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Developing a self-determination motivation scale for English learners with Chinese background

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“Interest” is one of the most important factors that trigger English learning behavior, and self-determination theory believes that “interest” and “value” are important factors associated with target behavior. Therefore, the purpose of this study is to construct and establish a “Self-Determination Motivation Scale of English Learners” based on the core concept of self-determination theory, which encompasses the three innate needs. There were 169 participants, all university students from various majors with Chinese backgrounds, who were taking English classes at a university. The research tool is extracted from the Learning Climate Questionnaire (LCQ) (six questions on autonomy), perceived competence for learning (PCS) (four questions on competence), and basic psychological needs (BPN) in general (eight questions on relatedness) and developed an 18-item questionnaire. The data were obtained from the existing three different self-determination questionnaires and analyzed using confirmatory factor analysis (CFA). The results show that after CFA, 15 items of the scale, which were extracted from the existing three different self-made questionnaires, were maintained, and the removed three items are all reverse items. The reliability of the developed 15-item scale is 0.95. The conclusion is that the developed 15-item scale is more suitable for university English learners with a Chinese background, although the existing three different self-determination questionnaires are still valid and reliable. Three suggestions for future research include adding expert validity for item review, adjusting the number of reverse items, and having more participants to master the scale. The implications, limitations, and future research plans are presented in this paper.

KEYWORDS

SDT, English learning motivation, scale development, EFL, higher education

1 Introduction

Self-learning is becoming increasingly important in higher education when applying artificial intelligence (AI) in education. Self-learning also plays a role that cannot be overlooked in English language education. If the level of student’s self-determination is proven to impact education significantly, then the self-determination theory which emphasizes the interest of individuals and the value behind the learning behaviors can also apply to English language learning. [Gou and Okita \(2001\)](#) and [Wen \(1997\)](#) identified that learning motivation is vital in teaching a second language. Furthermore, learning motivation is a significant factor in the effectiveness of language learning. [Gardner and Tremblay \(1995\)](#) found that second language achievement positively correlates with motivation. [Brown \(2014\)](#)

emphasized the importance of intrinsic motivation in second language learning in the book titled *Principles of Language Learning and Teaching*. This study encourages cultivating students' intrinsic motivation rather than extrinsic motivation to induce students' learning desires. This is because behaviors with strong intrinsic motivation are more likely to produce self-directed learning (Deci and Ryan, 1985). Based on the self-determination theory developed by Deci and Ryan, it provides contemporary English language learners with the opportunity to make self-determined choices. The self-determined choices can fully meet their personal interests and needs while building self-efficacy, value, and the value behind learning goals, inducing behavioral motivation more effectively (Chiang, 2011). To transform external motivation into internal motivation with a high degree of self-determination, the ideal approach is to meet the basic learning needs of students, enabling them to become interested in learning English from the heart (Wang and Reynolds, 2024; Wang and Wang, 2024). Compared to the traditional passive English education method, self-directed English language learning inspired by the internal motivation to meet the basic needs of learners can have a long-term effect. As such, learners are generally more able to continue learning, which verifies the importance of the self-learning theory in English education. However, the present self-determination-related studies tend to apply the theory on healthcare (Resnicow et al., 2022), medical care (Ntoumanis et al., 2021), and disabilities (Hansen et al., 2023) to help people with dissatisfaction in a variety of needs recover themselves. The same goes for physical education. The theory has mildly touched upon education such as physical education (Adefila et al., 2020; Saugy et al., 2020; Vasconcellos et al., 2020) is because the theory is arguably helpful in athleticism and health. On the other hand, the theory has not adequately emphasized English learning and there is deprivation in the specific self-determination motivation scale for English learners.

Based on the above, the objectives of this study are as follows:

1. To analyze the relationship between self-determination motivation and English learning motivation.
2. To develop a self-determination motivation scale for English learners.

2 Literature review

2.1 Motivation for English learning

Based on motivational concepts for learning English, Liang and Lai (2003) suggest that learning motivation is the basis of learning behaviors that support the motivation and direction of a learner's behavior. This affects their persistence, commitment, learning achievement, autonomy, and enthusiasm.

Gardner and Lambert (1972) used foreign language learning motivation to suggest that if learners have a high level of learning motivation, their willingness to learn, and their learning experiences will increase. Furthermore, individuals can gain a sense of accomplishment and become more willing to participate in second language learning activities. The authors also examined the main aspects of language learning motivation, including motivation intensity, desire for language learning, and attitude toward language learning through scales.

