



## When the going gets tough: Grit predicts costly perseverance



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### ABSTRACT

In this research, we investigate how grittier individuals might incur some costs by persisting when they could move on. Grittier participants were found to be less willing to give up when failing even though they were likely to incur a cost for their persistence. First, grittier participants are more willing to risk failing to complete a task by persisting on individual items. Second, when they are losing, they expend more effort and persist longer in a game rather than quit. Gritty participants have more positive emotions and expectations toward the task, which mediates the relationship between grit and staying to persist when they are losing. Results show gritty individuals are more willing to risk suffering monetary loss to persist.

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### 1. Introduction

To introduce the concept of grit, Duckworth, Peterson, Matthews, and Kelly (2007) titled their paper *Grit: Perseverance and Passion for Long-Term Goals*. With this defining phrase, we can envision how people with grit persist in endeavors related to important life objectives, and empirical research bears this out. Grittier individuals persist through to completion of important life goals like getting married, completing Army training, performing well in class (e.g., GPA), on other academic tasks (e.g., National Spelling Bee) and graduating from school, as well as performing well at work and remaining employed (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011; Duckworth, Quinn, & Seligman, 2009; Duckworth et al., 2007; Eskreis-winkler, Duckworth, Shulman, & Beal, 2014; Robertson-Kraft & Duckworth, 2014).

Personality researchers have primarily conceptualized grit as one facet of the larger personality trait of conscientiousness; indeed, there is empirical evidence that grit and conscientiousness overlap strongly (e.g., Duckworth & Quinn, 2009). While grit is most commonly seen as one facet of conscientiousness, some researchers instead conceptualize grit as a type of courage (Maddi, Matthews, Kelly, Villarreal, & White, 2012). Courage is the ability to push through fear to perform an action, and from this perspective on grit, grit is the courage to push through fear of

failure to persist at a given task. Accordingly, while less gritty individuals “change their direction in order to cut losses,” people with this kind of courage resist changing their direction and instead “stay the course” (Maddi et al., 2012, p. 21).

This tendency to resist changing direction when losses could be cut could have various implications for gritty individuals. First, we propose that it may inhibit their ability to perform on certain kinds of tasks. While previous research suggests that grit predicts more successful performance, such as in a Spelling Bee (Duckworth et al., 2007), grittier participants may not do as well with tasks that require them to give up on more difficult items to complete the task. For example, while grittier individuals do better at school (e.g., GPA), they might not do as well on standardized tests like the SAT where success is improved if test-takers are able to pass over hard items to first identify and complete the easier items. Indeed, gritty individuals might not want to give up on solving the more difficult questions, to the detriment of answering simpler questions or completing the test. Some suggestive research supports this possibility: while grit *itself* is unrelated to scores on tests of intellectual ability (Duckworth et al., 2007), the larger personality trait of conscientiousness – which grit is a facet of – actually predicts poorer performance on intelligence tests (Moutafi, Furnham, & Paltiel, 2004). We therefore examine whether grittier participants complete as many items on a verbal task that has items that should be passed over (i.e., unsolvable items).

In testing the possibility that higher grit individuals might perform more poorly on tasks that require passing over difficult items, it is valuable that we utilize the context of laboratory tasks. In such tasks, we can not only engineer items that *should* be passed over,

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but we can also directly control the expected likelihood of success at the task. Although theoretically individuals high and low in grit should only be differentiated under conditions of failure or difficulty, prior research examining important life goals could not pinpoint that difficulty is a necessary condition because researchers do not have experimental control over failure at such important goals. It is, however, possible to induce failure on laboratory tasks, which allows us to test the hypothesis that difficulty is a necessary condition to differentiate behavior by grit.

There are other benefits of considering the influence of grit in laboratory tasks. First, while research demonstrates that grit predicts achievement of long-term goals – like staying in a relationship, graduating from school, and keeping a job – it usually cannot isolate the role of effort and performance; however, short-term experimental tasks can be constructed to better isolate effort. By considering such tasks, we are therefore able to examine the role of grit in continuation of effort alone, and we do so in one of the present studies.

Furthermore, we can incentivize success on our laboratory tasks with monetary rewards. If grittier individuals do persist at the cost of attempting more items when incentivized by monetary rewards for *more* correct answers, it seems that they would be trading off greater chances at monetary gains to persist at the more difficult questions. Indeed, because grit includes resistance to “change their direction in order to cut losses,” grittier individuals may be more willing to risk suffering monetary loss to persist at such tasks than their less gritty counterparts.

