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DEVELOPMENT AND VALIDATION OF QUESTIONNAIRE ON L2 MOTIVATION, EPISTEMIC BOREDOM AND EPISTEMIC CURIOSITY

Liangliang Su*

Faculty of Language and Linguistics, Universiti Malaya, Malaysia

*E-mail: s2024270@siswa.um.edu.my

ABSTRACT

This study aimed to design and test the psychometric properties of a questionnaire assessing L2 motivation, epistemic boredom, and epistemic curiosity of adolescent learners of English in China. While L2 motivation has been extensively researched, the two epistemic emotions, particularly curiosity, remain overlooked in the L2 research literature. This could be due to a lack of appropriate research instruments to conduct such studies. This article describes the steps and stages of the instrument development and validation. The psychometric properties of the questionnaire were tested with a sample of 312 (N=312) Chinese secondary school students. The Cronbach's alpha values demonstrated that the internal reliability of the three proposed scales was good. The exploratory factor analysis ascertained the underlying structure of the learners' L2 motivation, epistemic boredom, and epistemic curiosity, evaluating the validity of the constructs. The results revealed six dimensions of L2 motivation, namely, general motivation-attitude, ideal L2 self, ought-to L2 self, instrumental orientation, general motivation-effort, and integrative orientation. The results also uncovered the scale measuring epistemic boredom and epistemic curiosity retained the originally proposed structure. These empirical results indicated that the questionnaire has good psychometric qualities.

Keywords: *boredom, English language learning, epistemic, epistemic curiosity, language learning (L2) motivation, questionnaire design*

INTRODUCTION

Questionnaires have become one of the most used research instruments to gather data on the psychological aspects of learning a second or a foreign language (L2). Questionnaires enable researchers to collect vast volumes of data in a speedy and efficient manner. However, before a questionnaire is distributed to respondents, it needs to fit the purpose of the study and yield the data needed to answer the research questions. In other words, the research instrument needs to be designed based on a certain theoretical framework to capture the relevant variables and have solid psychometric qualities, such as reliability and validity (Dörnyei, 2007). This study describes the process of constructing a questionnaire on L2 motivation and two epistemic emotions that are ubiquitous in educational settings, namely, boredom and curiosity.

The rationale for this study is discussed in the following paragraphs. Motivation is one of the most explored psychological variables in L2 research. There are various questionnaires on L2 motivation that adopt various theoretical perspectives (Dörnyei & Taguchi, 2009; Nikitina et al., 2016). However, another important and salient driver of learning behaviour is the emotions that learners experience inside and outside the classroom (Mega et al., 2014; Pritchard & Wilson, 2003). Negative and positive emotions play an important role in individuals' learning, academic outcomes, and motivation (Meyer & Turner, 2006; Pekrun et al., 2002b). Studies in the domain of education have explored a wide range of such emotions, including enjoyment and anger (Pekrun et al., 2017) and anxiety (Pekrun et al., 2002a). L2 research for several decades has been limited to explorations of language learning anxiety (MacIntyre & Vincze, 2017). Gradually, researchers have shown

considerable academic interest in a wider range of emotions linked to L2, including positive emotions, such as enjoyment and curiosity (Dewaele & Alfawzan, 2018; Jiang & Dewaele, 2019; MacIntyre & Vincze, 2017; Mahmoodzadeh & Khajavy, 2019).