Hong (2012) summarized the motivation of foreign language learning into two parts: extrinsic and intrinsic motivation. Extrinsic motivation refers to an individual's engagement in foreign language learning activities to obtain external material and social rewards or to avoid punishment. In contrast, intrinsic motivation refers to an individual's engagement in a foreign language learning activity because the activity is interesting and satisfying as the main reason. This is due to the internal motivation of the self to engage in the activity.

Zhang (1996) proposed that motivation can maintain activities that have already been instigated and guide the internal process of the activity toward a specific goal. Motivation is formed according to its origin and classification and is easily affected by external environmental factors, i.e., "extrinsic motivation." However, when it relates to intrinsic needs, it is referred to as "intrinsic motivation." To promote better academic performance, Deci and Ryan (2000a,b) found intrinsic motivation to be a natural motivational tendency that increases knowledge and skills according to human intrinsic interests. Furthermore, extrinsic motivation differs from intrinsic motivation because it is caused by the satisfaction of extrinsic requirements or potential rewards (Lin, 2008).

2.2 Self-determination theory

Since 1995, Ryan and Deci have published a series of related discussions regarding SDT, a theory of the motivational process of human self-determined behavior. The theory holds that humans are active organisms with innate potential for psychological growth and development. Self-determination leads to the potential for empirical choice. This represents a free choice of action made by an individual based on a complete understanding of their personal needs and environmental information. The theory includes three needs, three social agencies, three types of motivations, four regulations, and internalization, as discussed below.

According to SDT, the three basic human needs are the "need for autonomy," the "need for competency," and the "need for relatedness," which are innate and present in no sequence. With the support of social context, there is more chance that the basic human needs will be fully satisfied, where the motivation could become internalized from extrinsic to intrinsic motivation. In other words, human self-determination behavior is socially interactive, not independent, and motivation is dynamic for sustaining a high level of learning motivation. Therefore, how or to what extent human basic needs are satisfied in the context of society is key to determining internal motivation.

Moreover, humans have three critical psychological needs. That only when the three basic human needs are met will the performance behavior be ideal. This suggests that the meaning of human behavior in pursuit of these three basic needs arises from instinct (Chiang, 2011). A sense of autonomy refers to the perception of the degree of control an individual has over their actions. When individuals believe that their actions are motivated by their own free will rather than being ordered, forced, or threatened, they are more likely to be willing to their chosen goals. Competence refers to the degree to which an individual feels able to control and be competent in their environment. As such, individuals tend to select the jobs or tasks that they find moderately challenging to gain a sufficient sense of competence. Relatedness involves the degree to which an individual feels emotionally connected to others. When an

environment can provide enough acceptance, care, and emotional strength, it promotes individuals to accept various challenges and achieve psychological growth. The innate nature of humans is to enhance and integrate these three needs to reach a suitable state for social development and wellbeing (Deci and Ryan, 1985, 2000a,b, 2002). SDT suggests that when individuals can make their own choices, their self-abilities are more able to satisfy the three basic needs: autonomy, competence, and relatedness. They can be integrated into the surrounding group atmosphere. They can also automatically and spontaneously engage in certain behaviors to sustain intrinsic learning (Van den Broeck et al., 2010).

The existing self-determination-related studies about measuring English learning motivation are rare and, in these present studies, the scales as research tools were mostly modified from basic psychological needs (BPN). For example, Leeming and Harris (2022) used the restructured BPN named Basic Psychological Needs Satisfaction and Frustration Scale (BPNSFS) and also the Language Learning Orientation Scale (LLOS) in investigating 600 Japanese university students' English learning motivation. Alamer (2022) restructured BPN and used the Self-Determination Theory of Second Language Scale (SDT orientations) to 366 Saudi university students, Jeon (2022) used BPN directly to investigate the motivation of 179 Korean primary students to learn English.

