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Investigating the Relationships between Middle School Students' Motivational Factors and English Proficiency Based on Self-Determination Theory

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Abstract: *Motivation is a critical factor for predicting learners' academic achievement. Based on Self-Determination theory, the current study investigated the relationship between Chinese middle school English language learners' motivational variables for learning English and their English proficiency. Research results showed that students' autonomous motivation was a stronger predictor for students' perceived autonomy support and students' psychological need satisfaction than students' controlled motivation. Additionally, both students' autonomous motivation and controlled motivation were significantly linked to students' self-efficacy and students' classroom engagement, which in turn predicted students' English proficiency. However, contrary to previous studies, students' perceived autonomy support was not a significant predictor for explaining the extent of students' psychological need satisfaction.*

Keywords: *Self-Determination Theory; Learning Engagement; English Self-Efficacy; Middle School Students; English Proficiency*

1. Introduction

Students' motivation for learning is not directly associated with their academic achievement[1][2]. In school settings, compared with students' who have low motivation for learning, students who have high motivation for learning are likely to learn more, show greater interest in learning, demonstrate better self-regulatory ability to learn, and achieve better academic results[2]. For this reason, instead of directly looking at the relationship between students' motivation for learning and their academic achievement, it may be more reliable and valid to examine the predictive power of students' motivational variables[3].

In the field of second language acquisition, students' motivation for learning a language has also turned out to be an important factor for predicting students' language academic achievement[4][5][6]. Although prior studies have provided much information about students' motivation for learning a language, less is known about Chinese middle-school English language learners' motivation for learning English as a foreign language in China.

Based on self-determination theory, this study was to investigate how Chinese middle school English language learners' motivation (i.e., autonomous motivation, controlled motivation) contributed to explain their English academic achievement. Additionally, we further examined how psychological constructs of students' perceived autonomy support (e.g., English teachers provide me with learning options in English class.), students' psychological need satisfaction (i.e., I feel that I am learning what I want to learn in English class), classroom engagement (e.g., students actively participate in instructional activities), and their English self-efficacy (e.g., I feel I am good at English writing) mediated the relationship between students' motivation for learning English and English academic achievement.

2. Self-Determination Theory

This study was framed upon self-determination theory (SDT)[7][8][9][10] and its assumptions about autonomous and controlled motivational regulations. With respect to the perceived motives that drive people to act, Ryan and Deci identified several types of motivational regulations differing in dimensions of regulatory styles, loci of causality, and relevant regulatory processes.

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2.1. Controlled Motivation

In SDT, controlled motivation consists of external motivational regulation and introjected motivational regulation. As for external motivational regulation, one may perform a task in order to obtain rewards. At this stage, people feel least autonomous. When one is regulated by introjected motivational regulation, he/she may feel guilty or anxious if he/she does not perform the task (e.g., a student may feel guilty and anxious if he/she does not follow his/her parents' advice to work hard on math). At this stage, although one may have developed a small amount of autonomy, "introjected behaviors still have an external perceived locus of causality and are not really experienced as part of the self" [8].

2.2. Autonomous Motivation

Autonomous motivation reflects internalized externally-controlled reasons or values which are important to people and become personal meaningful. When one is regulated by autonomous motivation for performing a task, one engage in a behavior initiated by the self, because one feels more self-determined[10]. Autonomous motivation consists of identified motivational regulation, integrated motivational regulation, and intrinsic motivation. As for identified motivational regulation, one may perform a task as the task itself is important. Integrated motivational regulation reflects a moving toward intrinsic motivation but is still considered as extrinsic motivation. Intrinsic motivation represents the most self-determined and autonomous behavior.

Prior studies have shown that students' autonomous motivation is often related to positive learning outcomes, whereas students' controlled motivation is often associated with negative learning outcomes[11]. To be specific, compared with students' controlled motivation, students' autonomous motivation is often associated with positive learning outcomes such as greater persistence and effort[12], higher academic self-efficacy[13], stronger perceptions of autonomy, competence, and relatedness support from learning environments[14][15], better classroom engagement[11], and higher levels of academic achievement[11][16].

