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Persistence: Defining the multidimensional construct and creating a measure

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ABSTRACT

Persistence is often viewed as a behavioral event, whereby a person works through obstacles in the pursuit of a goal. This operationalization does not speak to persistence as an individual difference, but many researchers have observed people for which persistence appears habitual and is applied in the pursuit of all goals broadly. We suggest that several closely related constructs, such as grit and perseverance, may partially capture multiple dimensions of the overall construct of persistence. These dimensions are Persistence Despite Difficulties (PDD), Persistence Despite Fear (PDF), and Inappropriate Persistence (IP). In an initial study, we show that these three dimensions emerge in multiple measures for these closely related constructs, along with the construct of Goal Time Preference (GTP). Then, we create the Multidimensional Persistence Scale through a three-study process, showing that the scale has satisfactory psychometric properties and validity, and we support our three-dimensional conceptualization of persistence. Lastly, in two studies, we demonstrate that the three dimensions of persistence have notable and distinct relationships with personal well-being; however, only PDD appears to significantly influence organizational outcomes, supported through its significant relationship with organizational citizenship behaviors.

1. Introduction

Persistence, defined as the personal tendency to endure through hardships to achieve goals, is highly valued within organizations. In the "era of the startup" (Zwilling, 2013), people are praised for undertaking heavy entrepreneurial challenges, and their persistence is regularly considered a key predictor of success (Dimotakis, Conlon, & Ilies, 2012; Gilbert, 2009; Trougakos, Jackson, & Beal, 2011). As such, quantifying persistence and identifying its outcomes is important from both a research and practical perspective. While interest in persistence has provided many discoveries, a multitude of persistence-related constructs have been conceptualized with definitions that overlap considerably. Among these constructs are goal striving, goal commitment, work commitment, need for achievement, self-control, ambition, courage, zeal, passion, work ethic, dependability, industriousness, grit, tenacity, stamina, conscientiousness, perseverance, and persistence itself (Cassidy & Lynn, 1989; Duckworth, Peterson, Matthews, & Kelly, 2007; Grant, 2008; Howard & Alipour, 2014; Klein, Wesson, Hollenbeck, Wright, & DeShon, 2001; Locke, 1996; Vancouver, Weinhardt, & Schmidt, 2010). Although these constructs are often considered to be unique, they are also discussed interchangeably in certain contexts. In some instances, one construct has even been used to define the other (i.e., "grit is perseverance and passion towards..." Duckworth et al., 2007, p. 1087).

The proliferation of persistence-related constructs incurs several concerns. First, as these concepts are often interchanged, they are likely repetitive. Studying these constructs separately may delay advancements in research, and the same questions may be repeatedly tested with different labels. Likewise, this relatedness may detract from the impact of studies that separate the constructs, particularly if similar theories are used to justify research questions. Second, misconceptions about these constructs may cause measures to be created that misrepresent persistence. Such misrepresentations are difficult to identify, as to do so requires a standard, comprehensive theoretical perspective to view persistence. The current absence of a guideline allows differences in interpretation to influence measure development, making it more likely that instruments intended to gauge the same or similar concepts will vary in their results. Third, many persistence-related constructs have been proposed, but the suggested number and nature of these constructs varies greatly. We argue that a portion of these constructs may represent separate dimensions of an overall construct of persistence. By studying these dimensions together, a more accurate understanding of persistence and related constructs can be achieved.

We address these concerns in the current study. First, we review

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persistence and related constructs to determine their conceptual distinctness. In doing so, a suggested dimensionality of persistence is proposed, composed of Persistence Despite Difficulty, Persistence Despite Fear, and Inappropriate Persistence. We also note a construct that is often included in the domain of persistence, Goal Time Preference, but it is not a dimension of the broader construct. We then undergo a multiple-study process to clarify the dimensionality of persistence and create the Multidimensional Persistence Scale, a new measure with satisfactory psychometric properties and validity that is designed to be shorter and less biased by method effects than the multiple existing measures. Lastly, the new scale is applied in two studies to identify the relationship of persistence with important personal and organizational outcomes, including life-satisfaction and performance. We show that the dimensions of persistence have distinct effects on outcomes, and the overall impact of persistence cannot be understood through studying a single dimension in isolation. This is a stark contrast to prior research that almost exclusively includes a single persistence-related construct in studies. Together, our studies clarify prior findings regarding persistence while opening several avenues for future research and practice.

2. Background and rationale

2.1. Persistence – what it is

Although persistence is often discussed as state-level motivation towards a particular goal, researchers have also observed people for whom persistence appears habitual and is applied in the pursuit of all goals broadly. The latter observation prompted the notion of the persistent person, and the idea that persistence may also manifest as a distinct trait. Given the nature of the construct, as well as commonly held beliefs about persistent people, researchers have repeatedly speculated that trait persistence is a primary predictor of personal success. The pursuit of this relationship, and an understanding of the underlying individual differences, has resulted in an array of persistence-related constructs describing relatively stable traits (Table 1; Duckworth et al., 2007; Klein et al., 2001; Locke & Latham, 2002; Lufi & Cohen, 1987; Serpell, Waller, Fearon, & Meyer, 2009; Vancouver et al., 2010). While these terms may have slightly different connotations, they all are partly described as the personal tendency to struggle through hardship to accomplish goals.

Along with advances in research, however, comes a potential reduction in clarity. The continued addition of constructs and measures that are derived from trait persistence may bring research to a state of confusion, where the fundamental elements of persistence become subsumed by other constructs. Such a development is counterproductive for the understanding of persistence and related constructs, as research addressing constructs that lack clear theoretical boundaries is likely to muddle the broader literature. There is no argument that any persistence-related constructs are unworthy of further study or are inferior to alternative conceptualizations of persistence; to the contrary, we contend that attempts to clarify this literature will allow those constructs to be more readily applied in future research and their impact more easily recognized. As a literature grows in both popularity and measurable influence, so too does it require a periodic reassessment to avoid confusion or redundancy. Several highly-researched constructs and theories have dealt with the same cycle of issues: the construct or theory is established; researchers bring new complexities and nuances; and an effort is made to re-clarify (see Dinh et al., 2014; Morrow, 1983; Roodt, 2004).

The current article is the product of similar concerns regarding persistence, which we contend is prime for a systematic reassessment. Our objective is to address and prevent possible contamination and redundancy issues by clarifying the construct of persistence and developing a reliable tool for its measurement. This re-grounding of persistence allows for more consistent operationalizations and theoretical advancements, as well as the development of distinct, yet related, research streams on persistence-related constructs. Thus, in the following sections, we differentiate persistence from related constructs, and we propose a new conceptualization of persistence that captures its central elements via the confluence of distinct dimensions.

2.2. Persistence – what it isn't

Although the Big Five is still the dominant conceptualization of personality (DeYoung, 2015; Moon, 2001), recent years have seen

Table 1
Definitions of persistence and related constructs.

