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Validating the Measurement Model of Parental Involvement, Motivational Beliefs, and English Learning Achievement: An EFA and CFA Approach

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***Abstract*—This study aimed to investigate the validity and reliability of the instruments to measure parental involvement, students' motivation, self-efficacy, and English learning achievement among primary EFL students in Thailand. Adapted questionnaires were administered to 306 student–parent dyads. A two-step approach to the analysis was adopted, utilising Exploratory Factor Analysis (EFA) to extract the factorial structure in the first step and then Confirmatory Factor Analysis (CFA) to verify the measurement model in the second step. Results of the EFA supported a multidimensional structure within the constructs, and all retained items had loadings above 0.50, demonstrating theoretical coherence. CFA also endorsed the proposed model as fitting the data very well (χ^2/df = 1.521, CFI = .962, TLI = .955, RMSEA = .042, SRMR = .80, AVE > .50), supporting its general validity. Discriminant validity was verified through correlations among parental constructs, which demonstrated their distinctiveness (parental involvement, motivation, and self-efficacy). The results indicate that the adapted tools are both psychometrically sound and culturally relevant when used with Thai young learners. The validated measurement model of the study provides a reliable methodological underpinning for future SEM studies and contributes to the development of proper diagnostic tools for educators and policymakers to evaluate and improve parental engagement and learner motivation in English language learning.**

***Index Terms*—exploratory factor analysis, confirmatory factor analysis, parental involvement, motivational beliefs, English learning achievement**

I. Introduction

In EFL settings, students' performance is not based only on their in-service teacher instruction, but a broader ecology of family-level and psychological factors also influences it. Parental involvement in their children's academic endeavours has long been recognised as a significant factor in supporting both direct help with lessons and indirect encouragement that fuels learning enthusiasm. At the same time, family socioeconomic status (SES) influences the educational opportunities of students through financial, cultural, and social resources, which can either facilitate or limit their chances to learn (Liu et al., 2020). Together, personal learner psychology, particularly motivation and self-efficacy, is key for mediating how these external supports are internalised and how they, in turn, translate into academic success. All together, these factors contribute to a more comprehensive understanding of students' language learning achievement and success in EFL contexts (Eccles & Harold, 1996; Ryan & Deci, 2020).

Although the conceptual importance of these constructs is well established, the possibility of testing the relationships among them empirically is based on the availability of instruments that are proper to measure the constructs, which are valid and reliable. Without sound psychometric measures, findings from more advanced statistical procedures, such as SEM, can be compromised or misleading (Crowley & Fan, 1997). Strong measurement models are essential for accurately measuring latent variables, properly testing relationships among them, and accurately interpreting theories.

Responding to this methodological demand, the current study specifically aims to demonstrate the validity and reliability of measurement instruments for documenting parental involvement, students' motivational beliefs (motivation, self-efficacy), and EFL achievement among Thai primary school students. Construct validity and reliability were tested using a rigorous two-step approach that involved Exploratory Factor Analysis (EFA) followed by Confirmatory Factor Analysis (CFA). This study has not only established a solid measurement model with strong psychometric properties for

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further SEM analysis, but also extended methodological rigour and theoretical knowledge related to explaining the differences in students' EFL achievement. The following questions guide this study.

1. What are the factor structures of the parental involvement, motivation, self-efficacy, and English learning achievement using the EFA?
2. Is there a good fit, with good reliability and validity, of the proposed measurement model as examined by CFA?

II. Literature Review

A. Parental Involvement and Family Income

Parental involvement has been recognised as a crucial factor influencing student achievement, both directly and indirectly, by supporting learning across all subjects (Sharma, 2024). Utami (2022) points out, parental involvement is one of the well-established predictors of school success, and in more recent studies, active parental participation, providing help with homework, creating study habits, checking offspring's progress, and staying in touch with teachers, has consistently been found to facilitate students' motivation, adjustment, and achievement (Park & Kim, 2023). Within the EFL context, in particular, where the opportunity for using English in classrooms is limited, the importance of parental support lies in extending the learning environment. Home-based potential learning practices such as shared-book reading, practising vocabulary discussions, or incorporating English into everyday routines, can support and extend learning beyond formal educational experiences (Liang et al., 2024; Zhang et al., 2023).

