, 1992). Furthermore, age-related disabilities might be judged as amenable to "reasonable accommodation" by employers under disability discrimination laws, which usually require "reasonable accommodation" of the worker, making it much harder to justify an apparently discriminatory practice on the basis of business necessity (Gardner and Campanella, 1991).

reflected in differences in callback rates for job interviews. And the use of all states allows us to fully capture the variation in state age and disability discrimination laws.[4] We code features of state age discrimination laws that extend beyond the federal ADEA, and of state disability discrimination laws that extend beyond the ADA, to study the relationships between these state laws and the measures of age discrimination in hiring from the field experiment.[5] Our focus is on discrimination against job applicants aged 64 to 66, who are at or near the age of retirement – an age range that is particularly germane to whether age discrimination hinders policy reforms to encourage potential retirees to work longer, and whether anti-discrimination laws can help.

We find some evidence that state age discrimination laws that allow larger damages than the federal ADEA reduce hiring discrimination against older workers – as measured by differences in callback rates. We also find some evidence that state disability discrimination laws that allow larger damages than the federal ADA reduce against older workers, although for older women only. Other features of these laws are not associated with differences in relative callback rates or older versus younger job applicants.

It may seem natural to expect that the effects of stronger anti-discrimination protections for older workers or workers with disabilities will – if anything – increase the hiring of older workers. However, these laws may be ineffective at reducing age discrimination in hiring. Enforcement relies in large part on potential rewards to plaintiffs' attorneys. In hiring cases, it is difficult to identify a class of affected workers, which inhibits class action suits and substantially limits awards. In addition, economic damages can be small in hiring cases because one employer's action may extend a worker's spell of unemployment only modestly.

In contrast, terminations can entail substantial lost earnings and pension accruals, and it is much

[4] This is a substantial expansion from the 12 cities in 11 states studied in Neumark et al. (2019), although we limit the analysis to retail jobs – whereas the previous study sent out resumes for three other types of jobs. The limited state-level variation in Neumark et al. (2019) is not enough to identify the effects of features of age and disability discrimination laws separately, which motivates our expansion to all states in the present study.

[5] We are aware of only two other papers that look at variation in experimental evidence on discrimination across jurisdictions with different anti-discrimination laws – Tilcsik's (2011) study of discrimination against gay men, and Ameri et al.'s (2018) study of discrimination against individuals with disabilities.

easier to identify a class of workers affected by an employers' terminations. If the principal effect of laws protecting older workers from discrimination is to make it costlier to terminate older workers, then these laws could have the unintended consequence of deterring hiring of older workers (Bloch, 1994; Posner, 1995). This hypothesis was explored most fully by Oyer and Schaefer (2002), with regard to the effects of the Civil Rights Act of 1991 (CRA91) on the employment of blacks and females. CRA91 expanded the rights of plaintiffs bringing discrimination claims – increasing damages when intentional discrimination could be established, increasing damages for discrimination in terminations of employment, and establishing a right to a jury trial, which is viewed as more likely to lead to outcomes favorable to plaintiffs.[6]

Oyer and Schaefer (2002) report evidence consistent with CRA91 leading to less hiring from the groups for which protections from discrimination ostensibly increased – evidence of this kind of unintended consequence of anti-discrimination laws.[7] However, based on our experimental measures of discrimination in hiring – reflected in relative callback rates – we find no evidence indicating that laws protecting older workers from discrimination have the unintended consequences of making older job applicants less attractive to employers. Rather, as noted above, the evidence if anything points in the direction of these laws reducing hiring discrimination against older workers.

One important caveat is that the variation in age discrimination that we measure is cross-sectional, not longitudinal, as there have been very few changes in state anti-discrimination laws in recent decades.[8] Thus, our evidence could in principle reflect other factors correlated with employer decisions about callbacks for older workers versus younger workers and with anti-discrimination laws. However, the callback outcomes we measure are responses to very similar resumes in a single industry and do not

[6] Oyer and Schaefer (2002) focus on race and sex because CRA91 had much less impact on cases brought under the ADEA.

[7] Lahey (2008b) reaches a similar conclusion regarding age discrimination laws, based on differences between state and federal laws (in some states). However, Neumark (2009) argues that her evidence more likely indicates that stronger age discrimination laws in fact boosted the employment of protected workers.

[8] See Neumark and Song (2013), Neumark et al. (2017), and Button, Armour, and Hollands, 2018a, 2018b). This is documented in our online legal appendix (Online Appendix OB). For an interesting example of correspondence study evidence collected before and after a policy change (in the context of hiring differences related to race and criminal backgrounds), see Agan and Starr (2018).

reflect, for example, decisions of older workers to apply for jobs, or population differences between older and younger workers. Coupled with the fact that the anti-discrimination laws we study have been in effect for many years (typically decades), there are no obvious candidate explanations for a spurious relationship between the discrimination laws and the callback differences we measure.

In addition, our estimated effects of anti-discrimination laws are sensitive to how we weight the data – an issue that arises in our study because the data collection in the field experiment oversampled job ads from some cities (states) and undersampled them from others. We argue that the preferred estimates – which we summarized above – are based on weighting the data to be representative of the underlying distribution of employment. More generally, though, the sensitivity to weighting implies that field experiments on discrimination – especially when relating measured discrimination to local variation in laws or other factors – should use a large number of cities or states so that researchers can avoid non-representative results. We also echo suggestions in Solon, Haider, and Wooldridge (2015) that researchers should present both weighted and unweighted estimates and explore any differences in estimates.

Correspondence Study Evidence on Discrimination

Experimental audit or correspondence (AC) studies of hiring are generally viewed as the most reliable means of inferring labor market discrimination (e.g., Fix and Struyk, 1993), because the group differences they (potentially) detect are very hard to attribute to non-discriminatory factors. It is true that AC studies do not directly distinguish between taste discrimination and statistical discrimination. However, both are illegal under U.S. law.[9] Indeed, the last decade has witnessed an explosion of AC studies of discrimination.[10] Most recent research – including the present paper – use the correspondence study method, which creates fake applicants (on paper, or electronically in more recent work) and captures "callbacks" for job interviews. Correspondence studies are preferred because they can collect far larger samples than audit studies, which use in-person interviews. And correspondence studies avoid

[9] Neumark et al. (2019) devote considerable attention to weighing these two alternative explanations of evidence consistent with age discrimination – analyses we do not delve into here.
[10] For example, see the registry maintained by Stijn Baert (http://users.ugent.be/~sbaert/research_register.htm, viewed November 7, 2018).

"experimenter effects" that can influence the behavior of the actual applicants used in audit studies (Heckman and Siegelman, 1993).

A potential downside of correspondence studies is that we observe callbacks for job interviews, rather than actual job offers (which, in audit studies, can be observed). However, there is evidence pointing to discrimination in callbacks also reflecting discrimination in hiring. In a previous audit study of age discrimination, Bendick et al. (1999) found that 75 percent of the discrimination occurred at the interview selection stage. And Riach and Rich (2002) discuss studies of ethnic discrimination in audit studies by the International Labor Organization (ILO), in which 90 percent of discrimination occurred at the interview selection stage. Neumark (1996) finds similar evidence in an audit study of sex discrimination in restaurant hiring. Nonetheless, while we think this evidence justifies interpreting evidence on callbacks as informative about hiring, we are careful to interpret our results in terms of callback rates, given that we do not have direct evidence on actual hiring (job offers).

The Experimental Design

This paper significantly extends the correspondence study of age discrimination by Neumark et al. (2019). That study focused on improving the basic evidence one could obtain on age discrimination in hiring (based on callbacks). One concern was the sensitivity of results to the common practice of giving older and younger applicants similar lower levels of labor market experience, consistent with the usual AC study paradigm of making applicants identical except with respect to the group characteristic in question. Although the absence of relevant experience commensurate with an older applicant's age could be a negative signal, estimates of age discrimination were generally not sensitive to giving older workers more realistic resumes, including for the retail sales jobs on which we focus in this paper. In addition, the resumes were designed to implement a method developed in Neumark (2012) to address the Heckman critique of AC study evidence (Heckman and Siegelman, 1993; Heckman, 1998) – namely, that experimental estimates of discrimination can be biased if the groups studied have different variances of unobservables. The same resume design is used in the present study.

The key difference in the field experiment used in the present study is to extend the data

collection to obtain estimates of age discrimination in all 50 states, which is critical to our goal of estimating the effects of state anti-discrimination laws. At the same time, the extensive resources required to extend the experiment to all 50 states necessitated focusing only on retail sales, omitting some of the occupations included in the previous study. This limitation implies that the evidence should be regarded as a case study, which may not generalize to other low-skill jobs.[11] In addition, because the prior evidence indicated that in retail sales there was no difference in measured age discrimination whether we used high-experience or low-experience resumes for older applicants, in this paper we use low-experience resumes that match those of younger applicants. This simplified the resume creation because a long work history did not have to be developed for the older applicants, which would be challenging given that the work histories have to be tailored to the local market.

Methods

The core analysis uses models for callbacks (C) as a function of dummy variables for age (S for older/senior) and observables from the resumes (X). The latent variable model (for C, denoted C^*) is

(1) $C_i^* = \alpha + \gamma S_i + X_i\delta + \varepsilon_i$.

In this basic model, the null hypothesis of no discrimination against older workers implies that $\gamma = 0$. We always estimate the model for separately for the male and female job applicants we created, based on the evidence from Neumark et al. (2019) that older women experienced stronger age discrimination.

The key contribution of this paper is to estimate the effects of state anti-discrimination laws affecting older workers on relative callbacks of older versus younger applicants. We do this by modifying equation (1) to include interactions between the dummy variable for older applicants and a vector of dummy variables for these state laws (discussed in detail below). To ensure that we estimate the independent effects of each of the variations in state anti-discrimination protections, we simultaneously estimate the effects of the different anti-discrimination laws that we study, because the presence or

[11] AC studies typically use a very limited number of jobs. For example, Farber et al. (2017) focus only on age discrimination against women in administrative assistant jobs.

absence of different features of state laws are correlated across states.

Adding to equation (1) an 's' subscript to denote states, and defining A_s as the vector of dummy variables capturing state anti-discrimination laws, we augment the model to be

$$(2) \qquad C_{is}^{*} = \alpha + \gamma S_{is} + S_{is} \cdot A_s \gamma' + X_{is}\delta + \varepsilon_{is},$$

where X includes the state dummy variables. Because we include state dummy variables, we do not include the main effects of the state anti-discrimination laws. Excluding the state dummy variables, and including the main effects of the laws, would generate a less saturated model, whereas the models we estimate allow more flexibly for differences in baseline callback rates for younger workers across states. Of course, we have to assume that state-by-age interactions can be excluded from the model to estimate the interactive effects of interest.

The key empirical question is whether stronger or broader state anti-discrimination laws are associated with differences in the relative callback rate of older workers, captured in the vector γ'. Given that C_{is}^{*} is a latent variable for the propensity of a callback, for which we see the corresponding dichotomous outcomes, we estimate probit models. The vector γ' measures the effects of the interactions in $S_{is} \cdot A_s$, which are difference-in-differences estimates of the effects of each feature of anti-discrimination laws. However, the calculation of marginal effects of interaction variables in probit (or logit) models is more complicated than in linear models (Ai and Norton, 2003). In Online Appendix OA, we detail how we use the probit model estimates to estimate the difference in differences.[12]

Resumes

Our overarching strategy in designing the resumes for our study was to use as much empirical evidence as possible to guide decisions about how to create the resumes, to minimize decisions that might limit the external or "comparison" validity of the results. Much of this evidence comes from a large sample of publicly available resumes that we downloaded from a popular national job-hunting website, and then scraped to convert the resume information to data. We also rely on public-use data in choosing

[12] Results were very similar using linear probability models. These estimates are described in more detail later. However, we need the probit specification to address the Heckman critique.

resume features.[13]

We use an age range for young workers similar to other studies (29-31), but compare results to older workers near the retirement age (64-66). This older age range is interesting in light of policy efforts to prolong work lives of potential retirees. We convey age on the resumes via the year of high school graduation. Based on the ages of our artificial job applicants, we chose common names (by sex) for the corresponding birth cohorts, based on data from the Social Security Administration, choosing first and last names that were most likely to signal that the applicant was Caucasian. In response to each job ad, we send out a quadruplet of resumes consisting of a young and old male applicant and a young and old female applicant.

The resume database verified that there are older applicants in retail sales, and they apply for jobs online. In addition, data from the Current Population Survey (CPS) Tenure Supplement show a sizable representation of low-tenure older workers in the occupations that make up retail sales (retail salespersons and cashiers in the Census occupational classification). The data further show that retail sales capture appreciable shares of new hiring of older workers (especially for the types of low-skill retail jobs that we use in the experiment), and that the share of older workers among all hires is particularly high in retail, as compared to other industries.

As noted above, we use cities in all 50 states to maximize external validity and to include all variation in state anti-discrimination laws. This contrasts sharply with most previous experimental studies of discrimination, which typically use one or perhaps two cities (Pager, 2007; Neumark, 2018).

Because low-skill workers have low geographic mobility (Molloy, Smith, and Wozniak, 2011), we target the resumes to retail jobs in specific cities, with the job and education history on each resume matching the city from which the job ad to which we apply originates. This need to customize resumes to

[13] The discussion here is brief. Many additional details are provided Neumark et al. (2019), including the online appendix to that paper, although there are some differences because that paper presents a more complex study with additional occupations, additional resume types, etc. With regard to resume creation, we do not do anything in the current paper that extends beyond what was done in Neumark et al. (2019), but in some cases what we do is more limited.

the city in which a job application is submitted is the reason we limited the analysis in this paper to retail sales jobs.

We constructed realistic job histories on the resumes using the actual jobs held by retail job applicants in the resume database we scraped, and the resume characteristic randomizer program created by Lahey and Beasley (2009). We chose job turnover rates based on secondary data for retail trade from the Job Openings and Labor Turnover Survey (JOLTS). We used the resume randomizer to produce a large number of job histories, and then selected a smaller set that looked the most realistic based on the resumes found on the job-hunting website. From this sample of acceptable histories, we created four job histories for each city, adding employer names and addresses randomly to each job in our final job histories, based on actual employers present in each city at the relevant dates, relying mainly on national chains that had stores in many cities.

Half the resume quadruplets we sent out included higher skills, and half did not.[14] For higher-skilled resumes, there are seven possible skills, five of which are chosen randomly (so that they are not perfectly collinear within the higher-skilled resumes). Five of the seven skills are general: a Bachelor of Arts degree; fluency in Spanish as a second language; an "employee of the month" award on the most recent job; one of three volunteer activities (food bank, homeless shelter, or animal shelter); and an absence of typographical errors. Two skills are specific to retail sales, including Microsoft Office and programs used to monitor inventory (VendPOS, AmberPOS, and Lightspeed).

Each of the four resumes in the quadruplet was randomly assigned a different resume template, which ensured that all four resumes looked different. Most other characteristics were randomly and uniquely assigned to each resume in each quadruplet to further ensure that the applicants were distinguished from each other.[15]

Applying for Jobs

[14] This skill variation across resumes is needed to address the Heckman critique (Neumark, 2012).
[15] Other details of the resumes, including the assignment of residential addresses and schools, as well as examples of resume types, are provided in Neumark et al. (2019, and online appendix).

We identify jobs to apply for using a common job-posting website. Research assistants read the posts regularly during the data collection period to select jobs for the study, using a well-specified set of criteria. We used Python code to automate and randomize the application process for the job ads selected.[16] Our sample size resulted from an explicit ex ante data collection plan that covered two academic quarters, in which we collected as much data as the available job ads would allow. No data were analyzed until the data collection was complete. During that time period, we sent 14,428 applications to 3,607 jobs.

