Baxter Expert Opinion involving statistical analysis and refutation of Opposing Expert's Opinion

Age discrimination suit against employer of smoke-jumper parachuting firefighters.
Defendant admits rejecting experienced age 51Plaintiff once his run test time exceeded 11minutes

In my expert opinion, based on my education, training, research, and 35 years relevant experience:

- The 1.5 mile timed run (hereafter "run test") has a statistically significantly adverse impact on smokejumper candidates protected by ADEA, which is rebuttable evidence of age discrimination;
- Absent a validation study compliant with the Uniform Guidelines on Selection, proving that the run test validly predicts successful performance of smokejumper job duties, Defendant cannot rebut the evidence of age discrimination by claiming Plaintiff's run test score as a "reasonable factor other than age" in this ADEA case;
- Evidence shows that the timed run has not been validated as required by law as a business necessity, offsetting its adverse impact against ADEA-protected candidates.

I reserve the right to expand or amend my opinions if additional evidence becomes available.

Detailed Findings

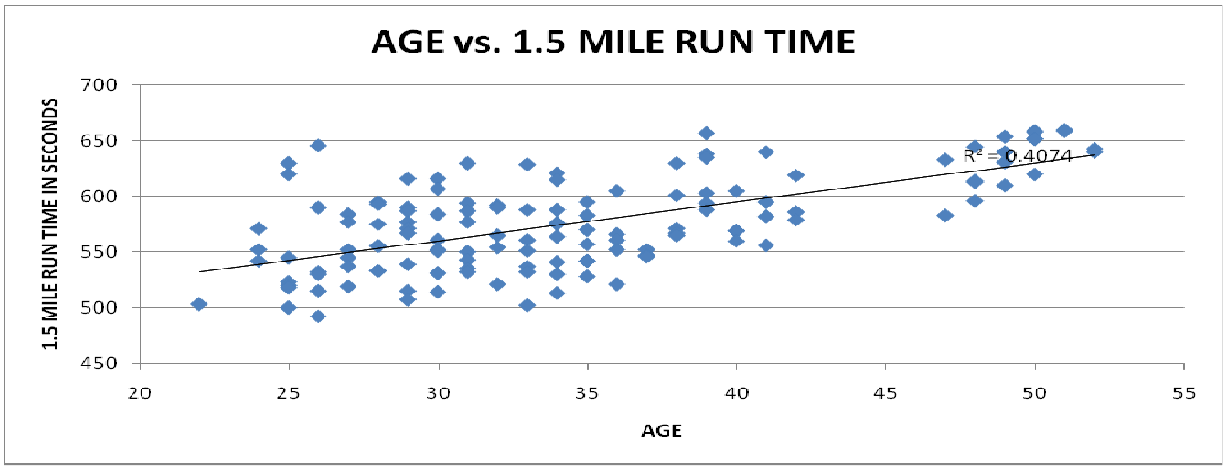
I was engaged to offer an Expert Opinion on whether the run test Defendant imposes on smokejumper candidates has significant disparity of outcomes by age, which is evidence of age discrimination.

I was also asked for a Human Resources Expert opinion on whether the Defendant's use of the run test as an employment selection test met EEOC's rules on Reasonable Factors Other Than Age (RFOA) as a defense against ADEA charges.

Data from Defendant show the run test performance of 134 candidate smokejumpers from 2002 to 2006. The 134 entries included 31 candidates older than age 39 and protected by ADEA.

Statistical Findings

The Correlation Coefficient (R) between age and run test time was very high at .64. The Coefficient of Determination (R^2) is substantial at .41, meaning that age accounts for 41% of the variation in run times, and all other factors – body weight, general fitness, randomness - account for the other 59% of variation.



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Federal courts don't give much weight to "straight-line" correlations using age as a "continuous factor", but prefer analyses by age cohorts. The average run test time in minutes and seconds by age cohort:

Under age 40: 9:25 (hereafter, "Group Y" for young)
Age 40+ 10:18 ("Group A" for ADEA-protected)
Age 40 – 45: 9:47
Age 46 – 49: 10:24
Age 50+: 10:49

So, the average candidate in Plaintiff's age 50+ cohort took 84 seconds longer to complete the run test than did the average Group Y candidate. The average age 50+ runner, at 10:49, was only 12 seconds away from failure (11:01), while the average Group Y runner ran 96 seconds faster than failure.

