

ORIGINAL ARTICLE

The relationship between self-identity and ego depletion among Chinese university students: The mediating role of self-efficacy

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ABSTRACT

University students always face psychosocial stressors that may deplete self-regulatory resources. This study aimed to investigate whether self-efficacy mediates the relationship between self-identity and ego depletion among Chinese undergraduates. A sample of 256 university students (20.46 ± 1.15 years) completed the self-identity scale, general self-efficacy scale, and self-regulatory fatigue scale. Mediation analysis was conducted and the results showed that self-identity positively predicted self-efficacy ($\beta = 0.118$, $P < 0.001$) and negatively predicted ego depletion ($\beta = -0.992$, $P < 0.001$). Critically, self-efficacy was found to partially mediate the relationship between self-identity and ego depletion (indirect effect = -0.180 , 95% confidence interval [CI] -0.300 , -0.075), accounting for 18.15% of the total effect. This suggests that self-efficacy is a significant mechanism through which a clear self-identity protects against ego depletion. These findings suggest that enhancing both self-identity and self-efficacy may help reduce self-regulatory depletion and improve resilience among university students.

Key words: self-efficacy, self-identity, self-depletion, mediation, resource depletion

INTRODUCTION

Self-depletion—a transient state of diminished self-control following sustained regulatory effort—has been shown to impair cognitive performance and motivation in academic contexts (Baumeister *et al.*, 1998; Muraven & Baumeister, 2000; Vohs & Heatherton, 2000). At the same time, the development of self-identity represents a crucial psychosocial task for undergraduates as they navigate role transitions and identity exploration (Erikson, 1968), a period often described as emerging adulthood (Arnett, 2000). Previous research suggests that a clear sense of self-identity may serve as a buffer against self-regulatory depletion (Tan *et al.*, 2012), while self-efficacy has been widely demonstrated to promote adaptive coping and resilience (Bandura, 1997) and is

theorized to facilitate more efficient use of self-regulatory strategies (Muraven *et al.*, 2006). However, the potential mediating role of self-efficacy in the relationship between self-identity and self-depletion remains empirically unexamined.

This study focuses on university students for both theoretical and pragmatic reasons. Theoretically, the university period represents a critical developmental stage for identity exploration and consolidation, while simultaneously demanding high levels of self-regulation for academic success, making students particularly vulnerable to self-depletion. Pragmatically, understanding the protective factors against depletion in this population has direct implications for supporting their mental health and academic achievement. While

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previous research on self-depletion has utilized diverse samples, including general adults in workplace settings and clinical populations engaged in health behaviors (Hagger *et al.*, 2010), and has been linked to outcomes ranging from muscular performance (Bray *et al.*, 2008) to interpersonal conflict (Finkel *et al.*, 2009) and prejudice (Govorun & Payne, 2006), less is known about the specific mechanisms that buffer against depletion in the high-demand academic context. The current study integrates social cognitive theory (Bandura, 1986) and the strength model of self-control (Baumeister *et al.*, 2007) to propose that self-identity enhances self-efficacy, which in turn reduces self-depletion. While social cognitive theory elucidates the cognitive mechanisms of personal agency, and the strength model delineates the limited nature of self-regulatory resources, few studies have integrated these perspectives to examine how cognitive factors might preserve these resources, especially as the field continues to refine its understanding of the ego depletion effect (Inzlicht & Friese, 2019; Heatherton, 2011). Bridging these frameworks offers a more comprehensive understanding of the psychological resources that mitigate depletion.

We test this mediation model to achieve two primary aims: First, to clarify the underlying cognitive and motivational mechanisms linking self-concept to self-regulatory outcomes, and second, to inform the development of targeted interventions aimed at supporting student well-being by bolstering these psychological resources. Furthermore, by investigating this mediating pathway, our study also aims to explore other potential mechanisms that may account for the relationship between self-identity and self-depletion.

Based on the theoretical framework and literature review, the present study proposes and tests the following hypotheses: Hypothesis 1—self-identity will be negatively associated with ego depletion. Hypothesis 2—self-identity will be positively associated with self-efficacy. Hypothesis 3—self-efficacy will be negatively associated with ego depletion. Hypothesis 4—self-efficacy will mediate the relationship between self-identity and ego depletion.