Collecting Responses

Responses to job applications could be received by email or phone. We read each email and listened to each voicemail to record the response, using information generated by the job site and auxiliary information from the responses to match responses to job ads. Table 1 reports the distribution of responses by phone or email. Each response was coded as an unambiguous positive response (e.g., "Please call to set up an interview"), an ambiguous response (e.g. "Please return our call, we have a few additional questions"), or an unambiguous negative response (e.g. "Thank you for your interest, but the job has been filled"). To avoid having to classify subjectively the ambiguous responses, they were treated as callbacks.[17]

Disproportionate Numbers of Ads and Weighting

We applied to retail jobs in one city in each state (these are listed in Table 2, discussed below). Under the assumption that we applied to the number of retail jobs in proportion to the actual number of retail jobs in each city, the unweighted data would provide estimates representative of the universe of retail jobs in these cities – or at least those that advertise on the job-posting website we use. As it turns out, however, we obtained quite different numbers of observations by city relative to what would be

[16] The code matched the job ad data entered into a spreadsheet by the research assistants to the applicant based on city and date. Each day was randomly assigned a different quadruplet of resumes in terms of skill levels, and currently employed or unemployed. Within each quadruplet the order of resumes was randomized. The code ran every other day and added 7- to 8-hour delays between applications to the same job.

[17] The ambiguous responses are 7.8% of all cases coded as positive callbacks.

expected based on the number of retail jobs in the city. This occurred for several reasons. First and foremost, for some cities the website we used defines the market as the whole city, whereas for larger cities the city is divided into multiple markets, and we used a single market because of the resource constraints imposed by collecting data for cities in all 50 states.[18] Second, for a couple of very large cities where the number of ads was huge, the research assistants did not apply to every job, whereas for the other cities they applied to all of them. And third, the frequency with which employers post ads on the job-hunting website we use in this study, relative to other methods of posting jobs, can vary.

Figure 1 displays information on differences in representativeness across cities. For example, we applied to a very large number of job ads in Seattle, WA (black bar), relative to the share of retail jobs computed from the Quarterly Workforce Indicators data for retail (gray bar).[19] In contrast, New York, NY has a large number of retail jobs, as does Los Angeles, CA, but fewer observations in the experimental data.

If there is heterogeneity in the effects of discrimination laws across the markets we study, then the estimates can be sensitive to the weighting, and disproportionate sampling of job ads by market relative to the actual distribution of jobs could generate biased estimates of the effects of the average effects of these laws for the representative worker – or "average partial effects" (Solon et al., 2015). Thus, in our core analyses, we reweight the data by the ratio of the percent of employment in the QWI data (by sex) to the percent of observations in the experimental sample in the city.[20] This will make the

[18] The issue of how to sample job ads from geographic areas in correspondence studies is not unique to the job board we used.

[19] These figures are based on age ranges covering the age groups we study. The data are NAICS codes 44-45, for the MSA-level data, for ages 25-34, 55-64, and 65-99, and for men and women. The percentages reported by the gray bars are the sums across age ranges and sexes for the MSA, divided by the totals for the MSAs used in the states covered by the graph. We use only the portion of the MSA in the state in question. The QWI data are for 2015Q1-Q3. Given the lag in the release of QWI data, this is the closest we could get to the period in which the experimental data were collected (February-July, 2016); note we try to overlap quarters to capture the same seasonal pattern. For two states (Michigan and Wyoming) we have to use data from 2014Q1-Q3, since the 2015 data were not yet available.

[20] This is the "pweight" option in STATA, which assigns as weights the inverse of the probability that the observation is included because of the sampling, and hence preserves the correct degrees of freedom.

estimates more representative of the distribution of retail jobs by city in the QWI data.[21] [22] As an alternative to gauge sensitivity of the results, we reweight the data by one over the share of observations in the city, giving each city equal weight and making the data representative of cities (shown by the horizontal dashed line in Figure 1.[23]

If one views the goal of our analysis as estimating population descriptive statistics – namely, the difference in callback rates between older and younger applicants, and the differences in callback rates by age under different anti-discrimination laws – then these two weighting choices are consistent with the simple advice, in Solon et al. (2015), to use weights to obtain representative estimates when the sample is unrepresentative. Between the two choices, we view reweighting the data to be representative of retail jobs to be more meaningful, as it provides estimates of the differences faced, on average, by workers applying to these jobs. Solon et al. (2015) also argue that researchers should present both weighted and unweighted estimates, to gauge whether there are heterogeneous effects (or other model misspecification). Our two differently weighted sets of estimates might be expected to reveal this heterogeneity if it is important, as the weighting of different states varies quite dramatically. In contrast, if the callback rate differences are similar across states, then we should obtain similar estimates whether we weight the data to be representative of jobs or of states. In practice, as detailed below, weighting does affect the statistical conclusions we draw.[24]

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[21] For example, the Seattle data for both men and women are weighted by 0.27, reflecting the overrepresentation of Seattle observations by a factor of about four in the experimental data (Figure 1). And the New York City data are weighted by 4.74 for men and 4.42 for women, consistent with the underrepresentation of New York City observations in the experimental data (Figure 1).

[22] However, Solon et al. (2015) warn that weighting in this fashion does not guarantee that the estimates match the population average partial effect. In their example, both weighted and unweighted estimates can inconsistently estimate the population average partial effect when the variances of different groups differ. They also note how even absent this issue, not all groups are treated, so the average effect that is estimated will always be on a particular subset of groups which happen to be treated.

[23] Figure 1 also shows that the reweighting based on equal weighting is extreme for Arkansas, South Dakota, and Wyoming, owing to very small numbers of observations for these states. (The same would be true for West Virginia, but it is dropped because there are no callbacks for West Virginia so there are perfect predictions for the probit model.) We therefore drop observations for these states, all of which have fewer than 10 observations (by sex).

[24] Most previous correspondence studies only focus on estimating differences in callback rates (rather than differences associated with laws), and most use a small number of cities. In her review of the experimental literature, Pager (2007, p. 120) describes only a small number of studies that use more than one location, and states that none in her survey used more than two. In a more recent study that provides a comprehensive survey of

Coding of Anti-Discrimination Laws

Our coding of age discrimination laws and disability discrimination laws entailed extensive background research on state statutes and their histories, culled from legal databases including Lexis-Nexis, Westlaw, and Hein Online, as well as many other sources (e.g., case law, secondary sources, law journal articles, state offices, unpassed bills, and jury instructions).[25] The laws as of 2016 are reported in Table 2.[26] Further details that underlie this coding are reported in Online Appendix OB.

We focus on the two aspects of age discrimination laws that past research suggests are important. The first is the minimum firm-size cutoff for the law to apply. For example, in Florida, a worker who works at a firm that employs fewer than 15 employees is not covered under the Florida state law. On the contrary, all employees in Colorado are covered by state law because it is applicable to all firms with at least one employee. We use a firm-size cutoff of fewer than 10 workers to capture state laws that extend to substantially smaller firms (the minimum for the ADEA to apply is 20). The smaller firm-size cutoff may be important because older workers are more likely to be employed at smaller firms (Neumark and Song, 2013). The second is whether compensatory or punitive damages are allowed; such damages are not allowed under federal law.[27] We characterize a state law that specifies a lower firm-size cutoff as a

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experiments related to discrimination against older workers (Baert et al., 2016), none of the studies covered focus on differences across jurisdictions, except, at most, to compare mean differences in callback rates. And none discuss issues of representativeness of the cities in their sample or consider the issue of weighting. The same is true of our prior paper (Neumark et al., 2019), which focused solely on estimating the age gap in callback rates (based on data from 12 cities in 11 states). We note, though, that our conclusion regarding the age difference in callback rates is not sensitive to the weighting; as documented below, we always find significantly lower callback rates for older applicants; the result that is a bit more sensitive is the actual magnitude for older vs. younger men.

Of the two papers that focus on differences across jurisdictions, none have reweighted the data to be representative. Ameri et al. (2018) applied to jobs across the United States, but they do not report differences across states, or discuss representativeness or weighting. Tilcsik (2011) applied to jobs in seven states, and also does not reference representativeness across states or weighting. Neumark et al. (2019) did some analysis by state (there were 11 states) to test the effects of the laws tested in this paper, but their study was not designed to test these laws. They did not employ weighting either.

[25] Earlier coding of these laws was done for the analysis in Neumark and Song (2013) and Neumark et al. (2017); these papers also report some analyses of the effects of these laws using non-experimental data. We updated these laws to those that were active at the time of our data collection (2016).

[26] Table 2 reveals that the distribution of stronger protections across states does not reflect the usual pattern related to generosity of social programs, minimum wages, etc. For example, some southern states have among the strongest anti-discrimination protections.

[27] See United States Equal Employment Opportunity Commission (2002). Some states require proof of intent to discriminate in order for compensatory or punitive damages to be awarded, whereas others require "willful" violation. Because the federal law allows additional liquidated, non-punitive damages (double back pay and

broader law, and one that allows larger damages as a stronger law.

State disability discrimination laws are sometimes stronger or broader than the federal ADA in three principal ways that are captured in Table 2. Like with age laws, there is a minimum firm size to which disability discrimination laws apply. The minimum firm size for the ADA to apply is 15; in our analysis, we distinguish states with a firm-size minimum lower than 10, the same as for age discrimination laws. In fact, Table 2 shows that there is virtually no independent variation in whether the firm-size minimum is lower for age discrimination or disability discrimination laws. There is only a handful of states where this differs, and some are small states without much data (e.g., Arkansas and South Dakota). Consequently, we code a single dummy variable for whether the firm-size cutoff is lower than 10 for the age discrimination law, the disability law, or both.

There is also variation in damages, through higher or uncapped compensatory and punitive damages, relative to the capped damages available under the ADA. We distinguish states with larger damages than the ADA; we base this classification on punitive rather than compensatory damages since punitive damages are likely to drive large judgments.

Finally, state laws vary in terms of the definition of disability – a different dimension of the breadth of anti-discrimination laws. Most states adopt the ADA definition, either explicitly or via case law. Under the ADA and similar state laws, plaintiffs need to prove that they have a condition that "…substantially limits one or more major life activities…" (42 U.S. Code §12102 (1)). This has proven difficult, leading plaintiffs to lose many cases (Colker, 1999).[28] However, some states use a laxer definition, changing a key part of the definition of disability from "substantially limits one or more major life activities" to either "materially limits" (Minnesota) or just "limits" (California) (Button, 2018). Other

benefits) when there is "willful" violation, the question of whether the state requires intent or willful violation may seem to be potentially relevant in deciding whether a state law offers greater protection. However, willful violation is a much stricter standard than intent (Moberly, 1994). Moreover, compensatory or punitive damages are almost certainly greater than liquidated damages, and they can be much greater. As a consequence, a state law that provides compensatory or punitive damages, whether or not this requires proof of intent or willful violation, clearly entails stronger remedies than the federal law.

[28] Even with the broadening of the definition of disability with the ADA Amendments Act of 2008 (ADAAA), proving coverage is not easy for many conditions.

states vary the definition of disability by requiring that the disability be "medically diagnosed" without regard to whether the impairment limits major life activities (Long, 2004); the disability definition in these states is the broadest. Table 2 includes information on both dimensions of the definition of disability, and we use both in our analysis.

Results

Basic Callback Rates

Figure 2 displays information on callback rates by age and by sex. This is a radar chart, which shows, for each state, the difference between the callback rate for older and younger applicants, for men (gray) and women (black). The dashed circle represents equal callback rates for older and younger applicants, so the concentration of data points inside that circle indicates that, for most states and for both sexes, callback rates are lower for older applicants. The evidence across states is remarkably consistent, as the callback rate is higher for young applicants for most state-by-sex pairs, and usually notably so. Moreover, this consistency in the callback rate difference is particularly evident for women, where there is only one state (Maine) for which the callback rate for older applicants is higher. There are eight such states for men, but many are states with a very small number of observations; the exceptions are Florida and North Carolina, for which the numbers of observations are higher, although for these two states the estimated differences in callback rates are very small.[29] Nonetheless, there is some variation across states, which suggests that studies that include only a few cities or states – which is the norm for existing correspondence studies (Pager, 2007; Neumark, 2018) – could generate results that are unrepresentative.

Table 3 reports aggregate descriptive information on raw differences in callback rates by age, and statistical tests of whether callback rates are independent of age;[30] here, as in our preferred specifications, the data are weighted to be representative of retail jobs in the cities in our experiment. In Panel A, for males, we find strong overall evidence of age discrimination, with callback rates statistically significantly

[29] Across all the job ads, 3.6 percent of the observations come from Florida, and 2.4 percent from North Carolina. For the other six states, these percentages range from 0.08 percent to 1.2 percent.

[30] This test treats the observations as independent. In the regression (probit) analyses that follow, the standard errors are clustered appropriately.

lower by 6.11 percentage points for older workers compared to younger workers, or 26.47% lower. The evidence in Panel B, for females, similarly points to age discrimination. The absolute and relative differences are larger (8.06 percentage points and 31.60%, respectively). These results are similar to those in Neumark et al. (2019), although there the callback differential was larger for women (about 10%, versus 6% for men).[31]

Multivariate Estimates

Table 4 reports the results of probit estimates for callbacks (equation (1)), showing marginal effects. In each case, we first report results with controls for the state, the order in which applications were submitted, current employment/unemployment, and skills. We then add controls for an extensive set of resume features listed in the table notes. The random assignment of age to resumes implies that the controls should not affect the estimated differences associated with age, and that is reflected here, as the estimates in Table 4 are very similar to those in Table 3, with an estimated shortfall in callbacks of 6.4-6.7 percentage points for older men, and 8.1-8.3 percentage points for older women.[32] Given that the additional resume feature controls make essentially no difference to the estimates, nor should they, going forward we use the more parsimonious specifications in columns (1) and (3).

Adding State Anti-Discrimination Laws

We next turn to the main contribution of this paper – the estimation of the effects of state anti-discrimination laws protecting older workers on callback rates for older relative to younger workers. This analysis is based on equation (2), and the additional calculations described with reference to equations (OA1-OA4) in Online Appendix OA. Our first estimates are reported in Table 5; these estimates use our preferred weighting by retail jobs (as in Tables 3 and 4).

The main effects of "Old" refer to states where the federal law binds, and the interactions with the

[31] Note that the callback rates at all ages are higher for women than for men. Similarly, Neumark et al. (2019), Bertrand and Mullainathan (2004), and Button and Walker (2019) did not find discrimination against women in retail.

[32] In this and subsequent tables, the estimates are clustered at the age-by-state level, because the policy variation we study when we estimate the effects of state anti-discrimination laws on callbacks varies by state and by age. Absent this consideration, one might want to cluster at the level of the resume or the job ad or use multi-way clustering. In Neumark et al. (2019) we verified that these alternatives have virtually no effect on the standard errors.

features of the anti-discrimination laws capture the differential in the relative callback rate where there is a stronger or broader state law along the dimension considered. We find no statistically significant evidence that lower firm-size cutoffs reduce discrimination against older job applicants (which would be reflected in positive coefficient estimates). The two estimates for men are negative, and the two estimates for women are positive, but they are quite small relative to other estimates discussed next, and none are statistically insignificant.

The estimates for larger damages under age discrimination laws are consistently positive and larger – indicating a reduction in the callback differential by 3.4 to 3.9 percentage points for men, and 2.7 percentage points for women. The estimates are statistically significant at the 5-percent level for men and the 10-percent level for women. In contrast, the estimates for larger damages under disability discrimination laws are smaller (especially for men) and statistically insignificant.