Construct	Definition
1.) Goal striving	"Planning action, monitoring progress, and adjusting action plans based on impediments encountered during goal pursuit." (Cardon et al., 2009, p. 524)
2.) Goal commitment	"The extension of effort, over time, towards the accomplishment of an original goal and emphasized an unwillingness to abandon or to lower the goal." (Hollenbeck & Klein, 1987, p. 213)
3.) Work commitment	"The underlying preference for work over other activities." (Desai & Waite, 1991, p. 552)
4.) Need for achievement	"The personal striving of individuals to attain goals within their social environment." (Cassidy & Lynn, 1989, p. 301).
5.) Self-control	"The tendency, in a consistent and reliable fashion, to suppress, redirect, inhibit, or in other ways control the impulse to act, in those situations where self-restraint is appropriate." (Baumrind, 1967, p. 127)
6.) Ambition	"Desire to carry out multiple responsibilities competently and help work towards collective goals" (Benschop et al., 2013, p. 703).
7.) Courage	"Persistence or perseverance despite having fear." (Norton & Weiss, 2009, p. 213).
8.) Zeal	"Getting the job done right; contagious enthusiasm." (Shanahan & Hyman, 2003, p. 200)
9.) Passion	"A strong inclination towards an activity that people like, that they find important, and in which they invest time and energy." (Vallerand & Houlfort, 2003, p. 175)
10.) Work ethic	"A set of beliefs and attitudes reflecting the fundamental value of work." (Meriac, Woehr, & Banister, 2010, p. 316)
11.) Dependability	"Consistently honoring his or her specific promises." (Harich & LaBahn, 1998 p. 92)
12.) Industriousness	"Achievement seeking, competence, and self-discipline." (Derler & Weibler, 2014, p. 175)
13.) Grit	"Perseverance and passion for long-term goals." (Duckworth et al., 2007, p. 1087)
14.) Tenacity	"Tenacity, or perseverance, is a trait that involves sustaining goal-directed action and energy even when faced with obstacles." (Baum & Locke, 2004, p. 588).
15.) Stamina	"Defined as endurance and refers to the strength to withstand (or remain standing), resist, or hold up under pressure or difficulty." (Osborn, 2014, p. 319).
16.) Conscientiousness	"The propensity to follow socially prescribed norms for impulse control, to be goal-directed, planful, able to delay gratification, and to follow norms and rules." (Jackson et al., 2010, p. 2)
17.) Perseverance	"Remaining on a task to complete a project, regardless of its mundane nature or difficulty." (Miller & Rucas, 2012, p. 177)
18.) Persistence	Personal tendency to endure through hardships to achieve goals.

Note: References for these citations are provided in Supplemental Material A.

notable shifts away from a sole reliance on this framework (Block, 2010; Hough, Oswald, & Ock, 2015; Saucier & Srivastava, 2015). In these shifts, two directions are evident. Many authors have noted that narrow personality traits are often better predictors than broad traits, and they have likewise suggested that certain facets of the Big Five factors, when treated as unique constructs, may be more effective at predicting outcomes than the broader factors from which they are derived. Alternatively, other research has suggested that certain traits are not included in the Big Five factors, preventing a comprehensive view of personality when applying the framework. We agree with both of these directions and identify a construct separate from the Big Five, persistence, but we also situate it in relation to the framework.

Of the Big Five, persistence is most analogous to conscientiousness. Conscientious people are described as thorough, careful, reliable, organized, orderly, efficient, vigilant, self-controlled, industrious, and myriad other adjectives (Goldberg, 1990, 1992), which causes the construct to contain multiple facets (DeYoung, 2015; Goldberg, 1990, 1992; Hough, 1992; Moon, 2001). The two most commonly described facets are dutifulness and achievement striving (Hough, 1992; Moon, 2001). Both allude to the tendency to be hard-working and complete tasks at hand, showing self-control and an ability to resist the temptation to abandon goals. However, Moon (2001) theorized that these facets differed in that dutifulness is other-centric while achievement striving is self-centered. As such, those who have high achievement striving and low dutifulness may score highly on global conscientiousness indices, but behave in a way that is qualitatively different than those who are more dutiful than achievement-oriented. These subtle, yet important differences help to separate conscientiousness from persistence, as trait persistence should be contextually agnostic. One who is highly persistent should demonstrate this trait regardless of the task, as persistence is only intended to describe a specific behavioral tendency in pursuing goals. This is opposed to conscientiousness which is thought to have broader implications, including tendencies to be organized and conventional, careful and thorough, as well as professional and calculated. These describe preferences for approaching tasks, whereas persistence only describes tendencies to complete tasks. Therefore, while persistence likely overlaps with conscientiousness, the two are theoretically distinct.

Similar discrepancies can be established between persistence and other constructs that are associated with the persistent archetype, lending additional support for persistence as a unique trait. Possibly the most proximal related construct is need for achievement, described as the drive to attain goals with immediate feedback (Cassidy & Lynn, 1989). Those with high need for achievement value achieving goals and receive satisfaction from accomplishments. While need for achievement may cause people to overcome obstacles, those high in need for achievement may also abandon difficult goals to accomplish many easy goals, thus satisfying their needs. Alternatively, persistent people may not necessarily be satisfied by accomplishing goals, but will remain steadfast in their goals. While related, need for achievement and persistence are distinct.

Lastly, other constructs describe the tendency to strive towards a certain goal or set of goals, including goal, employee, and work commitment (Hyggen, 2012; Klein et al., 2001). Still others describe the unfolding process of goal attainment, such as goal striving (Vancouver et al., 2010). These do not, however, describe a general tendency to strive towards all goals despite hardships. We cannot fully integrate every alternative construct with persistence in the current article, but references and suggestions for further integration are suggested throughout.

2.3. Persistence dimensions

We propose a multidimensional conceptualization of persistence, in which the broader construct is composed of three dimensions. Personality traits are often described as unitary constructs, but a multidimensional approach to personality is well established (Law, Wong, & Mobley, 1998; Patrick, Curtin, & Tellegen, 2002). Persistence is believed to be no exception. Thus, we use prior research to identify dimensions of persistence that describe the general tendency to endure hardships in order to achieve goals, but these dimensions differ in the nature of those hardships.

When both scholars and laypersons conceptualize persistence, they often invoke thoughts of "overcoming the odds." Sports stories regularly mention athletes that persist in their training and conquer difficulties (McManus, 2012). In organizational research, persistence is believed to influence the completion of challenging assignments (Grant, 2008; Macey & Schneider, 2008). No matter the context, those who persist despite difficulty are considered better performers. Further, inherent in certain constructs, such as grit, is the notion that the difficulty of maintaining effort over an extended period of time is a primary deterrent of persistence (Duckworth et al., 2007; Duckworth & Quinn, 2009). For example, athletes may falter from their training because it is difficult to maintain a routine over the course of months or years, rather than the training being difficult. Lastly, many prior constructs include aspects of overcoming difficulties to achieve goals. Pettigrove (2007) partially described ambitious people as those working towards goals that are "temporally distant" and "difficult to achieve" (p. 58), and the definition of achievement striving includes, "work[ing] hard to achieve even difficult goals" (Moon, 2001). We propose that the tendency to continue efforts towards goals regardless of perceived difficulties, which we label Persistence Despite Difficulty (PDD), is a primary dimension of persistence.

Alternatively, difficulties are not the only deterrent of persistence. People can also be turned-away through fear. Fear is traditionally believed to be caused by spiders, snakes, and other "creepy-crawlies" (Norton & Weiss, 2009), causing many to believe that conquering fears is not needed in organizations. Nevertheless, many other contexts, experiences, and events may cause fear. For example, any employee who has whistle-blown likely felt great fear before taking action, and many others may have never whistle-blown because they were deterred by this fear (Rothwell & Baldwin, 2007; Skivenes & Trygstad, 2010). Although the fear is a type of difficulty, fear is notably different from difficulties caused by typical hardships. Fear is a certain poignant emotion, which may require specific cognitive process to overcome. Further, Howard and Alipour (2014) directly suggest that many prior studies on courage may have inadvertently investigated persistence through fear, and they call for more study into this emergent construct. For these reasons, it is important to consider persisting through fear separately from PDD, as they may be two distinct constructs. We label this construct Persistence Despite Fear (PDF).

Another possible persistence dimension has almost solely been studied in the field of Abnormal Psychology. This dimension describes when a person expends effort towards a worthless goal, deemed worthless because the goal is unattainable or unrewarding. Persistence is beneficial, but the inability to realize when to discontinue efforts can be detrimental. Studies have shown that those with psychological disorders often suffer from not knowing when to disengage from goals. For example, those with eating and obsessive-compulsive disorders attempt unattainable or unrewarding goals through ineffective behaviors, which preclude more valuable behaviors (Davis, 1997; Davis, Kaptein, Kaplan, Olmsted, & Woodside, 1998; Serpell et al., 2009). Although these disorders are largely irrelevant to organizations, worthless persistence can still damage a workplace. If an employee persists on a doomed project, they are wasting their time and resources. This, in turn, costs the organization money and person-hours, which can cause further negative outcomes. We label persistence towards an unrewarding or worthless goal as Inappropriate Persistence (IP). Whereas PDD and PDF are beneficial for employees and organizations, IP is the only form of persistence that leads to negative outcomes.