3. Interactions among Students' Perceived' Autonomy Support, Psychological Need Satisfaction, Classroom Engagement, and Their Learning Self-Efficacy

In the following, we continued to discuss the relationships among students' perceptions of teachers' autonomy support, psychological need satisfaction, classroom engagement, and their learning self-efficacy.

3.1. Students' Perceived Autonomy Support & Psychological Need Satisfaction

Ryan and Deci proposed that peoples' behavior results from three basic innate psychological needs, and satisfaction of these needs is critical for the development of self-determined motivation. According to SDT, the three types of inner needs that will enhance one's intrinsic motivation, self-regulation (i.e., the ability to control one's impulses and to stop doing something), and well-being (i.e., a state characterized by health or happiness), include competence, autonomy, and relatedness[7][8].

The need for competence refers to the need to have skills for taking control of the environment[17]. The need to feel competent and be competent is critical for individuals to interact with other people, with activities, and with the broad environment[2]. The need for autonomy refers to the need to have a sense of agency in interacting with the larger context. In other words, people may have a basic psychological need for feeling and being autonomous in their interactions with the environment. The need for relatedness refers to one's desire to interact with other people, to maintain close and affectionate relationships with other people[18][7].

In general, research has shown that when one's three psychological needs are satisfied, he/she has more positive functioning[8], and contexts that satisfy one's psychological needs have been shown to improve motivation for performing a task compared to contexts that thwart satisfaction of these needs[8]. Among the three basic psychological needs, learners' sense of agency or perceived autonomy is critical for learning[19]. One's feelings of competence and relatedness will not enhance intrinsic motivation unless they are accompanied by a sense of autonomy[8]. In school settings, compared to students with low levels of perceived autonomy, students who demonstrate high levels of perceived autonomy are more likely to

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obtain positive educational outcomes including enhanced engagement in learning tasks[20][21], greater intrinsic motivation[22][23][24][25], and greater perceived competence[25].

3.2. Students' Classroom Engagement

In school settings, engagement refers to the degree of a student's active involvement in instructional activities[26]. Students' classroom engagement is a personal construct that may predict learning outcomes; meanwhile, it may reveal students' underlying motivation[11]. Prior studies have shown that students' engagement in learning could predict their academic performance and achievement[11][26]; at the same time, it is also viewed as an important indicator of students' underlying motivation during instruction[11][27].

3.3. Students' Learning Self-Efficacy

According to Bandura, "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of actions required to produce given attainments" [28]. In school settings, students who feel more self-determined in learning are likely to have less learning anxiety, more positive attitudes toward learning, and higher self-efficacy[29][30].

As for the relationship between self-efficacy and engagement, Bandura stressed that when individuals have high self-efficacy perceptions, they are more likely to engage in tasks that facilitate the development of capabilities and skills than individuals whose self-efficacy is low. Prior studies have indicated that high levels of self-efficacy can instigate and sustain task engagement[31].

By and large, studies using SDT has shown that, compared to students who are motivated by controlled motivation for learning a language, students who are motivated by autonomous motivation are likely to achieve positive academic outcomes, including better learning engagement[32][23], stronger perceptions of autonomy-, competence-, and relatedness-support from learning environments[15], higher sense of language self-efficacy[23][30], and higher language proficiency[23][30].

Based on the above literature review results, we proposed a path model addressing the following research questions:

1) Do students' perceived autonomy support, psychological need satisfaction, classroom engagement, and English self-efficacy mediate the relationship between students' autonomous motivation and English proficiency?

2) Do students' perceived autonomy support, psychological need satisfaction, classroom engagement, and English self-efficacy mediate the relationship between students' controlled motivation and English proficiency?