The last two rows of the table report estimates of the effects of the two alternative broader definitions of disability – the broader medical-only definition, and the definition that adds in the two states (California and Minnesota) with relatively "intermediate" definitions based on broader definitions of "limits" than the ADA. The effect of a broader definition can, of course, cut two ways. On the one hand, it can extend protections and increase hiring (as reflected in callbacks). On the other hand, it could make employers warier of hiring an older worker who might suffer a health decline and become subject to state disability discrimination protections more easily because of the broader disability definition. The estimates are always positive, but in two of four cases are quite small (less than 0.01), and only significant at the 10-percent level for one specification for men – based on the second and more expansive definition of disability. Thus, we do not view these estimates as providing a clear case of an effect of broader definitions of disability.

The estimates reported thus far are based on data weighted to make the estimates representative of retail jobs in the cities in our experiment. We next report estimates of the same models as in Table 5, using two alternative weighting schemes. We first (Table 6) reweight by the inverse of the proportion of observations in each city, which, by weighting cities equally, makes the estimates representative of the

cities in our study. We then (Table 7) report simply unweighted estimates, which reflect the over- and under-sampling of jobs by city discussed earlier. In Tables 6 and 7, the key difference is that the estimated effects of larger damages under age discrimination laws on the relative callback rate for older applicants diminish and becomes statistically insignificant (although the estimates remain positive). The estimated positive effects of a broader definition of disability also diminish, although this positive effect was not as strong to begin with.[33]

The estimated effects of larger damages under disability discrimination laws, for women, vary relatively little, and across Tables 5-7 are in a tight range between vary between 0.017 and 0.022 and are marginally significant. Finally, across Tables 5-7 there is no evidence of adverse effects of anti-discrimination laws related to either age or disability on the hiring of older workers.[34]

The implication of the different conclusions based on the weighting is that the effects of larger damages under age discrimination laws in reducing discrimination against older workers is stronger in the states for which weights are higher in the weighted data relative to the unweighted or equally-weighted

[33] Examination of Figures 1 and 2, and Table 2, provide some suggestive information on why and how the results might be sensitive to the weighting. For example, Figure 1 shows that Washington (Seattle) is severely downweighted based on the QWI data, while California (Los Angeles) and New York (New York) are severely upweighted. Figure 2 shows that the age-related callback difference is relatively large for men in Washington, whereas the age-related relative callback rates for New York and California are similar for men and women, and a bit smaller than the average. Table 2 shows that California, New York, and Washington all have larger damages for age discrimination claims. Thus, for women we might expect downweighting Washington and upweighting California and New York to weaken the evidence that larger damages for age discrimination claims reduce measured age discrimination. To explore this further, we re-estimated the weighted models for women in columns (2) and (4) of Table 5, but without California, New York, and Washington. The results show exactly this, as the estimated coefficient (standard error) on the interaction between "Old (64-66)" and "Age larger damages" declines to 0.015 (0.016). For men, we do not have as clear a prediction, because the large age-related difference in callbacks in Washington pushes things in the other direction. Again, though, when we re-estimated the weighted models for men without California, New York, and Washington, the estimated effect of larger damages for age discrimination claims in reducing measured discrimination became a bit weaker than in Table 5 (0.031, with a standard error of 0.014). Thus, for both men and women we get the same qualitative result from dropping these three states as from dropping the reweighting that makes the data representative of employment in retail.

[34] As noted earlier, the results were very similar using a linear probability model. For example, for the reweighted estimates corresponding to Table 5, we still found statistically significant evidence that larger damages under age discrimination claims increased the relative callback rate for older males, with similar estimated effects (0.028-0.034, vs. 0.034-0.039 in Table 5). For women, the estimates were a bit smaller and became insignificant (0.017-0.018, vs. 0.027 in Table 5). For the estimates corresponding to Table 6, the corresponding estimates remained positive but insignificant (for men, 0.017, vs. 0.020 in Table 6, and for women, 0.005 vs. 0.004-0.005 in Table 6). For the estimates corresponding to Table 7, the corresponding estimates remained positive but insignificant (for men, 0.005-0.009, vs. 0.007-0.011 in Table 7, and for women, 0.004-0.007 vs. 0.006-0.009 in Table 6).

data. Figure 1 shows which states get significantly upweighted in the weighted data. These include California, Florida, Georgia, Massachusetts, and New York (most dramatically). The states that get significantly downweighted include Colorado, Hawaii, Oregon, and Washington. We maintain that the weighted data are most relevant to asking how laws protecting older workers from discrimination affect the representative worker.

Nonetheless, an important implication of the variation in some of the results depending on the weighting is that anti-discrimination laws may have different impacts in different states (or cities). Thus, researchers have to be cautious in assuming that results generalize to all states, and studies of small numbers of states (or markets defined in other ways) may be unreliable. This same caution is likely also warranted in studies of the effects of laws intended to protect against discrimination along dimensions other than age.

Heterogeneous Effects

One other suggestion Solon et al. (2015) make when estimates are sensitive to weighting to explore sources of heterogeneous effects, to see if the sensitivity to weighting is actually due to heterogeneous effects. We explore this using linear probability models for simplicity, given the large set of interactions involved. Specifically, we consider heterogeneous effects with respect to the age structure of the population – in particular, the share aged 65 and over. This could be relevant in light of Becker's model of consumer discrimination, which seems especially likely to be relevant, if at all, for retail hiring.

Specifically, we added to the model interactions between the share of the population age 65 and over with the dummy variable for older workers, and with the interactions between the old dummy variable and the two damages variables (for which our key findings emerge).[35] The question

[35] Note that we also need to interact the share old with the main damages variables, because unlike the main effects, these are not absorbed in the fixed state effects.

is whether adding these heterogeneous treatment effects leads to estimates that are more robust across different weighting schemes.[36] The results are reported in Table 8.

Briefly, there is some evidence of heterogeneous effects. First, for men, when the share old is higher, the age difference in callbacks rate is significantly lower, consistent with less age discrimination against men when the customer base is older. Second, for men, when the share old is high, there is some evidence of a negative effect of larger damages for disability discrimination on the relative callback rate for older applicants. Conversely, for women, when the share old is higher there is more evidence that larger damages for age discrimination do more to increase the relative callback rate for older applicants. It is hard to know how to interpret these opposite-signed effects.

Most important, though, is the question of whether allowing for heterogeneous effects reduces the sensitivity of the average effects to weighting. For one of our key results – concerning the effect of larger damages for age discrimination on the relative callback rate for older males – it remains the case that the effect is positive and significant only in Table 5, using the weights representative of workers. On the other hand, with the heterogeneous effects, there is now somewhat more consistent evidence that, for women, larger damages for age discrimination increase the relative callback rate for older applicants, for states with older populations.

Addressing the Heckman Critique

Finally, we turn to estimates that are intended to eliminate the bias identified by the Heckman critique. We discuss our methodology in Online Appendix OA, and this critique as applied to age discrimination is discussed in depth in Neumark et al. (2019). As shown in the online appendix, correcting for this bias (while using our preferred weighting as in Table 5) eliminates the evidence of positive effects of larger damages under age discrimination laws. However, in this case, we find some statistically significant evidence of positive effects on the relative callback rate for older women of larger

[36] As a simple example, if the age difference in relative callback rates is larger in more populous states, then in a model with a homogeneous effect of age, we will find a larger difference in callback rates if we weight by population than if we weight states equally. But if we interact the age dummy variable with population size, we will see evidence of heterogeneous effects that are not sensitive to weighting.

damages under disability discrimination laws – evidence that, in Tables 5-7, was in the same direction but only marginally significant.

Conclusions and Discussion

We provide evidence from a correspondence study field experiment on age discrimination in hiring for retail sales jobs. The experiment provides direct estimates of age discrimination in hiring – captured as differences in callback rates. We conduct the experiment in labor markets in all 50 states (which turned out to be important given the role of weighting). Our key focus is the empirical relationship between the measures of age discrimination by state – the difference in callback rates between old and young applicants – and variation across states in laws protecting older workers from discrimination. The identifying variation comes from state laws that are stronger than the federal laws.

We study both age discrimination and disability discrimination laws. While age discrimination laws explicitly target discrimination against older workers, we argue that it is also natural to expect disability discrimination laws to do more to protect older workers than younger workers from labor market discrimination, and hence to act as a second type of law that affects treatment of older relative to younger workers.

As in past studies, we find evidence of hiring discrimination against older men, and stronger evidence of hiring discrimination against older women. The key new evidence, however, concerns the relationship between hiring discrimination against older workers and state variation in age and disability discrimination laws. We find some evidence that stronger laws protecting older workers from discrimination – providing for larger damages – boost callback rates for older relative to younger job applicants, consistent with reducing age discrimination in the labor market. In particular, we find some evidence of lower discrimination against both older men and older women in states where the law allows larger damages in age discrimination claims, and we find some evidence of lower discrimination against older women in states where the law allows larger damages in disability discrimination claims.

This evidence is not robust to all of the estimations we report. However, we find this evidence for age discrimination laws, for both men and women, when we weight the data to make the estimates

representative of the universe of retail jobs in the cities included in our experiment; and we find this evidence for disability discrimination laws, for women, when we also adjust for potential biases in correspondence study estimates, and also when we allow for heterogenous effects of laws protecting older workers from discrimination.

We do not find evidence that features that make state laws broader, covering more older workers, affect age discrimination in hiring. Specifically, we do not find effects of a lower firm-size cutoff for state age or disability discrimination laws, or for broader definitions of disability under disability discrimination laws.

Finally, we find no consistent evidence indicating that stronger or broader laws protecting older workers from discrimination reduced callbacks to older workers (consistent with deterring hiring of older workers). This evidence contrasts with the argument that these kinds of anti-discrimination protections principally increase termination costs and hence lead to the unintended consequence of deterring hiring of older workers.

A potential limitation of our evidence is that it is based on cross-sectional relationships between measured discrimination and anti-discrimination laws. This is unavoidable in our context; the laws we study are long-standing, and our key innovation is to use a correspondence study to obtain direct measures of discrimination against older job applicants, which can only generate contemporaneous evidence. Nonetheless, the absence of this unintended adverse effect of laws protecting older workers from discrimination, based on our experimental evidence, is largely consistent with non-experimental evidence on age discrimination laws and a good deal of recent non-experimental evidence on disability discrimination laws, and hence bolsters the empirical case against the idea that discrimination protections have the unintended consequence of deterring hiring of protected groups – at least with respect to older workers.

The results of our analysis also have implications for the design of experimental correspondence studies of discrimination, especially studies for which regional variation in estimated discrimination is important – like, in our case, for inferring the effects of state anti-discrimination laws. In particular, there

is some evidence of heterogeneous effects of these laws across cities or states, which argues for (a) using a large number of cities or states, so that results do not reflect idiosyncrasies of narrow regions,[37] and (b) ensuring that the estimates are representative of the population sampled. Given that correspondence studies of labor market discrimination sample job ads in a manner similar to what we did, rather than using more standard sampling methods reflected in traditional secondary data sources, one can either weight (as we do), or try to build this representativeness into the experiment and data collection. Finally, we note that – in our study – this sensitivity pertains only to the estimation of the effects of anti-discrimination laws; the evidence of lower callback rates for older workers is highly robust and not sensitive to weighting.

[37] As counterexamples, Tilczik (2011) studied 7 jurisdictions, and Agan and Starr (2018) studied two.

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Table 1: Level of Matching of Callbacks

	Matched positive responses	No responses	Total
Voicemail	1,614	N.A.	1,614
Email	1,218	N.A.	1,218
Both	438	N.A.	438
All	3,270	11,158	14,428

Notes: There are 3,270 matched responses to 14,428 resumes that were sent out. For responses received from employers, we tried to match each response to a unique job identifier. We received three voicemails that we were unable to match to either a unique job identifier or to the resume that was sent.

Table 2: State Disability and Age Discrimination Laws, 2016

	Age discrimination laws		Disability discrimination laws		
State (City)	Minimum firm size	Larger damages than ADEA	Minimum firm size	Larger damages than ADA	Broader (medical) definition of disability
Alabama (Birmingham)	20	No	No law	No law	No law
Alaska (Anchorage)	1	Yes	1	Yes	No
Arizona (Phoenix)	15	No	15	No (no punitive damages)	No
Arkansas (Little Rock)	No law	No law	9	No (same as ADA)	No
California (Los Angeles)	5	Yes	5	Yes (uncapped)	Yes (“limits” only)
Colorado (Denver)	1	No	1	No (same as ADA)	No
Connecticut (Hartford)	3	No	3	No	Yes
Delaware(Wilmington)	4	Yes	4	No (same as ADA)	No
Florida (Miami)	15	Yes	15	No (punitive capped at $100k)	No
Georgia (Atlanta)	1	No	15	No (no punitive)	No
Hawaii (Honolulu)	1	Yes	1	Yes (uncapped)	No
Idaho (Boise)	5	Yes	5	No (punitive capped at $10k)	No
Illinois (Chicago)	15	Yes	1	No (no punitive)	Yes
Indiana (Indianapolis)	1	No	15	No (no punitive)	No
Iowa (Des Moines)	4	Yes	4	No (no punitive)	No
Kansas (Wichita)	4	Yes	4	No (no punitive damages, damages capped at $2k)	No
Kentucky (Louisville)	8	Yes	15	No (no punitive)	No
Louisiana (New Orleans)	20	Yes	15	No (no punitive)	No
Maine (Portland)	1	Yes	1	Yes	No
Maryland (Baltimore)	1	Yes	1	No (same as ADA, no punitive damages in Baltimore County for employers < 15)	No
Massachusetts (Boston)	6	Yes	6	Yes (uncapped)	No
Michigan (Detroit)	1	Yes	1	No (no punitive)	No
Minnesota (Minneapolis)	1	Yes	1	No (punitive capped at $25k)	Yes (“materially limits” only)
Mississippi (Jackson)	No law	No law	No law	No law	No law
Missouri (Kansas City)	6	Yes	6	Yes (uncapped)	No
Montana (Billings)	1	Yes	1	No (no punitive)	No
Nebraska (Lincoln)	20	No	15	No (no punitive)	No
Nevada (Las Vegas)	15	No	15	No (no punitive)	No
New Hampshire (Manchester)	6	Yes	6	No (no punitive)	No
New Jersey (Trenton)	1	Yes	1	Yes (uncapped)	Yes
New Mexico (Albuquerque)	4	Yes	4	No (no punitive)	No
New York (New York)	4	Yes	4	No (no punitive)	Yes
North Carolina (Charlotte)	15	No	15	No (no punitive)	No
North Dakota (Bismarck)	1	No	1	No (no damages)	No
Ohio (Columbus)	4	Yes	4	Yes (uncapped)	No
Oklahoma (Oklahoma City)	1	No	1	No (no punitive)	No
Oregon (Portland)	1	Yes	6	Yes (uncapped)	No
Pennsylvania (Pittsburgh)	4	No	4	No (no punitive)	No

	Age discrimination laws		Disability discrimination laws		
State (City)	**Minimum firm size**	**Larger damages than ADEA**	**Minimum firm size**	**Larger damages than ADA**	**Broader (medical) definition of disability**
Rhode Island (Providence)	4	Yes	4	Yes (uncapped)	No
South Carolina (Columbia)	15	No	15	No (same as ADA)	No
South Dakota (Sioux Falls)	No law	No law	1	No (no punitive)	No
Tennessee (Memphis)	8	Yes	8	No (no punitive)	No
Texas (Houston)	15	Yes	15	No (same as ADA)	No
Utah (Salt Lake City)	15	No	15	No (no punitive)	No
Vermont (Burlington)	1	Yes	1	Yes (uncapped)	No
Virginia (Virginia Beach)	6	No	1	No (no punitive)	No
Washington (Seattle)	8	Yes	8	No (no punitive)	Yes
West Virginia (Charleston)	12	No	12	Yes (uncapped)	No
Wisconsin (Milwaukee)	1	No	1	No (no punitive)	No
Wyoming (Cheyenne)	2	No	2	No (no punitive)	No

Notes: State laws are as of 2016. Age discrimination laws are from Neumark and Song (2013) and disability discrimination laws are from Neumark et al. (2017), but both are updated to 2016. For Maryland, under Minimum firm size, we list the value 1. This is the case for Baltimore County, from which our data come; the minimum is 15 for the rest of the state. For the states listed as "Yes" under Larger damages than ADA, but not uncapped, details are as follows: Alaska – uncapped compensatory damages, punitive damages capped above ADA levels; Maine – exceeds ADA cap for firms of 201+ employees. As discussed more in-depth in Online Appendix OB, for Connecticut the evidence favors punitive damages not being available, and compensatory damages were definitely not available.