Theoretically, parental involvement has been theorised as parents' engagement in their children's school life through both home and school-based activities, such as academic guidance, support, and interaction with teachers (Hoover-Dempsey & Sandler, 1997). For instance, in the field of language education research, parental involvement has been found to lead to increased exposure to English, develop learners' self-efficacy, and cultivate perseverance in the face of challenging circumstances (Kim & Sheridan, 2015). In addition, involved parents establish conducive atmospheres that facilitate understanding now, while also setting the stage for independence and self-direction later in a child's education. In this regard, the parents' participation is not just supplemental; it serves as a foundation for shaping learners' attitudes, beliefs, and behaviour (Sharma, 2024), which helps ensure that English learning can be carried out in a sustainable manner.

Family income has also been shown to be one of the most significant predictors of students' educational achievement, influencing both the quality and quantity of learning opportunities that children have access to (Sirin, 2005). Higher SES families are, on average, more likely to have access to educational resources, such as tutoring, learning materials, digital technology, and enriched after-school programs, which facilitate both language development and academic learning (Bradley & Corwyn, 2002). On the other hand, students from low-income households often have limited access to these resources, resulting in unequal learning opportunities and outcomes. In addition to resources, family income shapes the time, energy, and cognitive bandwidth parents have available to dedicate to their children's learning. Wealthier parents are also more likely to experience less stress and to be able to play an active role in school-based activities as well as to offer consistent academic learning support at home (Conger & Donnellan, 2007).

In the case of EFL, family income becomes more important, given the limited exposure to English outside the classroom. Families from more affluent homes often provide additional opportunities for language acquisition through participation in English classes, exposure to English media, or international experiences (e.g., travel or studying abroad) (Park & Kim, 2023). Yet, the effect of income is not solely direct. As posited by Bronfenbrenner's (1995) ecological systems theory, family income influences the proximal processes in the home environment, such as the extent of parental involvement. Indeed, research has shown that socioeconomic advantage is associated with greater parental involvement, which in turn supports children's motivational beliefs and self-efficacy (Hill & Tyson, 2009; Kim & Sheridan, 2015). This indicates that most of the educational effect of family income is indirect, operating through its impact on parents' capacity to support and guide their children's learning.

With these goals in mind, the current study treats family income as an exogenous variable that directly or indirectly affects English language achievement through parent involvement and learner psychological variables. Appreciating this mediating role is essential, particularly in considering equity concerns in EFL, as non-equity-based gaps in learning may persist despite resource gaps.

B. Motivation and Self-Efficacy

Motivation is seen as playing a crucial role in second language learning. It motivates learners to initiate, sustain, and manage their work in learning a new language, forming the basis for how intensely (or not) and for how long (or not) to stay involved in learning tasks (Dörnyei, 2005; Ushioda, 2011). In settings where students of English as a Foreign Language (EFL) have limited opportunities for authentic communication, the role of motivation in maintaining learners' engagement with the language cannot be overstated. Based on the Self-Determination Theory (Ryan & Deci, 2020), motivation is a multidimensional concept. It encompasses both intrinsic motivation (the desire to engage in an activity for its own sake, driven by curiosity, interest, or enjoyment) and extrinsic motivation (arising from external rewards, evaluations, or expectations). Each type of motivation has been tied to students' persistence and achievement, with intrinsic motivation typically associated with longer-term learning outcomes. In fact, motivated learners are more likely

to set better goals, employ more effective learning strategies, and are more resilient when facing linguistic challenges (Howard et al., 2021).

Similar to motivation, the concept of self-efficacy is a construct that explains learners' beliefs about their ability to perform tasks and achieve specific learning outcomes (Bandura, 1997). Self-efficacy not only influences how much effort students put into learning but also how they react to challenges or failures. Students with high self-efficacy tend to be more willing to take risks, use effective strategies, and persist in the face of failure, resulting in greater success in language learning (Schunk & DiBenedetto, 2020). Self-efficacy has also been found to predict willingness to communicate, confidence in engaging with the target language, and academic achievement in EFL studies (Usher & Pajares, 2008). Additionally, motivation and self-efficacy are closely related: motivated learners often exhibit higher self-efficacy, and higher self-efficacy is known to increase intrinsic motivation and engagement (Shan, 2020).

