Why grit requires perseverance and passion to positively predict performance

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Prior studies linking grit—defined as perseverance and passion for long-term goals—to performance are beset by contradictory evidence. As a result, commentators have increasingly declared that grit has limited effects. We propose that this inconsistent evidence has occurred because prior research has emphasized perseverance and ignored, both theoretically and empirically, the critical role of passion, which we define as a strong feeling toward a personally important value/preference that motivates intentions and behaviors to express that value/preference. We suggest that combining the grit scale—which only captures perseverance—with a measure that assesses whether individuals attain desired levels of passion will predict performance. We first metaanalyzed 127 studies ($n = 45,485$) that used the grit scale and assessed performance, and found that effect sizes are larger in studies where participants were more passionate for the performance domain. Second, in a survey of employees matched to supervisor-rated job performance ($n = 422$), we found that the combination of perseverance, measured through the grit scale, and passion attainment, measured through a new scale, predicted higher performance. A final study measured perseverance and passion attainment in a sample of students ($n = 248$) and linked these to their grade-point average (GPA), finding that the combination of perseverance and passion attainment predicted higher GPAs in part through increased immersion. The present results help resolve the mixed evidence of grit's relationship with performance by highlighting the important role that passion plays in predicting performance. By adequately measuring both perseverance and passion, the present research uncovers grit's true predictive power.

grit | perseverance | passion | performance | motivation

The concept of grit has captured the public imagination. Angela Duckworth's 2013 TED talk introduced grit to a broad audience and described it as an important predictor of future success; the talk clearly resonated with audiences, as it has over 14 million views to date (1). Her subsequent 2016 book, *Grit: The Power of Passion and Perseverance*, became an international best-seller (2). Grit has also crept into educational policy throughout the United States, influencing the design of school curriculums to boost their future success by making students “grittier” (3). These developments are seemingly occurring for good reason: prior studies have found that grit relates to several intermediaries of success, including increased deliberate practice (4), sustained retention in difficult jobs (5, 6), and task persistence (7).

Given the widespread attention and initial evidence, one would expect to find copious studies showing that grit predicts performance. Surprisingly, evidence linking grit and performance is beset by contradictory empirical results. A recent metaanalysis, as well as high-powered empirical studies, have found a weak or nonsignificant relationship between grit and various indicators of success (8–10). Because the evidence regarding the relationship between grit and performance has been inconclusive, several commentators have stated that grit is “overrated,” “limited,” “hyped,” and “under attack” (11–14).

We propose that the inconsistency between grit's initial promise and its subsequent lack of empirical support has occurred because

grit's measurement has not matched its definition. Duckworth et al. (5) define grit as “perseverance and passion for long-term goals.” Although this definition of grit contains two conceptual components—perseverance and passion—we suggest that the grit literature, and consequently its measurement, has focused only on perseverance and has not adequately captured passion. The tight link between grit and perseverance has even made its way into online thesauruses: on <https://www.thesaurus.com/>, synonyms of perseverance include grit and synonyms of grit include perseverance, but neither includes passion.

The issue is not just conceptual but also methodological. We propose that the current measure of grit likely reflects perseverance alone. Indeed, studies that find effects of the grit scale on performance-related outcomes are highly connected to perseverance (e.g., increased deliberate practice, sustained retention, and task persistence). We suggest that passion is key to grit but missing in its theory and measurement, which as a result, has produced the empirical inconsistencies found in the grit literature.

Overall, academics and popular commentators alike frequently equate grit with perseverance alone and neglect the passion component. Prominent educational psychologist Mike Rose, critiquing grit, states, “[r]ather than calling their construct ‘perseverance’ or ‘persistence,’ they chose to call it ‘grit’” (15). Similarly, consider that a metaanalysis of the grit literature refers to grit as “a personality trait” (8), and compares grit to

Significance

Grit has captured the public imagination and crept into educational policy throughout the United States. However, because prior studies linking grit and performance are beset by contradictory evidence, commentators increasingly state that grit is overhyped. We propose that the inconsistency between grit's initial promise and its subsequent lack of empirical support has occurred because grit's measurement has not matched its definition. Although grit is defined as the combination of perseverance and passion, its measurement has focused on perseverance and has not adequately captured passion. In a metaanalysis of 127 studies and two field studies, we show that passion is a key component of grit. The current theory and results suggest that perseverance without passion isn't grit, but merely a grind.

