



# The mediating roles of academic self-efficacy and academic emotions in the relation between basic psychological needs satisfaction and learning engagement among Chinese adolescent students



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## ABSTRACT

A sample of 605 junior school students in China was examined by using a Basic Psychological Needs Satisfaction Scale, an Academic Self-efficacy Scale, an academic emotions scale, and a Learning Engagement Scale to explore the relations among competence, autonomy, and relatedness satisfaction, academic self-efficacy, positive and negative academic emotions, and learning engagement. The findings showed that under mutual control between the three kinds of needs satisfaction, the direct prediction of competence and relatedness satisfaction on learning engagement were significant, but autonomy satisfaction was not; academic self-efficacy and positive academic emotions could mediate the relations between both competence and relatedness satisfaction to learning engagement; negative academic emotions could only mediate the relation of relatedness satisfaction, but not of competence satisfaction, to learning engagement; both competence and relatedness satisfaction had positive prediction on learning engagement through academic self-efficacy via positive/negative academic emotions in a multiple mediating way. Educators and relevant researchers are suggested to be aware of the cultural difference in the roles of basic psychological needs satisfaction under different learning contexts, especially autonomy satisfaction.

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## 1. Introduction

The Programme for International Student Assessment (PISA) has included learning engagement as one of the indicators that reflects the quality of school education, and Chinese educators have recognized the importance of student engagement in the reform of elementary education curriculum (Lu, 2009). Learning engagement can be conceptualized as a three-dimensional construct (i.e., behavioral, affective, and cognitive elements) that underlie students' connectedness to academics (Appleton, Christenson, & Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004; Fredricks & McColskey, 2012). It has been well-documented that students with a higher level of learning engagement are inclined to have higher academic achievement (Carter, Reschly, Lovelace, Appleton, & Thompson, 2012; Lin, Wang, Zhang, & Zhou, 2009; Salanova, Schaufeli, Martínez, & Bresó, 2010), healthier mental health status (Steele & Fullagar, 2009), and lower dropout rates or fewer incidents of misconduct (Saeki & Quirk, 2015; Wang & Fredricks, 2014). Therefore, Chinese

educators now place more emphasis on learning engagement in educational practice and evaluation because of its key role in predicting positive academic outcomes and adaptive behaviors (Chen, Guo, & Hu, 2015). The purpose of the present study was to examine the factors that inspire students to engage in learning activities, and how the engagement process works.

### 1.1. Basic psychological needs satisfaction and learning engagement

Basic psychological needs satisfaction is one of the salient factors that are closely associated with learning engagement (Wilson et al., 2012; Yu, Li, & Zhang, 2015). Self-determination theory (SDT) posits that competence, autonomy, and relatedness are the three basic psychological needs that affect a variety of individuals' adaptive behaviors and psychological outcomes (Ryan & Deci, 2000). Students' perception of the three basic psychological needs satisfaction are positively associated to the levels of academic well-being and school engagement (Niemiec & Ryan, 2009). Learning behaviors occur in a certain learning environment; when feel competent, autonomous, and connected to the environment, students' intrinsic motivation can be activated to propel them to engage in academic tasks and to achieve higher performance (Sansone & Harackiewicz, 2000).

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### 1.2. Academic self-efficacy and learning engagement

Academic self-efficacy is another important factor that fosters learning. Previous researchers have suggested that students with a high level of academic self-efficacy tend to have a higher level of engagement in learning (Caraway, Tucker, Reinke, & Hall, 2003), whereas those with a low level show more indifference in class (Bassi, Steca, Fave, & Caprara, 2007). This may lie in the motivational function of academic self-efficacy. Academic self-efficacy refers to one's confidence in his/her abilities to accomplish certain academic tasks, and it can be considered as a motivational force (Bandura, Freeman, & Lightsey, 1999). Students who experience a greater sense of academic self-efficacy will be motivated to use more learning strategies and improve cognitive competency (Pajares, 1996), and are more likely to put forth effort and be persistent in the presence of learning challenges (Wright, Jenkins-Guarnieri, & Murdock, 2012). Thus, they demonstrate greater engagement through behavioral manifestations that are necessary to attain specific academic goals.

### 1.3. Academic emotions and learning engagement

While previous studies emphasized the possible effects of motivational factors, including basic psychological needs satisfaction and academic self-efficacy, the role of emotional factors has received relatively less attention. The broaden-and-build model from Fredrickson (2001) has proposed that learning-related positive emotions such as pride and enjoyment can broaden the scope of individuals' cognition and activities, and help to envision goals and challenges and to open the minds to positive thoughts (Fredrickson & Branigan, 2005). Positive academic emotions can help individuals to actively search out learning opportunities and resources, and foster greater persistence and effort (Pekrun, Goetz, Titz, & Perry, 2002a, 2002b), which make students feel more engaged in learning (Reschly, Huebner, Appleton, & Antaramian, 2008). Conversely, students with negative academic emotions, such as anxiety and boredom, are inclined to focus on threats, which will limit the cognitive resources that are necessary to learning activities (Derakshan, Smyth, & Eysenck, 2009). Thus, learning-related negative emotions can pose a negative influence on students' cognition and behaviors (Owens, Stevenson, Hadwin, & Norgate, 2014) that will further hinder students' learning engagement (Putwain, Sander, & Larkin, 2013). In short, academic emotions might be an important factor for learning engagement; positive academic emotions play a propelling role whereas negative academic emotions play the opposite role.