Curiosity, another positive emotion, is vital for the knowledge acquisition process. Although limited studies have indicated the function of curiosity in education, less research has explored the important role of curiosity in the field of language acquisition (Mahmoodzadeh & Khajavy, 2019). Our search was able to locate only one study by Mahmoodzadeh and Khajavy that developed a questionnaire to measure epistemic curiosity associated with L2 learning. Therefore, to encourage and enable more L2 studies on a wider range of emotions, this article reports on the process of construction and validation of a questionnaire that consists of three scales, namely, L2 motivation, epistemic boredom, and epistemic curiosity. The questionnaire described in this study was developed for a study among adolescent Chinese learners of English, which is a less explored group of L2 learners (Liu, 2024). This is a notable omission because this age group is recognised as the most prone to boredom (Farmer & Sundberg, 1986). Therefore, while developing the instrument, consideration was given not only to the composition of the scales but also to the wording of the questionnaire items and their cultural appropriateness. This article functioned as an essential addition to the emerging domain of investigations on emotions in the L2 classroom. It specifically provided L2 researchers with a reliable and valid research instrument to capture the phenomenon of epistemic boredom and epistemic curiosity associated with L2 learning because only a limited number of the questionnaires measuring such two epistemic emotions linked to L2 learning, especially for secondary school students (i.e., Li, Dewaele, & Hu, 2021; Mahmoodzadeh & Khajavy, 2019).

Furthermore, this article offered a detailed description of procedures concerning the questionnaire development. This addressed the language teachers' need for guidelines involving the construction of questionnaires to measure different psychological and emotional concepts essential in L2 acquisition and instruction. This expertise could serve as a useful addition to language teachers' professional knowledge.

Research Questions

The research questions that guided this study were as follows:

1. How reliable and valid is the questionnaire on L2 motivation, epistemic boredom, and epistemic curiosity? Specifically:
2. What dimensions of L2 motivation are present in the data obtained from adolescent mainland Chinese English learners?
3. Do the epistemic emotions of boredom and curiosity form distinct dimensions?

STAGES IN THE QUESTIONNAIRE DEVELOPMENT

The process of designing and validating a questionnaire involves two phases: qualitative and quantitative (Colton & Covert, 2007; Dörnyei, 2007; Nikitina et al., 2016). These phases are not rigidly chronological; they intertwine and inform each other, especially in the early phase of the questionnaire development. In the qualitative phase, the researcher would conduct a comprehensive review of the literature on the relevant topic. Upon building a solid background and a comprehensive understanding of the subject, one proceeds to select the theoretical framework, identify the variables to be examined in the questionnaire survey, develop appropriate scales, and write items to measure each of the variables. Following this, the validity of the instrument needs to be established. To do this, the research would seek expert opinions about the composition and wording of the questionnaire items. The researcher then proceeds to the quantitative phase, conducting a series of statistical tests to assess the psychometric properties of the newly constructed questionnaire. The following sections describe the qualitative and quantitative phases of the development of the scales to measure L2 motivation and the two epistemic emotions of boredom and curiosity.

LITERATURE REVIEW

Theoretical Underpinnings of the Questionnaire Constructs

L2 Motivation

L2 motivation in the current study was approached from two influential theoretical perspectives, that is the socio-educational model proposed by Gardner and

Lambert (1959) and formalised by Gardner (1985) and the L2 motivational self-system (L2MSS) developed by Dörnyei (2005, 2009). The latter is considered as a further progression of the Gardnerian model. Accordingly, the instrument development was guided by these two theoretical frameworks.

In Gardner's (1985) socio-educational model, L2 motivation incorporates four dimensions: the language learners' goals, the goal-attaining efforts they expend, the desire to achieve these goals, and a positive attitude towards learning a target language. The language learning goals can be pursuing some pragmatic gains, such as achieving good grades, being admitted to a prestigious college, establishing better career prospects, or earning money by doing transition work. These goals are identified as 'instrumental orientation'. Other goals can stem from learners' interest in the target language country, its people, cultures, and their desire to better understand the target language cultures. These goals are collectively known as 'integrative orientation'. The integrative orientation is recognised as a multi-dimensional notion (Gardner, 2010). Besides pursuing a set of learning goals, it is essential that language learners have a strong commitment to their studies and expend efforts to achieve these goals. All these aspects were reflected in the questionnaire items, which, in turn, constitute the L2 motivation variable.