One final possible aspect of persistence should be considered. In recent years, authors have given considerable thought to the temporal

aspect of goals. Constructs such as grit, defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007, p. 1087), have become increasingly popular, and these constructs highlight the importance of completing long-term goals. As the common axiom says, "Rome wasn't built in a day," and organizations are not successful overnight. Many goals take years to complete, and employees need to remain persistent to complete them. The difficulty of long-term goals should be included in PDD, as the main deterrent of long-term goals is the difficulty to complete them; however, the preference for short- or long-term goals should not be included in the construct. Preference for a particular type of goal does not necessarily result in persistence towards those goals, and this preference is more akin to goal, employee, or work commitment. In the current article, a temporal preference for goals is labeled Goal Time Preference (GTP), and it is not considered a dimension of persistence.

These four dimensions comprise the existing research on persistence and closely related constructs. To our knowledge, however, they have not been studied concurrently, and it is unknown whether they are unique or largely overlapping constructs. It is possible that PDD and PDF are only one dimension and/or GTP is only a subset of PDD. Likewise, it is unknown if these possible dimensions are actually representative of persistence. To understand their interrelation, we investigate several existing measures that may gauge PDD, PDF, IP, and GTP.

3. Study 1 – investigation of existing scales

The goal of Study 1 is threefold. The first goal is to determine whether our proposed structure emerges from multiple persistence-related measures. The second goal is to identify any repetitiveness of these measures. The third goal is to analyze whether existing measures are biased by three method effects: positive affect, negative affect, and social desirability. Method effects signify influences on measurement that are not due to the construct itself. Participants may inappropriately alter their true responses if the items describe socially desirable behaviors or cognitions, and participants may also subconsciously alter their true responses if item responses are susceptible to momentary changes in affect. At the same time, persistence-related constructs may have theoretically-supported relationships with affect, which is discussed further in the future directions section below. We consider large relationships with affect to be concerning, whereas small-to-moderate relationships can be theoretically justified. Therefore, these measures are not appropriate to gauge persistence if they are overly biased by method effects, such as moderate relationships with social desirability and large relationships with affect.

3.1. Measures

Many scales may gauge possible persistence dimensions. It would be statistically inappropriate to administer all existing, relevant scales and analyze their factor structure. When using an item to participant ratio of 1:2 (well below the recommended ratio of 1:10), the probability of obtaining the correct factor structure is only 10% (Costello & Osborne, 2005). Considering the number of existing scales, even achieving this ratio would be difficult. For this reason, each measure was carefully chosen, and the selection process is described below.

3.1.1. Persistence despite difficulty

Many prior scales may gauge PDD, including the Perseverance Scale for Children (Lufi & Cohen, 1987), Persistence in Academics Scale (Lufi, 1979), the Tenacity Scale (Gartner, Gatewood, & Shaver, 1991), the Self-Appraisal Schedule (Wang, 1932), the Career Advancement Ambition Scale (Desrochers & Dahir, 2000), and Pursuit of Excellence Measures (Cassidy & Lynn, 1989). Several of these scales are much too long (40+ items), only relevant to a single goal (i.e. academic success, career advancement), or have a theoretical overlap with conscientiousness. The 8-item Persistence, Perseveration, and Perfectionism Questionnaire (Serpell et al., 2009) does not have any of these concerns. An example item is "I tend to keep going with a long task until it is complete, rather than giving up quickly."

3.1.2. Persistence despite fear

Howard and Alipour (2014) theoretically and statistically demonstrated that The Courage Measure (Norton & Weiss, 2009) does not gauge courage, and they argue that it instead measures PDF. This 12-item scale was created after the operational definition, "persistence or perseverance despite having fear" (Norton & Weiss, 2009, p. 213), and it has adequate psychometric properties. Therefore, The Courage Scale was administered to measure PDF. An example item is, "I tend to face my fears."

3.1.3. Inappropriate persistence

The scale chosen to gauge PDD contains an IP dimension, which the authors label perseverance (Serpell et al., 2009). An example item is "Sometimes I find myself continuing to do something even when there is no point in carrying on."

3.1.4. Goal time preference

Grit is concerned with long-term persistence and the preference for long-term goals. For this reason, Duckworth et al.'s (2007) grit scale was used to gauge GTP. The scale consists of two dimensions, Consistency of Interests and Perseverance of Effort. The Consistency of Interests subscale gauges whether respondents stay committed to a single goal or shift between many. An example Consistency of Interests item is "New ideas and new projects sometimes distract me from previous ones." The Perseverance of Effort subscale gauges whether respondents prolong their efforts, and an example item is "I finish whatever I begin."

3.1.5. Affect

Watson, Clark, and Tellegen's (1988) PANAS was used to assess positive and negative affect. To measure trait affect, participants were asked the extent that they felt "in general."

3.1.6. Social desirability

Paulhus's (1991) 20-item scale was used to gauge social desirability. An example item is "There have been occasions when I have taken advantage of someone."

3.2. Participants

Participants (N = 228, M_{age} = 19.09, 78% female, 80% Caucasian) were recruited from a Northeastern university and compensated with course credit. Two attention check were used (i.e. "Please mark the answer one to ensure you are paying attention"), and all reported statistics reflect the sample after removing those that failed either attention check.

3.3. Procedure

Participants signed-up for the study via an online service. They provided their digital informed consent and completed the survey online. Then, they were debriefed about the project.

3.4. Results and discussion

The persistence, courage, perseverance, and grit scales were subject to an exploratory factor analysis (EFA). EFA was chosen rather than confirmatory factor analysis (CFA), as the former allows for an easier analysis of item cross-loadings. We used a principal axis factoring method with direct oblimin rotation, which revealed that the scales represented five factors. This was determined through a Scree plot

Table 2
Exploratory factor analysis results of goal commitment scales.

	1	2	3	4	5
1.) Courage 1			0.587		
2.) Courage 2			0.511		
3.) Courage 3			0.562		
4.) Courage 4			0.459		
5.) Courage 5			0.647		
6.) Courage 6			0.495		
7.) Courage 7			0.500		
8.) Courage 8			0.732		
9.) Courage 9			0.734		
10.) Courage 10			0.435		
11.) Courage 11			0.736		
12.) Courage 12			0.359		
13.) Persistence 1	0.683				
14.) Persistence 2	0.697				
15.) Persistence 3	0.353				0.434
16.) Persistence 4	0.658				
17.) Persistence 5	0.399				
18.) Persistence 6					0.353
19.) Persistence 7					0.619
20.) Persistence 8					0.341
21.) Perseverance 1					0.784
22.) Perseverance 2				0.305	0.578
23.) Perseverance 3					
24.) Perseverance 4				0.572	
25.) Perseverance 5				0.664	
26.) Perseverance 6				0.603	
27.) Perseverance 7					
28.) Perseverance 8					
29.) Grit 1		−0.713			
30.) Grit 2		−0.733			
31.) Grit 3		−0.752			
32.) Grit 4		−0.658			
33.) Grit 5		−0.709			
34.) Grit 6		−0.560			
35.) Grit 7	0.403				
36.) Grit 8	0.554				
37.) Grit 9	0.694				
38.) Grit 10	0.549				
39.) Grit 11	0.869				
40.) Grit 12	0.827				

Only factor loadings above 0.30 are presented.
Note: The eigenvalues are: (1) 7.544, (2) 3.654, (3) 3.368, (4) 2.469, (5) 1.978, (6) 1.530, (7) 1.398, (8), 1.302, (9) 1.136, (10) 1.101.

analysis showing a sharp decrease in eigenvalues after the fifth factor, and a parallel analysis (1000 replications) that suggested five factors (*EFA eigenvalues* = 7.544, 6.654, 3.368, 2.469, 1.978, 1.530; *parallel analysis 95th percentile eigenvalues* = 2.207, 2.060, 1.965, 1.894, 1.823, 1.760). Table 2 presents the factor loadings.