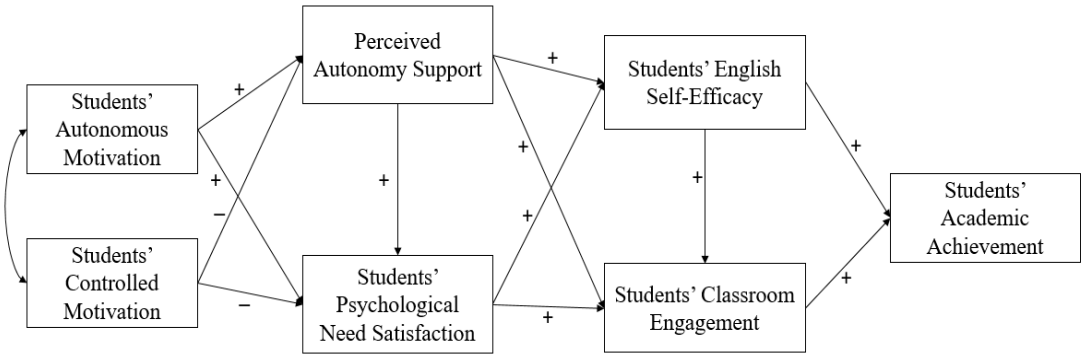

Figure 1. Proposed path model

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4. Method

4.1. Participants and Procedures

This study was conducted in a public middle school located in a medium-sized city in Anhui Province. Surveys were created by using an online survey tool of Qualtrics. A total of 418 middle-school English language learners completed the survey. Table 1 and 2 provided descriptive information about variables in this study.

Table 1 Descriptive Statistics of key Variables (n=418)

Variables	Minimum	Maximum	Mean	SD
1. Students' Autonomous Motivation	2.00	5.00	3.79	0.60
2. Students' Controlled Motivation	1.00	5.00	2.91	0.73
3. Students' Perceived Autonomy Support	1.50	5.00	3.78	0.61
4. Students' Psychological Need Satisfaction	1.60	5.00	3.29	0.64
5. Students' Classroom Engagement	1.50	5.00	3.29	0.59
6. Students' English Self-Efficacy	1.33	11.00	7.45	1.71
7. Students' Academic Achievement	2.00	11.00	7.17	1.48

Table 2 Correlations Matrix of the Key Variables in the Model

Variables	1	2	3	4	5	6	Number of Items	Cronbach's Alpha
1. Students' Autonomous Motivation	—						12	0.95
2. Students' Controlled Motivation	0.36**	—					15	0.92
3. Students' Perceived Autonomy Support	0.32**	0.15**	—				6	0.89
4. Students' Psychological Need Satisfaction	0.50**	0.28**	0.52**	—			15	0.94
5. Students' Classroom Engagement	0.51**	0.39**	0.47**	0.76**	—		17	0.96
6. Students' English Self-Efficacy	0.37**	0.44	0.11**	0.35**	0.37**	—	24	0.98

***p < .001*

4.2. Instruments

The surveys were composed of statements that elaborate students' perceptions, feelings, and beliefs about their English learning experience. Participants were asked to respond to each statement with their level of agreement.

Students' autonomous and controlled motivation. To measure students' autonomous and controlled motivation, they were asked to complete an adapted version of Noels et al.'s[24] Language Learning Orientation Scale–Intrinsic Motivation, Extrinsic Motivation, and Amotivation Subscales (LLOS-IEA) and Wong and Liu's[33] survey of students' perceived parental supports for a hospitality and tourism (H&T) career. Therefore, we adapted Wong and Liu's[33] survey to further examine middle school students' controlled motivation for learning English in China. For example, an item that was used to assess students' perception of parental supports to the H&T career is, "I perceive my parents have a positive attitude towards the hospitality and tourism industry." We revised this item to be, "I perceive my parents have a positive attitude towards learning English."

Students' perceived autonomy support. We assessed students' perceived autonomy support by asking them to complete an adapted version of the six-item short version of the Learning Climate Questionnaire (LCQ)[34]. The short version of LCQ has been widely used to measure students' perceptions of autonomy support in classroom[35]. The adapted version was used to assess students' perceived autonomy support

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in middle school English class. For example, we revised one item to be, "my English teacher conveys confidence in my ability to do well in English".

Students' psychological need satisfaction. Items about measuring students' psychological need satisfaction were developed based on Reeve and Sickenius'[36] the Activity-Feelings States (AFS). The original AFS[36] scale was used to assess people's perceived autonomy, competence, relatedness, and tension they experienced and felt in the process of solving SOMA puzzles. In the present study, the construct of tension was not included, as based on Ryan and Deci, tension is not a psychological need. The adapted scale was used to assess students' perceived autonomy, perceived competence, and perceived relatedness in English class. Items were modified to satisfy the need of this study. For example, we changed the stem to be, "during English class". Another example, an item that was used to measure students' perceived autonomy is, "I am doing what I want to be doing". We changed the item to be, "I feel that I am learning what I want to learn".