### 1.4. Basic psychological needs satisfaction, academic self-efficacy, and academic emotions

The extant literature has indicated the potential prediction of the three factors mentioned above on students' learning engagement; however, there might be a combined relation between the three factors. Fulfillment of basic psychological needs might be a far-end factor that predicts learning engagement by means of some proximal motivational factors, such as academic self-efficacy. When an individual feels autonomous and self-determined in an activity, he tends to make internal attribution and perceive high sense of control over his behaviors; fulfillment in competence need enhances one's belief in accomplishing a task, thus promoting self-efficacy; as satisfaction in relatedness implies that students enjoy others' caring and support when tackling problems, one's confidence in solving problems will be boosted and self-efficacy enhanced (Ryan & Deci, 2000). Specifically, by satisfying students' needs for autonomy, relatedness, and competence, students are encouraged to utilize each possible opportunity to explore learning tasks; then they are more likely to demonstrate academic readiness skills and to interact with the learning environment more effectively (Deci & Ryan, 2000) by exhibiting a high

level of academic self-efficacy (Diseth, Danielsen, & Samdal, 2012). Once students' academic self-efficacy has been inspired with regard to its priming effects on strategy usage, learning efforts, and persistence (Wigfield, Battle, Keller, & Eccles, 2002; Zimmerman & Schunk, 2006), academic self-efficacy will inevitably benefit learning engagement (Deci & Ryan, 2002). Therefore, it is possible that basic psychological needs satisfaction can predict learning engagement through academic self-efficacy.

Moreover, studies have found that domain-specific needs fulfillment is associated with positive emotions and well-being (Baard, Deci, & Ryan, 2004; Milyavskaya & Koestner, 2011), and SDT also emphasizes the importance of basic psychological needs for elevating positive emotions and inhibiting negative emotions (Deci & Ryan, 2002). Within an educational setting, positive academic emotions can help students to envision goals and challenges, expand the mind to thoughts and problem solving, and lay a foundation for students' self-regulation processes (Diamond & Aspinwall, 2003; Pekrun et al., 2002a, 2002b), and hence lead to students' involvement in terms of learning courses and career aspirations (Wigfield et al., 2002). However, negative academic emotions will do harm to students' enthusiasm and cognitive resources invested into learning activities (Derakshan et al., 2009), which might further result in disengagement or school dropout (Ouweneel, Le Blanc, & Schaufeli, 2014). Taken together, basic needs satisfaction may predict learning engagement indirectly through both positive and negative academic emotions.

More importantly, academic self-efficacy may have prediction on learning engagement through academic emotions. Control-value theory (Pekrun & Perry, 2014) considers academic self-efficacy as a fundamental element in the appraisal of learning-related situations as threats or challenges for the arousal of different academic emotions. Therefore, students might have a better sense of control over learning activities when they attribute positive academic outcomes to controllable efforts, leading to positive academic emotions such as enjoyment and pride (Goetz, Frenzel, Hall, & Pekrun, 2008). However, students who feel incapable to change learning outcomes are more likely to experience negative academic emotions such as anxiety, boredom, and fatigue (King & Gaerlan, 2014). Different types of learning-related emotions will then promote or impede learning involvement as previously mentioned (Reschly et al., 2008; Wigfield et al., 2002), suggesting the mediation role of academic emotions between academic self-efficacy and learning engagement.

### 1.5. The current study

Several theoretical frameworks have been validated to describe the relations among competence, autonomy, and relatedness satisfaction, academic self-efficacy, academic emotions, and learning engagement. However, the predictive sizes in the theories that focused on learning engagement have not been evaluated rigorously. Moreover, previous studies have not examined positive and negative academic emotions simultaneously to achieve a comprehensive understanding of the different roles of academic emotions on two aspects in learning engagement. Based on the self-determination theory (SDT, Ryan & Deci, 2000), broaden-and-build model (Fredrickson, 2001), and control-value theory (Pekrun & Perry, 2014), this study proposed the following hypotheses:

- H1.** Competence, autonomy, and relatedness satisfaction will have direct prediction on learning engagement.
- H2.** Academic self-efficacy will mediate the relations between competence, autonomy, relatedness satisfaction, and learning engagement.
- H3.** Academic emotions (positive and negative aspects) will mediate the relation between competence, autonomy, relatedness satisfaction, and learning engagement.

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