Another influential theoretical framework of L2 motivation considered while developing the questionnaire is the L2 Motivational Self System (L2MSS) model. It was proposed by Dörnyei (2005) as a further progression of the Gardnerian socio-educational model. The L2MSS incorporates the Ideal L2 self and Ought-to L2 self among its components. Based on these two theoretical frameworks, five motivational constructs were included in the questionnaire. They are general motivation, integrative orientation, instrumental orientation, Ideal L2 self, and Ought-to L2 self. The definitions of these constructs are as follows:

General Motivation: Language learners' efforts and commitment, which they expend while learning the English language, and their positive attitudes towards learning the target language.

Integrative Orientation or Integrativeness: Language learners' willingness to learn English to interact with its speakers and their positive interest in the L2 itself, L2 cultures, and L2 countries.

Instrumental Orientation or Instrumentality: Language learners' goal is to learn English for practical reasons, such as their future career or studies and earning money.

Ideal L2 Self: A language learner's vision of himself or herself as a proficient speaker of English in the future.

Ought-to L2 Self: Language learner's perceptions of the attributes that he or she should have to meet the expectations of people who are important to them and their understanding of negative consequences of neglecting their studies.

These five motivational constructs guided the development of the item pool on L2 motivation.

Emotions in L2 Learning

In the process of learning, emotional undercurrents interact with cognitive functions and behavioural impulses in complex architectonics. The role of emotions in the process of learning an L2 has been recognised since the 1980s when Elain Horowitz and her colleagues conducted and published a series of influential studies on language learners' anxiety (Horwitz, 1986; Horwitz et al., 1986). L2 researchers' interest in the emotional aspect has intensified over time, and this phenomenon has been described as "the emotional turn" in SLA and L2 literature (White, 2018). A range of emotions and their interactions with motivational drivers have been investigated by applied linguistics researchers (MacIntyre & Vincze, 2017). However, such key epistemic emotions as boredom and curiosity remain relatively underexplored in the L2 research literature. Partially, this might be due to a lack of appropriate research instruments. To address this gap, this study develops and evaluate the psychometric properties of the scales to measure epistemic boredom and epistemic curiosity in the context of L2 learning.

Epistemic Boredom

Boredom, generally perceived as a negative emotion, is a salient element in various types of human activities, including learning an additional language. Furthermore, boredom has been found to exert an adverse influence on individuals' motivation to take actions in their various pursuits (Eren & Coskun, 2016). Psychological literature recognises different types of boredom, such as academic boredom (Acee et al., 2010), workplace boredom (Fisherl, 1993),

and relational boredom (Harasymchuk & Fehr, 2010). This emotion has been extensively researched in the fields of psychology and general education (Daschmann et al., 2011; Mercer-Lynn et al., 2014). However, as our search of the SCOPUS and Web of Science databases has revealed, explorations of boredom in L2 settings were initiated in the middle of the 2010s (e.g., Kruk, 2016; Zhu & Zhou, 2012). Several definitions of boredom exist in the research literature, most highlighting the negative aspects of this emotional state (Lehr & Todman, 2009). In the current study, the following definition of epistemic boredom is proposed.

***Epistemic boredom*:** Language learners' negative affective state consisting of dissatisfaction, disengagement, inattention, inactive participation, and distorted time perception in the L2 classroom.

Epistemic Curiosity

Unlike boredom, curiosity is perceived as a positive emotion that promotes learning behaviours and enhances the new knowledge acquisition process by making it intrinsically enjoyable and rewarding (Csíkszentmihályi, 1990; Kashdan et al., 2004). Research literature identifies two types of curiosity: perceptual curiosity and epistemic curiosity (Loewenstein, 1994). The former acts as a sensory (i.e., visual, aural, tactile, or olfactory) stimulus that drives further explorations (Litman, 2005; Litman & Spielberger, 2003). In contrast, epistemic curiosity ignites a cognitive drive for a better and deeper understanding of a phenomenon. Hence, epistemic curiosity is part of the process of learning (Loewenstein, 1994).