Table 3: Callback Rates by Age

		Young (29-31)	Old (64-66)	Absolute (percentage point) difference in callback rate for old	Percent difference in callback rate for old
A. Males (N=7,184)					
Callback (%)	No	76.92	83.03	-6.11	-26.47%
	Yes	23.08	16.97		
Tests of independence (p-value), young vs. old		0.00			
B. Females (N=7,184)					
Callback (%)	No	74.49	82.55	-8.06	-31.60%
	Yes	25.51	17.45		
Tests of independence (p-value), young vs. old		0.00			

Notes: For each city, the observations are weighted by the ratio of QWI Retail Employment, by sex, to the number of observations in the sample. The p-values reported for F-statistics for weighted tests of independence. There were no positive responses for West Virginia, so it drops out of the probit analysis in subsequent tables. We therefore also drop West Virginia from this table to have results for the same sample; this has virtually no impact on the estimates in this table. We also drop the very small number of observations for Arkansas, South Dakota, and Wyoming.

Table 4: Probit Estimates for Callbacks by Age, Marginal Effects

	Males		**Female**	
	(1)	(2)	(3)	(4)
Callback estimates				
Old (64-66)	-0.064*** (0.006)	-0.067*** (0.006)	-0.081*** (0.007)	-0.083*** (0.007)
Controls				
State, order, unemployed, skills	X	X	X	X
Resume features		X		X
Callback rate for young (29-31)	23.08%		25.51%	
N	7,184		7,184	

Notes: Marginal effects are reported, computed as the discrete change in the probability associated with the dummy variable, evaluating other variables at their means. For each city, the observations are weighted by the ratio of QWI Retail Employment, by sex, to the number of observations in the sample. Standard errors are clustered at the age-by-state level. Significantly different from zero at 1-percent level (***), 5-percent level (**) or 10-percent level (*). Resume features include: template; email script; email format; script subject, opening, body, and signature; and file name format. See notes to Table 3.

Table 5: Probit Estimates for Callbacks by Age, and Effects of State Age and Disability Anti-Discrimination Laws, Marginal Effects

	Males		**Female**	
	(1)	(2)	(3)	(4)
Callback estimates				
Old (64-66)	-0.057*** (0.011)	-0.056*** (0.011)	-0.091*** (0.018)	-0.092*** (0.018)
Old (64-66) x Age and/or disability firm-size cutoff < 10	-0.016 (0.013)	-0.021 (0.013)	0.014 (0.016)	0.014 (0.016)
Old (64-66) x Age larger damages	0.039** (0.013)	0.034** (0.013)	0.027* (0.016)	0.027* (0.016)
Old (64-66) x Disability larger damages	0.002 (0.013)	0.011 (0.014)	0.017 (0.013)	0.021 (0.014)
Old (64-66) x Broader disability definition (medical only)	0.008 (0.012)		0.009 (0.013)	
Old (64-66) x Broader disability definition (medical or limits)		0.021* (0.011)		0.017 (0.013)
Controls				
State, order, unemployed, skills	X	X	X	X
Callback rate for young (29-31)	23.08%		25.51%	
N	7,184		7,184	

Notes: See notes to Tables 3 and 4. For each city, the observations are weighted by the ratio of QWI Retail Employment, by sex, to the number of observations in the sample.

Table 6: Probit Estimates for Callbacks by Age, and Effects of State Age and Disability Anti-Discrimination Laws, Marginal Effects, Cities Weighted Equally

	Males		**Female**	
	(1)	(2)	(3)	(4)
Callback estimates				
Old (64-66)	-0.091*** (0.016)	-0.091*** (0.016)	-0.091*** (0.012)	-0.092*** (0.012)
Old (64-66) x Age and/or disability firm-size cutoff < 10	0.021 (0.020)	0.020 (0.020)	-0.006 (0.014)	-0.006 (0.014)
Old (64-66) x Age larger damages	0.020 (0.017)	0.020 (0.018)	0.004 (0.014)	0.005 (0.014)
Old (64-66) x Disability larger damages	-0.005 (0.016)	-0.005 (0.017)	0.022 (0.016)	0.021 (0.016)
Old (64-66) x Broader disability definition (medical only)	0.015 (0.018)		-0.003 (0.011)	
Old (64-66) x Broader disability definition (medical or limits)		0.016 (0.015)		-0.008 (0.011)
Controls				
State, order, unemployed, skills	X	X	X	X
Callback rate for young (29-31)	27.12%		30.48%	
N	7,184		7,184	

Notes: See notes to Tables 3 and 4. For each city, the observations are weighted by 1 divided by the share of observations in the city.

Table 7: Probit Estimates for Callbacks by Age, and Effects of State Age and Disability Anti-Discrimination Laws, Marginal Effects, Unweighted

	Males		**Female**	
	(1)	(2)	(3)	(4)
Callback estimates				
Old (64-66)	-0.062*** (0.016)	-0.062*** (0.016)	-0.087*** (0.012)	-0.088*** (0.011)
Old (64-66) x Age and/or disability firm-size cutoff < 10	-0.013 (0.016)	-0.015 (0.017)	-0.009 (0.012)	-0.007 (0.011)
Old (64-66) x Age larger damages	0.011 (0.014)	0.007 (0.015)	0.006 (0.012)	0.009 (0.012)
Old (64-66) x Disability larger damages	-0.013 (0.014)	-0.007 (0.016)	0.020 (0.013)	0.018 (0.012)
Old (64-66) x Broader disability definition (medical only)	-0.014 (0.014)		0.006 (0.015)	
Old (64-66) x Broader disability definition (medical or limits)		-0.0003 (0.016)		-0.002 (0.014)
Controls				
State, order, unemployed, skills	X	X	X	X
Callback rate for young (29-31)	25.00%		28.37%	
N	7,184		7,184	

Notes: See notes to Tables 3 and 4. The observations are unweighted.

Table 8: Linear Probability Estimates for Callbacks by Age, and Effects of State Age and Disability Anti-Discrimination Laws, Marginal Effects, with Interactions and Alternative Weighting

	Males			**Female**		
	(1)	(2)	(3)	(4)	(5)	(6)
Weighting	Table 5	Table 6	Table 7	Table 5	Table 6	Table 7
Callback estimates						
Old (64-66)	-0.066***	-0.088***	-0.059***	-0.104***	-0.092***	-0.086***
	(0.011)	(0.016)	(0.015)	(0.022)	(0.014)	(0.013)
% Old x Old (64-66)	0.010***	0.008*	0.010***	-0.008	-0.003	-0.002
	(0.003)	(0.005)	(0.003)	(0.005)	(0.004)	(0.003)
Old (64-66) x Age and/or disability firm-size cutoff < 10	-0.031**	0.009	-0.026	0.005	-0.009	-0.012
	(0.012)	(0.019)	(0.017)	(0.019)	(0.015)	(0.013)
Old (64-66) x Age larger damages	0.025*	0.014	0.003	0.015	0.003	0.004
	(0.013)	(0.017)	(0.015)	(0.018)	(0.014)	(0.012)
% Old x Old (64-66) x Age larger damages	-0.003	-0.003	0.000	0.020***	0.009	0.011*
	(0.005)	(0.009)	(0.007)	(0.007)	(0.007)	(0.005)
Old (64-66) x Disability larger damages	0.007	-0.006	-0.004	0.016	0.019	0.017
	(0.011)	(0.017)	(0.015)	(0.014)	(0.015)	(0.013)
% Old x Old (64-66) x Disability larger damages	-0.016**	-0.006**	-0.013*	-0.011	0.005	-0.001
	(0.007)	(0.009)	(0.007)	(0.012)	(0.011)	(0.009)
Old (64-66) x Broader disability definition (medical or limits)	0.015	0.006	0.008	0.012	-0.001	0.008
	(0.012)	(0.017)	(0.018)	(0.018)	(0.016)	(0.015)

Notes: See notes to Tables 5-7. The other control variables are the same. The % Old is the percent of the population aged 65 and over, by MSA, from the 2016 American Community Survey 5-year estimates. The model also includes interactions between % Old and the two damages variables; the main effects of the damages variables are absorbed in the fixed state effects, but these interactions are not. The variable is demeaned before forming interactions, so the main effects measure effects evaluated at the sample means and are hence comparable to Tables 5-7. The % Old variable is defined from 0-100.

Figure 1: Percent of Observations by State (City), and Reweighting by QWI Data for Retail (Male and Female), and for Equal Weighting

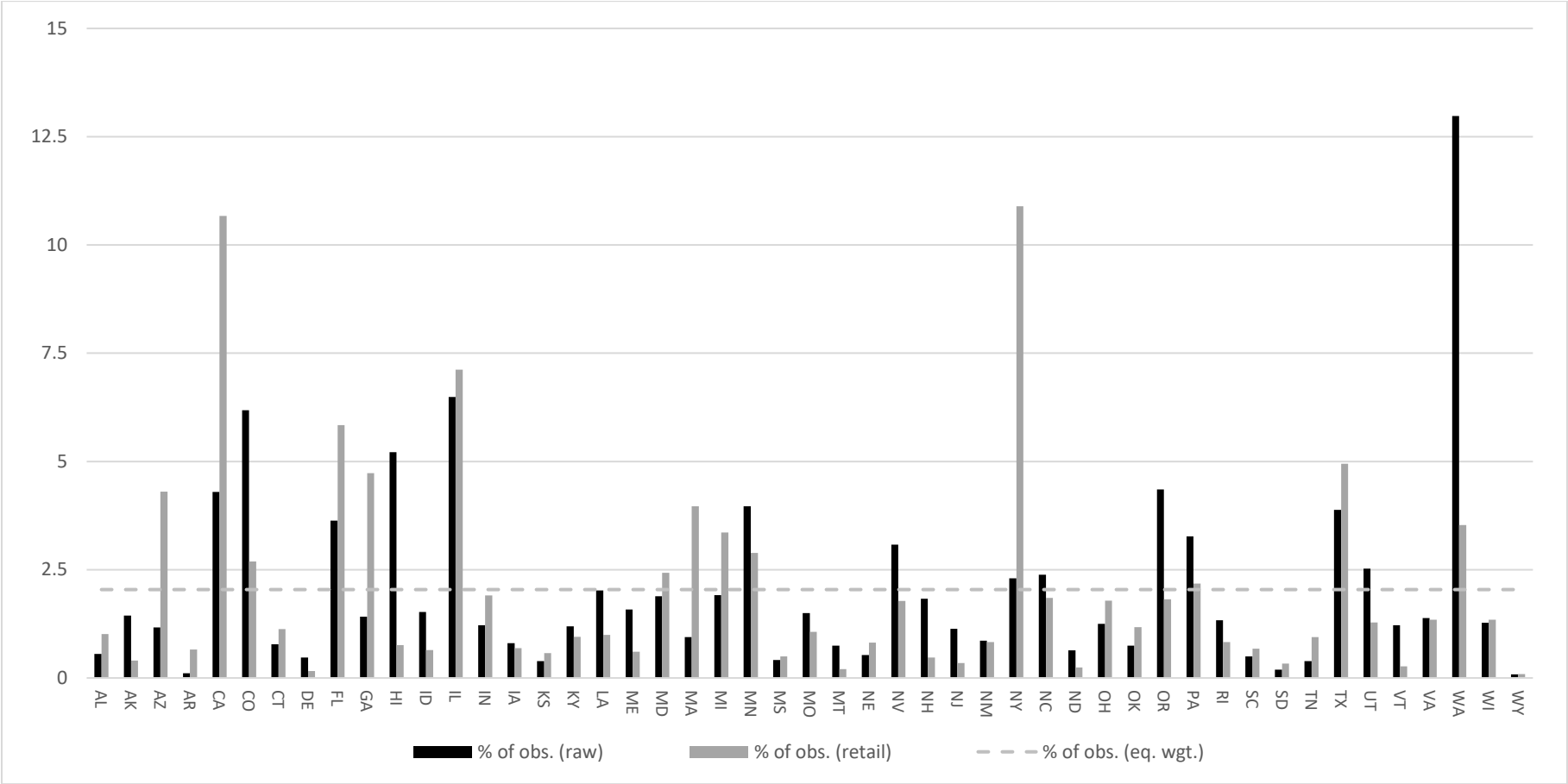
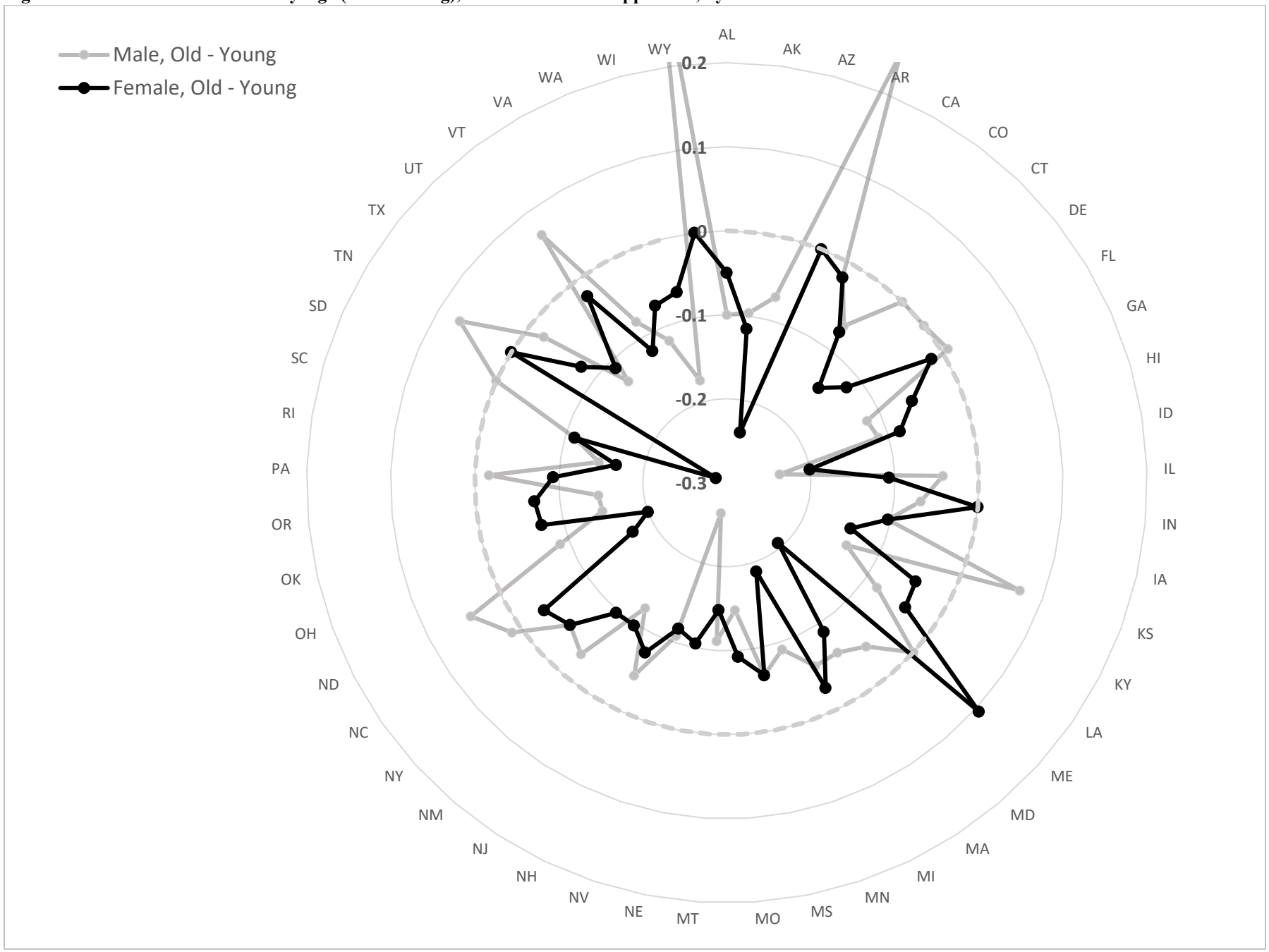