The BPN scale is a 21-item scale addressing need satisfaction in general in one's life and was originally satisfied for people to develop and function in a healthy way (Deci and Ryan, 2000a,b). Nevertheless, BPN is universal and fits in a wide range of empirically isolated contexts. Using a variety of questionnaire items targeting the three innate needs, to be more precise and effective, is an alternative way of developing a more suitable scale of learning motivation. The learning climate questionnaire (LCQ) pertains to autonomy support and is used to assess students' learning status with respect to the autonomy of an individual instructor and peers, whereas the perceived competence scale (PCS) is one of the most face valid questionnaires designed to assess constructs from SDT. Therefore, using the six autonomy question items from LCQ, the four competence question items from PCS, and eight relatedness question items from BPN as a whole new scale for English learners can alternatively provide them a more concise and convenient learning advice.

3 Research design

This study recruited 169 university students in Taiwan in a variety of majors. The participants were taking an English course, and they were motivated to send back the original in-print questionnaire with 18 items.

The research tool was a survey questionnaire called the Self-Determination Motivation Scale for English Learners. The scale was divided into three dimensions with 18 questions: factor autonomy, factor competence, and factor relatedness. The questionnaire items were retrieved from the LCQ (six questions on autonomy), perceived competence for learning (four questions on competence), and Basic Need Satisfaction in General (eight questions on relatedness). The LCQ was adapted by Williams and Deci (1996) from the healthcare climate questionnaire (Williams and Deci, 1996). The PCS is a 4-item short questionnaire and is one of the most face-valid instruments designed to assess participants' feeling of competence about, say, taking part in an English course, and engaging in a more active behavior regularly. The alpha measure of internal consistency for the perceived competence

items in these studies was above 0.80 (Williams and Deci, 1996; Williams et al., 1998). The basic need satisfaction in general is a 21-item questionnaire that addresses the need satisfaction of relatedness from SDT (Deci and Ryan, 2000a,b; Gagné, 2003). Internal consistency of the scale in the current sample was considered excellent: Cronbach's alpha is 0.90 (Lataster et al., 2022). The scales were all English versions.

The data collection was taken place in class in a semester and the selected participants were from 10 different departments in a university. A total of 169 questionnaires were collected, and after deducting invalid questionnaires, 169 valid questionnaires were counted. Data were analyzed using descriptive statistics, Item analysis along with comparisons of extreme groups, correlation analysis, confirmatory factor analysis (CFA), and reliability, and all the statistical analyses of the study were conducted by SPSS 26.

4 Findings

4.1 Descriptive statistics

Table 1 shows that the majority of participants, 112 (66.3%), were women, while 57 (33.7%) were men. There were 11 freshmen (6.5%), 9 sophomores (5.3%), 9 seniors (5.3%), and 1 person (0.6%) who did not answer the question in this part.

4.2 Item analysis

4.2.1 Comparisons of extreme groups

The study showed that items 13 and 16 had p -values >0.05 and <0.05 , respectively. Additionally, item 16's CR value was negative, indicating the performance of each extreme group is opposite, indicating no discrimination. Therefore, items 13 and 16 with no discrimination are needed to be deleted for the next step.

4.2.2 Correlation analysis

The criterion for the choice of items is that the correlation coefficient must reach 0.3 or higher (DeVellis, 1998). In this study, all 18 items' correlation coefficients are more than 0.3 but three of them do not reach 0.3. They are items 13, 16, and 17, meaning the items are not corresponding to the scale. Therefore, the three items were heterogeneous.

4.2.3 Cronbach's α value when item deleted

Table 2 represents that all 18 items are not increasing when deleted but three of them are against it. They are items 13, 16, and 17, meaning the items are not corresponding to the scale. Items 13 and 16 are non-discriminative and heterogeneous. Their Cronbach's α are increasing when they are deleted. The two items need to be deleted for validity and reliability analysis, while item 17 remains.

4.2.4 Confirmatory factor analysis, CFA

After item analysis, the 16 items (excluding items 13 and 16) were used to extract factors with eigenvalues greater than 1 for validity. Due to the dimensions being set up, all factors are to be extracted with a certain number of dimensions based on the need of study (Wu, 2009). According to Hair et al. (2010), it is recommended that the factor loading should be more than 0.5 and the variance should be more than 60%. Table 3 presents the results of the CFA conducted in this study.

TABLE 1 Descriptive statistics.

	Number	Percentage (%)
Gender		
Male	57	33.7
Female	112	66.3
Major		
Health management	28	17.2%
Advertising and marketing	23	14.1%
Finance	21	12.9%
Leisure management	20	12.3%
Business management	15	9.2%
Commercial design	12	7.4%
Business technology	8	4.9%
Maritime	7	4.3%
International business	6	3.7%
Accounting	6	3.7%
Not answered	17	10.4%
Grade		
Freshmen	11	6.5
Sophomore	9	5.3
Junior	76	45.0
Senior	9	5.3
Five-grader	63	37.3
Not answered	1	0.6
N = 169		

TABLE 2 Results of item analysis.