Students' classroom engagement. Students' classroom engagement scale was adapted from Reeve and Tseng's[37] study on students' engagement during learning activities. The items that were used in Reeve and Tseng's[37] study originally measured high school students' classroom engagement. We revised the items by focusing on the context of learning English as a foreign language. For example, an item that was used to measure students' behavioral engagement is, "I try very hard in school". We adjusted the item to be, "I try hard to do well in English class".

Students' English self-efficacy. Items that measure students' English self-efficacy was adapted from Torres and Turner's[38] Foreign Language Self-Efficacy Scale (FLSES). The original scale was to assess students' self-perceived competence in foreign language skills including listening, speaking, reading, and writing. In the present study, items were revised to measure students' self-efficacy in learning English as a foreign/second language. For example, there was an item measuring about students' self-efficacy in foreign language writing, "write your teacher an email in the foreign language". We changed it to be, "write my teacher an email in English".

Students' English academic achievement. To assess students' academic achievement, I asked students' to report their final English course grade on an 11-point scale.

5. Results

Based on literature review results, we proposed that students' perceived autonomy support, students' psychological need satisfaction, students' English self-efficacy, and their classroom engagement all functioned as mediators between the relationship of students' motivation for learning English and their English academic achievement. In other words, as shown in figure 1, students' autonomous motivation may be directly and positively related to students' perceived autonomy support and students' psychological need satisfaction. In contrast, students' controlled motivation may be directly but negatively associated with students' perceived autonomy support and students' psychological need satisfaction. Students' perceived autonomy support may predict their psychological need satisfaction. Students' perceived autonomy support and their psychological need satisfaction may be positively associated with students' English self-efficacy and classroom engagement which may directly predict students' English academic achievement. Additionally, students' English self-efficacy may predict their classroom engagement during instruction.

With respect to determining a minimum sample size for conducting a structural path analysis, Boomsma suggested that a sample size of 200 is considered as the minimum for structural equation models[39][40]. In this study, the hypothesized model including 20 parameters was examined with a sample of 418, resulting in a sample size to estimated parameter ratio of 15, which exceeded the recommended ratio of 10[41].

We tested the proposed model using Mplus (version 8.0; Muthén & Muthén, 2004)[42] with maximum likelihood estimator. As shown in Table 3, although other fit indexes supported the proposed model, chi-square test results did not show a good fit ($\chi 2(8) = 88.40$, $p = 0.00$; Table 3). After evaluating analysis results and relevant theories, we came up with a revised model by adding one direct path from students' autonomous motivation to students' English self-efficacy and one from students' autonomous motivation to students' classroom engagement (Figure 2). Additionally, we also added one direct path from students' controlled motivation to students' English self-efficacy and one from students' controlled motivation to students' classroom engagement. We added a direct path from students' psychological need satisfaction to students' academic achievement.

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Table 3 Fit Evaluation of Models

Models	*Fit Indices*					
	Chi-Square	*df*	*CFI*	*TLI*	*SRMR*	*RMSEA*
Proposed Model	88.40	8	0.83	0.57	0.10	0.20 (0.16~0.24)
Revised Model	5.46	7	1.00	1.01	0.02	0.00 (0.00~0.06)

***p < .001.*

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; SRMR = standardized root mean square residual; RMSEA = root mean squared error of approximation.