METHOD

Participants and procedure

A total of 256 undergraduate students were recruited from three comprehensive universities located in eastern, central, and western China, respectively, to ensure geographical diversity. A convenience sampling method was employed. Data were collected *via* an online survey created on the Wenjuanxing platform. The survey link was distributed through university student forums and social media groups. Before starting, all participants

were presented with an electronic informed consent form that detailed the study's objectives, the voluntary nature of their participation, and assurances of anonymity and confidentiality. Only those who agreed to the terms could proceed. The questionnaire took approximately 15 min to complete. The final sample comprised 130 males and 126 females, with ages ranging from 19 to 22 years (20.46 ± 1.15 years). Participants were distributed approximately evenly across the four academic years: 64 freshmen, 63 sophomores, 64 juniors, and 65 seniors.

Instruments

Self-identity scale (SIS)

The 19-item SIS (Li & Lou, 2009) was used to assess participants' clarity and confidence in their social roles and personal values (*e.g.*, "I am confident in my social roles"). Responses were collected on a 4-point Likert scale. In this study, the scale demonstrated acceptable internal consistency, with a Cronbach's α of 0.727.

General self-efficacy scale (GSES)

Self-efficacy was measured using the 10-item GSES (Schwarzer & Jerusalem, 1995). Participants rated items such as "I can solve difficult problems with effort" on a 4-point Likert scale. The scale showed excellent reliability in the current sample, with a Cronbach's α of 0.922.

Self-regulatory fatigue scale (SRF-S)

The 16-item SRF-S (Wang *et al.*, 2010) was employed to measure self-depletion across cognitive, behavioral, and emotional domains (*e.g.*, "I feel mentally exhausted"). The scale yielded good internal consistency in this study, with a Cronbach's α of 0.840.

Data analysis

Data were analyzed using SPSS 27. Descriptive statistics and correlation analyses were conducted to examine the relationships among key variables. To test the mediation model, the SPSS macro PROCESS (Version 3.5; Hayes, 2017) was employed. A two-tailed *P*-value < 0.05 was considered statistically significant.

RESULTS

Descriptive statistics

The data from 256 participants were analyzed. The correlations among the study's key variables are presented in Table 1. Findings show minimal correlations between demographic variables (gender, age, academic year) and psychological constructs (self-identity, self-efficacy, self-depletion), justifying their exclusion as covariates. Significant intercorrelations among the psychological variables indicate a close relationship, meriting further analysis.

Mediation effect analysis

Using SPSS PROCESS macro model 4 and following the procedures outlined by Hayes (2017). Self-efficacy mediates between self-identity and self-depletion. Table 2 shows self-identity negatively predicts self-depletion ($\beta = -0.992$, $P < 0.001$), confirming hypothesis 1, and positively predicts self-efficacy ($\beta = 0.118$, $P < 0.001$), supporting hypothesis 2. In model 3, the negative effect of self-identity on self-depletion remains significant ($\beta = -0.812$, $P < 0.001$), with self-efficacy negatively predicting self-depletion ($\beta = -1.521$, $P < 0.001$), confirming hypotheses 3 and 4. The decrease in the regression coefficient indicates mediation, validated by bootstrap analysis with 5000 resamples; significance is confirmed if the 95% confidence interval (CI) excludes zero, as shown in Table 3.

The mediating effect of self-efficacy in the self-identity and self-depletion model is -0.180 (95% CI excluding zero), accounting for 18.15% of the total effect. The direct effect of self-identity on self-depletion is -0.812 (95% CI excluding zero), representing 81.85%. Both effects are statistically significant, confirming partial mediation by self-efficacy, as depicted in Figure 1.

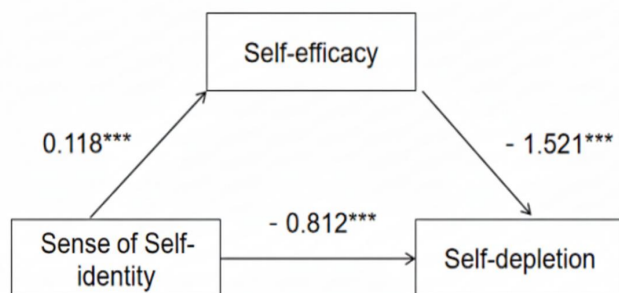


Figure 1. Mediating model of self-identity, self-efficacy, and self-depletion. ***, $P < 0.001$

DISCUSSION

The present study yielded several key findings. Self-identity was a significant positive predictor of self-efficacy and a significant negative predictor of ego depletion. Self-efficacy also negatively predicted ego depletion. Furthermore, self-efficacy partially mediated the relationship between self-identity and self-depletion. These results align with and extend previous theoretical frameworks and empirical studies in the field.