Figure 2: Relative Callback Rates by Age (Old − Young), Male and Female Applicants, by State



Online Appendix OA: Additional Discussion and Results

Estimating the Difference-in-Differences in a Probit Model

In a simple difference-in-differences model, with two states, the latent variable model corresponding to equation (2) in the main paper is

$$\text{(OA1)} \quad C_{is}^{*} = \alpha + \gamma S_{is} + S_{is} \cdot A_s \gamma' + A_s \gamma'' + X_{is}\delta + \varepsilon_{is},$$

where we have introduced a dummy for the state with a particular law, and X now does not include the state dummy variable. In this case, we compute the marginal effect of $S_{is} \cdot A_s$ by applying the Delta method to the expression

$$\text{(OA2)} \quad \Phi(\hat{\alpha} + \hat{\gamma} + \hat{\gamma}' + \hat{\gamma}'' + \overline{X}\hat{\delta}) - \Phi(\hat{\alpha} + \hat{\gamma}'' + \overline{X}\hat{\delta}) - \{\Phi(\hat{\alpha} + \hat{\gamma} + \overline{X}\hat{\delta}) - \Phi(\hat{\alpha} + \overline{X}\hat{\delta})\},$$

where $\Phi(\cdot)$ denotes the standard normal CDF, and $\overline{X}$ denotes sample means. The first difference is the difference in probabilities of callbacks between old applicants in the state with the law, and young applicants in the same state, and the second difference is between old and young applicants in the state without the law.

Another complication is that, when there are multiple states, the latent variable equation has a vector of state dummy variables, which absorb the main effect of A_s. Unlike in a linear model, where the state dummy variables difference out, we need to construct an average estimated intercept for the states with a law and the states without a law (paralleling the use of $\hat{\alpha} + \hat{\gamma}''$ for treated states and $\hat{\alpha}$ for control states in equation (OA2)). We do this by specifying the model to include dummy variables for every state, and no intercept, and construct the appropriate intercept for states with and without the policy as the sample-weighted averages of state dummy variable coefficients for the states with or without a law, including these averages in the corresponding first difference. Defining $P_{s,A=1}$ as the proportion of observations in state s, relative to all states with A = 1, and similarly for $P_{s,A=0}$, and defining $\hat{\theta}_s$ as the estimated coefficient of the dummy variable for state s, $\hat{\alpha} + \hat{\gamma}''$ in the first difference shown in equation (OA2) is replaced by

$$\text{(OA3)} \quad \sum_{s \in A=1} \{\hat{\theta}_s \cdot P_{s,A=1}\}$$

and $\hat{\alpha}$ in the second difference in equation (OA2) is replaced by

$$\text{(OA4)} \quad \sum_{s \in A=0} \{\hat{\theta}_s \cdot P_{s,A=0}\}.$$ [1]

Heckman Critique

This section briefly explains the procedure to correct for the Heckman critique. As explained in Neumark (2012), allowing for different variances of the unobservables for young and old workers requires adding to some of the resumes characteristics that shift the callback probability, which in this study are skill measures described below, and estimating a heteroskedastic probit model. We first estimate a probit model with the controls and their interactions with "Old" included. We then test the overidentifying restriction for the controls, to see whether the data are consistent with the effects for young and old differing in a way that is driven only by the difference in variance of the unobservables

[1] Our comment in the main text about linear probability model estimates being very similar to the probit estimates applies equally well to the estimated interactions between the policy variables and the indicator for older applicants. Of course, with the linear probability model the estimation of interaction effects is much simpler.

(that is, the ratios of effects for young and old workers are equal).[2] It turns out that the overidentifying restriction using all of the controls is not rejected by the data, so we do not have to narrow down the set of variables used to identify the relative variance. We then estimate a heteroskedastic probit model that imposes equal coefficients of the controls in the latent variable model, with the variance of the residual differing between young and old workers. The estimates of this model are used to estimate marginal effects, and – as explained earlier – to decompose the marginal effects to isolate the effects of the variables on the level of the latent variable, which are the unbiased estimates of discrimination.

In this model, the age of applicants has two separate effects. The first effect is the usual discrimination channel we have in mind, exactly paralleling the effect of S in equation (1) of the main paper, which can be interpreted, perhaps most simply, as the effect of age on the employer's valuation of the worker's marginal product – just as in the Becker employer discrimination model. The second effect is via the variance of the unobservable, and as explained in Neumark (2012) this effect is an artifact of the details of the experimental design and is the source of the bias identified by the Heckman critique. Thus, adapting estimation of the effects of age, and its interactions with anti-discrimination laws, requires separating out these two effects and focusing on the first. Denoting by σ the ratio of the standard deviation of the unobservable for older applicants to the standard deviation for younger applicants, the difference-in-difference paralleling equation (OA2) becomes

$$\text{(OA5)}\quad \Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\hat{\gamma}'+\hat{\gamma}''+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\hat{\gamma}''+\overline{X}\hat{\delta})-\left\{\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\overline{X}\hat{\delta})\right\},$$

where σ appears in the first and third expressions because they apply to older applicants.

Equation (OA5) can be decomposed in two ways to isolate the effect of age through the level, each of which entails adding and subtracting terms that sum to zero. The first decomposition is

$$\begin{aligned}\text{(OA6)}\quad &\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\hat{\gamma}'+\hat{\gamma}''+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}''+\overline{X}\hat{\delta}}{\sigma}\right)-\left\{\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi\left(\frac{\hat{\alpha}+\overline{X}\hat{\delta}}{\sigma}\right)\right\}+\\ &+\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}''+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\hat{\gamma}''+\overline{X}\hat{\delta})-\left\{\Phi\left(\frac{\hat{\alpha}+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\overline{X}\hat{\delta})\right\}.\end{aligned}$$

The second decomposition is

$$\begin{aligned}\text{(OA6')}\quad &\Phi(\hat{\alpha}+\hat{\gamma}+\hat{\gamma}'+\hat{\gamma}''+\overline{X}\hat{\delta})-\Phi(\hat{\alpha}+\hat{\gamma}''+\overline{X}\hat{\delta})-\{\Phi(\hat{\alpha}+\hat{\gamma}+\overline{X}\hat{\delta})-\Phi(\hat{\alpha}+\overline{X}\hat{\delta})\}\\ &+\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\hat{\gamma}'+\hat{\gamma}''+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\hat{\gamma}+\hat{\gamma}'+\hat{\gamma}''+\overline{X}\hat{\delta})-\left\{\Phi\left(\frac{\hat{\alpha}+\hat{\gamma}+\overline{X}\hat{\delta}}{\sigma}\right)-\Phi(\hat{\alpha}+\hat{\gamma}+\overline{X}\hat{\delta})\right\}.\end{aligned}$$

In either equation (OA6) or (OA6'), the first difference-in-difference isolates the effects of age (corresponding to the parameter estimate $\hat{\gamma}$) and the age-by-law interaction ($\hat{\gamma}'$), and the second difference-in-difference isolates the effect of age via the variance of the unobservable. It is the first effect – the effect via the "level" – that provides unbiased estimates of the effects of age, and of age-by-law interactions, which we obtain by netting out the second effect. There are two alternative decompositions depending on whether we evaluate the first effect based on the variance of the unobservable for older applicants (equation (OA6)) or young applicants (equation (OA6')).[3]

The results are reported in Online Appendix Table OA1, using our preferred weighting from Table 5. Results are shown for women only because, for men, there was no evidence against the

[2] To identify the effect of the old-state law interactions, we have to assume equal coefficients for the state dummy variables, so this restriction is simply imposed. The overidentification test we use pertains to all of the other controls.

[3] This modifies the approach in Neumark (2012), where the marginal effect of group membership (there were no interactions with laws) was calculated treating the indicator of group membership as continuous rather than discrete, which has the advantage of providing a unique decomposition into the effect via the level and via the variance. However, for marginal effects involving interacted variables, this approach is not applicable.

homoskedastic model. For men, the old/young ratio of standard deviations of unobservables was 0.97 (p-value for test that ratio equals 1 = 0.89) for the first specification corresponding to Online Appendix Table OA1, and 0.90 (p-value = 0.56) for the second specification. In contrast, as the second panel of the table shows, the ratio of the standard deviation of the unobservable for old relative to young workers for women exceeds 1.2, and is significantly different from 1 at the 10-percent level, rejecting (at this significance level) the homoskedastic model – which implies that the Heckman critique applies.

The upper rows of the table report the marginal effects corrected for bias. The specifications are otherwise the same as those in Table 5, using all the laws simultaneously, and hence can be compared directly. The estimates in the first row indicate that the main effects of "Old," which measure age discrimination in the states where the federal laws bind, become larger by about 3 to 4 percentage points. Thus, for these states the evidence of age discrimination against women strengthens.

The remaining rows of the top panel report the unbiased estimates of the marginal effects of the estimated interactions between "Old" and the features of state anti-discrimination laws. As described in the main text, correcting for this bias, and using our preferred weighting (in Table 5), eliminates the evidence of positive effects of larger damages under age discrimination laws. However, we find statistically significant evidence of positive effects on the relative callback rate for older women of larger damages under disability discrimination laws, for the second specification that uses the more expansive definition of disability to define broader laws. There is also one estimate (in column (1)) suggesting that a broader definition of disability can reduce relative hiring of older workers, but this evidence is generally not statistically significant, nor was there support for this conclusion in the earlier tables.

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Online Appendix Table OA1: Probit Estimates for Callbacks by Age, and Effects of State Age and Disability Anti-Discrimination Laws, Marginal Effects, with Correction for Bias from Different Variances of Unobservables for Young and Old Applicants, Women Only

	Specification 1		**Specification 2**	
	(1)	(2)	(3)	(4)
Decomposition	Eq. (8)	Eq. (8')	Eq. (8)	Eq. (8')
Callback estimates (heteroskedastic probit, marginal effect via level)				
Old (64-66)	-0.119*** (0.025)	-0.124*** (0.027)	-0.124*** (0.026)	-0.129*** (0.029)
Old (64-66) x Age and/or disability firm-size cutoff < 10	0.020 (0.020)	0.024 (0.024)	0.023 (0.021)	0.028 (0.025)
Old (64-66) x Age larger damages	0.001 (0.018)	0.003 (0.022)	0.003 (0.018)	0.006 (0.022)
Old (64-66) x Disability larger damages	0.016 (0.017)	0.019 (0.019)	0.027* (0.016)	0.031* (0.019)
Old (64-66) x Broader disability definition (medical only)	-0.037* (0.022)	-0.035 (0.024)		
Old (64-66) x Broader disability definition (medical or limits)			-0.031 (0.020)	-0.029 (0.022)
Overidentification test: ratios of coefficients on skills for old relative to young are equal (p-value, Wald test)	0.96		0.96	
Standard deviation of unobservables, old/young	1.21		1.22	
Test: equal variances of unobservables (p-value, Wald)	0.09		0.10	
Controls				
State, order, unemployed, skills	X	X	X	X
Callback rate for young (29-31)	23.08%		25.51%	
N	7,184		7,184	

Notes: For each city, the observations are weighted by the ratio of QWI Retail Employment, by sex, to the number of observations in the sample. The overidentification test is based on interactions of the skill variables, order of application, and unemployment, with the dummy variable for old. See notes to Tables 3 and 4. Results are shown for women only. For men, there was no evidence against the homoskedastic model. The old/young ratio of standard deviations of unobservables was 0.97 (p-value = 0.89) for specification 1, and 0.90 (p-value = 0.56) for specification 2.

Online Appendix OB: Legal Appendix

Coding of State Laws

To study the effects of disability discrimination laws, we first needed to code up these laws. To do this, we followed the procedure developed in Neumark and Song (2013) to code state age discrimination laws. This required extensive background research on state statutes and their histories, culled from legal databases including Lexis-Nexis, Westlaw, and Hein Online, as well as many other sources. The first step in assembling information on state disability discrimination laws was to identify the appropriate state statute, which can be complicated because the disability discrimination law can be listed under various sections of state law (e.g., a fair employment act, a separate disability discrimination act). After the appropriate statute was identified, we traced the history of the statute using the legal databases to look for changes over time. In some cases, we had to look beyond the statutes to information from state agencies, case law, or other sources.

Because it is complicated to read and interpret the law correctly based solely on statutes, we cross-checked our understanding of the statute with other legal references or treatises and additional sources of information on state laws.[1] The other sources were also useful because of a further challenge in reading statutes. In particular, one section may define what a discriminatory act is, while other provisions may be delegated to the Civil Rights Commission, or the remedies may be listed under a different section of the statute.

To minimize inaccuracies, once all the necessary information was obtained from these sources, we attempted to compare and validate it using other sources. If information obtained from different sources matched, we were confident that the information was correct. In cases of what should be unambiguous information – in particular the minimum firm size for laws to apply – we use the information from the statute regardless. However, in cases of information that can be more easily misinterpreted from the statute, when we found discrepancies we turned to state agencies or other sources for corroborating information. We also examined case law, using the legal databases, to see if rulings established fixed features of the state laws that were not specified in the statute, such as damages allowed.

As a result of these efforts, we were able to fill in all the information on these laws for our sample period. The only possible exception is for damages. In particular, if our information on damages came not from statutes (since the statutes did not mention damages) but rather from case law or other sources, then we did not necessarily have an explicit "reading" on these damages in every year. But since our other sources cover many years, the only variation we could miss was some short-term change between the level of damages we get from other sources. We assume, though, that there is little or no such variation.

As noted in the main text, there are three major ways in which state disability discrimination laws can be stronger than the federal ADA. Here we provide some general discussion of these differences, and then we provide state-specific details.

The minimum firm size for the ADA to apply is 15. We create an indicator variable equal to one if the firm size minimum is lower than 10 (i.e., substantially lower than the ADA minimum), and zero otherwise. When the firm size minimum is lower, more workers (and employers) are covered.

Defining disability is of course more complicated than defining other protected groups, like age, race, and sex, and the definition of disability differs across states. Most states adopt the same definition as the ADA, either explicitly or via case law. The ADA provides three routes for an individual to be considered disabled:

"The term "disability" means, with respect to an individual-

[1] These included Beegle and Stock (2003), Buckley and Green (2011, 2009, 2008, 2006, 2002, 1997), Colker and Milani (2002), DRI (2011), Green (1992), Long (2004), Perry (2011), and a 50-state survey of discrimination laws at http://www.navexglobal.com/sites/default/files/uploads/lb_Descrimination-50States.pdf (viewed September 22, 2014).