Item number/content	Comparisons of extreme groups (CR value)	Cronbach's α	Cronbach's α when item deleted	Note	Assigned factor
1	11.73***	0.70	0.88	⊙	1
2	9.04***	0.59	0.88	⊙	1
3	10.52***	0.67	0.88	⊙	1
4	11.50***	0.71	0.88	⊙	1
5	9.65***	0.68	0.88	⊙	1
6	8.33***	0.66	0.88	⊙	1
7	12.95***	0.78	0.87	⊙	2
8	11.61***	0.75	0.88	⊙	2
9	11.20***	0.73	0.88	⊙	2
10	11.35***	0.70	0.88	⊙	2
11	15.83***	0.73	0.88	⊙	3
12	15.32***	0.76	0.88	⊙	3
13 I pretty much keep to myself and do not have a lot of social contacts. (R)	1.82	0.03	0.91	×	3
14	10.08***	0.58	0.88	⊙	3
15	13.82***	0.68	0.88	⊙	3
16 There are not many people that I am close to. (R)	-4.10***	-0.38	0.91	×	3
17	2.10*	0.04	0.90	△	3
18	13.23***	0.73	0.88	⊙	3

TABLE 3 KMO and Bartlett's test.

Kaiser–Meyer–Olkin measure of sampling adequacy		0.92
Bartlett's Test of Sphericity	Approx. Chi-Square	2009.6
	df	105
	Sig.	<0.001

TABLE 4 Summary of CFA.

Item number/content	Components			Factor
	1	2	3	
5	0.816		0.304	1
2	0.768			1
3	0.748	0.349		1
4	0.730		0.366	1
6	0.618	0.455		1
1	0.603		0.449	1
10		0.815		2
8	0.308	0.783		2
7	0.382	0.741	0.325	2
9	0.484	0.693		2
11 I really like the people I interact with.		0.595	0.589	2
15	0.334		0.773	3
18	0.368		0.756	3
14		0.354	0.696	3
12		0.532	0.620	3
Eigenvalue	4.01	3.72	3.25	
% of variation	26.74	24.82	21.64	
cumulative %	26.74	51.56	73.20	

Extraction method: principal axis factoring. Rotation method: Varimax with Kaiser normalization.

*Rotation converge in four iterations. Factor: 1. autonomy 2. competence 3. relatedness.

TABLE 5 Reliability.

	item number	Cronbach's α
1 Autonomy	6	0.91
2 competence	5	0.92
3 Relatedness	4	0.85
Overall	15	0.95

However, the result shows that Factor 3 contains only one item (item 17) which is against the 3-item principle, so it should be deleted for the second time CFA. The rest of 15 items were distributed in three dimensions: 6 items in Factor 1, 5 items in Factor 2, and 4 items in Factor 3. Table 4 represents the number of the need for autonomy (6), competence (5), and relatedness (4). In Table 4, item 11 belongs to Factor 2 (Competence) but it was initially in Factor 3 (relatedness).

4.3 Reliability

According to Nunnally (1978), 0.70 is the minimum acceptable confidence value. Table 5 indicates that the three needs' Cronbach's α is from 0.85 to 0.92 with an average of 0.95.

In short, after item analysis, CFA and the reliability analysis, the Self-Determination Motivation Scale of English Learners could be summarized into three factors, similar to SDT, with a total of 15 items. The scale questions are shown in Table 6.

5 Discussion and conclusion

This study investigated relevant studies on self-determination and English learning to meet the three research objectives. Current studies indicate that self-determination motivation plays a vital role in English learning and that the result of developing an English scale based on SDT in this study was feasible. All items in the Self-Determination Motivation Scale of English Learners were adequately

TABLE 6 Self-determination motivation scale for English learners.