Mahmoodzadeh and Khajavy (2019) proposed that when epistemic curiosity is explored in the context of L2 learning, this emotion can be theorised as a motive or a drive to maintain and produce the desire to acquire and use a second language. Based on the prior studies, epistemic curiosity in L2 settings is operationalised in this study as follows:

***L2 epistemic curiosity*:** An inner inquiry-driven desire for the acquisition and usage of an L2.

QUALITATIVE STAGE OF QUESTIONNAIRE DEVELOPMENT

Construction of the Item Pool and Assessment of Instrument Validity

The instrument developers consulted theoretically-oriented literature and reviewed a number of questionnaires on L2 motivation that had been used in various educational contexts (Gardner et al., 1985; Gardner, 1985, 2004; Noels et al., 1999; Noels et al., 2000; Noels et al., 2001; Kouritzi et al., 2009; Ryan, 2009; Taguchi et al., 2009; Dörnyei & Csizér, 2011; Nikitina et al., 2016; Ngo et al., 2017; Tanaka & Kutsuki, 2018; Li & Park, 2021; Zhang & Modehiran, 2021).

As explained in the previous section, the current study identified five prominent L2 motivation constructs: general motivation, integrative orientation, instrumental orientation, Ideal L2 self, and Ought-to L2 self. Hence, items to measure these variables were sourced from various questionnaires (Gardner, 1985, 2004; Ryan, 2009; Taguchi et al., 2009; Dörnyei & Csizér, 2011; Nikitina et al., 2016). The original item pool on L2 motivation was made up of 125 items, of which 38 items assessed general motivation, 14 items estimated integrative orientation, 39 items measured instrumental orientation, 20 items examined Ideal L2 self, and Fourteen items assessed Ought-to L2 self. The statements were often repetitive since the initial 125-item pool was drawn from questionnaires that employed similar theoretical perspectives. In such cases, only one most pertinent item was retained. As a result, the item pool was reduced to 60 items, with 20 items estimated general motivation, nine measured integrative orientation, 11 assessed instrumental orientation, 10 measured Ideal L2 self, and 10 assessed Ought-to L2 self.

To develop scales on epistemic boredom, the researchers reviewed several relevant questionnaires (i.e., Acee et al., 2010; Daschmann et al., 2011; Fahlman et al., 2013; Farmer & Sundberg, 1986; Goetz et al., 2012; Lichtenfel et al., 2012; Pawlak et al., 2022; Ragheb & Merydith, 2001; Shehzad et al., 2020). Our search also included the questionnaires employed in L2 studies (i.e., C. Li et al., 2021; Pawlak et al., 2020; Pekrun et al., 2011). The original item pool on epistemic boredom consisted of 55 items, aligned with this study's theoretically informed operationalisation of boredom. Unavoidably,

some of the 55 items were very similar. For example, "Time always seems to be passing slowly in my language classes" (Pawlak et al., 2020) resembled "Time is dragging on in English class" (Li et al., 2021). In line with our approach while developing the L2 motivation scales, only one item was retained. This reduced the item pool for epistemic boredom to 29 items.

Regarding the development of the epistemic curiosity scale, only a limited number of instruments measuring this construct are available (e.g., Litman, 2008; Litman & Jimerson, 2004; Litman & Spielberger, 2003; Mahmoodzadeh & Khajavy, 2019). Two particularly relevant instruments were developed by Mahmoodzadeh and Khajavy (2019) on L2 learning curiosity and by Litman (2008) on epistemic curiosity in academic settings. After consulting these two and other available questionnaires, we identified 21 items aligned with the operationalisation of curiosity in this study. When similarly worded items were removed, the item pool contained 14 items on epistemic curiosity.

To reduce the number of questionnaire items and to establish the face validity of the research instrument, two experts, an applied linguist and a statistician, were consulted. Then, the first author and his two colleagues, who are experienced English language teachers in China, translated the questionnaire statements into Chinese. A professional translator then checked the veracity of the translation from Chinese into English.

