The GRIT Gauge™ 3.0 was developed by PEAK Learning, a global research and consulting firm specializing in adversity related solutions and products, to measure an individual’s “grit” – one’s tenacity and resilience to thrive on adversity. The GRIT Gauge™ 3.0 is intended to provide insights into both the quality and quantity of one’s grit. The items used to assess grit include four subscales (dimensions) of GRIT including Growth, Resilience, Instinct, and Tenacity which comprise an individual’s Total GRIT score. The assessment also includes ratings for one’s Robustness and Quality.

**SCALE SCORES**

The **Total GRIT Score** is comprised of four subscales and includes two additional measures – Robustness and Quality.

- **Growth**
  - Mean: 78.28
  - Std Dev: 14.96
  - Range: 10 – 100

- **Resilience**
  - Mean: 74.42
  - Std Dev: 15.75
  - Range: 10 – 100

- **Instinct**
  - Mean: 75.34
  - Std Dev: 14.73
  - Range: 10 – 100

- **Tenacity**
  - Mean: 81.10
  - Std Dev: 14.25
  - Range: 10 – 100

- **Robustness**
  - Mean: 70.93
  - Std Dev: 9.94
  - Range: 20 – 100

- **Quality**
  - Mean: 76.18
  - Std Dev: 12.93
  - Range: 10 – 100

**RELIABILITY**

The overall reliability of the Total GRIT Score is very good. 

Cronbach’s Alpha .94

Subscale reliability scores ranged from .87 to .88.

**CFA**

A Confirmatory Factor Analysis (CFA) indicates that all items are considered acceptable indicators and loaded on the expected observed variables with standardized loadings of 0.50 or higher.

**VALIDITY**

Subscale intercorrelations ranged from .52 to .84. Each subscale accounts for some unique variance and demonstrates good discriminant validity.
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ACKNOWLEDGEMENTS

The GRIT Gauge™ 3.0 was developed by Paul G. Stoltz, Ph.D., Founder and CEO of PEAK Learning, a global research and consulting firm. Dr. Stoltz is a world leader on the integration of grit, resilience, and human interface with adversity and has authored five international bestselling books on grit and resilience.

This report was authored by Billie-Jo Grant, Ph.D., President of Grant Consulting, a research and evaluation company. Dr. Grant is a faculty member in the Statistics Department at California Polytechnic State University, San Luis Obispo and holds a Ph.D. in Educational Research, Statistics and Evaluation.
INTRODUCTION

This report is a compilation of information regarding the technical properties of the GRIT Gauge™ 3.0. The report begins with a description of the assessment, followed by a discussion of how the subscales align, and the psychometric properties of the complete assessment.

DEVELOPMENT AND DESCRIPTION OF THE GRIT GAUGE™ 3.0

The GRIT Gauge™ 3.0 was developed by PEAK Learning, a global research and consulting firm specializing in adversity related solutions and products, to measure an individual’s quantity and quality of “grit” – one’s tenacity and resilience to thrive on adversity. The PEAK Learning team is led by CEO and founder, Paul Stoltz, Ph.D., an expert in theory and practice of human grit and resilience.

The GRIT Gauge™ 3.0 is based on 35 years of general research, and 15 years of grit-specific research (Stoltz, 2011; Stoltz, 2015). The assessment is intended to provide insights into both the quality and quantity of one’s grit, along with personalized tips for improvement. The GRIT Gauge™ was originally developed in 2004 and the multiple subsequent versions reflect the ongoing improvements and evolution of the assessment.

