

# Bias Audit for Plum's Talent Match Model

plum



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## Bias evaluation for Plum’s Talent Match model

*Report prepared by FairNow on November 7th, 2024*

### Introduction and executive summary

This report presents a disparate impact analysis of Plum’s Talent Match model in alignment with the specifications for New York City’s Local Law 144 (referred to as NYC LL144, or the NYC AEDT law). The Plum platform uses assessments of cognitive and personality traits to match job seekers with jobs. On the platform, job seekers answer a series of questions that measure various traits, and employers determine the most relevant traits associated with each of their job postings. The Plum Talent Match model outputs a score that measures the alignment between the job seeker’s assessment and the associated criteria of a job requisition.

The results of this evaluation did not indicate evidence of disparate impact, as there were no groups for which the selection rate was less than 80% of the selection rate of the most favored group when analyzing race, gender or combinations thereof.

# Background

## About NYC LL144

NYC LL144 entered effect on July 5th, 2023. The law prohibits employers and employment agencies from using Automated Employment Decision Tools (AEDTs) to make or substantially assist in hiring or promotion decisions without meeting specified requirements, detailed below:

1. **Independent bias audit:** Employers must engage an independent auditor to conduct a bias audit of any in-scope AEDTs to evaluate candidate pass rates along the lines of gender, race and intersectional pairs of the two.
2. **Notice to candidates:** Employers must provide candidates with at least 10 business days notice before administering the AEDT, and include instructions on how to request an alternative assessment method if one is available.
3. **Published results:** Employers must publish the date and a summary of the results of the most recent bias audit on the employment section of their website.

This report represents an independent bias audit in alignment with the requirements of NYC LL144. It does not entail an evaluation of whether usage of Plum's Talent Match model constitutes an AEDT under NYC LL144 specifications, and it does not include a review of the notice or published result specifications under NYC LL144.

## Bias audit requirements

A bias audit as defined by NYC LL144 requires the following:

- The assessment includes a review of gender, race, and intersectional pairs of the two.
- A 'selection' or 'scoring' rate is calculated for each category.
- An impact ratio is calculated for each category.
- Counts are included for applicants with unknown gender or race.

The evaluation outlined in this document has been conducted in accordance with the NYC LL144 bias audit requirements.

Note that the data used in this audit was provided by Plum. FairNow has not independently verified the correctness and completeness of this data, and has relied on Plum's representations of accuracy, comprehensiveness, and representativeness.

## System description

The Plum Talent Match model is designed to enable organizations to determine how well suited a candidate is for a role by comparing a candidate's set of Talents to those required for success in the role. Talents are derived from the Five-Factor Model (FFM) of personality as well as facets

of cognitive ability, and are grounded in years of research on personality, cognitive ability, and social intelligence. The following inputs are used to identify Talents for matching purposes:

- A set of expert contributors within the employer’s organization completes Plum’s Match Criteria Survey to define behavioral role requirements. Outcomes of the survey are aggregated to determine the top 5 Talents most critical for success in the role.
- Candidates are asked to complete the Plum Discovery Survey, which includes questions focused on personality, problem solving, cognitive ability and social intelligence. From this survey, the candidate receives scores for each of the 12 Talents.

The Talent Match model combines candidate Talent results and the ranked Talents from the employer to calculate scores reflecting the job seeker’s alignment with the employer’s top criteria for a given role. Candidates are ranked based on these scores, which can be used to influence whether an employer decides to move a job seeker forward in the hiring process.

## **Bias evaluation results**

### Data used

This evaluation includes historical data from applicants assessed by Plum’s Talent Match model from the prior year, from August 22nd, 2023 to September 13th, 2024. This date range was chosen to include all samples from the cutoff date of the data used in Plum’s last bias audit. The data sample covers 528,891 applications from job requisitions based in the United States for all of Plum’s customers. Of these, 28,881 applications had demographic data on gender and/or race.

Demographic data for this population was collected in two ways. First, candidates had the option to submit demographic data directly to Plum when they began an assessment on the platform. Second, certain Plum customers opted to provide additional demographic information from their candidates as part of this audit. The population of candidates for whom demographic data is available may not be representative of the full population. While we recognize this matter, the audit has been conducted using the data that was available.

Gender was represented as one of the following values:

- Female
- Male
- Non Binary (not included in the analysis due to low sample size)
- Opt-out or otherwise unknown (not included in the analysis)

Race/Ethnicity was represented as one of the following values:

- Asian
- Black or African American
- Hispanic or Latino
- Indigenous or Native American

- Two or More Races
- White
- Opt-out or otherwise unknown (not included in the analysis)

## Scoring methodology

Each application receives an associated score ranging from 30 to 99 based on how well the candidate's Talents align with the top 5 Talents specified by the hiring organization. All candidates are shown to the recruiter, ranked by match score. Because there is not a designated pass/fail cutoff, this audit applies the scoring rate method recommended by NYC LL144 and compares scores against the median value across the sample.

## Univariate Categories

### Results by gender

Gender	# of Applications	# Selected	Selection Rate	Impact Ratio
Female	9,849	5,081	51.6%	95.9%
Male	18,936	10,184	53.8%	100%

There were 500,078 applications for which the candidate's gender was not known. There were 28 applications with a gender of Non Binary. This data was not included in the above table.

### Results by race

Race	# of Applications	# Selected	Selection Rate	Impact Ratio
Asian	16,106	8,437	52.4%	87.2%
Black or African American	2,419	1,209	50.0%	83.2%
Hispanic or Latino	2,976	1,641	55.1%	91.7%
Indigenous or Native American	44	22	50.0%	N/A
Two or More Races	647	389	60.1%	100%
White	3,421	1,998	58.4%	97.2%

*"N/A" refers to categories that comprised less than 2% of the total. These groups are excluded from the disparate impact analysis.*

There were 503,278 applications for which the applicant's race/ethnicity was not known. This data was not included in the above table.

## Intersectional Categories

### Results by race and gender

Race	Gender	# of Applications	# Selected	Selection Rate	Impact Ratio
Asian	Female	5,346	2,711	50.7%	86.1%
Asian	Male	10,715	5,705	53.2%	90.4%
Black or African American	Female	875	424	48.5%	82.3%
Black or African American	Male	1,526	781	51.2%	86.9%
Hispanic or Latino	Female	988	544	55.1%	93.4%
Hispanic or Latino	Male	1,974	1,092	55.3%	93.9%
Indigenous	Female	15	5	33.3%	N/A
Indigenous	Male	28	16	57.1%	N/A
Two or More Races	Female	168	97	57.8%	N/A
Two or More Races	Male	473	289	61.1%	N/A
White	Female	1,202	692	57.6%	97.7%
White	Male	2,207	1,300	58.9%	100%

*“N/A” refers to categories that comprised less than 2% of the total. These groups are excluded from the disparate impact analysis.*

There were 503,346 applications for which the applicant’s gender or race/ethnicity were not known. There were 28 applications with a gender of Non Binary. This data was not included in the above table.

## About FairNow

FairNow is an organization dedicated to helping companies leverage AI in a responsible, fair, and well-managed way. FairNow is an independent auditor in alignment with the specifications of New York City Local Law 144.