Scale Refinement

As advised in methodological literature, besides consulting scholarly literature, questionnaire developers must seek the opinions of key stakeholders in the social processes of interest because they are an important source of information (Nikitina et al., 2016; Onwuegbuzie et al., 2009). Crookes and Schmidt (1991) noted that the key informants in L2 studies on motivation are L2 learners and their teachers. According to the researchers, some aspects of language learners' classroom behaviours observed by L2 educators could function as crucial indicators of the students' L2 motivation. Similarly, it could be proposed that language educators are a vital source of information on their students' epistemic emotions. Therefore, in the process of scale refinement, the first author of this article invited his language teacher colleagues to evaluate the cultural appropriateness of the questionnaire for this specific learning context in a high school in China.

Next, five Chinese secondary school students were invited for a pilot study where they completed the questionnaire and offered their comments about the questionnaire items. Based on the comments received from the students, the wording of several items was slightly modified for better clarity. The scales were then tested again in a pilot study involving 10 Chinese learners of English who were secondary school students of the same age range and studying in the same school as the targeted participants in the main research. The first author was present all the time in the pilot study to take notes if any questions or comments arose from the respondents. However, the students did not raise any further questions. Hence, the questionnaire for the main study was finalised.

The final version of the questionnaire consisted of four sections: Section 1 (31 items) assessed five L2 motivation constructs, namely, General motivation (items 1 to 9), Integrative orientation (items 10 to 14), Instrumental orientation (items 15 to 20), Ideal L2-self (items 21 to 25) and Ought-to L2 self (items 26 to 31). Section 2 (6 items) measured epistemic boredom; Section 3 (5 items) assessed epistemic curiosity. The responses were to be given on five-point Likert-type scales ranging from "strongly disagree" to "strongly agree" choice of answers. Section 4 sought demographic information about the participants. (See Appendix for English and Chinese versions of the questionnaire). The next section reports on the quantitative stage of the questionnaire development, that assessed the psychometric properties of the instrument. The statistical analyses were performed with the aid of SPSS version 29 software.

QUANTITATIVE STAGE OF QUESTIONNAIRE DEVELOPMENT

Sampling and Data Collection

A convenience sampling method was employed. The participants were 312 (*N*=312) secondary school students in the north-western region of China, who participated in this study voluntarily. Prior to data collection, approval from the ethics committee was obtained. Only those students who had signed the consent forms took part in this research.

Data Analysis

In the first step, Cronbach's alpha (*α*) statistics were computed to determine the internal reliability of the proposed scales and partially answer research question #1. To examine latent dimensions in the questionnaire constructs and answer research questions #1, #2 and #3 we performed exploratory factor analysis (EFA). Prior to carrying out the EFA, the dataset was checked for suitability for the EFA (Hair et al., 2019).

The EFA helped ascertain the underlying structure of the students' L2 motivation, epistemic boredom, and epistemic curiosity and evaluated the validity of the constructs. In this step, the Principal Component Analysis (PCA) with varimax rotation was run, where values below 0.4 were suppressed. The EFA was first performed on the L2 motivation scale, followed by the two epistemic emotions scales. Cronbach's alpha coefficients for each of the latent dimensions that transpired during the EFA were assessed.

FINDINGS AND DISCUSSION

This section briefly describes the demographic profile of the respondents and reports the results from the psychometric tests.

Study Participants

Analysis of the demographic data indicates that there were slightly more female (n=165 or 52.9%) than male (n=147 or 47.1%) students among the 312 respondents. The age of the respondents ranged between 16 and 19 years old (Mean=17.2; SD=0.6; Mode=17).

Internal Reliability of Scales

As shown in Table 1, the Cronbach's alpha values ranged from .778 for the instrumental orientation scale to .861 for the epistemic boredom scale. In other words, all Cronbach's alpha values exceed the minimum agreed-upon benchmark of .70 (Hair et al., 2019). These findings attest to the good consistency of the proposed questionnaire scales.