To date, approximately 450,000 individuals have completed some version of the GRIT Gauge™. The GRIT Gauge™ 3.0 is currently used worldwide by industry leading organizations such as:

- JP Morgan
- AT&T
- Mars
- Anthem
- Amazon
- Discovery Channel
- Chicago Cubs
- U.S. Government
- UAW
- Google
- Banco de Oro
- BMW
- Whole Foods
- Prudential

The GRIT Gauge™ 3.0 is also used by dozens of colleges and universities such as Harvard Business School, Massachusetts Institute of Technology (MIT), Lone Star College, University of North Texas, and California Polytechnic State University (Cal Poly). Corporate or educational organizations typically use the GRIT Gauge™ to measure an individual’s grit and help improve an individual’s capacity to enhance their grit. Schools may use the GRIT Gauge™ to test the impact of The GRIT Program, a Pearson Education program. The GRIT Gauge™ 3.0 can be used as a pretest and posttest or as a one-time assessment and takes respondents on average 5–8 minutes to complete. Although there are multiple applications, only the pretest scores and one-time administration scores are analyzed and reported in this document.
The items used to assess grit include four subscales (dimensions) of GRIT including Growth, Resilience, Instinct, and Tenacity which comprise an individual’s Total GRIT score. The assessment also provides scores for one’s Robustness and Quality. Individuals self-rate themselves using a 32-item digital assessment, with Likert-type scales to measure an individual’s grit. Items are scored using 5-10 point Likert scales such as Never (1) to Always (10), and Bad (1) to Good (10). Examples of the items on the scale include “The people who know me best would say I seek new ideas,” “In comparison to everyone else, I tend to handle tough moments really well,” and “In comparison to everyone else I persist in completing my tasks.”

<table>
<thead>
<tr>
<th>GROWTH</th>
<th>Propensity to seek and consider new ideas, additional alternatives, different approaches, and fresh perspectives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESILIENCE</td>
<td>Capacity to respond constructively and make good use of all kinds of adversity.</td>
</tr>
<tr>
<td>INSTINCT</td>
<td>Gut-level capacity to pursue the right goals in the best and smartest ways.</td>
</tr>
<tr>
<td>TENACITY</td>
<td>Capacity to persist, commit to, stick with, and relentlessly go after what one chooses to achieve.</td>
</tr>
<tr>
<td>ROBUSTNESS</td>
<td>The wear and tear factor. How well one holds up – the degree to which someone is worn down or becomes stronger over time.</td>
</tr>
<tr>
<td>QUALITY</td>
<td>The quality of one’s GRIT on a rating from “Dumb to Smart” and “Bad to Good.”</td>
</tr>
</tbody>
</table>

The assessment measures an individual’s Growth, Resilience, Instinct, and Tenacity using five items for each subscale, Robustness using four items, and Quality using eight items. Researchers calculated total scores for each of the subscales by adding the ratings for items comprising each subscale. Ratings were scored carefully, taking into account positively or negatively worded questions.
## Sample of Scales and Subscales Contributing to the GRIT Gauge™ 3.0

<table>
<thead>
<tr>
<th>GRIT Gauge Scales</th>
<th>Contributing Items</th>
</tr>
</thead>
</table>
| **GROWTH**        | The people who know me best would say I seek new ideas  
In comparison to everyone else, I tend to be an avid learner  
Item 2  
Item 4  
Item 5                                                                 | |
| **RESILIENCE**    | The people who know me best would say I respond extremely well to most adversities  
In comparison to everyone else, I tend to handle tough moments really well  
Item 2  
Item 4  
Item 5                                                                 | |
| **INSTINCT**      | The people who know me best would say I make smart choices about where to and where not to invest my energy  
In comparison to everyone else, I tend to have good instincts for deciding where to and not to invest my effort  
Item 2  
Item 4  
Item 5                                                                 | |
| **TENACITY**      | The people who know me best would say I put my full energy into what I do  
In comparison to everyone else, I tend to put my full effort into what I do  
Item 2  
Item 4  
Item 5                                                                 | |
| **ROBUSTNESS**    | How many difficulties you have faced in comparison to everyone around you  
Item 2  
Item 3  
Item 4                                                                 | |
| **QUALITY**       | Remain flexible on how I achieve even my most difficult goals  
Go after my most important goals in a way that tends to benefit everyone/no one  
Item 3  
Item 4  
Item 5  
Item 6  
Item 7  
Item 8                                                                 | |