The three-dimensional persistence conceptualization, with the added construct of GTP, clearly emerged in the four scales. Most of the Persistence Scale items and the Perseverance of Effort Subscale items loaded onto the first factor, and both of these were believed to gauge PDD. The second factor consisted of the Consistency of Interests Subscale items, believed to gauge GTP. All Courage Scale items loaded onto the third factor, believed to gauge PDF. The fourth factor was solely comprised of the Perseverance Scale items, believed to gauge IP. Finally, the fifth factor was unclear. The items represented multiple scales, and some cross-loaded. This factor is believed to represent item contamination, and it may not constitute a dimension of persistence. Therefore, the four factors align with the hypothesized structure of persistence.

Some items did not load onto their intended factor, however. Particularly, several of the persistence and perseverance items loaded onto the contamination factor, and some of the perseverance items did not load at all. Thus, some scales may contain concerning items.

Supplemental Material B includes all correlations and reliabilities. Most reliabilities were acceptable, but the perseverance scale was slightly concerning ($\alpha = 0.67$). The inter-correlations ranged from small (0.01) to large (0.59), suggesting that the constructs are complementary.

Lastly, some scales posed significant method effect concerns. The Persistence Scale had moderate correlations with positive affect (0.32), negative affect (−0.23), and social desirability (0.23). A regression analysis revealed that they account for 18% of its variance. The most problematic was the Perseverance of Effort Subscale. It had a strong correlation with positive affect (0.40), and moderate correlations with negative affect (−0.24) and social desirability (0.20). A regression analysis showed that these three variables account for 24% of the variance in the Perseverance of Effort Subscale. These effects are reduced in the full scale, but it is concerning that one-fourth of the Perseverance of Effort Subscale is determined through method effects.

In light of these findings, the three goals of Study 1 were achieved. First, the proposed structure of persistence, along with GTP, emerged in the four scales. Second, some overlap was seen among the scales. The Persistence Scale and the Perseverance of Effort Subscale gauge the same construct, as suggested by the proposed structure of persistence. Third, the psychometric properties and method effects of some measures were concerning, suggesting that biases are present in their use. Also, the administered measures constitute 40 items. It would be beneficial to create a more concise multidimensional persistence measure with appropriate psychometric properties and reduced method effects. Therefore, the Multidimensional Persistence Scale (MPS) is created in the following, which contains the dimensions of PDD, PDF, and IP. Also, a GTP scale is simultaneously created to ensure that the MPS is not contaminated by this construct.

4. Study 2 – item sort task

We undergo a multiple-phase process to create the MPS, adapted from prior studies and suggestions (Ferris, Brown, Berry, & Lian, 2008; Hinkin, 1995, 1998; Lent & Brown, 2006). To begin, we created an over-representative item list to ensure that the full criterion space for each dimension was gauged. Items were rationally derived and adapted from prior scales, resulting in 64 items to be reduced into a more concise measure. To do so, an item-sort task was chosen. Item-sort tasks provide evidence for items' face and substantive validity, which is indicative of the overall scale's construct validity (Anderson & Gerbing, 1991; Howard, 2018; Howard & Melloy, 2015). Items that have adequate face and substantive validity should be retained, whereas other items should be discarded. This process results in a more concise measure that avoids construct contamination.

For the item-sort task, the over-representative item list of 64 items was presented to 24 participants from an undergraduate participant pool, which is the sample and approximate sample sizes of Anderson and Gerbing (1991) as well as Howard and Melloy (2015). Participants were asked to sort each item into the category which they believed it represented. The response choices were “Persistence Despite Difficulty,” “Persistence Despite Fear,” “Inappropriate Persistence,” “Long-Term Goal Commitment,” and “Short-Term Goal Commitment,” and “None of the Above.” Participants were given thorough definitions of each answer choice. Although we previously proposed the dimension of GTP, it was undetermined whether this dimension was unitary or consisted of two dimensions. We erred on the side of safety, and categorized items into Short and Long-Term Goal Commitment. Two items were included to check for insufficient motivation, as well as two questions that asked participants about the amount of effort they devoted to the item-sort task. All participants passed all motivation checks.

To determine which items should be retained, a c_{sv} value was created for each item as outlined by Anderson and Gerbing (1991) and Howard and Melloy (2015). These values were compared to the $\bar{c}_{sv}$, which is a cutoff value based on the sample size. Items above this cutoff are determined to be representative of the construct of interest more so

than any other given construct, which is evidence of the item's face and substantive validity.

Most items exceeded this cutoff value. We retained the six items with the highest c_{sv} value for each dimension; however, seven items were retained from the Short-Term Goal Commitment category, as the sixth and seventh values had identical c_{sv} values. This resulted in an initial 18-item MPS and 13 items that represented the two GTP dimensions.

5. Study 3 – scale reduction and convergent validity

With the initial MPS created, Study 3 accomplishes several goals. First, while the scale seems adequate, some items are likely unsatisfactory. An EFA may identify which items are not representative of their intended constructs. Also, the GTP items are included in this analysis to ensure that no MPS items gauge this alternative construct. Second, the MPS should be minimally related to method effects. Third, because the MPS is based upon existing persistence-related scales, the dimensions should show adequate convergent validity with the existing scales.

5.1. Measures

5.1.1. MPS and GTP scale

The initial MPS and GTP scales were administered.

5.1.2. Other constructs

All measures administered in Study 1 were also administered in Study 3.

5.2. Participants

Participants (N = 263, M_{age} = 19.19, 71% female, 80% Caucasian) were recruited from a Northeastern university and compensated with course credit. Two attention check were used, and all reported statistics reflect the sample after removing those that failed the attention checks.

5.3. Procedure

Participants signed-up for the study via an online service. They provided their digital informed consent and completed the survey online. Then, they were debriefed about the project.

5.4. Results and discussion

An EFA was performed to reduce the initial MPS. To ensure that any retained MPS items did not inadvertently gauge GTP, the GTP items were included in this EFA. Through a visual scree plot analysis and parallel analysis (*EFA eigenvalues* = 6.137, 3.894, 2.869, 2.406, 1.331; *parallel analysis 95th percentile eigenvalues* = 2.029, 1.885, 1.791, 1.713, 1.640), the MPS and the GTP items consist of four factors. The results suggested that the PDD and PDF items strongly loaded onto their intended factor without cross-loading onto other factors; however, the IP and GTP dimensions contained some items that cross-loaded, and some IP items did not load onto any factor. The GTP items primarily cross-loaded on the PDD factor, but their cross-loadings can be explained. The items which cross-loaded were akin to, "I have achieved a goal that took years of work." Although this was intended to be Long-Term Goal Commitment, the difficulty in persisting with a long-term goal may have been salient to respondents, causing the item to load onto the PDD factor. This aligns with propositions presented above about PDD.

Two criteria were used to reduce the number of items (Costello & Osborne, 2005; Hinkin, 1995, 1998; Howard, 2016). First, items that did not strongly load on their intended factor (loading < 0.39) were removed. Second, items that strongly loaded onto multiple factors were also removed (multiple loadings > 0.32). One item was added to an alternative dimension, as it was intended to gauge Long-Term Goal Commitment but strongly loaded onto PDD. Its inclusion made conceptual sense, and it was not seen as infringing on the dimension's construct validity. This process resulted in six items for each dimension, except IP which consisted of three items. The pattern matrix with only these items is presented in Table 3.

Table 3
Exploratory factor analysis results of the multidimensional persistence scale.

	1	2	3	4
1.) Persistence despite difficulty 1	0.773			
2.) Persistence despite difficulty 2	0.784			
3.) Persistence despite difficulty 3	0.377			
4.) Persistence despite difficulty 4	0.437			
5.) Persistence despite difficulty 5	0.551			
6.) Persistence despite difficulty 6	0.734			
7.) Persistence despite fear 1		0.589		
8.) Persistence despite fear 2		0.905		
9.) Persistence despite fear 3		0.938		
10.) Persistence despite fear 4		0.372		
11.) Persistence despite fear 5		0.386		
12.) Persistence despite fear 6		0.721		
13.) Inappropriate persistence 1			0.805	
14.) Inappropriate persistence 2			0.715	
15.) Inappropriate persistence 3			0.739	
16.) Time-goal orientation 1				0.554
17.) Time-goal orientation 2				0.561
18.) Time-goal orientation 3				0.765
19.) Time-goal orientation 4				0.908
20.) Time-goal orientation 5				0.639

Only factor loadings above 0.30 are presented.

