Short Communication

The freedom to persist: Belief in free will predicts perseverance for long-term goals among Chinese adolescents

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ABSTRACT

Increasing evidence supports the importance of perseverance for long-term goals in predicting personal success. However, less is known about factors that cause individual differences in perseverance. We tested the role of a specific philosophical belief among laypersons – the belief in free will – in predicting perseverance among two Chinese adolescent cohorts attending high school. In Study 1 (N = 1262), self-reported belief in free will was associated with stronger perseverance for long-term goals, as measured by the Grit-S scale. In Study 2 (N = 710), we first successfully replicated the association between self-reported belief in free will and perseverance. Then, we categorized the participants into free will believers and determinism believers by a two-alternative forced choice philosophical question regarding the existence of free will. Free will believers scored higher in perseverance than did determinism believers. Taken together, our study implied that the belief in free will is one crucial predictor of perseverance for long-term goals.

1. Introduction

In the last decade, numerous studies have suggested that grit, a newly explored personality trait, plays an extremely crucial role in achievement (see Eskreis-Winkler, Gross, Duckworth, Vohs, & Baumeister, 2016 for a review). The concept of grit was first introduced by Duckworth, Peterson, Matthews, and Kelly (2007), who defined grit as a higher-order construct with two lower-order facets: perseverance of effort (referring to sustaining effort in the face of adversity) and consistency of interest (referring to the consistency in one's interests over time) for long-term goals (hereafter referred to as perseverance and consistency). Moreover, a recent meta-analysis suggested that the primary utility of the grit construct lies in the perseverance facet. After controlling for conscientiousness, perseverance added predictive power to academic performance, while consistency did not (Credé, Tynan, & Harms, 2017).

To date, few empirical studies have formally explored the influential factors of the perseverance facet of grit (but see relevant works that demonstrated the influence of causal attribution on persistence in academic learning: Dweck & Leggett, 1988; Weiner, 1985). If possible influential factors are established, psychologists may develop training

programs to increase individuals' perseverance by facilitating the development of these factors. Here, we examined the possibility that a special belief may influence perseverance–the belief in free will. Recent studies have suggested that laypersons have different opinions about free will and this difference may influence individuals' behavior substantially (see Baumeister & Monroe, 2014 for a review). Conceptually, believing in free will means believing that individuals can freely act to make decisions (Baumeister & Monroe, 2014). Therefore, free will believers are more willing to exert deliberate effort when performing cognitive tasks (Rigoni, Kühn, Gaudino, Sartori, & Brass, 2012). Together, we further hypothesized that the belief in free will may also lead to more deliberate efforts during the pursuit of long-term goals. In other words, a stronger belief in free will may be associated with a stronger perseverance for long-term goals.

We conducted two studies here specifically to explore the association between the belief in free will and perseverance. In Study 1, we measured the belief in free will by using a widely used self-reported questionnaire (i.e., the FAD-Plus) and examined its correlation with perseverance. In Study 2, we categorized the participants into free will believers and determinism believers using a two-alternative forced choice philosophical question regarding the existence of free will and

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compared participants' scores on perseverance.

2. Study 1

The main goal of Study 1 was to perform an initial test of the hypothesis that the belief in free will is associated with perseverance. Moreover, we examined the unique contribution of belief in free will by controlling for two possible confounding third variables, i.e., self-control and Big Five conscientiousness, which have been shown to be simultaneously correlated with the belief in free will and perseverance (Duckworth et al., 2007; Li, Wang, Zhao, Kong, & Li, 2017).

2.1. Methods

2.1.1. Participants and procedures

The participants included 1260 10th-grade students recruited from five high schools in Chengdu, China (737 girls; mean age = 15.6 years, SD = 0.5 years). These students completed a battery of questionnaires online.

2.1.2. Measures

2.1.2.1. FAD-Plus. The FAD-Plus is a 27-item Likert scale that measures belief in free will and related constructs (Paulhus & Carey, 2011). The Chinese version of the FAD-Plus was translated and back-translated by the authors of the current study. We used only the free will subscale, which contained seven items, for the current study. Sample items include "People have complete control over the decisions they make" and "Criminals are totally responsible for the bad things they do." In the current study, Cronbach's α for this subscale was 0.71, which was comparable to those in the original scale (α = 0.69/0.70; Paulhus & Carey, 2011).