*Note: Not all items are provided in this table because the GRIT Gauge™ is a proprietary assessment. Contact PEAK Learning for more information.*
NORMS OF THE GRIT GAUGE™ 3.0

This section reports the means and ranges for each of the GRIT subscales, Total GRIT, Robustness, and Quality. The statistics reported in this section are based on a diverse sample of 24,570 individuals from more than 85 countries, and represents a broad range of job positions and responsibilities. The assessments included in this sample were administered between November 2014 and February 2018. Norms allow individuals to compare his or her scores with individuals who have taken the GRIT Gauge™ 3.0.

Scale Scores
Scale scores were calculated for each of the GRIT subscales and Total GRIT. Average GRIT subscale scores ranged from 74.42 to 81.10, Total GRIT averaged a score of 309.13, Robustness averaged a score of 70.93, and Quality averaged a score of 76.18.

Scale Score Statistics for the GRIT Gauge™ 3.0 (N = 24,570)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>78.28</td>
<td>14.96</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Resilience</td>
<td>74.42</td>
<td>15.75</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Instinct</td>
<td>75.34</td>
<td>14.73</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Tenacity</td>
<td>81.10</td>
<td>14.25</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Total GRIT</td>
<td>309.13</td>
<td>49.06</td>
<td>40</td>
<td>400</td>
</tr>
<tr>
<td>Robustness</td>
<td>70.93</td>
<td>9.94</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Quality</td>
<td>76.18</td>
<td>12.93</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Percentile Ranking
Researchers also calculated the percentile ranking, the percentage of individuals scoring at or below a specified value. The scale scores corresponding to percentile ranks from 5% to 95% for each subscale are:

Percentile Rank Ranges for the GRIT Gauge™ 3.0

<table>
<thead>
<tr>
<th>Scale</th>
<th>Percentile Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>50 – 100</td>
</tr>
<tr>
<td>Resilience</td>
<td>44 – 98</td>
</tr>
<tr>
<td>Instinct</td>
<td>48 – 98</td>
</tr>
<tr>
<td>Tenacity</td>
<td>54 – 100</td>
</tr>
<tr>
<td>Robustness</td>
<td>55 – 85</td>
</tr>
<tr>
<td>Quality</td>
<td>54 – 97</td>
</tr>
</tbody>
</table>

Total GRIT percentile rankings ranged from 220 to 380. The score distribution of the Total GRIT Gauge™ 3.0 ranged from 40 to 400 and appears normal. The table below shows the scores associated with every fifth percentile.
Scale Scores Corresponding to Selected Percentile Rankings (N=24,570)

<table>
<thead>
<tr>
<th>Percentile Ranking</th>
<th>Growth</th>
<th>Resilience</th>
<th>Instinct</th>
<th>Tenacity</th>
<th>Total GRIT</th>
<th>Robustness</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>50</td>
<td>44</td>
<td>48</td>
<td>54</td>
<td>220</td>
<td>55</td>
<td>54</td>
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<tr>
<td>10</td>
<td>58</td>
<td>52</td>
<td>56</td>
<td>62</td>
<td>244</td>
<td>60</td>
<td>59</td>
</tr>
<tr>
<td>15</td>
<td>62</td>
<td>58</td>
<td>60</td>
<td>66</td>
<td>260</td>
<td>60</td>
<td>63</td>
</tr>
<tr>
<td>20</td>
<td>66</td>
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<td>270</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>25</td>
<td>70</td>
<td>66</td>
<td>66</td>
<td>74</td>
<td>280</td>
<td>65</td>
<td>68</td>
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<tr>
<td>30</td>
<td>72</td>
<td>68</td>
<td>70</td>
<td>76</td>
<td>288</td>
<td>65</td>
<td>70</td>
</tr>
<tr>
<td>35</td>
<td>74</td>
<td>70</td>
<td>72</td>
<td>78</td>
<td>296</td>
<td>70</td>
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<td>74</td>
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<td>45</td>
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<td>76</td>
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<td>60</td>
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<td>86</td>
<td>326</td>
<td>75</td>
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<tr>
<td>65</td>
<td>86</td>
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<td>332</td>
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<td>82</td>
</tr>
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<td>70</td>
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<td>338</td>
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<td>84</td>
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<td>86</td>
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<td>344</td>
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<td>85</td>
</tr>
<tr>
<td>80</td>
<td>92</td>
<td>88</td>
<td>88</td>
<td>94</td>
<td>350</td>
<td>80</td>
<td>88</td>
</tr>
<tr>
<td>85</td>
<td>94</td>
<td>90</td>
<td>90</td>
<td>96</td>
<td>358</td>
<td>80</td>
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</tr>
<tr>
<td>90</td>
<td>96</td>
<td>94</td>
<td>94</td>
<td>98</td>
<td>368</td>
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<tr>
<td>95</td>
<td>100</td>
<td>98</td>
<td>98</td>
<td>100</td>
<td>380</td>
<td>85</td>
<td>97</td>
</tr>
</tbody>
</table>

