Using General Mental Ability Test Scores as Predictors of NFL QB Performance

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Can we predict the next Peyton Manning? Is a player’s Wonderlic score as useful as their 40 yard dash time?

Introduction
The Wonderlic Personnel Test is a measure of general mental ability (GMA) that assesses math, vocabulary, and reasoning skills (Bernardin & Russell, 2013). The National Football League (NFL) has been using the Wonderlic for many years as part of its assessment “combine.” Voluminous research involving almost any job indicates GMA has proven to be strong indicators of work performance (Kuncel & Hezlett, 2007; Schmidt & Hunter, 1996). However, both Kuzmits and Adams (2008) and Lyons, Hoffman, and Michel (2008) found no significant correlations between Wonderlic scores and NFL performance. Because of a general lack of trust in the Wonderlic, the NFL recently added a more objective test to assess athletes as the combine (Battista, 2013). Using a more reliable and valid criterion measure than that which was used in previous research (Total QB rating) (Stinson, 2011), this study found that Wonderlic scores of NFL QBs were statistically related to top levels of NFL performance.

Method
Parameters set for this study:
Rating
The performance rating was the Total QB Rating (TQR). The TQR is similar to the more popular “passer rating” system; however, it takes into account two additional factors that the passer rating system lacks. The first additional factor that the TQR considers is how critical each play performed by the QB was. For instance, a 12 yard pass for a 3rd down conversion in the 4th quarter of a close game would be considered more critical than a 12 yard pass for a 1st down conversion during the 1st quarter.

Method (Cont.)
Rating (Cont.)
The second being that it takes into account how much a QB contributes to the success of a play. An example of this would be if a QB threw a 45 yard pass in which his throw only contributed 10 yards of that pass and the wide receiver ran for an extra 35 yards. The contribution of the QB would be defined as only 10 yards.

Qualified QB
Because of the nature of the rating system, a QB could receive a high score without having a considerable amount of passing attempts per game. To rule out these QBs the definition of a “qualified QB” was determined “14 attempts passes per game.”

Top Performance
This was defined as the top 30 season performance by all qualified QBs since the 2008 season onward.

Using the above criterion I was able to develop two groups:

Group A All qualified QBs from the 2008 season onward without the top 30 season performances

Group B The top 30 season QB performances based on TQR scores from the 2008 season onward.

Results
Wonderlic scores were then compiled for these two groups. From these two groups means, standard deviations and standard errors were derived.

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
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<tbody>
<tr>
<td>Mean</td>
<td>27.700</td>
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<tr>
<td>Standard Deviation</td>
<td>7.600</td>
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<tr>
<td>Standard Error of the Mean</td>
<td>0.745</td>
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<tr>
<td>Group Size</td>
<td>106</td>
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Based on data from the 2008 through the 2012 seasons, and using an unpaired t test comparison, QBs with higher levels of GMA were more likely to be among the top 30 performers for those years (t=2.48 (132), p <.01).

Discussion
Bernardin & Russell (2013) concluded that “Many organizations use general mental ability (GMA) also known as cognitive ability tests) to screen applicants, bolstered by considerable research indicating that GMA tests are valid for virtually all jobs in the U.S. economy.” However, the only published studies involving the predictive validity of one measure of GMA, the Wonderlic Personnel Test, has found no significant relationship between Wonderlic scores and NFL performance (Kuzmits & Adams, 2008; Lyons, Hoffman & Michel, 2008). However, using a more reliable and valid operational definition of QB performance known as the “Total QB rating,” this study reports a positive relationship between Wonderlic scores and Total QB rating. Our results thus replicate previous validation research showing GMA is positively correlated with work performance although the relationship is not as strong as that which is reported for less physically challenging jobs (Kuncel & Hezlett, 2007).

References

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