2.1.2.2. Ten-item personality inventory (TIPI). The TIPI is an extremely brief scale that was designed to measure Big Five personality dimensions (Gosling, Rentfrow, & Swann, 2003). It contained only ten items, and each Big Five personality dimension was indexed by two items. Participants responded to each item using a 7-point Likert scale with response options ranging from 1 (strongly disagree) to 7 (strongly agree). Sample items include "extraverted, enthusiastic" and "anxious, easily upset." The Chinese version of the TIPI shows satisfactory psychometric properties with regard to Chinese adolescents (Li, 2013).

2.1.2.3. Brief self-control scale (SCS). The SCS is a 13-item questionnaire that contains only one dimension measuring self-control (Tangney, Baumeister, & Boone, 2004). Participants responded to each item using a 5-point Likert scale with response options ranging from 1 (not at all like me) to 5 (very much like me). Sample items include "I am good at resisting temptation". The Chinese version of the SCS was established through a translation and back-translation process by the authors of the current study. In the current study, the Cronbach's α for the SCS was 0.80.

2.1.2.4. Grit-S. The Grit-S is a self-report instrument measuring the personality trait of grit (Duckworth & Quinn, 2009). This 8-item scale consists of two subscales, the perseverance of effort factor and the consistency of interest factor, each with four items. Sample items include "I finish whatever I begin" and "I often set a goal but later choose to pursue a different one." The response options range from 1 (not at all like me) to 5 (very much like me). The Chinese version of the Grit-S used in the study has been validated in Chinese adolescents (Li et al., in press). In the current study, the Cronbach's αs for the perseverance and consistency facets were 0.75 and 0.76, respectively.

2.2. Results and discussion

First, the belief in free will was positively correlated with

Table 1
Descriptive statistics and correlation between study variables in Study 1.

	M	SD	1	2	3	4	5
1 Belief in free will	3.65	0.61	–				
2 Perseverance	3.44	0.68	0.25***	–			
3 Consistency	2.92	0.77	0.04	0.28***	–		
4 Self-control	3.01	0.55	0.15***	0.52***	0.57***	–	
5 Conscientiousness	4.44	1.09	0.14***	0.41***	0.35***	0.53***	–

*** $p < 0.001$.

perseverance (see Table 1 for the correlation matrix between study variables). However, no statistically significant correlation was found between the belief in free will and consistency. The difference of these two correlation coefficients was also statistically significant, Steiger's $Z = 6.18$, $p < 0.01$. In summary, a stronger belief in free will is associated with more perseverance but not consistency for long-term goals.

Next, to test whether the correlation between the belief in free will and perseverance was held when controlling for the possible third variables, i.e., self-control and conscientiousness, we performed a hierarchical regression analysis. Specifically, the regression model included self-control and conscientiousness in step 1 and the belief in free will in step 2. The analysis found that the belief in free will explained the additional variance ($\Delta R^2 = 3.1\%$, $p < 0.001$) in perseverance beyond the variance explained by self-control and the conscientiousness (Table 2). Therefore, the belief in free will has incremental power for predicting perseverance beyond other previously established predictors.

3. Study 2

One of the limitations of Study 1 is that the FAD-Plus may measure psychological traits other than the belief in free will, and these traits may also correlate with perseverance. For instance, one FAD-Plus item (i.e., "Criminals are totally responsible for the bad things they do") seems to overlap with moral responsibility.

One possible way to overcome this limitation is to measure the belief in free will in a direct and pure manner that excludes any possible confounding factors. To fulfil this goal, Study 2 followed a method developed by Nichols and Knobe (2007) to measure the belief in free will. Specifically, two concrete scenarios were used to describe two types of universe (a determinist universe vs. a free will universe). Then, we asked participants to indicate which universe they think is most similar to theirs. Based on their response, participants were classified into two categories: free will believers and determinism believers. Finally, we compare the score of perseverance between these two groups.

3.1. Methods

3.1.1. Participants and procedures

The participants were 704 11th-grade high school students recruited from one high school in Chengdu, China (400 girls; mean

Table 2
Hierarchical regression model for predicting perseverance in Study 1.

	B (SE)	β	Semi-partial correlations	$\triangle R^2$
Step 1				0.30***
Self-control	0.52 (0.03)	0.42	0.36	
Conscientiousness	0.12 (0.02)	0.19	0.16	
Step 2				0.03***
Self-control	0.50 (0.03)	0.40	0.34	
Conscientiousness	0.11 (0.02)	0.17	0.15	
Belief in free will	0.19 (0.03)	0.17	0.16	

*** $p < 0.001$.