RELIABILITY OF THE GRIT GAUGE™ 3.0

To estimate the reliability of the GRIT Gauge™ 3.0, researchers measured the internal consistency, the homogeneity of items within a scale, using Cronbach’s alpha. Reliability coefficients range from 0 to 1, with 1 being the highest and strongest score that can be achieved. Specifically, a reliability of 0 means that answers to questions are entirely unrelated to one another, often because they measure different traits. A reliability of 1 would mean that all answers are perfectly intercorrelated (a condition that would happen if all questions were identical or nearly identical). Realistically, a test is regarded as having "very good" reliability if its reliability coefficient is greater than roughly 0.8. Subscores, because they are based on fewer number of questions, generally have lower reliabilities than do total scores and a reliability greater than .7 may be regarded as “very good.”

The Total GRIT score and all four subscales were found to have high reliabilities (.87 - .88). The overall reliability of Total GRIT was very good (.94). The high inter-item correlations suggest that the items are all measuring dimensions the same thing.
Researchers also examined the reliability of the items that comprise each subscale and the Total GRIT score. Coefficients for each item ranged from .62 to .78. For each item, researchers examined the associated Cronbach’s alpha if the item were deleted. For all items, the alpha for Total GRIT would reduce if an item were deleted, which suggests that all items should remain in the calculation of each subscale and Total GRIT.

### GRIT Gauge™ 3.0 Alpha Coefficients for Subscales and Items

<table>
<thead>
<tr>
<th>Scale (alpha coefficient)</th>
<th>Subscales (alpha coefficients)</th>
<th>Items (alpha coefficients)</th>
<th>Total GRIT alpha if Item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total GRIT (.94)</td>
<td>Growth (.87)</td>
<td>Item 1 (.62)</td>
<td>.940</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 2 (.73)</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 3 (.66)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 4 (.75)</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 5 (.73)</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td>Resilience (.87)</td>
<td>Item 1 (.67)</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 2 (.75)</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 3 (.78)</td>
<td>.938</td>
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<tr>
<td></td>
<td></td>
<td>Item 4 (.76)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 5 (.67)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td>Instinct (.88)</td>
<td>Item 1 (.67)</td>
<td>.940</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 2 (.69)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 3 (.75)</td>
<td>.938</td>
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<tr>
<td></td>
<td></td>
<td>Item 4 (.72)</td>
<td>.937</td>
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<td></td>
<td></td>
<td>Item 5 (.75)</td>
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<td>Tenacity (.88)</td>
<td>Item 1 (.68)</td>
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<td></td>
<td>Item 2 (.62)</td>
<td>.940</td>
</tr>
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<td></td>
<td></td>
<td>Item 3 (.75)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 4 (.76)</td>
<td>.938</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Item 5 (.72)</td>
<td>.938</td>
</tr>
</tbody>
</table>

Reliability scores were not calculated for Robustness and Quality since these scores are not included in the calculation of Total GRIT.
CONFIRMATORY FACTOR ANALYSES

To better understand the relationships between the measures and the constructs they represent, a confirmatory factor analysis was conducted and supported the GRIT Subscale model. The model includes latent variables (the actual phenomenon of interest), individual items, and error. All items loaded on the expected observed variables with standardized loadings of 0.50 or higher. Albright (2008) defines loadings greater than .50 as acceptable indicators.