Motivation and self-efficacy are central psychological mechanisms that link parental involvement (and socioeconomic status) to academic performance and competence. Through the development of such positive motivational beliefs and learners' confidence, classroom teaching and parent involvement may indirectly influence English achievement, emphasising these as essential constituents of any multifaceted model of language learning outcomes.

III. Research Methodology

A. Participants and Context

The research site was located in the Northeastern part of Thailand; the sample consisted of Grade 6 students and one of their parents or legal guardians. A total of 306 parent–student pairs participated, where each pair constituted a single-family response in which student responses were paired with those of the corresponding parent or guardian. This arrangement ensured that the perspectives of children and their parents were successively combined.

The student participants were all in EFL classes. They had received English instruction for several years, starting in Grade 1, which equates to approximately 5 years of formal English learning in an EFL setting. As part of the national curriculum, Grade 6 students received approximately two hours of English instruction on a weekly basis, on average. This extent of exposure approximates the common learning situation for young learners in Thailand and thus offers a suitable context for investigating parental involvement, motivational beliefs, and EFL achievement.

Stratified random sampling was used to enhance representativeness and external validity. Schools representing a range of socioeconomic status and academic achievement levels were used to identify participants. By design, this approach facilitated the inclusion of a diverse range of family backgrounds and school settings in the sample, thereby enhancing the generalisability of the results. Indeed, there was no obligation to participate in the study. Both students and their parents or guardians provided written informed consent before the commencement of the study. Inclusion criteria consisted of being enrolled in 6th grade at the time of data collection and having a parent or guardian available to complete the corresponding survey.

B. Research Instruments

A structured questionnaire was designed based on established theoretical foundations and a large pool of literature. The questionnaire consisted of three parts: a socio-demographic questionnaire, a parental questionnaire, and a student questionnaire. The content validity of each section was ensured to ensure alignment with the theory, the pertinence of the context, and the empirical adequacy.

The first section of the questionnaire covered demographic and contextual information about the participants involved in this study. The factors were English GPA, gender, and family income. These covariates were added to account for any influence of socioeconomic status (SES) on students' experiences or differences in the amount of parental involvement. This prior knowledge is a vital cleansing factor; it will be considered as a covariate when fitting the statistical models in this analysis.

The second section, the Parent Questionnaire, consisted of 22 items across three dimensions of parental involvement: (1) parental role construction (5 items), reflecting parents' beliefs about their responsibility and influence in supporting their child's English learning; (2) parental capacity (10 items), capturing parents' confidence, time, energy, and ability to assist efficiently, and (3) home-based involvement (7 items), assessing direct parental actions, such as lesson review, homework, and creating English learning opportunities beyond school. Values for IOC ranged from 0.67 to 1.00 and were rated as satisfactory to strong (Rovinelli & Hambleton, 1977; Turner & Carlson, 2003). Changes were made in response to feedback to ensure clarity and review for cultural sensitivity.

The third part, the Student Questionnaire, consisted of a total of 19 items that assessed the motivational beliefs of ESL students, specifically motivation and self-efficacy. Motivation variables were based on Gardner's (1985) Attitude/Motivation Test Battery (AMTB Pro version) and covered both instrumental (type of information) and integrative motivation orientations. The self-efficacy items were based on Bandura's (1997) social cognitive theory, as they represented students' beliefs about their capabilities to accomplish English learning activities. All measures were rated on the same 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), for all items on both questionnaires. This scale permitted subjects to indicate a range of agreement (Joshi et al., 2015; Likert, 1932), thereby

allowing for the generation of powerful statistical models of the attitudinal and belief constructs (Boone & Boone, 2012; DeVellis, 2017).