To more directly test this possibility, we also consider what happens when individuals are given the choice to quit or persist when they are failing. Specifically, we allow participants to opt-out of a task before it is completed, giving them the choice to either exit (and get a \$1 bonus) or to continue, where they could get a \$2 bonus if they ended up winning (but no bonus if they lost). In this case, gritty people might also choose to continue even though things have “gotten tough” for them. As grit is expected to differentiate responses to difficulty, we predict that, although people high and low in grit should both persist when *succeeding*, if they are instead *failing*, grittier individuals will be more likely to continue a task when they have the option to exit. If grittier participants indeed choose to continue, they would be risking a monetary loss to persist in this task. We also explore a possible mechanism for this effect: high grit individuals might not give up when they have the option to quit *because* they have more positive emotions and expectations for the task. They might be optimistic about the task, even when they are failing. We expect grittier individuals to have more positive emotions and expectations for the task, and such positive feelings and expectations might explain why they continue when they could just quit.

We investigate all of these hypotheses by examining the role of grit in tasks that are based on solving anagrams (Study 1), clicking the computer mouse (Study 2), or solving math problems (Study 3). These tasks allow us to investigate whether grit predicts the decision to continue when given the option to quit. As we expect grittier individuals to differ from their less gritty counterparts *only* when they are failing, we use a verbal task that induces a sense of difficulty and failure (in Study 1) and experimentally manipulate feedback about failure at the task (in Studies 2 and 3). Overall, we expect that, when failing, grittier individuals will exert more effort and persist even when risking losses to do so.

## 2. Study 1

We predict that gritty participants might persist too long, staying on problems that they cannot solve. If they persist at more difficult problems, and thereby interfere with completing the remaining problems, grittier participants would attempt fewer

problems toward the end of the study. To test this possibility, Study 1 explores whether grittier participants complete as many items on a task that has items that should be passed over (i.e., unsolvable items). In particular, after participants reported their level of grit, they were asked to solve anagrams (Aspinwall & Richter, 1999; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002). Including unsolvable anagrams allowed us to test the possibility that grittier individuals may not want to give up on solving the more difficult questions, to the detriment of answering simpler questions or completing as many problems as possible in a limited timeframe. Indeed, if gritty participants persist at the unsolvable anagrams, they may be able to attempt fewer anagrams over the course of the study.

### 2.1. Methods

#### 2.1.1. Participants

Four hundred and twenty six undergraduates (131 men, 295 women) participated in our study in return for course credit. This sample size was selected based on resource constraints. It was the number of subjects from the subject pool allotted to our researchers by the department.

#### 2.1.2. Procedure and materials

Participants completed all measures online from a computer. After consenting, participants were then asked to report demographic information and complete the 8-item Grit-S (Duckworth & Quinn, 2009). Using a 1 (Not like me at all) to 5 (Very much like me) scale, participants rated items such as “Setbacks don’t discourage me” and “I finish whatever I begin.” This scale has been shown to have reasonable internal consistency with  $\alpha$ s from .73 to .83 (Duckworth & Quinn, 2009), with an  $\alpha$  of .73 in the current data. To incentivize performance, participants were informed that they would be given an opportunity to unscramble as many anagrams as they could in 20 min and would receive entries into a lottery for \$100 for correct solutions. Specifically, participants were then told that, to solve anagrams, they were to provide words that could be found in a standard English-language dictionary (e.g., not slang words or names) and use all of the letters provided. Participants then were allowed 20 min to make one attempt to unscramble each of 37 anagrams. Twenty one of the anagrams were highly difficult: they only had one correct solution and were chosen from among the most difficult for college-age samples to solve (Aspinwall & Richter, 1999; MacLeod et al., 2002). Interspersed among these 21 difficult (but solvable) anagrams were 16 unsolvable anagrams (Aspinwall & Richter, 1999; MacLeod et al., 2002). As there were no solutions to these 16 anagrams, they served as test items that should be passed over to perform well, as the short time-limit meant that fewer difficult, but solvable anagrams could be completed when time was devoted to these problems with no solution. This allowed us to test whether grittier participants were less likely to give up on solving the more difficult questions to the detriment of completing as many problems. Accordingly, the number of anagrams attempted was used as a dependent variable in this study.

### 2.2. Results and discussion

One participant failed to complete the Grit-S, and therefore was not included in the analyses reported below. Furthermore, while Study 1 was completed with participants online in order to obtain sufficient sample size within given resource limitations, the fact that participants were not observed in a lab meant they could cheat on the task. Indeed, programs are available online to solve anagrams (e.g., <http://anagram-solver.net>). To be able to exclude cheaters, the final three anagrams in this study were used because they were all

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