Descriptive Statistics:

- The 134 candidates included 31 over age 39, ADEA-protected (Group A).
- The overall average (mean} run time for N=134 was 9:37 minutes, standard deviation (SD) = 0:42.
- The 31 Group A runners averaged 10:18 minutes, SD = 0:33.
- The 103 Group Y runners averaged 9:25 minutes, SD = 0:37.

Analysis of Run Times by Age Cohort

I determined that Group A runners' times were significantly slower than run times overall ($p<.05$), and significantly slower than Group Y run times. ($p<.05$). Therefore, any employment selection based, even in part, on the run test had a significantly adverse impact on ADEA-protected candidates, as defined in federal rules.

Since we know the mean and SD of 134 run times, we can calculate how similar to THOSE run times is any other cluster of run times. There are millions of possible combinations of 31 run times we could draw from the 134 times, and Group A is only one of them. Statistical principles tell us that randomly-drawn combinations of 31 run times will be similar to the mean and SD of the parent group. We only call a combination unexpectedly different from the parent population ("a statistically significant disparity") if it had less than 5% probability of being drawn at random. If a combination's mean exceeds the 5% "critical value", it had less than a 5% chance of being drawn at random from the parent population.

The first method below compares Group A's mean to the overall mean. The second method compares Group A's mean and SD to Group Y's mean and SD.

- Null hypothesis: Group A run times were equal to or less than overall run test times. X<= 9:37 minutes. Older runners' performance was not very different from younger runners.
- Alternate hypothesis: Group A run times were larger than (slower than) the overall mean run time. X > 9:37 minutes.
- I applied a 5% probability threshold, appropriate to legal evidence.

Standard error (z) of Group A = 33 seconds / square root (31) = 33 / 5.57 = 5.93 seconds
Critical value @ 5% probability from table = 1.645 * z.
Critical value = 9:37 + (1.645 * 5.93 seconds) = 9:37 + 0:09.7 = 9:47 minutes.
Group A runners' average (mean) time = 10:18 minutes, which greatly exceeds 9:47 minutes. We must reject the null hypotheses. So, Group A runners' test times were significantly longer (slower) than the overall mean.

Equality of means and proportions
Two-tailed Critical values @ 5% = -1.96 to +1.96. There is no significant difference between Groups A and Y if calculated value Z falls between -1.96 and +1.96. Outside that range, the result is too odd to be randomness.
Group A mean – Group Y mean = (10:18 – 9:25) = 0:53 difference between means
Group Y SD squared over 103 = (37 * 37) / 103 = 0:13.3
Group A SD squared over 31 = (33 * 33) / 31 = 0:35.1
Sum = 13.3 + 35.1 seconds = 48.4 seconds. Square root of sum = 6.958 seconds
0:53 / 6.958 seconds =7.62 = Z
+7.62 greatly exceeds the critical value, +1.96, so we reject the hypothesis that the distribution curves are not significantly different.
Group A's run test times are significantly longer (slower) than younger runners' run times, and not explained by randomness.

Uniform Guidelines and EEOC Regulation on "Reasonable Factors Other Than Age"

Defendant concedes that its use of the run test as a selection device is effectively arbitrary. Agency Admission Number 1 admits there was never a professionally developed test design to create the selection battery Defendant applies to smokejumpers. I found that running 1.5 miles is not specified as a frequent job duty in the smokejumper position description; there is no testimony that smokejumpers on-the-job run 1.5 miles - whether wearing or not wearing firefighter turnout gear. Running is not listed as a job duty or essential function on advertisements for the position. That approximates the Davis Checklist for an essential job function.

Plaintiff asserts that his non-selection for smokejumper was largely based on his age. Defendant responds in Admission Number 5 that Plaintiff's non-selection was NOT based on his chronological age, but was based on a "reasonable factor other than age": his failing performance on the run test.