C. Data Collection

Formal permission was obtained from the principals of the schools before visiting the data collection sites to avail of the institutional support and fulfil the university's ethics committee requirements. The parents of the participants provided written informed consent and were briefed on the purpose, procedure, the voluntary nature of the study, and the confidentiality of the study. This procedure guaranteed transparency, ethical accountability, and the rights of students and their families.

The instrument was translated from English into Thai and then back-translated into English to ensure the linguistic precision and cultural sensitivity of the final Thai version of the questionnaire. The data were collected in schools where student–parent pairs had been invited to answer the questionnaires in dedicated rooms attended by trained research assistants. Short Thai-language instructions were included to ensure understanding and minimise the potential impact of language bias. This was especially relevant since school children may have had minimal exposure to English-based research instruments.

Research assistants provided structured assistance to participants, elaborating on unclear items and reviewing completed items to reduce missing data. Paper-and-pencil questionnaires were used because participants were more familiar with them, and to facilitate participation. Data were collected over two weeks to provide flexibility for families and schools, enabling the maintenance of systematic monitoring.

D. Data Analysis

A total of 321 questionnaires were distributed, and 306 were used in the analysis after excluding 15 with a large amount of missing or incomplete data. This ultimate sample size was considered appropriate for EFA and CFA, based on recommendations for robust multivariate analysis (Hair et al., 2019; Kline, 2016; Tabachnick & Fidell, 2019). Data were screened for completeness, accuracy, and normality assumptions before any statistical analysis. Descriptive statistics, including the mean, standard deviation, skewness, and kurtosis, were calculated, and we verified that all items fell within the acceptable range for subsequent analysis (Hair et al., 2019; Kline, 2016; Tabachnick & Fidell, 2019). A small amount of missing data was present, and to retain the integrity of the data, missing values were imputed using the mean.

The analysis was conducted in two principal stages using SPSS (Version 29) and AMOS (Version 29). First, internal consistency reliability was examined using Cronbach's alpha, with all constructs having coefficients exceeding the guideline of > .70 suggested by Nunnally and Bernstein (1994), indicating adequate reliability. Second, EFA with Principal Component Analysis (PCA) with Varimax rotation was performed, based on the assumption that the theoretical latent factors were correlated (Hair et al., 2019; Tabachnick & Fidell, 2019).

Factor loadings below 0.50, and the items with cross-loadings were removed systematically to increase construct clarity (Field, 2018; Stevens, 2009). CFA further supported the final factor solution with the measurement model tested for fit by a series of indexes, i.e., the χ^2/df ratio, Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) (Hu & Bentler, 1999; Kline, 2016; Hair et al., 2019). Convergent and discriminant validity were also evaluated through AVE and correlations between constructs (Fornell & Larcker, 1981; Hair et al., 2019).

The two-stage analytic process was conducted to validate the constructs of parental involvement, motivation, self-efficacy, and English achievement, ensuring that these constructs possess strong psychometric properties and allowing for the interpretation of scores based on a reliable measurement foundation.

IV. Results

A. Descriptive Statistics and Reliability

Descriptive statistics were computed for the primary variables of interest in this study, including parental involvement, learners' motivational beliefs, family income, and English learning achievement. The sample included 306 primary school children and their parents. Table 1 shows the mean, standard deviation, skewness, and kurtosis of all variables.

The analysis of the data revealed that the reported family income had a mean of 1.86 (SD = 1.47), with a high positive skewness (Skew = 2.12), suggesting that most families earned somewhere between 20,000 and 30,000 Thai baht per month. This distribution indicated a predominantly low-income sample, which may highlight variations in learning resources available to them.

Regarding parental involvement, the findings showed the mean scores from 2.88 to 3.97, indicating moderate parental involvement (P1-P22). The results also showed that many items were negatively skewed (e.g., P17 = –0.26), suggesting that a few participants had low engagement, while the distributions were approximately normal. Furthermore, the response patterns showed consistent engagement for homework support and encouragement.