The model also examined the correlations between each of the latent variables. The confirmatory factor analysis indicated the following correlations:

- .60 between Growth and Resilience,
- .67 between Resilience and Instinct,
- .73 between Instinct and Tenacity,
- .60 between Growth and Instinct,
- .61 between Resilience and Tenacity, and
- .65 between Growth and Tenacity.

The $\chi^2$ test for this model yields a value of 23,382.80, which, evaluated with 164 degrees of freedom, has a corresponding $p$-value of < .01. This $p$-value is less than .05, which corresponds to a good fit (Browne & Cudeck, 1993; Loehlin, 2004).

The squared multiple correlations ($R^2$) represent the proportion of variance that is accounted for by its predictors. GRIT item variance ranged from .43 to .68 for Growth, .51 to .69 for Resilience, .48 to .66 for Instinct, and .41 to .71 for Tenacity.
Results of the GRIT Gauge™ 3.0 Confirmatory Factor Analysis

**Growth**
- Item 1: .43
- Item 2: .64
- Item 3: .57
- Item 4: .68
- Item 5: .58

**Resilience**
- Item 1: .51
- Item 2: .64
- Item 3: .69
- Item 4: .66
- Item 5: .54

**Instinct**
- Item 1: .48
- Item 2: .54
- Item 3: .65
- Item 4: .64
- Item 5: .66

**Tenacity**
- Item 1: .53
- Item 2: .41
- Item 3: .69
- Item 4: .71
- Item 5: .60
VALIDITY

To examine validity, the extent to which an instrument measures what it is intended to measure, researchers calculated the intercorrelations among the subscores using Cronbach’s alpha (Cronbach, 1951).

**Intercorrelations for the GRIT Gauge™ 3.0**

<table>
<thead>
<tr>
<th></th>
<th>Growth</th>
<th>Resilience</th>
<th>Instinct</th>
<th>Tenacity</th>
<th>Total GRIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td>.55</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instinct</td>
<td>.52</td>
<td>.59</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenacity</td>
<td>.55</td>
<td>.55</td>
<td>.64</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Total GRIT</td>
<td>.80</td>
<td>.83</td>
<td>.84</td>
<td>.83</td>
<td>1.0</td>
</tr>
</tbody>
</table>

The intercorrelations range from .52 and .84. The highest correlations are between Instinct and Total GRIT and Tenacity and Total GRIT (.84). Since none of the intercorrelations are as high as the scale reliabilities, it shows that each of the subscales account for some unique variance, so the scales are not redundant. Thus, the four subscales demonstrate good discriminant validity.
SUMMARY

This report provides good evidence that the GRIT Gauge™ 3.0 can be used as a predictor of grit.

- The reliability of the Total GRIT Score was very high (.94) which indicates that the scores are suitable for drawing reliable inferences about individual test takers. The reliability of the GRIT Gauge™ subscales were also very high (.87 - .88).
- Based on an examination of Cronbach’s alpha if an item were deleted, all items should remain in the calculation of Total GRIT and each of the GRIT subscales.
- Based on an examination of a confirmatory factor analysis, all items loaded on their subsequent subscales with loadings of .50 or higher, demonstrating good discriminant validity.

While this report provides a review of the psychometric properties of the GRIT Gauge™ 3.0, users should review the assessment characteristics and judge the appropriateness of the assessment for their use.
REFERENCES