The positive predictive effect of self-identity on self-efficacy is consistent with existing literature. According to Erikson (1968), identity formation during young adulthood serves as a foundation for personal agency and competence. Our results support this notion by

demonstrating that a clear and stable self-identity enhances individuals' confidence in their abilities, thereby increasing self-efficacy. This finding is further corroborated by studies such as those by Waterman (2004) and Bandura (1997), which emphasized that a well-integrated identity—as part of a dynamic self-concept (Markus & Wurf, 1987)—reinforces motivational resources and promotes proactive behavior. Conversely, identity confusion or negative self-concept may diminish self-efficacy and increase vulnerability to helplessness (Marcia, 1966; Schwarzer & Warner, 2013).

Furthermore, self-identity showed a significant direct negative effect on self-depletion. This result is consistent with the proposition of Tan and colleagues (2012), who suggested that identity clarity helps conserve self-regulatory resources; relatedly, self-affirmation of core values has also been found to counteract ego depletion (Schmeichel & Vohs, 2009). Individuals with a stable identity may experience less internal conflict and lower cognitive load when making decisions, thereby reducing self-regulatory effort (Vohs *et al.*, 2008). In contrast, identity ambiguity or role confusion can exacerbate self-control demands, leading to faster depletion of psychological resources (Baumeister *et al.*, 1994; Baumeister *et al.*, 2007). The negative relationship between self-efficacy and self-depletion also corroborates earlier findings. Scholars such as Schwarzer (2014) and Bandura (1997) have argued that high self-efficacy facilitates adaptive coping and efficient use of self-regulatory strategies, thereby mitigating feelings of fatigue, a finding supported in domains like academic resilience (Fletcher & Sarkar, 2013) and athletic performance (Gernigon & Delloye, 2003). However, as suggested by Muraven *et al.* (2006), under certain conditions—such as prolonged demands—even individuals with high self-efficacy may eventually experience depletion due to cumulative effort. Thus, the relationship may be moderated by self-regulatory capacity and task demands, echoing the "strength model" of self-control (Baumeister *et al.*, 1998).

Most importantly, the mediation analysis revealed that self-efficacy partially mediated the pathway from self-identity to self-depletion. This indicates that self-identity not only directly reduces self-depletion but also does so indirectly by strengthening self-efficacy. This mediating mechanism is supported by social cognitive theory (Bandura, 1986), which posits that self-perceptions influence behavior through cognitive and motivational pathways. Our results are also in line with empirical work such as that by Holden *et al.* (2020), who found self-efficacy to mediate between self-concept and adaptive outcomes. Similarly, a longitudinal study found that self-identity foreshadows self-regulatory capacity through enhanced perceived competence.

Nevertheless, the partial mediation suggests that other

Table 1: Correlation matrix of variables (N = 256)

Variables	Mean ± SD	Gender	Age	Academic year	Self-identity	Self-efficacy	Self-depletion	Cognitive	Behaviora	Emotional
Gender	1.49 ± 0.50	-	-0.09	0.07	0.08	0.08	-0.06	-0.06	-0.03	-0.08
Age	20.46 ± 1.15	-0.09	-	-0.01	0.04	0.05	0.01	-0.02	-0.023	0.17**
Academic year	2.51 ± 1.31	0.07	-0.01	-	0.02	-0.02	-0.09	0.07	-0.02	-0.02
Self-identity	44.99 ± 4.57	0.08	0.04	0.02	-	0.63**	-0.69**	0.09	-0.82**	-0.32**
Self-efficacy	2.63 ± 0.87	0.08	0.05	-0.02	0.63**	-	-0.56**	-0.31**	0.53**	0.29**
Self-depletion	51.41 ± 6.55	-0.06	0.01	-0.09	-0.69**	-0.56**	-	0.26**	0.86**	0.56**
Cognitive	17.85 ± 2.07	-0.06	-0.02	0.07	0.09	-0.31**	0.26**	-	-0.06	-0.03
Behavioral	18.34 ± 5.17	-0.03	-0.03	-0.02	-0.82**	0.53**	0.86**	-0.06	-	0.37**
Emotional	15.65 ± 2.06	-0.08	0.17* *	-0.02	-0.32**	0.29**	0.56**	-0.03	0.37**	-

Correlations significant at $P < 0.05$ (two-tailed). **, $P < 0.01$ (two-tailed). SD, standard deviation.

Table 2: Mediating role of self-efficacy in the relationship between self-identity and self-depletion model

Predictor Variables	Model 1		Model 2		Model 3	
	β	t	β	t	β	t
Self-identity	-0.992***	-15.292***	0.118***	12.763***	-0.812***	-9.990***
Self-efficacy	-	-	-	-	-1.521***	-3.543***
R	0.692		0.625		0.710	
R ²	0.479		0.391		0.504	
F	233.837***		162.900***		128.514	

***, $P < 0.001$. Model 1: Self-identity → self-depletion. Model 2: Self-identity → self-efficacy. Model 3: Self-identity → self-efficacy → self-depletion.