Learners' motivational beliefs (S1-S19) scored a mean between 2.92 and 4.27, indicating that participants generally reported high levels of motivation and self-efficacy for each situation assessed, particularly in terms of goal setting and self-regulation. The average English learning achievement was 3.17 (SD = 0.70), and the distribution showed a slightly

negative skew (Skew = -0.61), suggesting that most students thought they performed well (Hair et al., 2019; Kline, 2016; Tabachnick & Fidell, 2019).

TABLE 1
DESCRIPTIVE STATISTICS OF VARIABLES

Item	Mean	Standard Deviation	Skewness	Kurtosis
P1	3.77	1.12	-0.85	0.12
P2	3.90	0.99	-0.93	0.56
P3	3.91	0.97	-1.01	1.06
P4	3.95	0.98	-0.94	0.59
P5	3.97	1.00	-1.03	0.76
P6	3.56	1.10	-0.58	-0.33
P7	3.28	1.06	-0.76	0.09
P8	3.17	1.03	-0.72	-0.02
P9	3.56	1.06	-0.58	-0.18
P10	3.28	1.16	-0.37	-0.66
P11	3.17	1.15	-0.38	-0.69
P12	3.21	1.15	-0.33	-0.70
P13	3.36	1.08	-0.49	-0.30
P14	3.42	1.13	-0.56	-0.26
P15	3.45	1.13	-0.56	-0.34
P16	3.21	1.15	-0.29	-0.75
P17	2.88	1.13	-0.26	-0.71
P18	3.03	1.15	-0.17	-0.65
P19	3.17	1.15	-0.30	-0.58
P20	3.04	1.12	-0.32	-0.51
P21	3.19	1.16	-0.36	-0.48
P22	3.17	1.24	-0.26	-0.81
S1	3.12	0.98	-0.47	0.17
S2	2.92	1.13	-0.01	-1.12
S3	2.92	0.97	-0.22	-0.22
S4	3.40	1.07	-0.23	-0.21
S5	3.04	1.02	-0.01	-0.38
S6	2.93	1.00	-0.08	-0.77
S7	3.88	1.06	-0.86	-0.03
S8	3.88	1.07	-0.80	0.23
S9	3.90	1.13	-0.84	-0.12
S10	4.27	0.97	-1.44	1.84
S11	3.85	1.07	-0.73	-0.09
S12	3.85	1.02	-0.82	0.33
S13	4.03	1.00	-1.03	0.81
S14	3.69	1.06	-0.61	-0.13
S15	3.81	1.07	-0.75	0.03
S16	4.04	1.00	-1.05	0.78
S17	3.75	1.08	-0.70	-0.12
S18	3.40	1.05	-0.41	-0.30
S19	3.39	1.20	-0.49	-0.51
Family Income	**1.86**	**1.47**	**2.12**	**4.26**
Grade	**3.17**	**0.70**	**-0.61**	**-0.03**

Note: P = parental involvement; S = students' motivational beliefs

B. Exploratory Factor Analysis Results

An exploratory factor analysis (EFA) was conducted to determine the underlying factor structure of the questionnaire and assess its construct validity. Specifically, data suitability for factor analysis was verified by the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity before conducting EFA. The results showed that the KMO value was 0.931, indicating excellent sampling adequacy (Hair et al., 2019; Kaiser, 1974). The Bartlett's Test of Sphericity was also statistically significant ($\chi^2 = 7346.925$, df = 820, $p < 001$), which confirms that the correlation matrix was factorable.

An Exploratory Factor Analysis (EFA) via Principal Components extraction with Varimax rotation was employed to elucidate the latent factors of parental involvement and learners' motivational beliefs. The analysis of the data revealed five unique factors, all with loading above 0.40, which indicates the construct validity of the instrument (Hair et al., 2019; Stevens, 2009). The first factor, parental role construction, incorporates constructing the perceived parental assistive role in English learning. The second factor, parental capacity, refers to parents' readiness and confidence in helping. Third, home-based parental involvement refers to the practice of engaging in real behaviours at home. The fourth factor, student motivation, was defined as both intrinsic and extrinsic motivation. The fifth scale, self-efficacy, indicated participants' confidence in their English language abilities. All factors were conceptually consistent and valid according to

psychometric standards, which formed the basis for subsequent Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM). The details are listed in Table 2.