The resulting correlations and Cronbach alphas are presented in Table 4. Each dimension of the refined MPS had acceptable reliability, ranging from 0.79 to 0.87. All three dimensions also correlated strongly with their respective indicators of convergent validity (0.52–76). Positive affect reached moderate correlations with PDD and PDF. These moderate relationships support previous research that has demonstrated the ability of positive affect to motivate persistence when such behavior is necessary for task completion (Erez & Isen, 2002; Kavanagh, 1987). Together, the refined MPS has satisfactory psychometric properties and minimal concerns with method effects.

6. Study 4 – confirming factor structure in an adult sample

The factor structure of the MPS should be replicated through CFA. As the current article has solely used student samples, it is important to ensure the factor structure in an adult sample.

6.1. Measures

6.1.1. Refined MPS

The refined MPS was administered.

6.2. Participants

Participants (N = 277, M_{age} = 37.70, 37% female, 84% American) were recruited from Amazon's mTurk and provided a small amount of monetary compensation. Amazon's mTurk is an online platform that connects people willing to perform small tasks on their computer, such as taking a survey, with those who need these tasks performed. Several studies have shown results using mTurk as valid (Buhrmester, Kwang, & Gosling, 2011; Paolacci & Chandler, 2014; Shapiro, Chandler, & Mueller, 2013). Further, participants that failed the attention checks or provided incomplete data were removed, and all reported statistics reflect the sample after removing these participants.

Table 4
Correlations of scales administered in Study 3.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.) PDD	0.79												
2.) PDF	0.54**	0.87											
3.) IP	0.11	0.14*	0.80										
4.) GTP	0.23**	0.04	0.07	0.82									
5.) Persistence	0.66**	0.47**	0.07	0.13	0.75								
6.) Courage	0.45**	0.76**	0.06	0.12	0.46**	0.85							
7.) Perseverance	0.02	−0.02	0.52**	0.03	0.09	−0.04	0.71						
8.) Perseverance of effort	0.23**	0.02	−0.16*	0.27**	0.26**	0.10	−0.21**	0.75					
9.) Consistency of interest	0.67**	0.37**	0.09	0.24**	0.72**	0.39**	0.00	0.32**	0.74				
10.) Grit – total scale	0.53**	0.23**	−0.05	0.32**	0.58**	0.29**	−0.14*	0.84**	0.78**	0.78			
11.) Positive affect	0.44**	0.35**	−0.01	0.14*	0.41**	0.40**	−0.04	0.12	0.41**	0.31**	0.90		
12.) Negative affect	−0.12	−0.10	0.20**	−0.03	−0.14*	−0.14*	0.14*	−0.18**	−0.21**	−0.24**	0.07	0.88	
13.) Social desirability	0.18**	0.06	−0.15*	0.05	0.19**	0.01	−0.15*	0.30**	0.16*	0.29**	0.13	−0.18*	0.80

Note: PDD = Persistence Despite Difficulty; PDF = Persistence Despite Fear; IP = Inappropriate Persistence; GTP = Goal Time Preference.
* $p < .05$.
** $p < .01$.

6.3. Procedure

Participants signed-up for the study via mTurk. They provided their digital informed consent and completed the survey online. Then, they were debriefed about the project.

6.4. Results and discussion

To confirm the dimensions of the MPS, CFAs were performed. Visual representations of our CFA models are presented in Supplemental Material C, along with additional reporting information. Initially, model fit indices were below preferred cutoffs. To improve fit, all items with multiple error term modification indices > 10 were removed. This resulted in the removal of one item from both, the PDD and PDF subscales. Two pairs of items still had one error term modification indicator > 10. Prior authors have supported covarying pairs of error terms if they represent items that load onto the same factor, as the additional explained variance may be due to wording similarities (Brown, 2014; Kenny, 2011; Kline, 2015). One of these two pairs loaded onto the same factor (PDD), and we believe that the additional covariance was due to the similar wording. Thus, we allowed only one pair of error terms to covary.

Most fit indices suggest that the proposed model fit the data well (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). The CFI value (0.96) met its cutoff of 0.95, and the GFI value (0.92) met its cutoff of 0.90. The NFI value (0.93) was lower than the recommended cutoff of 0.95, but it approached a satisfactory value. The SRMR and RMSCA values of 0.06 and 0.07, respectively, met their cutoff (0.08). The chi-square to degrees of freedom ratio (2.51) met its preferred cutoff of 3. Also, all items loaded well onto their first-order factors (> 0.59). PDD and PDF loaded onto the second-order factor of Persistence well (> 0.70), but IP did not (< 0.30). An alternative model was analyzed which PDD and PDF loaded onto the second-order factor, and IP was independent and did not relate to any of the other latent factors. This model had worse model fit for all indices, and a chi-square difference test of the nested models indicated that the original model produced better fit than the alternative model ($\chi^2 = 13.563$, df = 2). Thus, the original model is preferred.

These findings were replicated by performing additional CFAs using a combined sample of participants from Studies 5 and 6 (samples described below). The same models were tested, and the same pair of error terms were covaried. The replication CFA very closely reproduced the prior CFA fit indices, indicating that the proposed model fit the current data well. The CFI (0.94), GFI (0.92), NFI (0.92), SRMR (0.05), RMSCA (0.09), and χ^2/df (4.15) each met or closely approached their cutoffs. All items loaded well onto their first-order factors (> 0.59). PDF loaded very strongly onto the second-order factor of Persistence (> 0.80), and IP loaded moderately well onto this factor (0.36). Again, the alternative model with IP as an intendent factor had worse model fit for all indices, and the chi-square difference test was statistically significant ($\chi^2 = 37.265$, df = 2). Thus, the finalized MPS demonstrates acceptable model fit when conceptualized as three separate second-order dimensions with an overarching first-order dimension.

7. Study 5 – persistence and personal outcomes

The finalized MPS appears to be a psychometrically sound and valid measure of multidimensional persistence, which can be used to better understand the relationships of the construct. In the following two studies, we make initial inferences into the importance of persistence. We focus on the relationship of persistence with personal well-being outcomes in Study 5, and we focus on the relationship of persistence with organizational outcomes in Study 6. In doing so, we demonstrate the relationship of the MPS with theoretically-related variables, which provides support for the scale's concurrent validity.

Those that persist through difficulties or fear experience more positive outcomes from their behaviors, causing them to expect these positive outcomes (Howard & Alipour, 2014; Sheldon & Elliot, 1999). Those that allocate efforts towards worthless or unrewarding behaviors, however, may experience fewer positive outcomes from their behaviors, causing them to not expect positive outcomes. We expect PDD and PDF to positively relate to positive outcome expectancies, and IP is expected to negatively relate to positive outcome expectancies.

Hypothesis 1. (a) PDD (b) and PDF are positively related to positive outcome expectancies; (c) IP is negatively related to positive outcome expectancies.

Further, those that persist through difficulties or fears likely accomplish more personally satisfying outcomes. Alternatively, those that strive towards worthless goals may never receive satisfying outcomes, whether because the goals themselves are not satisfying or because they are unattainable. For these reasons, we expect PDD and PDF to be positively related to life satisfaction, whereas IP is expected to be negatively related to life satisfaction.

Hypothesis 2. (a) PDD (b) and PDF are positively related to life satisfaction; (c) IP is negatively related to life satisfaction.

Negative life events occur both inside and outside the workplace every day. Some people persist through these negative events, often becoming more resilient (Ojeda, Navarro, & Morales, 2011). On the other hand, some people may be unable to address negative life events, as their repeated ineffective behaviors prevent performing more

worthwhile behaviors (Serpell et al., 2009). In turn, they are not able to benefit from overcoming these events. For this reason, we expect PDD and PDF to positively relate to psychological well-being, operationalized through stress, anxiety, and depression indices, whereas IP is expected to negatively relate to psychological well-being.

Hypothesis 3. (a) PDD (b) and PDF are positively related to psychological well-being; (c) IP is negatively related to psychological well-being.

7.1. Measures

7.1.1. MPS

The MPS was administered.