Dimensionality of L2 Motivation Scale

The findings of the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy (.870) and the Bartlett's test of sphericity, which was significant ($p < .001$), indicated the suitability of the dataset for the EFA. Therefore, we proceeded to assess the dimensionality of the questionnaire scales.

Table 1 Cronbach's alpha statistics for the questionnaire scales

Scale/Subscale	Number of Items	Cronbach's Alpha
General motivation	9	.854
Integrative orientation	5	.796
Instrumental orientation	6	.778
Ideal L2 self	5	.851
Ought-to L2 self	6	.828
Epistemic boredom	6	.861
Epistemic curiosity	5	.790

The first round of the EFA of the five L2 motivation scales yielded a seven-dimension structure, with a total variance explained of 63.12%. Two items had double and almost equal loadings. For example, "Whenever I think of my future career, I imagine myself using English" loaded on Factor 1 (.455) and Factor 2 (.450); the item "If I speak English well, I could get to know more people from other countries" (Inte14) loaded on Factor 2 (.459) and Factor 5 (.444). Furthermore, Factor 7 had loaded only one item (i.e., "If my English teacher would give the class an optional assignment, I would certainly volunteer to do it". All three items were removed, and the EFA was performed again.

The second round of EFA yielded a 6-dimension structure of L2 motivation. Upon closer inspection, it became clear that the items measuring effort that the students were willing to expend on learning English, which originally formed the general motivation construct, had been grouped together and formed into a distinct single factor. The total variance explained by the 6-dimension structure was 62.02%. There were no double loadings, and the dimensions of L2 motivation were lucid and psychometrically sound. Only two items had cross-loaded on other than the originally proposed factors. For example, the statement "I would like to be able to use English to communicate with people from other countries" loaded on the factor containing items measuring Ideal L2 self, while the item "I have to study English because I don't want to get bad marks" grouped with the items assessing the effort expended.

Overall, the results were satisfactory. We then proceeded to label the factors and compute the Cronbach's alpha statistics for each factor. The findings on the factors, the items that loaded on them and the loadings are presented in Tables 2 to 7. The six factors were labeled: Factor 1 "General motivation – Attitude" (Cronbach's α=.871), Factor 2 "Ideal L2 self" (Cronbach's α=.873), Factor 3 "Ought-to L2 self" (Cronbach's α=.828),

Table 2 Findings from EFA: Factor 1 'General motivation – Attitude'

Questionnaire items	Loadings
I like my English classes.	.844
I always look forward to English classes.	.808
I find learning English really interesting.	.804
I always volunteer to answer the questions my English teacher asks in the classroom.	.686
I concentrate on studying English more than any other topic.	.631
Cronbach's α	.871

Table 3 Findings from EFA: Factor 2 'Ideal L2 self'

Questionnaire items	Loadings
I can imagine myself speaking English with international friends.	.859
I can imagine a situation where I am speaking English with foreigners.	.844
I can imagine myself living in a foreign country and using English effectively to communicate with the locals.	.767
I would like to be able to use English to communicate with people from other countries.	.674
I can imagine myself as someone who is able to speak English well.	.671
Cronbach's α	.873

Table 4 Findings from EFA: Factor 3 'Ought-to L2 self'

Questionnaire items	Loadings
If I fail to learn English, I'll be letting my parents down.	.827
I have to study English because, if I do not study it, I think my parents will be disappointed with me.	.814
My parents believe that I must study English to be an educated person.	.754
I consider learning English important because the people I respect think that I should do it.	.692
It will have a negative impact on my life if I don't learn English.	.689
Studying English is important to me because my close friends think it is important.	.561
Cronbach's α	.828

Table 5 Findings from EFA: Factor 4 'Instrumental orientation'

Questionnaire items	Loadings
Studying English is important because, with a high level of proficiency in this language, I will be able to make a lot of money.	.769
Studying English is important because I think it will someday be useful in getting a good job.	.726
Studying English is important because I think I'll need it for further studies.	.702
Studying English is important because, if I know it well, I can work globally.	.691
The things I want to do in the future require me to use English.	.544
Cronbach's α	.804