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The present research brings passion back into the conceptualization and measurement of grit. We propose that only the combination of the current grit measure, the Grit-S scale (6)—which emphasizes perseverance—with a measure that assesses whether individuals attain desired levels of passion will predict higher performance. Furthermore, we hypothesize that immersion will be a key route through which the combination of perseverance and passion attainment will improve performance. We test these propositions in a metaanalysis, a field study with employees at a technology company, and a field study of undergraduate students.

From its inception, grit has theoretically stood on the dual pillars of perseverance and passion. The definition of grit includes the word passion: “perseverance and passion for long-term goals” (5). Drawing on, integrating, and extending prior conceptualizations of passion (21–24),* we define passion as a strong feeling toward a personally important value/preference that motivates intentions and behaviors to express that value/preference. We use the words “a strong feeling” to indicate that passion is an intense affective state, but one that is not necessarily limited to positive emotions alone (21, 24). We use the phrase “toward a personally important value/preference” to denote that the target of passion reflects an attribute that has high personal value or strong appeal to the individual (21, 23). This builds on prior notions that passion is domain-specific, such as passion for hobbies, relationships, or work (23, 25, 26). We use the phrase “that motivates intentions and behaviors to express that value/preference” to capture that passion leads individuals to consistently desire engaging and interacting with this personally important value/preference: that is, the target of their passion (22, 24).

*Perttula KM, Annual Meeting of the Academy of Management, August 1–6, 2003, Seattle.

Taking these data together, we find that there is considerable theoretical and empirical evidence that the scale intended to measure both components of grit—perseverance and passion—likely captures only perseverance. We therefore subsequently refer to what the grit scale measures as perseverance. [The grit scale, developed by Duckworth et al. (5) contained 12 items, but was superseded by a shortened eight-item version of the grit scale (termed the Grit-S scale), which has superior psychometric qualities (6). In the studies described below, we focus on the Grit-S scale, which has been used predominantly since its publication.] We highlight why passion is a key component of grit's beneficial effects and propose that uncovering grit's predictive power requires adequate measurement of both perseverance and passion.

We propose that passion is a key ingredient of grit and needs to be empirically captured for a positive relationship between perseverance and performance to emerge. We suggest that passion is essential for perseverance to unfold its beneficial effects because it combines with perseverance to increase immersion in an activity, evidenced by increased focus and pursuit of activities related to their passionate endeavor (17–19). That is, the increased immersion produced by the combination of perseverance and passion leads individuals to devote greater cognitive effort and investment to their goals, as evidenced in more intense concentration (32). This heightened immersion, in turn, provides the energy and dedication that makes it more likely that individuals attain their goals (33, 34). Although perseverance helps individuals by remaining committed to their goal pursuit (5, 31), passion provides individuals with the focus necessary to achieve their goals (4, 29, 35). Thus, when individuals pursue goals they are not passionate for, perseverance may not produce increased performance. In contrast, when employees pursue goals they are passionate for, higher perseverance may improve their performance.

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In further understanding the role of passion, the current research highlights the importance of passion attainment: that is, whether people experience desired levels of passion (37). In prior research, passion has commonly been assessed using an adaptation of Vallerand et al.'s (23) harmonious passion scale, which was originally developed to assess how individuals feel about activities that are "very dear to their heart" (23). However, individuals commonly assess whether they are experiencing desired levels of passion (38, 39) and are guided by whether they have met this expectation (40–42). Indeed, a recent stream of research highlights that the experience of passion is guided by whether an individual attains or falls short of desired levels of passion and not by their absolute levels of harmonious passion (37). Thus, we propose that the combination of perseverance and passion attainment will predict performance.

Study 1: Assessing the Role of Passion in Prior Studies

To begin investigating the impact of the combination of perseverance and passion in predicting performance, we first reviewed prior studies in which the grit scale was used, and performance measured. A literature search yielded 127 studies ($n = 45,485$) (for more details on search and analyses, see *Materials and Methods*; see *SI Appendix, Table S1* for list of studies included). Replicating prior research (8), we find a small but statistically significant effect of perseverance, as measured by the grit scale, on performance (estimate = 0.13, SE = 0.02, $P < 0.001$) (see also *SI Appendix, Fig. S1*).