7.1.2. Outcome expectancies

Outcome expectancies were gauged by adapting the 10-item scale of Lent and Brown (2006), which has been used to assess expectancies related to personal, social, and socioeconomic outcomes.

7.1.3. Life satisfaction

Life satisfaction was gauged by the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

7.1.4. Psychological well-being

We operationalize psychological well-being as the absence of stress, depression, and anxiety. The 21-item Depression Anxiety Stress Scales (DASS) was used, which has been shown to be psychometrically sound and valid (Lovibond & Lovibond, 1995).

7.2. Participants

Participants (N = 164, M_{age} = 19.12, 80% female, 71% Caucasian) were recruited from a Northeastern university and compensated with course credit. All reported statistics reflect the sample after removing those that failed the attention checks.

7.3. Procedure

Participants signed-up for the study via a website. They provided their digital informed consent and completed the survey online. Then, they were debriefed about the project.

8. Results and discussion

Correlations and Cronbach's alphas are included in Table 5. Both PDD ($r = 0.40$, $p < .01$) and PDF ($r = 0.27$, $p < .01$) were significantly related to outcome expectancies, but IP was not significantly related ($r = 0.04$, $p > .10$). These results support Hypothesis 1a and b, but fail to support Hypothesis 1c. Next, both PDD ($r = 0.21$, $p < .01$) and PDF ($r = 0.16$, $p < .05$) were significantly related to life satisfaction, but IP was not significantly related ($r = -0.04$, $p > .05$). These results support Hypothesis 2a and b, but fail to support Hypothesis 2c. Lastly, PDD was significantly related to stress ($r = -0.17$, $p < .05$), depression ($r = -0.25$, $p < .01$), and anxiety ($r = -0.17$, $p < .05$) – supporting Hypothesis 3a. PDF was not significantly related to stress ($r = -0.12$, $p > .10$), depression ($r = -0.13$, $p > .10$), or anxiety ($r = -0.10$, $p > .10$) – failing to support Hypothesis 3b. IP was significantly related to stress ($r = 0.18$, $p < .05$), and it was marginally related to depression ($r = 0.14$, $p < .10$) and anxiety ($r = 0.15$, $p < .10$) – partially supporting Hypothesis 3c.

These results support that PDD and PDF are positively related to personal well-being, whereas IP is negatively related to personal well-being. These results also suggest that variation exists between the outcomes of PDD, PDF, and IP. Particularly, PDD more strongly relates to well-being compared to PDF and IP. Also, PDD was relatively consistent in its magnitude of relationships, but PDF and IP had more variation. While PDF related to outcome expectancies and life satisfaction, it did not significantly relate to psychological well-being. Likewise, while IP related to psychological well-being, it did not significantly relate to outcome expectancies and life satisfaction. These results suggest that the dimensions are unique, and subsequent research may benefit from predictions regarding their differential relationships. Lastly, these results support the concurrent validity of the MPS, as most relationships were as expected. Together, these results support the importance of persistence for personal well-being and the concurrent validity of the MPS, and they suggest that the relationship of persistence merits further study.

9. Study 6 – concurrent validity and organizational outcomes

With persistence shown to significantly relate to personal outcomes, it is also important to investigate its relationships with important organizational outcomes. In Study 6, we analyze the relationship of persistence with conscientiousness, organizational citizenship behaviors (OCBs), voice, prosocial rule breaking (PSRB), counterproductive work behaviors (CWBs), and performance. In doing so, we do not expect that each persistence dimension will relate to each outcome. Instead, most outcomes are only expected to relate to a single dimension.

Those who are conscientious are described as hard-working and persistent (Barrick, Mount, & Strauss, 1993), and they are often top performers that complete difficult assignments (Dudley, Orvis, Lebiecki, & Cortina, 2006; Moon, 2001). Also, the difficulty of completing long-term goals often arises in organizations, as employees are often assigned to a work project for months or years. Conscientious employees are known to work through these difficult long-term goals (Duckworth et al., 2007). Conscientiousness is expected to be positively related to PDD.

Hypothesis 4. PDD is positively related to conscientiousness.

When performing OCBs, employees voluntarily perform activities outside their job duties for the benefit of the organization (Podsakoff, MacKenzie, Paine, & Bachrach, 2000; Williams & Anderson, 1991). In these instances, employees need to persist through their difficult workloads with these added tasks. We expect PDD to positively relate to OCBs.

Hypothesis 5. PDD is positively related to OCBs.

Many beneficial workplace behaviors involve “going against the grain.” One such type of behavior is employee voice. Voice is the “provision of information intended to improve organizational functioning … even though such information may challenge and upset the status quo” (Detert & Burris, 2007, p. 869). Although beneficial, employees may be reluctant to enact in voice behaviors due to fear of retaliation. We expect PDF to positively relate to voice.

Hypothesis 6. PDF is positively related to voice.

Another type of beneficial workplace behaviors that “goes against the grain” is PSRB. PSRB is volitional rule breaking to benefit the organization (Dahling, Chau, Mayer, & Gregory, 2012). Once again, although beneficial, employees may be reluctant to enact in PSRB behaviors due to fear of retaliation. We expect PDF to positively relate to PSRB.

Hypothesis 7. PDF is positively related to PSRB.

CWBs are behaviors performed to intentionally harm an organization. Employees often perform CWBs to vent frustration or “get back” at the organization instead of directly addressing their problems (Fox, Spector, & Miles, 2001; Jones, 2009). Such behaviors may sometimes be effective, but they are often ineffective at resolving problems. Some CWBs may be behaviors towards an ineffective or worthless goal, possibly causing IP to positively relate to CWBs.

Table 5
Correlations of scales administered in Studies 5 and 6.

Study 5

	1	2	3	4	5	6	7	8
1.) PDD	0.82							
2.) PDF	0.64**	0.92						
3.) IP	−0.00	0.14	0.75					
4.) Outcome expectancies	0.40**	0.27**	0.04	0.88				
5.) Life satisfaction	0.21**	0.16*	−0.04	0.20**	0.80			
6.) Stress	−0.17*	−0.12	0.18*	−0.08	−0.31**	0.85		
7.) Depression	−0.25**	−0.13	0.14	−0.13	−0.35**	0.67**	0.89	
8.) Anxiety	−0.17*	−0.10	0.15	−0.01	−0.23**	0.77**	0.66**	0.82

Study 6

	1	2	3	4	5	6	7	8	9
1.) PDD	0.85								
2.) PDF	0.64**	0.93							
3.) IP	0.31**	0.35**	0.76						
4.) Conscientiousness	0.49**	0.24**	0.02	0.84					
5.) OCBs	0.25**	0.14	−0.07	0.06	0.77				
6.) Voice	0.12	0.04	−0.10	−0.15	0.33**	0.86			
7.) PSRB	−0.11	−0.09	−0.06	−0.19*	−0.04	−0.06	0.96		
8.) CWBs	−0.06	0.01	−0.10	−0.13	−0.14	0.05	0.40**	0.98	
9.) Performance	0.13	0.10	0.13	−0.08	0.35**	0.12	0.01	−0.04	0.89

Note: Variables below the dotted line in Study 6 were supervisor-rated. PDD = Persistence Despite Difficulty; PDF = Persistence Despite Fear; IP = Inappropriate Persistence; OCBs = Organizational Citizenship Behaviors; PSRB = Prosocial Rule Breaking; CWBs = Counterproductive Work Behaviors.
* $p < .05$.
** $p < .01$.

Hypothesis 8. IP is positively related to CWBs.

Employee performance is considered the ultimate outcome of business research, and each of the outcomes above is believed to subsequently impact performance. We expect that PDD and PDF are positively related to performance, whereas IP is negatively related to performance.

Hypothesis 9. (a) PDD (b) and PDF is positively related to performance. (c) IP is negatively related to performance.

9.1. Measures

9.1.1. MPS
The MPS was administered.

9.1.2. Conscientiousness
Conscientiousness was measured through **Goldberg et al.'s (2006)** ten item measure taken from the International Personality Item Pool (IPIP).