Factor	Content	
1. Autonomy	1	I feel that my instructor provides me with choices and options.
	2	I feel understood by my instructor.
	3	My instructor conveyed confidence in my ability to do well in the course.
	4	My instructor encouraged me to ask questions.
	5	The instructors listened to how we would like to do things.
	6	The instructors tried to understand how we see things before suggesting new ways to do things.
2. Competence	7	I feel confident in my ability to learn this material.
	8	I am capable of learning the material in this course.
	9	I am able to achieve my goals in this course.
	10	I feel able to meet the challenge of performing well in this course.
	11	I really like the people I interact with.
3. Relatedness	12	I get along with people I come into contact with.
	13	I consider the people I regularly interact with to be my friends.
	14	People in my life care about me.
	15	People are generally pretty friendly toward me.

constructed from the items of the selected three related questionnaires and analyzed properly. The scale in this study comprised 15 questions and it retained the same three factors as SDT does.

The scale deleted the three reverse questions from the original scale for three reasons. First, the judgment of university-aged students was insufficient for interpreting or reading reverse questions, which affected the results of completing the questions. It caused them not to be statistically significantly different. Second, from a psychological perspective, the social attitude of the Chinese tends to conceal evil and promote good. As such, they have a more lenient way of judging reverse questions, resulting in less judgmental results. Third, the scale items were initially written in English. The survey could be lost in the translation of the reverse item. This could result in a loss of focus regarding the scale prediction's purpose, leading to low discrimination.

Item 11 (I really like the people I interact with) was assigned to Factor 3, referring to the relatedness dimension. However, after the CFA analysis, it was moved to Factor 2, which relates to the competence dimension for three reasons. First, the line between competence and relatedness might not be as clear as the scale intended for presenting to students with a Mandarin background learning English. Second, Western people tend to “feel” the environmental atmosphere. In contrast, Chinese culture tends to see getting along with surrounding people as a need to survive in society based on the convention of “*yi he wei gui*,” meaning “harmony is what matters” in English. Therefore, the significance represents a need for competence compared to the feeling of relatedness when comparing Chinese and Western cultures, respectively. Third, the social distance between people from a Chinese background is not as close as in Western countries (Park, 2009). Western people are more likely to have larger groups of friends, whereas people in Chinese culture tend to make a smaller social circle with families, neighbors, and those they are familiar with. Based on the above, the phrase “the people I interact with” may have a broader explanation than a small circle that they take

as a competence or capability of maintaining the entire social relationship in the Chinese context.

The findings indicate that the 15 items are crucial for university English learners with a Chinese background in datafication of the human needs in SDT. To meet the two research objectives, this study analyzed and explored the present questionnaires in autonomy, competence, and relatedness of SDT. They are also vital in promoting students' interest in learning. Based on the above findings, the present questionnaires are written in English and mostly used for a variety of areas, rather than learning English as a second and foreign language. The results show that the developed 15-item scale is with a reliability of 0.95 after CFA. With it, the developed scale can provide meaningful learning opportunities through a suitable academic setting. This can help learners with Chinese backgrounds understand the satisfaction of the feelings of autonomy, competence, and relatedness to achieve better academic outcomes in school.

Most importantly, the satisfaction of the three innate needs is the starting point of learning motivation toward intrinsic motivation the interest of an individual may occur spontaneously. In other words, the developed scale is more suitable and provides an alternative for university English learners with a Chinese background to excavate what they need and what they lack for basic needs, leading them in the right way of learning English as a second or foreign language.

The study limitations exist due to workforce and time constraints. The study was also limited by the lack of conducting expert validity for the possibility of adding reserve items back into the scale. Future research should examine the formative 15 items by inviting more university participants and processing relevant analysis. Research should also explore the modification possibilities to make the scale easier for English learners and instructors.

6 Suggestions for further research

Based on the Conclusion section, suggestions are made for further research.

1. Add expert validity for item review

It is needed to have experts examine more on the aspects of competence and relatedness, based on the results of item 11, to require further confirmation for better and clearer descriptions in the two dimensions, avoiding speaking on the line and ambiguity.

2. Adjust the number of reverse items

It is suggested that if reverse items are deleted in some way, then adding back reverse items with different content or discretion when extending the item bank is another way to keep the variety of questionnaires because they may have their affections in the original scales as consideration.

3. Have more participants to master scale

Limited by research funding and manpower, 169 university students were selected by random sampling, and after statistical analysis, the scale was further established with good validity and reliability. However, to master the scale, it is worth sampling with more as the better sample size.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not sought for the present study because of the national laws. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the

participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements. Verbal informed consent was obtained from all subjects before the study.

Author contributions

JC: Writing – original draft, Writing – review & editing.

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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