Capturing the Multiplicative Effect of Perseverance and Passion: Measurement Issues of Combining Two Grit Facets

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Jachimowicz et al. (1) recently attributed the lack of empirical support for the strong grit-performance relationship to the measurement of grit (2,3). While the grit scale (2,3) comprises two facets - perseverance of effort (PE) and consistency of interest (CI, also sometimes referred to as passion), Jachimowicz et al. argued that it focuses only on perseverance without adequately capturing passion and that success requires both *passion* and *perseverance* by the grit definition (2). Consequently, they proposed measuring grit through a combination of their passion attainment scale for passion and an aggregate of PE and CI for perseverance. They found a significant and synergistic interaction effect between perseverance and passion attainment on job (Study 2) and academic (Study 3) performance, providing support for their claim. We show that these results stem from inappropriate statistical analyses regarding measurement validity for the grit scale.

The assumption of the unidimensionality for the grit scale (only capturing perseverance) and the direct summation approach to aggregate facet-level scores into an overall grit score, used by Jachimowicz et al. (1), are problematic for several reasons. First, we meta-analysed the correlation between PE and CI based on 39 studies from two previous meta-analyses (1,4) and showed PE and CI were only moderately correlated (Fisher's z = 0.45; weighted correlation: $r = 0.43$, 95%CI[0.30,0.54], see Fig 1). Furthermore, a re-analysis with structural equation modelling of the raw data from studies 2 and 3 in Jachimowicz et al. (1) found (a) the unidimensional model underlying the direct summation approach did not fit the data; (b) the correlations between PE and CI were only 0.35 and 0.29, respectively; and (c) more importantly, PE and CI had differentiated correlation patterns with various psychological variables (e.g., the Big Five factors, intrinsic/prosocial motivation) (see Online Supporting Information https://osf.io/7j5nd/). These findings indicate that PE and CI are two distinct grit facets and should not be aggregated (also see a recent review (5)).

In line with these finding, we tested the interaction between grit and passion attainment, keeping PE and CI separate and relying on the more sophisticated statistical approach of latent moderated structural equations (LMS) (6), which takes into account measurement errors, a particularly important consideration when testing interaction effects. Our findings revealed that neither PE nor CI interacted with passion attainment to predict job performance in Study 2; and only CI (but not PE) significantly interacted with passion attainment to predict GPA scores in Study 3 (estimate = 0.25, SE = 0.08, $P < 0.01$, see Online SI). However, the interaction effect on the academic outcome should be interpreted cautiously given that the items assessing passion attainment are work-related (2) but CI is domain general.

To summarise, our re-analysis illustrates two important points. First, researchers using the current grit scale (2,3) should treat the two grit facets separately given that aggregating CI and PE into a single construct is not empirically justifiable. Second, the contribution of the interaction between passion attainment developed by Jachimowicz et al. (1) and perseverance on performance needs further investigation.

References

1. Jachimowicz JM, Wihler A, Bailey ER, Galinsky AD (2018) Why grit requires perseverance and passion to positively predict performance. *Proc Natl Acad Sci USA* 115:9980-9985.
2. Duckworth AL, Peterson C, Matthews MD, Kelly DR (2007) Grit: Perseverance and passion for long-term goals. *J Pers Soc Psychol* 92(6):1087–1101.
3. Duckworth AL, Quinn PD (2009) Development and validation of the short grit scale (Grit-S). *J Pers Assess* 91(2):166–174.
4. Credé M, Tynan MC, Harms PD (2017) Much ado about grit: A meta-analytic synthesis of the grit literature. *J Pers Soc Psychol* 113(3):492–511.
5. Credé M (2018) What shall we do about grit? A critical review of what we know and what we don't know. *Educ Res* https://doi.org/10.3102/0013189X18801322.
6. Klein A, Moosbrugger H (2000) Maximum likelihood estimation of latent interaction effects with the LMS method. *Psychometrika* 65(4):457–474.

Figure Legends.

Fig 1. Forest Plot of Correlations between Perseverance of Effort (PE) and Consistency of Interest (CI)