(A) a physical or mental impairment that substantially limits one or more major life activities of such individual;

(B) a record of such an impairment; or

(C) being regarded as having such an impairment" (42 U.S. Code §12102 (1)).

Given that the definition of physical and mental impairment is quite broad, the "substantially limits" requirement can probably be thought of as the main criterion defining disability under the ADA and similar state laws. Moreover, the "substantially limits" phrase has been interpreted by the courts as quite restrictive[2]. The U.S. Supreme Court, in the "Sutton Trilogy" of cases (Sutton v. United Airlines (119 S. Ct. 2139 (1999)), Murphy v. United Parcel Service, Inc. (119 S. Ct. 2133 (1999)), and Albertson's, Inc. v. Kirkingburg (119 S. Ct. 2162 (1999))), deemed individuals to be not disabled if mitigating measures, such as glasses or medication, made the limiting features of the disability dormant. A U.S. Court of Appeals, 4th Circuit, decision also restricted episodic conditions, such as epilepsy, from being considered a disability in EEOC v. Sara Lee Corp., 237 F.3d 349 (4th Cir., 2001).[3]

Some states use a weaker criterion in this regard than the "substantially limits" requirement of the ADA under the first criterion above. In two states this is done by the statutes substituting "materially limits" (MN) or just "limits" (CA) for "substantially limits," with legal interpretations or statutes being explicit that this is a less stringent standard. Several states (CT, IL, NJ, NY, and WA) adopt an even laxer definition, considering an individual to be disabled if their impairment is medically diagnosed, regardless of whether the impairment substantially limits one or more major life activities. Long (2004) argues, as seems quite reasonable, that these medical definitions broaden coverage relative to the ADA. To capture this variation, we create two dichotomous variables called "broader disability definition." The first is a dummy variable for states with the medical definition of disability ("broader disability definition (medical only)"), and the second is a dummy variable that also captures states with the "limits" (CA) definition, or the "materially limits" (MN) definition ("broader disability definition (medical or limits)").

Damages are likely to play a major role in the strength of discrimination laws, based in part on evidence from age discrimination laws (Neumark and Song, 2013). The ADA caps the sum of compensatory and punitive damages per claimant based on firm size, as follows:

1. 15-100 employees: $50,000
2. 101-200 employees: $100,000
3. 201-500 employees: $200,000
4. 500 plus employees: $300,000.

Few states follow this exact schedule (AR, CO, DE, MD, SC, and TX). 12 states allow larger potential damages, either through higher caps (AK and ME) or, more commonly, through allowing compensatory damages and uncapped punitive damages (CA, HI, MA, MO, NJ, OH, OR, RI, VT, and WV). We create a dichotomous variable called "larger damages," which equals one for the 12 states where potential damages exceed those under the ADA, and zero otherwise. Three states (FL, ID, and MN) have lower damage caps than the ADA, and two states (AL and MS) have no law (in which case we code the state as not having the stronger provision). There are 26 states with no punitive damages. We do not include these states in the larger damages category because compensatory damages require

[2] For example, Burgdorf (1997, p. 536-538) cites numerous cases stemming from numerous cases stemming from Forrisi v. Bowen, 794 F.2d 931, 934 (4th Cir. 1986), which interpreted the ADA to only cover the "truly disabled" and not those with more minor impairments.

[3] These decisions were reversed by the ADA Amendments Act (ADAAA), effective in 2009, which is beyond our sample period. Under the ADAAA, states where the ADA's definition of disability prevailed became more like those states using a medical impairment definition, discussed next. In principle we could use data pre- and post-2009 for identifying information on this dimension of variation in disability discrimination laws, but the confounding effects of the Great Recession make this unlikely to be informative.

documentation and, in many cases, seem unlikely to be as large; an example might be medical bills if an employee was terminated unjustly, and dropped from a health insurance plan. Thus, punitive damages are likely more the driver of large judgments.[4,5]

The coding of the state age and disability discrimination laws is summarized in Table 2 in the main text. Online Appendix Table OB1 lists the year of adoption of these laws.

Definition of Disability

Some state laws bypass the requirement that a mental or physical impairment "substantially limits" one or more major life activities. This occurs either by replacing "substantially limits" with either just "limits" (California) or "materially limits" (Minnesota), or by defining disability as a medical diagnosis (Connecticut, Illinois, New Jersey, New York, Washington effective May 4, 2007). These state laws are discussed in more detail below.

California

California's disability discrimination law is discussed in further detail by Button (2018), but we provide a summary here. California adopts a similar definition of disability to the ADA but specifies in statute that the impairment must "limit" instead of "substantially limit" a major life activity. Although dropping the word "substantially" may seem trivial, this did in fact make establishing that a disability exists less burdensome, but not initially. The Prudence Kay Poppink Act took effect in California in 2001, and this act made it explicit that the "limits" requirement in California was less burdensome than the federal ADA. Before this act passed however, the "limits" requirement was interpreted in the same way as the federal ADA (Long, 2004). For example, in Colmenares v. Braemer Country Club, Inc., 63 P.3d 220, 223 (Cal. 2003), the plaintiff was deemed not disabled because his case preceded the Poppink Act, when California's "limits" was interpreted the same as the ADA's "substantially limits."

Connecticut

In Connecticut, a diagnosis of a physical or mental impairment makes the individual disabled under law, bypassing the "substantially limits" requirement. CONN. GEN. STAT. § 46a-51(15). states that "'Physically disabled' refers to any individual who has any chronic physical handicap, infirmity or

[4] For reasons explained below, some of our analyses incorporate information on two features of state age discrimination laws – larger damages, and the firm-size cut-off – in some of our analyses. This information (from Neumark and Song, 2013) is listed in the last two columns of Table 1. As the table shows, firm-size minimums are similar for disability and age discrimination laws, but there are 11 states that have a different minimum (AL, AR, GA, IL, IN, KY, LA, NE, OR, SD, and VA). Regarding damages, we focus on whether compensatory or punitive damages are allowed, which they are not under federal age discrimination law (the ADEA). Some states require proof of intent to discriminate in order for compensatory or punitive damages to be awarded, whereas others require "willful" violation. Because the federal law allows additional liquidated, non-punitive damages (double back pay and benefits) when there is "willful" violation, the question of whether the state requires intent or willful violation may seem to be potentially relevant in deciding whether a state law offers greater protection. However, willful violation is a much stricter standard than intent (Moberly, 1994). Moreover, compensatory or punitive damages are almost certainly greater than liquidated damages, and they can be much greater. As a consequence, a state law that provides compensatory or punitive damages, whether or not this requires proof of intent or willful violation, clearly entails stronger remedies than the federal law, so our classification captures whether either is allowed.

[5] In principle one might classify states with combinations of the three dimensions of laws tabulated in Table 2 as having the strongest laws. However, this would provide virtually no difference in variation, and hence almost no additional variation. As Table 2 shows, the set of states with the broader definition is quite small, and only one state (New Jersey) overlaps this dimension of state laws with larger damages. Similarly, for the overlap between broader definition and smaller firm size, no states differ. And finally, if we look at the overlap between larger damages and smaller firm size, only one state with larger damages leaves its firm size cutoff at 10 or greater (West Virginia); the independent variation in firm size cutoffs comes from the states that do not have larger damages.

impairment, whether congenital or resulting from bodily injury, organic processes or changes or from illness, including, but not limited to, epilepsy, deafness or hearing impairment or reliance on a wheelchair or other remedial appliance or device."

Connecticut is even more explicit in its definition of mental disability (Long, 2004), as CONN. GEN. STAT. § 46a-51(20) states that "'Mental disability' refers to an individual who has a record of, or is regarded as having one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's 'Diagnostic and Statistical Manual of Mental Disorders'."

Illinois

775 ILL. COMP. STAT. 5/1-103(I) defines a disability as "…a determinable physical or mental characteristic of a person, including, but not limited to, a determinable physical characteristic which necessitates the person's use of a guide, hearing or support dog, the history of such characteristic, or the perception of such characteristic by the person complained against, which may result from disease, injury, congenital condition of birth or functional disorder…"

Minnesota

Similar to California, MINN. STAT. § 363.01(12) defines disability as "…any condition or characteristic that renders a person a disabled person. A disabled person is any person who (1) has a physical, sensory, or mental impairment which materially limits one or more major life activities; (2) has a record of such an impairment; or (3) is regarded as having such an impairment." While the distinction between materially and substantially may seem trivial, Long (2004) notes that the Minnesota Supreme Court, in Sigurdson v. Carl Bolander & Sons, Co., 532 N.W.2d 225, 228 n.3 (Minn. 1995), stated that the Minnesota definition is less stringent.

New Jersey

N.J. STAT. ANN. § 10:5-5(q) defines disability as a "…physical disability, infirmity, malformation or disfigurement which is caused by bodily injury, birth defect or illness including epilepsy and other seizure disorders, and which shall include, but not be limited to, any degree of paralysis, amputation, lack of physical coordination, blindness or visual impediment, deafness or hearing impediment, muteness or speech impediment or physical reliance on a service or guide dog, wheelchair, or other remedial appliance or device, or any mental, psychological or developmental disability, including autism spectrum disorders, resulting from anatomical, psychological, physiological or neurological conditions which prevents the normal exercise of any bodily or mental functions or is demonstrable, medically or psychologically, by accepted clinical or laboratory diagnostic techniques. Disability shall also mean AIDS or HIV infection."

New York

New York's Executive Law § 292(21)(a) defines a disability as "a physical, mental or medical impairment resulting from anatomical, physiological, genetic or neurological conditions which prevents the exercise of a normal bodily function or is demonstrable by medically accepted clinical or laboratory diagnostic techniques." The requirement that the impairment be "demonstrable by medically accepted clinical or laboratory diagnostic techniques" bypasses the "substantially limits" requirement and makes New York disability discrimination law more broadly applicable (Long, 2004).

Washington

Washington's definition of disability was rather vague before an amendment, effective May 4, 2007, changed Washington's definition to follow a medical diagnosis definition like Connecticut, Illinois,

New Jersey, and New York. Prior to this amendment, WASH. REV. CODE § 49.60.180 prohibited discrimination on the basis of physical disability, but the term was not defined. Noting this, Long (2004) could not categorize Washington's laws and instead put them in a "miscellaneous" category. It appears that Washington's lack of definition caused courts to rely on the federal definition of disability, which included the "substantially limits" requirement.[6] After the 2007 amendment, Washington law states that

" 'Disability' means the presence of a sensory, mental, or physical impairment that:

(i) Is medically cognizable or diagnosable; or

(ii) Exists as a record or history; or

(iii) Is perceived to exist whether or not it exists in fact" (Wash. Rev. Code § 49.60.040 (7)(a)).

Compensatory and Punitive Damages

As discussed in the main text, we classify 12 states as having damages that exceed those provided by the ADA. Of these 12 larger damages states, two states (AK and ME) have caps on either compensatory or on punitive damages, but these caps exceed those of the ADA caps on the sum of compensatory and punitive damages. The remaining ten states (CA, HI, MA, MO, NJ, OH, OR, RI, VT, and WV) allow compensatory damages and allow punitive damages that are uncapped. Of the 38 states that we classify as not having damages that exceed the ADA, six states (AR, CO, DE, MD, SC, and TX) have the exact same damage caps as the ADA, three (FL, ID, MN) have lower damage caps, 26 do not allow punitive damages (AZ, GA, IA, IL, IN, KS, KY, LA, MI, MT, NC, ND, NE, NH, NM, NV, NY, OK, PA, SD, TN, UT, VA, WA, WI, and WY), two (AL, MS) do not have an employment non-discrimination law for disability, and CT had an ambiguous law at the time of data collection, such that we code it is not having larger damages since this category is a much better fit.

States with Compensatory Damages and Uncapped Punitive Damages

Ten states (CA, HI, MA, MO, NJ, OH, OR, RI, VT, and WV) offer both compensatory damages and uncapped punitive damages. Determining that these damages were in fact uncapped was difficult. For all these states, statutes did not mention explicit caps on damages, nor was there explicit mention that damages were uncapped. While it seemed likely that these states allowed uncapped damages, we confirmed this conjecture with various sources.

California

California's employment non-discrimination law is vague as to what damages are available, and this had to be clarified in case law. The Fair Employment and Housing Act (Cal. Govt. Code §§12900–12996) provides no mention of statutory caps on civil damages. The case Commodore Home Sys., Inc. v. Superior Court, 32 Cal. 3d 211, 221 (1982) concluded that allowable damages fell under Cal. Civ. Code, § 3294, which provides no caps.[7] The National Conference of State Legislatures (2015) (henceforth NCSL) also indicates that punitive damages are available.

Hawaii

Hawaii's employment non-discrimination law states that compensatory and punitive damages are available, but no caps, or lack thereof, are explicitly mentioned (HI ST § 378-5, HI ST § 368-17). DRI (2011, p. 97) and NCSL (2015) confirm that there are in fact no caps. Jury instructions mention punitive

[6] See Pulcino v. Fed. Express Corp., 9 P.3d 787, 794 (Wash. 2000) as discussed by Long (2004).
[7] See http://scocal.stanford.edu/opinion/commodore-home-systems-inc-v-superior-court-28300 (viewed February 2,015).

damages but do not mention caps.[8] Punitive damages are discussed in-depth by Antolini (2004) who notes that punitive damages are not capped (p. 159).

Massachusetts

Massachusetts' employment non-discrimination law states that compensatory and punitive damages are available, but no caps, or lack thereof, are explicitly mentioned (MA ST 151B). These damages can only be obtained from trial court and not through the Massachusetts Commission Against Discrimination (DRI, 2011, p. 191; Sperino, 2010). NCSL (2015) and Guide to Employment Law & Regulation (2016) (henceforth GELR) also indicates that punitive damages are available.

Missouri

Missouri's employment non-discrimination law states that compensatory and punitive damages are available, but no caps, or lack thereof, are explicitly mentioned (MO ST 213). According to case law mentioned by DRI (2011, p. 223) "…the Missouri Courts of Appeals have indicated that, in most situations, the courts should not allow punitive damages in excess of a single digit ratio to actual damages. State ex rel. Bass Pro Outdoor World, LLC v. Schneider, 302 S.W.3d 103 (Mo. App. 2009). At least one court has held, however, that in appropriate circumstances a punitive damage award could significantly exceed a single digit ratio. Lynn v. TNT Logistics North America, Inc., 275 S.W.3d 304 (Mo. App. 2008)" Sperino (2010, p. 709), NCSL (2015), and GELR (2016) also indicate that punitive damages are uncapped.

New Jersey

New Jersey's employment non-discrimination law states that "All remedies available in common law tort actions shall be available to prevailing plaintiffs" (N.J.S.A. 10:5-13). This includes compensatory and punitive damages (DRI, 2011, p. 254) but there is no explicit mention of caps, or lack thereof. Case law, such as Baker v. National State Bank, 801 A.2d 1158 (N.J. App. Div. 2002) indicates that these damages are uncapped (DRI, 2011, p. 253). NCSL (2015) and GELR (2016) also indicate that punitive damages are available.

Ohio

Ohio law allows for "…damages, injunctive relief, or any other appropriate relief." (OH ST. § 4112.99). According to DRI (2011, p. 311), this includes uncapped compensatory and punitive damages for civil actions, but these damages are capped if the case is handled by the Ohio Civil Rights Commission. NCSL (2015) also indicates that punitive damages are available.