We hypothesized that in studies where participants were more likely to experience passion for a particular performance domain, the relationship between perseverance and performance would be stronger. To assess passion in prior research, three independent coders blind to the hypothesis of this study assessed whether the majority of participants in the study would find the performance domain personally important [interrater reliability (IRR) = 0.81], in line with prior theory and the definition of passion described above. For example, in a study of entrepreneurs starting their own companies (43), the majority of participants may consider the performance domain to be personally important. In contrast, college students taking a mandatory science class may consider the performance domain to be less personally important (44).

Our analysis suggests that passion levels of a performance domain moderate the relationship between perseverance and performance. That is, we found that in studies where participants likely experienced greater passion for a performance domain, there was a stronger relationship between perseverance and performance (moderator analysis of the metaanalytic effect: estimate = 0.07, SE = 0.04, $P < 0.05$) (see also *SI Appendix, Fig. S2* and *Table S2* for further information). This analysis thus provides preliminary support for our theory that passion moderates the relationship between perseverance and performance.

Study 2: Performance Is Predicted by the Combination of Perseverance and Passion Attainment

We next conducted a field study with employees at a technology company. We predicted that perseverance, as measured by the Grit-S scale, would only relate to increased supervisor-rated performance when employees attained desired levels of passion. In contrast, we predicted that for employees who did not attain desired levels of passion, there would be no significant relationship between perseverance and performance.

We tested this hypothesis with data from a technology company ($n = 422$), where we asked employees to respond to survey measures of perseverance (as measured by the eight-item Grit-S scale) and passion attainment (with a previously developed and validated three-item scale) (see also refs. 37 and 45). We then matched employees' survey responses to supervisor-rated performance ratings. We subsequently ran additional analyses

including various control variables (e.g., age, gender, tenure, motivation, and harmonious passion) (see *SI Appendix* for further information and *SI Appendix, Table S3* for bivariate correlations).

Before testing our hypothesis, we assessed the distinctiveness of the constructs by conducting confirmatory factor (confirmatory fit index, CFI) analyses. We first loaded items of each construct onto their respective factor, and find that the fit indices were acceptable (46) (with the exception of the CFI): $\chi^2(334) = 845.64$, root mean square error of approximation (RMSEA) = 0.06, CFI = 0.92, standardized root mean square residual (SRMR) = 0.08. We then compared this model to a model where we loaded all items from every measure on one common factor. This model fit the data worse: $\chi^2(350) = 3110.19$, RMSEA = 0.14, CFI = 0.55, SRMR = 0.12. Additionally, the fit of the first model was significantly better: $\Delta\chi^2 = 2264.55$, $\Delta df = 16$, $P < 0.001$. In addition, analyses reveal that the full Grit-S scale represents a single factor, which we label perseverance, and that this scale is distinct from the passion attainment measure (see *SI Appendix* for these and additional confirmatory factor analyses).

Our hypothesis was that the interaction between perseverance and passion attainment predicts job performance (*SI Appendix, Table S4*). Because supervisors assessed multiple employees, the data structure is nested; we therefore centered the variables and applied multilevel analyses (47) (*SI Appendix*). As shown in model 2, the interaction effect was both positive and statistically significant (estimate = 0.03, SE = 0.01, $\gamma = 0.14$, $P = 0.02$) and accounted for an additional 2% of variance in job performance. The highest job performance occurred when both perseverance and passion attainment were high, as depicted in Fig. 1. This finding was empirically supported through simple slopes analyses (*SI Appendix*).

We subsequently tested whether our results remain statistically significant when adding the control variables. As *SI Appendix, Table S4* shows, the interaction effect remains statistically significant in all models (model 3 adding in gender, age, and organizational tenure: estimate = 0.03, SE = 0.01, $\gamma = 0.16$, $P = 0.01$; model 4 adding in harmonious passion, prosocial, intrinsic, and extrinsic motivation: estimate = 0.03, SE = 0.01, $\gamma = 0.16$, $P = 0.01$; model 5 adding in the interaction between perseverance and harmonious passion: estimate = 0.04, SE = 0.01, $\gamma = 0.19$, $P < 0.001$). The values of the simple slopes also remained the same. These results provide support for our hypothesis that the combination of perseverance and passion attainment predict performance.