9.1.3. OCBs
OCBs were measured using Williams and Anderson's (1991) 13-item measure.

9.1.4. Voice
Employee voice was measured using Van Dyne and LePine's (1998) six-item measure.

9.1.5. PSRB
PSRB was measured with a 13-item measure of Dahling et al. (2012).

9.1.6. CWBs
CWBs were measured with a 19-item scale created by Bennett and Robinson (2000).

9.1.7. Performance
Performance was measured using the five-item measure of Jensen, Patel, and Raver (2014).

9.2. Participants

Participants were 248 currently working students recruited from a Northeastern university and compensated with course credit (M_{age} = 19.42; 84% female; 67% Caucasian) and 114 supervisors of these currently working students (M_{age} = 36.71; 66% female; 87% Caucasian). Some participants were removed as detailed in the procedures section. All reported statistics reflect the sample after removing these participants.

9.3. Procedures

Participants signed-up for the study via a website. They provided their digital informed consent and completed their survey online. Then, they were asked to send a survey to their supervisors, and ID codes were used to match responses. To ensure that students did not complete their supervisors' surveys, IP addresses were inspected to confirm that the same computer was not used to complete both surveys. If a student-supervisor pair had the same IP address, the supervisor responses were removed. Also, supervisor responses were removed if they started their survey within 30 min of the student starting their survey, as supervisors would be unlikely to receive the study information that quickly. These methods are similar to prior articles using currently working student participants (Kuyumcu & Dahling, 2014).

9.4. Results and discussion

Correlations and Cronbach's alphas are included in Table 5. PDD was significantly related to conscientiousness (r = 0.49, $p < .01$), supporting Hypothesis 4, and it was significantly related to OCBs (r = 0.25, $p < .01$), supporting Hypothesis 5. Also, PDF was not significantly related to voice (r = 0.04, $p > .10$) or PSRB (r = −0.09,

$p > .10$), failing to support Hypotheses 6 and 7. Although not hypothesized, PDF was significantly related to conscientiousness ($r = 0.35$, $p < .01$). Next, IP was not significantly related to CWBs ($r = -0.10$, $p > .10$), failing to support Hypothesis 8. Lastly, PDD ($r = 0.13$, $p > .10$), PDF ($r = 0.10$, $p > .10$), and IP ($r = 0.13$, $p > .10$) were not significantly related to performance, failing to support Hypothesis 9a, b, and c.

Together, these results have several implications. Although not significantly related to performance, PDD may still have a notable impact on organizational outcomes. The construct was significantly related to conscientiousness and, more importantly, OCBs. Organizations may benefit from employees that consistently persist despite difficulties, as they may be willing to perform extra beneficial activities resulting in greater workloads. PDF and IP, however, may be less important to organizations. PDF was only significantly related to conscientiousness, and IP was not significantly related to any outcome. These results may be due to two possibilities.

PDF and IP may simply have a small influence on organizational outcomes. Employees may persist through fearful events to benefit themselves, but they may be reluctant to persist through these negative events to benefit their organizations – thereby causing PDF to have a small influence on the organization. Likewise, employees may not have the opportunity to allocate efforts on worthless or unrewarding goals, as their supervisors may realign their efforts, causing IP to have a small influence on the organization.

Alternatively, persistent employees may indeed work through negative events to benefit their organizations, whereas others would turn away. It is possible, however, that those who turn away adopt new goals relatively quickly. In turn, these employees may complete their new goals at the same rate that persistent employees complete their original goals. Further, Study 6 used supervisor-reports for all workplace outcomes. Supervisors may only be aware of the quantity of goals that are completed – not the method that these goals are completed. Therefore, persistence may affect the manner which goals are completed, but not the overall impact of an employee to the organization. While these results provide initial inferences about persistence, future research is needed to draw more conclusive inferences about the construct – as further detailed below.

10. General discussion

In the current article, we suggested that the identified collection of persistence-related constructs may be better represented by three separate dimensions that form the higher-order construct of persistence. These three dimensions are Persisting Despite Difficulty (PDD), Persisting Despite Fear (PDF), and Inappropriate Persistence (IP). To test this conceptualization, Study 1 analyzed the factor structure of several persistence-related measures together, including scales of persistence, courage, perseverance, and grit. The results indicated that the three suggested dimensions clearly emerged, along with the separate construct of Goal-Time Preference (GTP). Also, some scales were notably biased by method effects. From this study, the creation of the Multidimensional Persistence Scale (MPS) seemed warranted.

Study 2 developed the initial three-dimensional MPS, as well as a GTP scale, by creating and subsequently reducing an over-representative item list. Study 3 further reduced the MPS, supported its factor structure, and showed that the measure did not inadvertently gauge GTP. This study also supported the convergent validity of the MPS. Study 4 finalized the MPS and confirmed its factor structure in a sample of largely working adults. Together, these three studies supported the psychometric properties of the MPS and the existence of PDD, PDF, and IP.

Lastly, two studies investigated the utility of persistence for personal and organizational outcomes. Study 5 showed that the three dimensions of persistence each relate to important personal outcomes, including outcome expectancies, life satisfaction, and psychological well-being. Study 6 showed that PDD and PDF relates to conscientiousness, and PDD alone related to OCBs. No dimension of persistence, however, related to voice, PSRB, CWBs, or performance. These results indicate that persistence may be important for personal well-being and PDD may benefit organizations, but PDF and IP may have little impact on the bottom-line of businesses.

Together, the current article suggests that persistence may be conceptualized as a three-dimensional construct, the MPS is a valid measure of this conceptualization of persistence, certain dimensions of persistence may predict valuable personal and organizational outcomes, and the dimensions of persistence may produce unique relationships that merit further study. With these results in mind, implications, future directions, and limitations are discussed below.

11. Theoretical and practical implications

The current article provides several theoretical implications for the study of personality and motivation. First, although many constructs describe the tendency to strive towards goals in general (Cassidy & Lynn, 1989; Klein et al., 2001; Locke, 1996), we showed these constructs may be more accurately conceptualized as dimensions of persistence. These results do not suggest, however, that these existing constructs are useless or even incorrect. Instead, these constructs may directly gauge particular persistence dimensions, without being labeled as such. For example, Norton and Weiss's conceptualization of courage, “persistence or perseverance despite having fear” (Norton and Weiss, 2009, p. 3), directly describes PDF (Howard & Alipour, 2014). Prior research using this conceptualization may apply to our understanding of PDF, and the same may be true for prior conceptualizations of other constructs similar to persistence, PDD, PDF, and IP.

Further, it is also possible that some constructs gauge multiple persistence dimensions, possibly along with other alternative constructs. For instance, grit may be a combination of PDD and GTP (Duckworth et al., 2007), and Serpell et al.'s (2009) persistence, perseverance, and perfectionism questionnaire may gauge PDD, IP, and perfectionism. While the current conceptualization of persistence may provide an accurate view of the construct, these prior conceptualizations of theoretically overlapping constructs may still provide important inferences about persistence itself. Some of these constructs have already been shown to predict important personal and organizational outcomes (Duckworth & Quinn, 2009; Norton & Weiss, 2009), and these prior studies should be re-viewed to determine the influence of persistence along with the other constructs gauged. This suggestion should especially be considered in the light of Credé, Tynan, and Harms' (2016) recent findings that grit may not be a substantive second-order construct.

Second, through creating the three-dimensional conceptualization of persistence, the current article may draw attention to the lesser-studied dimensions. Current research places an almost sole focus on the tendency to persist despite difficulties, ignoring the tendency to persist through fear or to inappropriately persist (Dimotakis et al., 2012; Gilbert, 2009; Gompers, Kovner, Lerner, & Scharfstein, 2010; Grant, 2008; Trougakos et al., 2011). Although a lack of research does not merit future research, these two dimensions may influence important outcomes, as suggested below.

Third, a great deal of research has studied the relationship between persistence-related constructs and organizational outcomes, but much less has studied the relation between these constructs and personal well-being. The current article showed that persistence may improve several aspects of a person's quality of life, possibly more so than any other outcome of the construct. In the context of work, persistence may improve one's career advancement opportunities by limiting the influence of perceptual obstacles. For example, an individual who is low in PDD may deliberately avoid work highly challenging work tasks. This approach is likely to limit opportunities for advancement, recognition, and future opportunity, resulting in job “plateaus”. People experiencing

such plateauing report higher levels of stress and depression than the population average (McCleese, Eby, Scharlau, & Hoffman, 2007), indicating a decrease in overall well-being. The inclusion of IP also provides further implications for persistence and well-being, suggesting that not all persistence is good persistence.