Oregon

Oregon's employment non-discrimination law states: "The court may award, in addition to the relief authorized under subsection (1) of this section, compensatory damages or $200, whichever is greater, and punitive damages…" (OR ST § 659A.885(3)(a)). DRI (2011, p. 326) confirms that damages are uncapped, noting that there are caps only if the action is against a government entity. NCSL (2015) and GELR (2016) also indicate that punitive damages are available.

Rhode Island

Rhode Island's employment non-discrimination law states that: "Any person with a disability

[8] See http://www.courts.state.hi.us/docs/legal_references/jury_instructions_civil.pdf (viewed February 5, 2017).

who is the victim of discrimination prohibited by this chapter may bring an action in the Superior Court against the person or entity causing the discrimination for equitable relief, compensatory and/or punitive damages or for any other relief that the court deems appropriate" (RI ST § 42-87-4). NCSL (2015) and GELR (2016) confirm that punitive damages are available for a private action. DRI (2011, p. 352) confirms that there are no caps, but notes that judges may intervene in cases when juries wish to award punitive damages that are deemed excessive, as in Mazzaroppi v. Tocco, 533 A.2d 203 (R.I. 1987).

Vermont

Vermont's employment non-discrimination law states that: "Any person aggrieved by a violation of the provisions of this subchapter may bring an action in superior court seeking compensatory and punitive damages or equitable relief, including restraint of prohibited acts, restitution of wages or other benefits, reinstatement, costs, reasonable attorney's fees and other appropriate relief" (21 V.S.A. §495b). DRI (2011, p. 399) interprets this to mean that both compensatory and punitive damages are uncapped. NCSL (2015) similarly confirms that punitive damages are available. The language "compensatory and punitive damages" was added by 1999, No. 19, § 5. Before this, the statute just said "damages" and it was left ambiguous as to if punitive damages were covered. This ambiguity prior to the 1999 amendment was settled in Fernot v. Crafts Inn, Inc., 895 F. Supp. 668, 682 (D. Vt. 1995), where it was deemed that punitive damages were not allowed.

West Virginia

West Virginia's employment non-discrimination law does not directly state that compensatory and punitive damages are available. It states that remedies include: "…reinstatement or hiring of employees, granting of back pay or any other legal or equitable relief as the court deems appropriate. In actions brought under this section, the court in its discretion may award all or a portion of the costs of litigation, including reasonable attorney fees and witness fees, to the complainant" (W. Va. Code §5-11-13). DRI (2011, p. 428) deems punitive damages to be available, citing Haynes v. Rhone-Poulenc, Inc.,521 S.E.2d 331 (W. Va. 1999) as an example. The question of if compensatory damages were available was settled in State Human Rights Commission v. Pauley, 212 S.E.2d 77 (W. Va. 1975), where the West Virginia Supreme Court deemed compensatory damages to be available. NCSL (2015) lists both compensatory and punitive damages.

States with Caps that Exceed the ADA

Alaska

Alaska's damages, as described in AS § 09.17.020(h), exceed those of the ADA for all firm sizes:

> "(h) Notwithstanding any other provision of law, in an action against an employer to recover damages for an unlawful employment practice prohibited by AS 18.80.220, the amount of punitive damages awarded by the court or jury may not exceed
>
> (1) $200,000 if the employer has less than 100 employees in this state;
>
> (2) $300,000 if the employer has 100 or more but less than 200 employees in this state;
>
> (3) $400,000 if the employer has 200 or more but less than 500 employees in this state; and
>
> (4) $500,000 if the employer has 500 or more employees in this state."

These caps are just caps on punitive damages, and these caps are even above the ADA caps which are caps on the sum of compensatory and punitive damages. NCSL (2015) lists that compensatory and punitive damages are available.

Maine

Maine's compensatory damages, as described in 5 M.R.S.A. §4613(2)(B)(8)(e), exceed those of the combined damages allowed under the ADA for firms with 201 or more employees, and are equal for all other firm sizes.

> "(e) The sum of compensatory damages awarded under this subparagraph for future pecuniary losses, emotional pain, suffering, inconvenience, mental anguish, loss of enjoyment of life, other nonpecuniary losses and the amount of punitive damages awarded under this section may not exceed for each complaining party:
>
> (i) In the case of a respondent who has more than 14 and fewer than 101 employees in each of 20 or more calendar weeks in the current or preceding calendar year, $50,000;
>
> (ii) In the case of a respondent who has more than 100 and fewer than 201 employees in each of 20 or more calendar weeks in the current or preceding calendar year, $100,000;
>
> (iii) In the case of a respondent who has more than 200 and fewer than 501 employees in each of 20 or more calendar weeks in the current or preceding calendar year, $300,000; and
>
> (iv) In the case of a respondent who has more than 500 employees in each of 20 or more calendar weeks in the current or preceding calendar year, $500,000."

The statute also allows for punitive damages "A complaining party may recover punitive damages under this subparagraph against a respondent if the complaining party demonstrates that the respondent engaged in a discriminatory practice or discriminatory practices with malice or with reckless indifference to the rights of an aggrieved individual protected by this Act." (5 M.R.S.A. §4613(2)(B)(8)(c)) This is confirmed both by DRI (2011, p. 170) and NCSL (2015).

<u>States with the Same Damage Caps as the ADA</u>

Arkansas

The Arkansas Civil Rights Act (Ark. Code Ann. §§16-123-101 et seq.) specifies the same damage caps as the ADA (§§16-123-107(c)(2)(A)). However, since firms of size nine to 14 are also covered under this law, the damage cap for this group is set at $15,000.

Colorado

The Colorado Anti-Discrimination Act (C.R.S. §§24-34-301 et seq.) allows both compensatory and punitive damages, but explicitly mentions that they are capped at ADA levels (see 42 U.S.C. sec. 1981a(b)(3)). Since the firm size minimum is one, damage caps are $10,000 for one to four employees, and $25,000 for five to 14 employees (C.R.S. §§24-34-405(d)).

Delaware

The Delaware Discrimination in Employment Act (19 Del. C. §711 et seq.) specifies that damages are capped at the same level as Title VII of the Civil Rights Act of 1964, which are the same damage caps that apply to the ADA.

Maryland

The Maryland Fair Employment Practices Act (Md. Code Ann., State Gov't §20–601 et seq.) provides for the same damage caps as the ADA (Md. Code Ann., State Gov't §20–1009(3)). Prior to the passage of Acts 2007, c. 176, however, the Maryland Fair Employment Practices Act did not allow

punitive damages. The statute allows for a minimum employer size of one for the law to apply in Baltimore County, but punitive damages are not allowed in Baltimore County in cases with employers of size one to 14 employees.

South Carolina

The South Carolina Human Affairs Law (S.C. Code §§1-13-10 et seq.) does not explicitly mention compensatory or punitive damages. DRI (2011, p. 363) argues that the damages are identical to those under Title VII / ADA cases, noting case law which states: "Thus, Title VII cases which interpret provisions or procedures essentially identical to those of the Human Affairs Law are certainly persuasive if not controlling in construing the Human Affairs Laws (Orr v. Clyburn, 290 S.E.2d 804 (S.C. 1982))."

Texas

The Texas Commission on Human Rights Act (Tex. Lab. Code §§21.001 et seq.) lists the same damage caps as the ADA.

States with Lower Damage Caps than the ADA

Florida

The Florida Civil Rights Act of 1992 (Fla. Stat. §§760.01 et seq.) allows uncapped compensatory damages, but it caps punitive damages at $100,000 (Fla. Stat. §§760.11(5)).

Idaho

Idaho allows "actual damages," and the statute does not mention caps, or a lack thereof (Idaho Code §67-5908(c)). Secondary sources were uninformative as to if this meant that actual damages were uncapped (DRI, 2011, p. 105; Green 1992; Buckley and Green 1997, 2002, 2006, 2008, 2009, and 2011). However, punitive damages are capped at $1,000 per willful violation (Idaho Code §67-5908(e)).

Minnesota

The Minnesota Human Rights Act (Minn. Stat. §363A) allows for compensatory damages capped at three times actual damages and punitive damages capped at $25,000 (Minn. Stat. §363A.29 Subd.4(a)).

States that Do Not Allow Punitive Damages

Arizona

Arizona's employment non-discrimination law does not mention compensatory or punitive damages, only mentioning non-monetary remedies, back pay, and that there is available "… any other equitable relief as the court deems appropriate" (A.R.S. §41-1481(G)). The history preamble to H.B. 2319 (Ariz. 45th legislature, 2001), an unpassed bill that attempted to amend this law, states that "Under Arizona law, the Attorney General's Civil Rights Division may only seek relief on behalf of a victim of discrimination in the name of the aggrieved party. Compensatory and punitive damages are not currently available to an aggrieved party under Arizona employment law, although under Arizona's housing law an aggrieved party may be awarded compensatory and punitive damages, and under the Arizonans with Disabilities Act, compensatory damages." This suggests that compensatory and punitive damages are in fact not available. DRI (2011) and GERL (2015) do not mention punitive damages, with DRI (2011) mentioning that "A successful plaintiff under the ACRA may recover damages similar to those available under Title VII prior to it being amended by the 1991 Civil Rights Act." (p. 13) Before the 1991 Civil

Rights Act, punitive damages were not available.

Georgia

O.C.G.A. §45-19-38(d) states that "Any monetary award ordered pursuant to this article shall be for actual damages only." This rules out punitive damages, which is echoed by DRI (2011, p. 88) and NCSL (2015). GELR (2016) also does not mention punitive damages.

Illinois

The statute allows for "actual damages, as reasonably determined by the Commission, for injury or loss suffered by the complainant" (775 ILCS 5/8A-104). No punitive damages are mentioned. Smith, O'Callaghan, and White[9] and DRI (2011, p. 111) state that in the Illinois Human Rights Act (775 ILCS 5/1-101 et seq.), punitive damages are not allowed but the actual damages allowed are uncapped. Sezer and Epting (2012) also state that punitive damages are not allowed. GELR (2016) also does not list punitive damages. Although this law was amended in 2007 to allow a private right of action, this did not change the available remedies. However, NCSL (2015) lists punitive damages as being available, so there is some contradiction in the secondary sources. Given this, case law could help resolve this uncertainty. Case law confirms the lack of punitive damages, with the Illinois Supreme Court striking a punitive damages award in *Crittenden v. Cook County Commission on Human Rights*, 2013 IL 114876 on June 20, 2013. While punitive damages may have been unclear before this case, it is clear since then that they are not allowed.

Indiana

The Indiana Civil Rights Law (Ind. Code §22-9-1-1, et seq.) does not mention compensatory or punitive damages. Case law clarified that the Indiana Civil Rights Commission (ICRC) is authorized to award damages to compensate for both economic and emotional distress losses but is not authorized to award punitive damages. See Indiana Civil Rights Com'n v. Alder, 1999, 714 N.E.2d 632 (referenced by Westlaw, 2013b, p. 39 and p. 67). NCSL (2015) also indicates that punitive damages are not available, DRI (2011, p. 121) does not mention punitive damages, and GELR (2016) does not mention damages as being available.

Iowa

Case law indicates that punitive damages are not allowed under Iowa's employment non-discrimination law, but compensatory damages are allowed and are uncapped. Case law notes via WestLaw (2013a, p. 156) for IA ST § 216.6 states: "Whereas Title VII places cap on compensatory and punitive damages recoverable by plaintiff who prevails on sex discrimination claims, the Iowa Civil Rights Act (ICRA) allows no punitive damages, but does not place cap on amount of compensatory damages. Baker v. John Morrell & Co., N.D.Iowa2003, 266 F.Supp.2d 909, affirmed 382 F.3d 816, rehearing and rehearing en banc denied." Other case law supports a lack of punitive damages: City of Hampton v Iowa Civil Rights Comm'n, 554 N.W.2d (referenced by DRI, 2011, p. 131), Ewing v. Federal Home Loan Bank of Des Moines, S.D.Iowa2009, 645 F.Supp.2d 707, Pospisil v. O'Reilly Automotive, Inc., N.D.Iowa2007, 619 F.Supp.2d 614, and Faust v. Command Center, Inc., S.D.Iowa2007, 484 F.Supp.2d 953, 100 Fair Empl.Prac.Cas. (BNA) 1238. Civil Rights (all three also mentioned in Westlaw, 2013a). NCSL (2015) and GELR (2016) also do not list punitive damages.

Kansas

[9] See http://www.socw.com/pdfs/Summary_of_new_IHRA.pdf (accessed January 9, 2017).

The Kansas Act Against Discrimination (K.S.A. §44-1001, et seq.) caps damages at $2,000 and does not list punitive damages. DRI (2011, p. 139), citing Labra v. Mid-Plains Constr., Inc., 32 Kan. App. 2d 821, 823, 90 P.3d 954 (2004), notes that it is unclear if this cap applies only to administrative proceedings or if it also applies to private actions. Neither DRI (2011) not GELR (2016) nor NCSL (2015) indicate that punitive damages are available.

Kentucky

Kentucky allows for compensatory damages (K.R.S. §344.230 (3); K.R.S. §344.450). No caps are mentioned in statute and other sources do not mention caps except to confirm that caps are not codified in statute (DRI 2011, p. 153; Buckley and Green 1997, 2002, 2006, 2008, 2009, and 2011; Green 1992). The availability of punitive damages was unclear until the Kentucky Supreme Court investigated this in 2003 and 2004. DRI (2011, p. 154) notes that: "The Kentucky Supreme Court recently clarified, in contrast to earlier decisions, that punitive damages are not available under the KCRA statutes. Kentucky Dep't of Corrs. v. McCullough, 123 S.W.3d 130, 138–39 (Ky. 2003); Brooks v. Lexington-Fayette Urban County Hous. Auth., 132 S.W.3d 790 (Ky. 2004)." Neither NCSL (2015) nor GELR (2016) list punitive damages.

Louisiana

Louisiana allows compensatory damages, and the statute mentions no caps (La. R.S. §23:303(A)). DRI (2011, p. 160) also states that there are no caps. Punitive damages are not available, as DRI (2011, p. 160) notes that "… punitive damages are not available under Louisiana law unless expressly authorized by statute. See, e.g., Ross v. Conoco, Inc., 2002-0299 (La. 10/15/02); 828 So. 2d 546, 555." (This case also cites Richard v. State, 390 So. 2d 882 (La. 1980); Killebrew v. Abbott Labs., 359 So. 2d 1275 (La. 1978) on this point). NCSL (2015) and GELR (2016) also do not mention that punitive damages are available.

Michigan

The Michigan's Persons with Disabilities Civil Rights Act (M.CL. §§37.1101 et seq.) is not explicit about compensatory and punitive damages, stating that: "… 'damages' means damages for injury or loss caused by each violation of this act, including reasonable attorneys' fees." (M.CL. §§37.1606(3)) DRI (2011, p. 201) states that while compensatory damages are allowed and uncapped, punitive damages (exemplary damages) are not allowed. The lack of punitive damages is confirmed in Dorsey v City of Detroit, 157 F Supp 2d 729 (ED Mich 2001). NCSL (2015) and GELR (2016) also list punitive damages.

Montana

The Montana Human Rights Act does not explicitly mention compensatory damages. DRI (2011, p. 229) and Perry (2011) both state that compensatory damages are allowed and uncapped. However, punitive damages are not allowed for employment discrimination and this is noted explicitly in statute (Mont. Code Ann. §§49-2-506(2)). The lack of punitive damages is also noted by NCSL (2015) and GELR (2016) does not list punitive damages.

Nebraska

The Nebraska Fair Employment Practice Act (Neb. Rev. Stat. §§48-1101 et seq.) does not explicitly indicate if compensatory or punitive damages are available. Gradwohl (1995) provides an in-depth discussion of punitive damages in Nebraska and both Gradwohl (1995) and DRI (2011, p. 235) state that punitive damages are generally unavailable in Nebraska. Other secondary sources suggest the

lack of punitive damages in Nebraska for employment discrimination (NCSL, 2015; GELR, 2016)[10].