Table 3: Mediating effect of self-efficacy in the relationship between self-identity and self-depletion

Model (self-identity → self-efficacy → self-depletion)	Effect size	Standard error	t	95% bootstrap confidence	
				Lower limit	Upper limit
Total effect	-0.992	0.065	-15.292***	-0.864	-1.120
Direct effect	-0.812	0.081	-9.990***	-0.625	-0.972
Indirect effect	-0.180	0.056	-	-0.075	-0.300
Proportion of direct effect	81.85%				
Proportion of indirect effect	18.15%				

***, $P < 0.001$

psychological mechanisms may also be at play. For example, identity may influence self-depletion through emotional regulation (Gross, 2015)—noting the established link between mood and self-efficacy (Kavanagh & Bower, 1985)—or social support (Cohen & Wills, 1985), which warrants further investigation. In conclusion, this study underscores the importance of self-identity and self-efficacy as protective factors against self-regulatory depletion among university students. These findings contribute to the growing body of literature integrating identity theory with models of self-control and social cognitive frameworks. Future studies may further explore boundary conditions, such as cultural context (Markus & Kitayama, 1991; Yeh & Bedford, 2003) or personality factors.

These results support this notion by demonstrating that a clear and stable self-identity enhances individuals' confidence in their abilities, thereby increasing self-efficacy. This aligns with research focusing specifically on Chinese university students, which has explored factors influencing identity formation (Yang, 2007; Zhang & Wen, 2011) and strategies for its cultivation (Lv & Liu, 2015). Similarly, the role of self-efficacy in academic settings is a significant topic within this context (Liu & Kong, 2017; Zhou & Guo, 2006).

PRACTICAL IMPLICATIONS AND FUTURE DIRECTIONS

The findings of this study offer significant practical

value. First, for university educators and mental health practitioners, the results suggest that interventions focused solely on time management or stress-coping skills may be insufficient to fundamentally address student ego depletion. It is crucial to also design and implement programs aimed at fostering self-identity exploration. Activities such as group counseling, career planning workshops, and reflective writing exercises can help students clarify their personal values and future goals. Second, enhancing self-efficacy is a key lever for protecting psychological resources. Self-efficacy can be systematically cultivated by creating challenging yet achievable tasks within the "zone of proximal development," providing timely and constructive feedback, and presenting relatable role models (Lent *et al.*, 1994). Such interventions could not only mitigate academic burnout but also bolster students' psychological resilience in the face of setbacks.

Future research could extend these findings in several ways. A longitudinal design would be valuable for examining the dynamic causal relationships among self-identity, self-efficacy, and ego depletion over time. Additionally, future studies could explore other potential mediators (*e.g.*, emotion regulation strategies) or moderators (*e.g.*, social support). Finally, incorporating neuroscientific methods, such as functional magnetic resonance imaging, could help uncover the neural mechanisms underlying these psychological processes, providing deeper evidence for theories of self-regulation.

CONCLUSIONS

This study provides an in-depth examination of the mediating role of self-efficacy in the relationship between self-identity and self-depletion among university students. The results demonstrate that self-identity positively predicts self-efficacy, indicating that a stable and clear perception of one's traits, abilities, and social roles enhances confidence in handling diverse life challenges. Furthermore, self-identity significantly negatively predicts self-depletion, suggesting that a well-defined identity helps sustain motivation and self-control while reducing unnecessary expenditure of self-regulatory resources. Additionally, self-efficacy serves as a negative predictor of self-depletion, implying that individuals with stronger efficacy beliefs manage psychological resources more efficiently and experience less fatigue under stress. Critically, self-efficacy partially mediates the relationship between self-identity and self-depletion: Self-identity not only directly reduces self-depletion but also does so indirectly through enhancing self-efficacy. These findings highlight the importance of fostering self-identity and self-efficacy as key psychological resources in mitigating self-regulatory depletion and promoting mental health among university students.

DECLARATION

Author contributions

Fang HJ contributed solely to the article.

Source of funding

This research received no external funding.

Ethical approval

Not required.

Informed consent

Before starting, all participants were presented with an electronic informed consent form that detailed the study's objectives, the voluntary nature of their participation, and assurances of anonymity and confidentiality. Only those who agreed to the terms could proceed.

Conflict of interest

The author has no conflicts of interest to declare. The article was subject to the journal's standard procedures, with peer review handled independently of the editor and the affiliated research groups.

Use of large language models, AI and machine learning tools

No AI tools were used.

Data availability statement

No additional data.

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