TABLE 2
EFA RESULTS FOR PARENTAL INVOLVEMENT AND LEARNERS' MOTIVATIONAL BELIEFS

Dimension	Observed variable	Label	Loading
Parental role construction	P1	Believing it is a duty to support English learning	0.703
	P2	Believing in the parents' role in English success	0.772
	P3	Providing English learning materials	0.750
	P4	Believing parental involvement improves learning	0.676
	P5	Encouraging English practice outside class	0.618
Parental capacity	P6	Feeling confident helping with English homework	0.669
	P7	Finding ways to support English learning	0.645
	P8	Helping develop a positive attitude toward English	0.701
	P9	Helping a child learn English effectively	0.727
	P10	Having time to support English learning	0.823
	P11	Setting aside time to support English learning	0.788
	P12	Having energy to assist with English practice	0.803
	P13	Managing time between chores and English helps	0.805
	P14	Not feeling too tired to help with English	0.680
	P15	Knowing how to help improve English	0.749
Home-based parental involvement	P17	Teaching English at home	0.564
	P18	Using materials to support English at home	0.607
	P19	Creating opportunities for English use outside school	0.604
	P20	Helping review English lessons	0.652
	P21	Supervising English homework	0.638
	P22	Helping prepare for English exams	0.649
Students' Motivation	S7	Wanting to speak English with foreigners	0.670
	S8	Persisting in learning despite difficulty	0.579
	S9	Aspiring to speak English well	0.642
	S10	Aiming for good grades in English	0.718
	S11	Using English for a future career	0.553
	S12	Learning English for real-life use	0.649
	S13	Valuing English as an important subject	0.721
	S14	Believing English opens up opportunities	0.637
	S15	Seeing English as useful in daily life	0.550
	S16	Believing English is helpful for the future	0.626
Students' self-efficacy	S1	Believing in English ability	0.666
	S2	Practising English at home	0.658
	S3	Doing English exercises independently	0.720
	S4	Understanding English lessons in class	0.594
	S5	Feeling confident in English exams	0.699
	S6	Feeling confident answering in class	0.619

The results of the reliability analysis, presented in Table 3, indicate a high level of internal consistency for all five constructs measured in the study. Parental capacity had the highest Cronbach's alpha ($\alpha = 0.94$), indicating excellent test-retest reliability for items assessing parents' confidence, time, and energy in supporting English learning. Home-based parental involvement ($\alpha = 0.87$) and parental role construction ($\alpha = 0.86$) demonstrated good reliability, confirming that the items reliably captured the behaviours parents engaged in at home and parents' perceptions of educational roles, respectively. The learner-related constructs, students' motivation ($\alpha = 0.86$) and students' self-efficacy ($\alpha = 0.81$), showed good reliability, reflecting the consistent measurement of the amount of effort they exert, their goals to master appropriate level tasks in English, and confidence in their ability to perform well on English learning tasks. Taken together, these results suggest that the internal consistency of all subscales is at least acceptable and can be used for further analyses (Cronbach, 1951; Hair et al., 2019; Nunnally & Bernstein, 1994).

TABLE 3
CRONBACH'S ALPHA COEFFICIENTS

VARIABLE	CRONBACH'S ALPHA	LEVEL
Parental Role Construction	0.86	Good
Parental Capacity	0.94	Excellent
Home-based Parental Involvement	0.87	Good
Students' Self-efficacy	0.81	Good
Students' Motivation	0.86	Good

C. Confirmatory Factor Analysis Results

(a). Parental Involvement in Learners' English Learning Achievement

To examine the construct validity of the parental involvement model, posited initially to consist of three latent dimensions (Parental Role Construction [PRC], Parental Capacity [PC], and Home-Based Parental Involvement [HBP]), confirmatory Factor Analysis (CFA) was employed using 22 observed indicators. The first model behaviour was presented as poorly fitting.