Nevada

The section of the statute detailing employment non-discrimination law does not discuss damages (Nev. Rev. Stat. §613.330 et seq.) Nev. Rev. Stat. §233.170 which lists the powers of the Nevada Equal Rights Commission only mentions "actual damages for any economic loss and no more." No secondary sources suggest that punitive damages are available (Green 1992; Buckley and Green 1997, 2002, 2006, 2008, 2009, and 2011; NCSL, 2015; GELR, 2016).

New Hampshire

According to New Hampshire's employment non-discrimination law, compensatory damages are available (N.H. R.S.A. 354A-21(d)). Punitive damages are not mentioned in this statute, but a more general statute on punitive damages states: "No punitive damages shall be awarded in any action, unless otherwise provided by statute." (N.H. R.S.A. 507:16) DRI (2011, p. 247) and NCSL (2015) also state that New Hampshire law does not allow punitive damages, and GELR (2016) lists compensatory damages only. Case law appears to indicate that punitive damages are not available[11].

New Mexico

The New Mexico Human Rights Act provides for "actual damages" with no caps mentioned (NMSA §§28-1-11-E). DRI (2011, p. 265) indicates that this mean that there are uncapped compensatory damages.[12] Punitive damages, however, are not available: "The NMHRA provides that an employee may recover actual damages and reasonable attorneys' fees. NMSA 1978, §§28-1-11(E), 28-1-13(D). This has been interpreted to be confined to compensatory damages. See Trujillo, 2001-NMSC-004, ¶30 ("[T]he Human Rights Act does not permit the award of punitive damages."); Gandy v. Wal-Mart Stores, Inc., 117 N.M. 441, 443, 872 P.2d 859, 861 (1994) ("Punitive damages… are not recoverable under the Human Rights Act.")" (DRI, 2011, p. 266). See also Behrmann v. Phototron Corp. 795 P.2d 1015 (1990) ("The treatises affirm that the phrase actual damages is synonymous with compensatory damages and that compensatory damages are exclusive of punitive damages.") Neither NCSL (2015) nor GELR (2016) mention punitive damages.

New York

According to New York Executive Law §297(4)(c), punitive damages are not allowed: "(iii) awarding of compensatory damages to the person aggrieved by such practice; (iv) awarding of punitive damages, in cases of housing discrimination only…" DRI (2011, p. 274), GELR (2016), and NCSL (2015) also indicate that punitive damages are not available.

North Carolina

Neither compensatory nor punitive damages are mentioned in the "Persons with Disabilities Protection Act" (N.C.G.S.A. §168A-11). Rather this statute states "(b) Any relief granted by the court shall be limited to declaratory and injunctive relief, including orders to hire or reinstate an aggrieved person or admit such person to a labor organization. In a civil action brought to enforce provisions of this Chapter relating to employment, the court may award back pay." and reasonable attorney's fees are also

[10] See also, e.g., http://www.workplacefairness.org/file_NE (accessed January 11, 2017).
[11] See Evans v. Work Opportunities Unlimited, Inc., 927 F. Supp. 554 (D.N.H. 1996) and The State of New Hampshire v. Daniel P. Hynes.
[12] Also see http://www.lawatbdb.com/employee-rights/file_NM?agree=yes (viewed February 2, 2015).

available under part (d). NCSL (2015), GELR (2016), and DRI (2011, p. 289) also do not indicate that punitive damages are available.

North Dakota

"Neither the department nor an administrative hearing officer may order compensatory or punitive damages under this chapter" (N.D. Cent. Code §14-02.4-20). Neither NCSL (2015) nor DRI (2011, p. 305) nor GELR (2016) indicate that these damages are available.

Oklahoma

Unlike for other protected classes in Oklahoma, aggrieved employees with claims of disability discrimination were previously able to pursue a private action and receive compensatory damages (DRI, 2011, p. 317). However, this was removed effective November 1, 2011, when an amendment (Laws 2011, c. 270, § 21) repealed Okla. Stat. tit. 25, §§1901. NCSL (2015) does not mention punitive damages as being available after this legal change. It appears that punitive damages were never available before this change, as neither the statute nor DRI (2011, p. 317) mention them as having been available. GELR (2016) and NCSL (2015) also do not list punitive damages.

Pennsylvania

There is no mention of punitive damages in the Pennsylvania Human Relations Act (43 P.S. §§ 951 et seq.). DRI (2011, p. 340) argues that they are not available, citing Hoy v. Angelone, 554, Pa. 134, 720 A.2d 745 (1998), which stated: "[i]n sum, we are of the view that the Legislature's silence on the issue of punitive damages, together with the statutory language, interpreted consistent with the laws of statutory construction and in the context of the nature and purpose of the Act, requires the conclusion that the Legislature did not intend to permit the award of exemplary damages." NCSL (2015) and GELR (2016) also do not indicate that punitive damages are available.

South Dakota

According to South Dakota's discrimination law, compensatory damages are available, but punitive damages are not available. More specifically, the statute states that "…In a civil action, if the court or jury finds that an unfair or discriminatory practice has occurred, it may award the charging party compensatory damages. The court may grant as relief any injunctive order, including affirmative action, to effectuate the purpose of this chapter. Punitive damages may be awarded under § 21-3-2 for a violation of §§ 20-13-20 to 20-13-21.2, inclusive, 20-13-23.4, or 20-13-23.7" (SDCL §20-13-35.1). However, these listed sections where punitive damages are allowed do not apply to employment discrimination based on disability. NCSL (2015) also does not indicate that punitive damages are available.

Tennessee

Neither the Tennessee Human Rights Act (THRA, T.C.A. §§4-21-401 *et seq.*) nor the Tennessee Handicap Act (THA, T.C.A. §§4-21-401 *et seq.*) mention punitive damages (the later refers to the former for the damages allowed). DRI (2011, p. 379) argues that punitive damages are not available, citing Carver v. Citizen Utils. Co., 954 S.W.2d 34 (Tenn. 1997). See also Forbes v. Wilson County Emergency Dist. 911 Bd., 1998, 966 S.W.2d 417, as cited by Westlaw (2013c, p. 18). NCSL (2015) also indicates that punitive damages are not allowed and GELR (2016) does not list punitive damages.

Utah

The Utah Anti-Discrimination Act states that the following relief is available for those successful in an employment discrimination claim:

"(b) provide relief to the complaining party, including:

(i) reinstatement;

(ii) back pay and benefits;

(iii) attorneys' fees; and

(iv) costs" (U.C.A. §34A-5-107(9)(b)).

Punitive damages are not mentioned. According to DRI (2011, p. 391), NCSL (2015), and the Labor Commission of the State of Utah[13], they are not allowed. GELR (2016) also does not list punitive damages.

Virginia

According to Virginians with Disabilities Act: "Any circuit court having jurisdiction and venue pursuant to Title 8.01, on the petition of any person with a disability, shall have the right to enjoin the abridgement of rights set forth in this chapter and to order such affirmative equitable relief as is appropriate and to award compensatory damages and to award to a prevailing party reasonable attorneys' fees, except that a defendant shall not be entitled to an award of attorneys' fees unless the court finds that the claim was frivolous, unreasonable or groundless, or brought in bad faith. Compensatory damages shall not include damages for pain and suffering. Punitive or exemplary damages shall not be awarded" (Va. Code §51.5-46(A).). DRI (2011, p. 407), GELR (2016), and NCSL (2015) also confirm that punitive damages are not available.

Washington

Washington's employment non-discrimination law (R.C.W. §49.60.030) states that "actual damages" are available, which has been interpreted to be uncapped compensatory damages (DRI, 2011, p. 491). DRI (2011, p. 491), NCSL (2015), and other sources[14] state that punitive damages are not allowed, and GELR (2016) does not list punitive damages. The lack of punitive damages is confirmed explicitly, with case law citations, in the Washington Civil Jury Instructions[15]:

> "Exemplary or punitive damages are generally not recoverable under Washington law unless expressly authorized by statute. Grays Harbor County v. Bay City Lumber Co., 47 Wn.2d 879, 289 P.2d 975 (1955); Anderson v. Dalton, 40 Wn.2d 894, 246 P.2d 853, 35 A.L.R.2d 302 (1952).

Punitive damages are contrary to Washington's public policy. E.g., Dailey v. North Coast Life Ins. Co., 129 Wn.2d 572, 574, 919 P.2d 589 (1996). The Supreme Court held that the Legislature, in enacting the state Law Against Discrimination (RCW Chapter 49.60), which allows for "any other remedy authorized by … the United States Civil Rights Act of 1964 as amended," had not unambiguously manifested an intention to make punitive damages available. Dailey v. North Coast Life Ins. Co, 129 Wn.2d at 575–77."

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[13] See https://laborcommission.utah.gov/divisions/Adjudication/EmploymentDiscrimationDetermination.html (accessed January 12, 2017).

[14] See also http://www.workplacefairness.org/file_WA (viewed February 3, 2014).

[15] See https://govt.westlaw.com/wciji/Document/I2c8b44cce10d11dab058a118868d70a9?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default) (accessed January 13, 2017).

Wisconsin

For most of its history, the Wisconsin Fair Employment Act (Wis. Stats. §§111.31–111.397) did not mention punitive damages. For a brief period between the passage of 2009 Act 20 (effective June 8, 2009) and the passage of 2011 Act 219 (effective April 20, 2012), the Wisconsin Fair Employment Act allowed the same damages as the ADA, which could be recovered in circuit court after the completion of administrative proceedings. But punitive damages were removed by 2011 Act 219. Wisconsin's Department of Workforce Development also notes that punitive damages are not currently available under state law[16] and GELR (2016) does not mention punitive damages.

Wyoming

The Wyoming Fair Employment Practices Act (Wyo. Stat. 27-9-101 et seq.) does not mention compensatory or punitive damages, or a lack thereof. DRI (2011, p. 449) seems to suggest that these damages are not available. NCSL (2015) and Hickox (1996) also notes that punitive damages are not available, and GELR (2016) does not mention punitive damages.

States with No Law

Alabama

Alabama only has an employment non-discrimination law that protects older workers, but not any other groups.

Mississippi

Mississippi does not have an employment non-discrimination law.

Unclear Cases

Connecticut

The statute does not mention compensatory or punitive damages: "The court may grant a complainant in an action brought in accordance with section 46a-100 such legal and equitable relief which it deems appropriate including, but not limited to, temporary or permanent injunctive relief, attorney's fees and court costs. The amount of attorney's fees allowed shall not be contingent upon the amount of damages requested by or awarded to the complainant." (Conn. Gen. Stat §46a-104)

The failure to mention compensatory and punitive damages made it unclear if these damages really were not allowed. The case Michael Tomick v. United Parcel Service, Inc. clarified if punitive damages were available under this statute. The court originally authorized punitive damages for disability discrimination in this case, but the defendant's motion to set aside the award of punitive damages was granted on October 28, 2010. The Supreme Court of Connecticut then ruled on December 30, 2016 that punitive damages were not available under Conn. Gen. Stat §46a-104 (Tomick *v.* United Parcel Service, Inc., SC19505 (Conn. 2017)). NCSL (2015) indicates that punitive damages are available ("litigated in court") but this is rather vague, providing little information. The confusion on punitive damages up until the final Tomick case at the end of 2016 is discussed thoroughly by Michael D. Colonese and Cassie N.

[16] See https://dwd.wisconsin.gov/er/discrimination_civil_rights/publication_erd_6160_p.htm (accessed January 13, 2017).

Jameson in an article in the Connecticut Law Tribune[17]. This ambiguity in case law was also mentioned by the Williams Institute, who referenced difference cases.[18]

As for compensatory damages, there were not allowed in employment cases since a 1995 Supreme Court of Connecticut ruling that the Connecticut Commission on Human Rights and Opportunities does not have the statutory authority to provide for these damages (Bridgeport Hospital v. Commission on Human Rights and Opportunities 232 Conn. 91). See also C*ommission on Human Rights & Opportunities v. Truelove & Maclean, Inc.*,238 Conn. 337, 350, 680 A.2d 1261 (1996). NCSL (2015) indicates that neither compensatory or punitive damages are expressly provided for in the statute and further notes that the Connecticut Supreme Court did not provide for compensatory damages in 1995 (referencing the above case).

In this case, we code Connecticut as not having larger damages than the federal ADA on the grounds that compensatory damages are not available, and it was not sufficiently likely that punitive damages were either, especially after the reversal of the punitive damages in the Tomick case in 2010.

A Brief Note on Age Discrimination Laws

As Table 1 in the paper shows, firm-size minimums are similar for disability and age discrimination laws, but there are 12 states that have a different minimum (AL, AR, DE, GA, KY, IL, IN, LA, NE, OR, SD, VA). Regarding damages, we focus on whether compensatory or punitive damages are allowed, which they are not under federal age discrimination law (the ADEA). Some states require proof of intent to discriminate in order for compensatory or punitive damages to be awarded, whereas others require "willful" violation. Because the federal law allows additional liquidated, non-punitive damages (double back pay and benefits) when there is "willful" violation, the question of whether the state requires intent or willful violation may seem to be potentially relevant in deciding whether a state law offers greater protection. However, willful violation is a much stricter standard than intent (Moberly, 1994). Moreover, compensatory or punitive damages are almost certainly greater than liquidated damages, and they can be much greater. As a consequence, a state law that provides compensatory or punitive damages, whether or not this requires proof of intent or willful violation, clearly entails stronger remedies than the federal law, so our classification captures whether either is allowed. For more details see Neumark and Song (2013).

[17] See http://ppg.brownjacobson.com/wp-content/uploads/2014/12/punitive-damages-claimed.pdf (accessed January 9, 2017).

[18] See https://williamsinstitute.law.ucla.edu/wp-content/uploads/15_ENDAvStateLaws2.pdf (accessed January 11, 2017).

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Online Appendix Table OB1: Years of Enactment of State Age and Disability Discrimination Laws

State	Year of adoption	
	Age discrimination law	Disability discrimination law
Alabama	1997	No law
Alaska	1960	1987
Arizona	1980	1985
Arkansas	No law	1987
California	1961	1973
Colorado	1986	1982
Connecticut	1959	1973
Delaware	1960	1988
Florida	1977	1974
Georgia	1971	1981
Hawaii	1963	1975
Idaho	1965	1988
Illinois	1967	1971
Indiana	1965	1975
Iowa	1972	1975
Kansas	1983	1974
Kentucky	1972	1976
Louisiana	1934	1980
Maine	1965	1975
Maryland	1968	1974
Massachusetts	1937	1978
Michigan	1965	1976
Minnesota	1977	1978
Mississippi	No law	No law
Missouri	1986	1986
Montana	1974	1986
Nebraska	1963	1973
Nevada	1973	1973
New Hampshire	1971	1977
New Jersey	1962	1972
New Mexico	1969	1974
New York	1958	1974
North Carolina	1977	1985
North Dakota	1965	1983
Ohio	1961	1976
Oklahoma	1985	1981
Oregon	1959	1973
Pennsylvania	1956	1978
Rhode Island	1956	1977
South Carolina	1979	1983
South Dakota	No law	1985
Tennessee	1980	1976
Texas	1983	1975
Utah	1975	1979
Vermont	1981	1978
Virginia	1987	1975
Washington	1961	1977
West Virginia	1971	1978
Wisconsin	1959	1976
Wyoming	1984	1985

Notes: Age discrimination laws come from Neumark and Stock (1999), cross-referenced with records used to compile law data for Neumark and Song (2013). Disability discrimination laws come from Beegle and Stock (2004).