Fig. 1. Study 2: Passion attainment moderates the relationship between perseverance and performance.

"grit." Additionally, we sent out a call for unpublished data to two academic listservs, the Society for Personality and Social Psychology, and the Association for Research in Personality. This search yielded a total of 253 datasets. We then reviewed each paper based on the inclusion criteria to develop our final sample (see below). The search was completed in May of 2018. The metaanalysis data and code are available via the Open Science Framework (<https://osf.io/kp7cb/>).

Criteria for inclusion and exclusion. Our primary metric of interest was the Pearson correlation coefficient between the grit scale and a measure of performance relevant to that study's sample. If the Pearson correlation coefficient was not reported directly but was available through other sources, the study was included in our final sample. In cases where the Pearson's r coefficient was not reported, a t -statistic, or a β -coefficient for a regression of grit on performance was recorded and converted into r . If the correlation was not reported directly and was not available through other sources, we contacted the first author of the paper with a request for the correlation coefficient. Studies were not excluded based on the location of the sample nor were any studies excluded based on publication information. We did not exclude papers based on the age of the participants, although subsequent analyses were done to examine variation by age and the differences did not qualify our findings in a meaningful way. Studies were excluded when they did not contain measures of performance, meaning that studies that only measured characteristics such as retention, well-being, or satisfaction were excluded. We also excluded studies that focused on negative behavioral characteristics (e.g., suicide, gambling). Additionally, three papers were excluded because they used duplicate datasets to studies included in the final sample. After thorough review of the papers based on the above qualifications, our final sample was determined with 127 studies, and a total of 45,485 participants (n s ranging from 21 to 4,800). All analyses were conducted in R using the statistical packages *metafor* (v2.0), and *MAc* (v1.1).

Coding procedure. All papers were coded by two authors (J.M.J. and E.R.B.) and all disagreements were resolved through internal discussion. The following data were collected from each study: Pearson's r correlation between the grit scale and performance, the type of performance metric, sample size, if the article was published in a peer-reviewed journal, the year of the study, and the journal type (psychology, education, other). In addition, three independent coders were instructed to code a binary variable indicating whether or not the majority of participants in the study would deem the performance domain to be personally important. The coders were blind to the hypothesis of this paper and had a high degree of interrater reliability ($IRR = 0.81$). Disagreements were discussed and resolved in subsequent coding review sessions.

Study 2.

Participants and procedure. The study was conducted with employees of a technology company located in a Spanish-speaking country. Employees work in teams guided by a supervisor who also provides annual evaluations of subordinates with an organizationally developed measure of job performance. Employees were contacted by an email sent out by J.M.J., which contained a link to the survey hosted on <https://Qualtrics.com>. Employees were guaranteed that their responses would be kept entirely confidential, and that their employer would not have access to any of their responses. The email was sent out to all of the firm's 2,293 employees, and 178 emails bounced back. In addition to the employee survey data, the company's Human Resources team provided performance ratings for each employee, which were conducted in the month before the survey was sent to employees.

Before our data collection, we conducted an a priori power analysis using conventional values for a small to medium effect size ($f^2 = 0.075$, $\alpha = 0.05$, $\beta = 0.95$; three variables) (45), as would be expected for typical interaction effects in social science (ranging from 3 to 10%) (46, 47). Calculations reveal that we would need a sample of 176 participants to be able to detect an effect of our hypothesized two-way interaction.

We received partial survey data from 1,265 employees and could match 560 employee-supervisor dyads. After dropping dyads with missing data on our focal variables, or where we were unable to identify the corresponding supervisors, our final sample consisted of 422 employees (response rate: 33.5%). This subset of employees did not differ in age, gender, or tenure from partial respondents (all P s > 0.22). Our sample included 169 female employees, ages ranged from 18 to 63 y (mean = 30.96 y, $SD = 6.99$), and employees had been working in the organization for an average of 3.69 y ($SD = 2.88$). Overall, 85 supervisors provided performance ratings with an average of five subordinate ratings per supervisor ($SD = 5.25$).

Measures. Given the company's location, we used the translation procedure outlined by Schaffer and Riordan (54) to adapt our measures to Spanish.