Model revision continued with both empirical diagnostics and theoretical rationale. The study considered Modification Indices (MIs) and standardised factor loadings to identify the source of fit misspecification at the item level (Byrne, 2016; Kline, 2016). P6–P8 and P13– P17, for instance, that belonged to the Parental Capacity construct had high MIs and could have also been cross-loading (were thus removed). Imitating the rejection of cross-loading items, item P18 (HBP) for slide 16 and items P3-P5, including P17-20 from PRC, eliminates some other factors. To achieve the best-fitting qualitative comparative analysis solution, the entire construct of the PRC factor was deleted, as it showed a high correlation with PC and lacked empirical distinctiveness (Hair et al., 2019; Brown, 2015). These figures are shown in Figure 1.

Two latent constructs remained in the revised model: Parental capacity (P9–P15) and home-based parental involvement (P19–P22). The fit of the revised model was significantly better than that of the original one (χ^2 = 46.574, df = 34, p < .0001). 074; CMIN/DF = 1.370; GFI= 0.970); RMSEA= 0.035) meeting the widely accepted benchmarks of good model fit (Hu & Bentler, 1999; Kline, 2016; Hair et al., 2019). Good standardised loadings were obtained for all retained items (λ = 0.63–0.85), except for P13 and P15 (λ = 0.45); however, these latter two items were included due to their theoretical importance (Byrne, 2016; Brown, 2015).

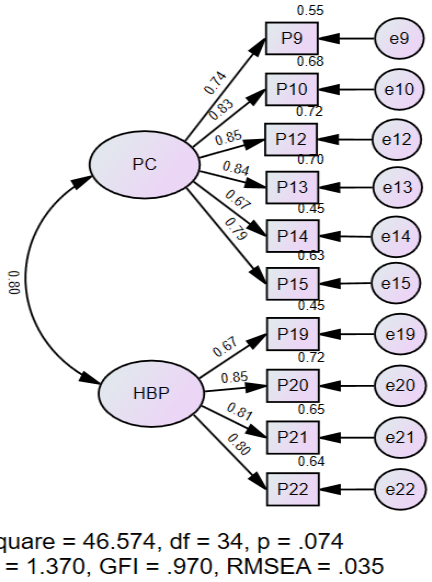

Figure 1. The Iterative Refinement of the CFA Model of Parental Involvement

Two latent constructs remained in the revised model: Parental capacity (P9–P15) and home-based parental involvement (P19–P22). The fit of the revised model was significantly better than that of the original one (χ^2 = 46.574, df = 34, p < .0001). 074; CMIN/DF = 1.370; GFI= 0.970); RMSEA= 0.035) meeting the widely accepted benchmarks of good model fit (Hu & Bentler, 1999; Kline, 2016; Hair et al., 2019). Good standardised loadings were obtained for all retained items (λ = 0.63–0.85), except for P13 and P15 (λ = 0.45); however, these latter two items were included due to their theoretical importance (Byrne, 2016; Brown, 2015).

(b). Learners' Motivation and Self-Efficacy in English Learning Achievement

A distinct CFA was conducted to confirm the measurement model of student motivational beliefs with a 2-latent factor solution: self-efficacy and motivation, measured by 19 items. As illustrated in Figure 2, the fit of the original model was moderate but insufficient (χ^2 = 345.317, df = 149, p = 0.58), and the factor structures were reasonably good. It was highly significant: (χ^2 = 69.834, df = 53, p < 060; CMIN/DF = 1.318; GFI = 0.964; RMSEA=0.032) according to proposed criteria for well-fitting models (Hair et al., 2019; Hu & Bentler, 1999; Kline, 2016). The correlation between self-efficacy and motivation was moderate and theoretically derivable (r = 0.58), which suggests construct validity of the internal structure and relational coherence of the model (Byrne, 2016; Fornell & Larcker, 1981). Taken together, the refined measurement model represents a valid approach for evaluating students' motivational beliefs.