In my expert opinion, an employer who defends against an ADEA charge by claiming that a reasonable factor other than age (RFOA) explains a suspicious result, must meet the published RFOA standard. EEOC regulations mandate that the claimed RFOA be a business necessity which meets the validation criteria of the Uniform Guidelines on Employee Selection Procedures ("UGESP").

Defendant's purported HRM Expert misread the applicability of the Uniform Guidelines to ADEA. When published in 1978, the UGESP included the phrase, "These guidelines do not apply to responsibilities under the Age Discrimination in Employment Act of 1967, as amended, not to discriminate on the basis of age". [That is the exact phrase Defendant relied on in Admission Number 6 to claim the run test's exemption from validation under UGESP standards.] In 1978, the US Department of Labor (not EEOC) enforced ADEA; DOL issued the quoted 1978 rule about ADEA compliance.

In 1981, when enforcement of ADEA shifted from DOL to EEOC, with legal authority to issue regulations, EEOC rejected the DOL rule quoted above. EEOC's 1989 rule on age discrimination and selection tests applies directly to this case.

"The EEOC scrutinizes tests which are asserted as the RFOA to see if they meet the federal government's standards set out at 29 C.F.R. Sec. 1607 et seq: the Uniform Guidelines on Employee Selection Procedures. 29 C.F.R. Sec. 1625.7(d) (1989).
When tests or other employment practices have an adverse impact on persons within the protected class, the EEOC requires that such practices be justified by business necessity. Id.
As to burden of proof, the EEOC places it squarely on the employer to show the RFOA in an individual claim of discriminatory treatment." 29 C.F.R. Sec. 1625.7(e) (1989).

Since Defendant asserts that Plaintiff's failure to run 1.5 miles in less than 11 minutes is the RFOA justifying his non-selection for smokejumper, the cited EEOC regulation applies. To avail itself of the RFOA defense, Defendant must now produce a validation study it performed before it imposed the run test on smokejumper candidates.

The UGESP defines validation: "*Validated in accord with these guidelines or properly validated.* A demonstration that one or more validity studies meeting the standards of these guidelines has been conducted, including investigation of suitable alternative selection procedures, and has produced evidence of validity sufficient to warrant use of the procedure for the intended purpose under the standards of these guidelines." 41 CFR 60-3.16X

So, Defendant's UGESP-compliant validation study would document for the court the decision that the ability to run 1.5 miles in 11 minutes is a business necessity – not merely "strongly preferred", or "work related", but a do-or-die necessity: research evidence that no person unable to run 1.5 miles faster than 11:01 can perform the essential duties of smokejumper The validation study must also explain why there is no reasonable and suitable alternative to a run test, since it has a disparity of effect by age.

Defendant repeatedly admits that it failed to perform a "properly validated" study before it imposed the run as a selection test decades ago, or at any subsequent time. Had Defendant introduced the run test before the 1978 UGESP (millions of employers lawfully used non-validated tests before 1978), the 1989 EEOC regulation on RFOA defenses still applies now: Defendant is denied a RFOA defense unless it offers a UGESP-compliant validation study conducted before the Plaintiff's rejection.

Defendant must be able to produce a study and honestly say, "Here is our professionally designed validation study, the findings of which led us to impose the run test decades ago. The researchers scientifically proved that the ability to run 1.5 miles is essential to smokejumper job duties, and that running 1.5 miles in 11 minutes or less is a valid predictor of smokejumper duty performance. The study further explains why we rejected all other alternatives to a 1.5 mile timed run, alternatives (perhaps a stationary bike or treadmill or a 1-mile run) which might have less of a disparity of impact by age."

Defendant cannot merely tell the court, "Trust us. We earnestly believe it's a darned good idea for smokejumpers to be able to run 1.5 miles in under 11 minutes. A bunch of us got together years ago, agreeing THAT specific test and THAT pass-fail score was a decent enough proxy for physical fitness … and we could think of nothing else that was. Our unscientific beliefs make the 1.5-mile run test a business necessity, and valid even if proven age-discriminatory."

In my expert opinion, the evidence supports Defendant being denied a RFOA defense.

I reserve the right to expand or amend my opinions if additional evidence becomes available.