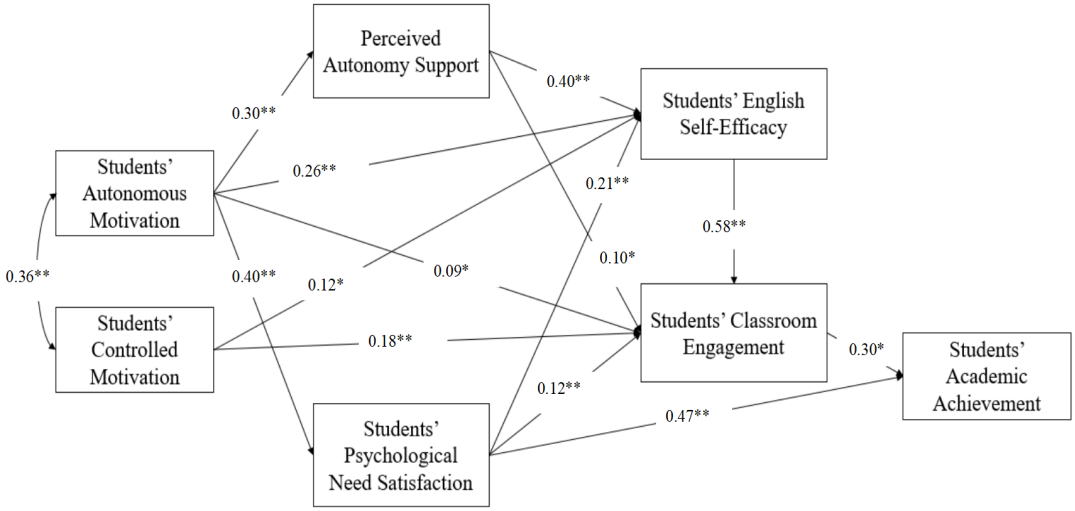

Figure 2. Standardized parameter estimates for final model

Based on fit indexes and literature, we removed the path from students' controlled motivation to students' perceived autonomy support and the path from students' controlled motivation to students' psychological need satisfaction. We also removed the path from students' perceived autonomy support to students' psychological need satisfaction and the path from students' English self-efficacy to students' academic achievement. The results showed that the revised model demonstrated a good fit to the data on the basis of goodness of fit indexes ($\chi 2(7) = 5.46$, $p = 0.60$; RSMEA = 0.00; CFI = 1.00; TLI = 1.01; SRMR = .02; Table 3). All model parameter estimates were significant at $\alpha = .05$.

6. Discussion and Conclusion

The above data analysis results (figure 2) showed that students' perceived autonomy support, students' psychological need satisfaction, students' English self-efficacy, and students' classroom Engagement fully medicated the effect of both students' autonomous and controlled motivation on their English academic achievement. This finding was aligned with literature, as motivation suggests the antecedent of actions rather than academic achievement itself [1] and it is not directly related to students' academic achievement. Research findings of this study also showed that compared with students' controlled motivation, students' autonomous motivation was directly associated with students' perceived autonomy support and students' psychological need satisfaction. This finding supported literature in that students' learning autonomy was directly and positively associated with their intrinsic motivation[22][23][24][25], and that students' psychological need satisfaction was critical for enhancing and sustain students' intrinsic motivation for learning[7][8]. However, different from literature, in this study, students' perceived autonomy support could not predict students' psychological need satisfaction. This may be because a longitudinal research design may be reliable to test the effect of teachers' autonomy support on students' psychological need satisfaction.

In this study, both students' autonomous and controlled motivation were directly associated with students' self-efficacy and students' classroom engagement. The findings supported literature, as students who are motivated by autonomous motivation are more likely to achieve positive academic outcomes including better classroom engagement[23][32] and higher sense of language self-efficacy[23][30] than students who are regulated by controlled motivation. However, different from literature, students' controlled motivation was also positively associated with students' English self-efficacy and students' classroom engagement. This may be because students in Chinese collectivist culture may view the

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introjected motivational regulation of parental involvement as an important externally-controlled reason or value for learning English as a foreign language. To be specific, these Chinese undergraduate English learners who learned English primarily because of controlled motivation, especially parental suggestions, may also actively engage in instructional activities, develop high sense of efficacy in learning English, and consequently, achieve academic success.

Self-Determination Theory[7][8][43] provided the theoretical framework for us to investigate Chinese undergraduate English learners' motivation for learning English as a foreign language and learning outcomes. Findings of this study deepened our understanding of students' motivation for learning a language by showing how students' initial reasons for learning a language affected their psychological process of learning and language proficiency.

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