Where not stated otherwise, the measures used a seven-point scale ranging from "strongly disagree" to "strongly agree."

Perseverance. To measure perseverance, we used the Short Grit Scale (Grit-5) (6), which has improved psychometric properties over the full Grit Scale (6), and consists of four items each for two different factors, "perseverance of effort" and "consistency of interests." Sample items are "I have overcome setbacks to conquer an important challenge (perseverance of effort)" and "I often set a goal but later choose to pursue a different one (reversed; consistency of interest)." Following prior research (5, 6), we computed an average score across both subcomponents, $\alpha = 0.73$.

Passion attainment. We measured the extent to which employees feel they attained their desired level of passion for their work with three previously developed and used items (37, 45). These items read "I am less passionate for my work than I should be," "I often feel as if I have to be more passionate for my work," and "I frequently feel obliged to be more passionate for my work than I currently am." We reverse-scored the items, such that higher levels corresponded to increased passion attainment, $\alpha = 0.82$.

Harmonious passion. To highlight that the results are driven by passion attainment, we also assessed harmonious passion with Vallerand et al.'s (23) harmonious passion scale ($\alpha = 0.90$). Sample items include "My work is in harmony with the other activities in my life" and "My work is well integrated in my life."

Job performance. We used the organization-wide measure to assess performance which supervisors use for annual performance evaluation. This measure was conducted and provided by the Human Resources department of the company and covers different aspects of work that are important for the organization. The performance measure varies on a scale of 1 (very poor performance) to 5 (very good performance). Given the average job performance score of 4.39 ($SD = 0.52$), we further evaluated the skewness and kurtosis of the performance measure. Both skewness (-0.80) and kurtosis (0.23) were acceptable (55).

Control variables. In our analyses, we also controlled for age, gender, tenure, and motivation. Age was included because older people tend to receive worse performance evaluations (56) and perseverance increases with age (6). We controlled for gender because research cannot rule out whether female employees receive worse performance ratings (57), and for organizational tenure because it has been shown to be related to job performance (58). Finally, to distinguish our effects of the interaction between perseverance and passion attainment from motivation (31), and to provide a more rigorous test of our hypothesis, we also controlled for prosocial ($\alpha = 0.85$), intrinsic ($\alpha = 0.88$), and extrinsic ($\alpha = 0.83$) motivation using measures from Grant (59). We included all control variables in subsequent steps after first testing our predicted interaction effect separately following recommendations by Becker (60) and Becker et al. (61) to avoid spurious results in our hypothesis tests.

Study 3.

Participants and procedure. The study was conducted with students at a private northeastern university. Participants were contacted by an email sent out by the university laboratory's recruitment mailing list, which contained a link to the survey hosted on <https://Qualtrics.com>. Participants were guaranteed that their responses would be kept entirely confidential.

Before our data collection, we conducted an a priori power analysis using conventional values for a small to medium effect size ($f^2 = 0.075$, $\alpha = 0.05$, $\beta = 0.95$; three variables) (45), as would be expected for typical interaction effects in social science (ranging from 3 to 10%) (46, 47). Calculations reveal that we would need a sample of 176 participants to be able to detect an effect of our hypothesized two-way interaction. We succeeded in obtaining responses from 248 participants (mean age: 21.66 y, 70.56% female).

Measures. Where not stated otherwise, the measures used a seven-point scale ranging from "strongly disagree" to "strongly agree."

Perseverance. We measured perseverance using the same eight-item measure as above ($\alpha = 0.73$).

Passion attainment. We measured passion attainment using the same three-item measure as above. Same as before, we reverse-scored the items, such that higher levels corresponded to increased passion attainment, $\alpha = 0.88$.

Performance. Participants were asked to report their major GPA. For verification purposes, we also asked students to upload their grade transcript to the online survey. Past literature has often relied on GPA as a measure of performance, because of its consistency across a large sample and its impact on graduation, honors, and job-seeking (see, for example, refs. 5 and 30). Major GPAs ranged from 2.1 (equivalent to a C average) to 4.33 (equivalent to an A+ average). Given the average major GPA of 3.52 ($SD = 0.47$), we

further evaluated both the skewness (−0.94) and kurtosis (0.29), which were acceptable (55).

Control variables. Finally, we measured participants' age and gender, their year of study, and major.

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