Fourth, much research has studied persistence-related constructs and organizational outcomes, and the results largely suggest that a significant relationship exists between the two. The current article, however, shed doubt on this relationship. Many of these prior studies analyzed constructs that are more than persistence alone, such as the inclusion of GTP along with PDD in grit. These alternative aspects of persistence-related constructs may have driven any significant relationships. Alternatively, these prior studies have often placed a sole focus on overcoming difficulties when analyzing the tendency to persist towards all goals. As shown in Study 6, PDD is the only dimension of persistence to have a significant relationship with organizational outcomes, and prior studies may be a reflection of this persistence dimension alone. Lastly, some of these studies specifically analyzed organizational outcomes that are directly relevant to persistence, such as overtime hours worked (Ellett, Ellis, & Westbrook, 2007; Grant, 2008; Rainlall, 2004). Persistence may only predict organizational outcomes that are specifically relevant, whereas general organizational outcomes are not predicted. Together, each of these suggestions is a plausible, but further research is needed.

12. Future directions

In light of these implications, certain directions for future research should be considered. As often quoted in scale development research, the measure validation process is never complete (Hinkin, 1995, 1998). The MPS should be continuously reanalyzed in novel contexts, and future research should use current evidence to justify further explorations of new potential persistence dimensions and their relationships with outcomes of interest. It should be noted, for example, that measures of PDD and PDF in the current studies were strongly correlated despite representing distinct factors of persistence (as supported by our CFA models). These results may suggest that PDD subsumes some variance in the PDF construct, wherein the obstacles identified by PDD encompass all challenging circumstances, including fear. Further still, it is possible that PDF exists as one of myriad subtypes of PDD (e.g., PD-lack of ability, PD-lack of social support, PD-anxiety, PD-depression), which have the potential to be distinctively categorized and captured through the creation of new measures. Both of these possibilities would suggest that PDD is a broader construct than PDF, and PDD may have a wider range of effects on further outcomes. It is additionally possible that the dimensional structure of persistence is more complex than is currently suggested, whereby persistence exists as a first-order dimension, PDD and PDF are second-order dimensions, and an array of third-order dimensions of persistence have yet to be identified. These complexities provide a wealth of potential for future scholars who seek to expand our understanding of this multi-faceted phenomenon.[2]

Relatedly, we examined the relationship between persistence and affect primarily through the lens of identifying method effects, the implication being that affective states may artificially alter participant responses to the MPS and its constituent constructs. However, we also note that the relationship between these constructs may have theoretical justifications and should, thus, be expected in some capacity. Moreover, methods scholars have suggested that concerns over the presumed negative impact of method effects on research interpretability may be overstated (Lance, Dawson, Birkelbach, & Hoffman, 2010), and that the standard for evidence of common method effects should be revised (Conway & Lance, 2010). Taken together, it may be prudent to explore the relationship between persistence and affect as a predictable and valuable component of this research, as opposed to an indicator of method effects.

Indeed, affect may be both a covariate or an outcome of persistence. For example, prior research has shown affect to be an important component of the goal-striving process (Erez & Isen, 2002; Kavanagh, 1987). Positive affect has a positive relationship with goal engagement, and people more readily strive towards goals that produce greater positive affect (Green, Oades, & Grant, 2006; Sheldon & Elliot, 1999). In these cases, persistence and positive affect may explain both independent and shared variance in goal-striving, and thereby an association between the two may not purely reflect method effects due to their theoretically-supported conceptual similarities. Likewise, those that are persistent are believed to accomplish more of their valued goals. These people are also believed to be satisfied by their accomplishments and possess greater positive affect, causing positive affect to be an outcome of persistence. Similar relationships have been identified in the study of grit, where affective states are used as both predictors (Hill, Burrow, & Bronk, 2016) and outcomes (Datu, King, Valdez, & Eala, 2018; Li, Lin, Zhao, Chen, & Wang, 2018) of the persistence-related construct. Given these considerations, future research should continue to study the relationship between persistence and affect beyond the context of method effects.

Although we provided a dim outlook on the relationship between persistence and organizational outcomes, future research should analyze other workplace outcomes that are particularly relevant to persistence. For example, Grant (2008) considered number of overtime hours worked as a behavioral indicator of persistence, but overtime hours may be more representative of performance or OCBs. When operationalized in this manner, persistence may be strongly related to this important organizational outcome. Likewise, many authors have used employee retention as a primary indicator of organizational success (Ellett et al., 2007; Rainlall, 2004), which may also be related to persistence. Outcomes such as these are certainly valuable to organizations, and any observed relationship with persistence may encourage future research.

Additionally, certain uncommon organizational outcomes may be strongly predicted by individual dimensions of persistence. For instance, although few employees ever need to engage in whistle-blowing against the unethical actions of their organization, it is understood in many organizational contexts that the implications of doing so are massive. Those that choose to whistle-blow may have high PDF, whereas those with low PDF may have a proclivity towards shying away from whistle-blowing and ignoring unethical organizational practices. Likewise, intervening to prevent workplace aggression may have powerful implications, and it may be predicted by PDD or PDF. Novel methods would be needed to study these relationships, due to the low base rate of the outcomes, but the observed results could deepen our understanding of persistence and the important organizational outcomes studied.

It should also be noted that developments in the study of persistence have applications outside of traditional social science disciplines. Scholars in the burgeoning field of personality neuroscience, for example, have shown an increasing interest in capturing the neurological basis for personality traits. Several recent studies have worked to identify the neurological underpinnings of grit (Nemmi, Nymberg, Helander, & Klingberg, 2016; Wang et al., 2017; Wang et al., 2018), and interest in understanding the structural correlates for other persistence-related phenomena continues to grow. This area of research may prove to be a significant boundary spanning opportunity, providing novel techniques and insights from the neuroscience literature that may be applied to future personality research – and vice versa. For example, Nemmi et al. (2016) found that individual differences in grit were

[2] The authors thank Reviewer 1 for suggesting the inclusion of this issue in our discussion as well as for providing conceptual guidance on how additional subdimensions of persistence might manifest in future research. The authors would like to thank Rick Jacobs for his invaluable assistance in the development of this article.

associated with differential volume in the nucleus accumbens, a cortical structure that is associated with reward-seeking behavior, and that children who scored highly in grit were more easily trained on difficult tasks. Future researchers could seek to identify similar correlates with the PDF, PDD, and IP dimensions of persistence, which may provide insight into how these constructs function and what interventions (in the case of IP) may be advisable given their physiological foundations.

Lastly, we used an innovative method to ensure that the MPS did not gauge GTP by creating a measure of GTP along with the MPS. Although not the focus of the current study, the GTP scale may also produce novel inferences about employees' goal preferences.

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Appendix A. Persistence Scale and Goal-Time Preference Scale

The Persistence Scale

Persistence Despite Difficulty

1.) I keep on going when the going gets tough.
2.) People describe me as someone who can stick at a task, even when it gets difficult.
3.) Even if it's difficult to understand, I will read an entire book until I "get" it.
4.) Setbacks do not discourage me.
5.) Even if something is hard, I will keep trying at it.

Persistence Despite Fear

6.) I tend to face my fears.
7) Even if I feel terrified, I will stay in that situation until I have done what I need to do.
8.) I stay persistent even when I am scared of things.
9.) If I am worried or anxious about something, I will do or face it anyway.
10.) If something is scary, I will do it anyways.

Inappropriate Persistence

11.) Sometimes I find myself continuing to do something, even when there is no point in carrying on.
12.) Sometimes I will keep doing the same thing over and over, but I believe that it is normal to do so.
13.) I will keep trying at something, even if I know my actions are worthless.

Goal-Time Preference Scale

1.) I prefer to work on long-term goals.
2.) Most of the goals I work on take years to finish.
3.) I usually work towards small goals.
4.) I prefer to work on short-term goals.
5.) Most goals I accomplish only take a few days to complete.

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