Table 6 Findings from EFA: Factor 5 'General motivation – Effort'

Questionnaire items	Loadings
I am working hard at learning English.	.771
Compared to my classmates, I think I study English relatively hard.	.685
I put great effort into understanding everything my English teacher teaches us during the class.	.680
I have to study English because I don't want to get bad marks.	.540
Cronbach's α	.674

Table 7 Findings from EFA: Factor 6 'Integrative orientation'

Questionnaire items	Loadings
Learning English will enable me to better understand the way of life in English-speaking countries.	.851
Learning English will allow me to get to know its speakers better.	.786
I am interested in the popular culture of English-speaking countries.	.582
Cronbach's α	.745

Table 8 Findings from EFA on epistemic boredom and epistemic curiosity scales

Questionnaire items	Factors	
	Boredom	Curiosity
My mind begins to wander in the English class.	.791	
During English classes, I often think about other things.	.787	
There are no exciting tasks in English classes.	.757	
I get restless and can't wait for the English class to end.	.717	
I often have to do repetitive or monotonous things in my English classes.	.716	
Time always seems to be passing slowly in my English classes.	.685	
When my English teacher corrects my grammatical mistake, I am just curious to know why it is not correct.		.750
When I learn something new regarding English, I would like to find out more about it.		.747
I always like to know how to use the new words I learn in conversational situations outside the classroom.		.710
When I have an English question in mind, I cannot rest without knowing the answer.		.693
If I see or hear an unfamiliar English word, I immediately check my dictionary or ask my English teacher.		.651
Cronbach's α	**.861**	**.790**

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation

Factor 4 "Instrumental orientation" (Cronbach's α=.804), Factor 5 "General motivation – Effort" (Cronbach's α=.674), and Factor 6 "Integrative orientation" (Cronbach's α=.745).

We then proceeded to analyse the structure of the epistemic emotions. The findings are presented in the next section.

Dimensionality of the Epistemic Emotion's Scales

The Dataset On The Scales Measuring Epistemic Emotions of boredom and curiosity was found appropriate for the EFA. The KMO measure of sampling adequacy was .852, and Bartlett's chi-square test of sphericity was significant (sig< .001). The EFA, which combined the boredom and epistemic curiosity scales, yielded a clear structure with a total variance of 57.62%. The questionnaire items that had been originally allocated to each of the two variables had loaded on the initially proposed variable (*see* Table 3). There was neither double-loading nor cross-loading of the items.

Overall, these and other findings indicate that the questionnaire has good psychometric properties. Interestingly, the questionnaire statements pertaining to the efforts the students were ready to put into learning English had formed their own cluster. This result aligns with the findings reported by Nikitina et al. (2016). It also highlights the importance of the study's adolescent learners of English and their commitment to putting efforts into learning L2.

CONCLUSION

This study described the development of a questionnaire to assess Chinese adolescent learners' English L2 motivational drivers and epistemic emotions of boredom and curiosity. It also reported findings on the questionnaire's psychometric properties. The empirical results indicate that the instrument is suitable for this age group of Chinese EFL learners. Notably, the items assessing students' effort to learn English formed a distinct dimension, originally included in the General motivation scale. This suggests that future studies might include a scale specifically measuring the language learners' efforts. The Ought-to L2 self, the instrumental orientation, and the integrative orientation scales retained their original composition, with no cross-loading items. Statements pertaining to the integrative orientation formed a distinct dimension within L2 motivation despite the construct's elusive nature. In conclusion, the questionnaire presented in this study can be used in future studies on motivational drivers and epistemic emotions of boredom and curiosity among adolescent English learners in China. Future studies may modify the questionnaire as needed. Additionally, the questionnaire can assess the latent dimensions within the constructs, examine the relationships among the three psychological variables, and explore how motivational and emotional aspects affect the academic achievements of L2 learners.

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