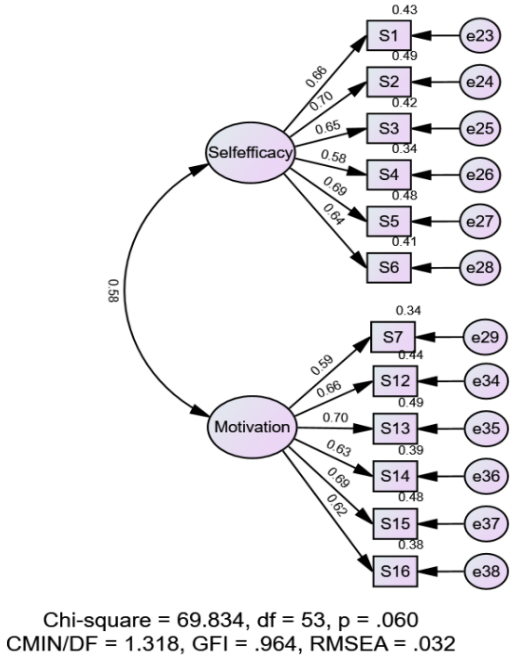

Figure 2. Iterative Refinement of Students' Motivational Beliefs

V. Discussion

The present study aimed to validate the measurement model of parental involvement, students' motivational beliefs (motivation and self-efficacy), and English language learning achievement in a Thai primary EFL context. Through an intensive two-stage process of EFA and CFA, the results provide robust empirical evidence for the reliability and validity of the constructs. The following discussion addresses two research questions and explains how the findings are interpreted in light of current theory and previous research.

A. Underlying Factor Structure of Parental Involvement, Motivational Beliefs, and English Learning Achievement

The findings of the EFA provided strong support for the multidimensionality of the constructs under study. The constructs of parental involvement, motivation, self-efficacy, and English achievement items tended to form separate and logically related factors, supporting the notion that the original adapted instruments effectively tapped into the cognitive and affective domains as intended in the Thai EFL context.

For parent engagement, items loaded on factors representing practices at home, parent–child communication, and monitoring of schoolwork. The multidimensional nature of this factor is consistent with Hoover-Dempsey and Sandler's (1997) definition, which views parental involvement as comprising multiple dimensions of influence and support within the home and at school. The factor structure reveals that the Thai parent provides direct support and encouragement to the child (e.g., directly helps with homework, establishes study routines) and indirect help and encouragement (e.g., communicates with and reinforces the school's expectations). These results lend support to the idea that parent involvement is not a single factor, but a collection of related behaviours and attitudes that collectively contribute to the learner experience.

The factor structure of motivation and self-efficacy was further supported by the results of the EFA, where the items loaded reliably onto the two factors. This suggests that students make a distinction between their interest and willingness to learn English (i.e., they are motivated to learn English) and their confidence in their ability to complete tasks related to English (i.e., task self-efficacy). Although they are interrelated constructs both theoretically and empirically (Usher & Pajares, 2008), the findings demonstrate their discriminant validity in the Thai EFL context. Additionally, the results further suggest that LSE and SRL are logically distinct yet related facets of learner psychology.

Finally, the English learning achievement items loaded very strongly on a single factor, suggesting a unified dimension of academic performance. This provides evidence that backs the appropriateness of including standardised test scores as measures of achievement in studies that deal with primary-level EFL. Taken together, these outcomes indicate that modified instruments are both theoretically sound and empirically strong, establishing a solid framework for measurement. Having verified this factor structure, the findings of this study now demonstrate a validated model from which we can draw confident results in subsequent confirmatory analyses (to fulfil the first research question).

B. Reliability and Validity of the Measurement Model

The strong measurement model was additionally supported by Confirmatory Factor Analysis (CFA) results. The model showed an excellent fit to the data, as indicated by all goodness-of-fit statistics exceeding well-established cut-off values (Hair et al., 2019; Hu & Bentler, 1999; Kline, 2016). In particular, the chi-square/df ratio was significantly less than one, and both the Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) exceeded 0.95, indicating a strong fit (Byrne, 2016). The Root Mean Square Error of Approximation (RMSEA) was 0.05, and the SRMR was also within the recommended range, both indicating a good fit between the hypothesised model and the raw data (Hu & Bentler, 1999; Brown, 2015).

The factor loadings further supported construct validity. All items were found to load significantly and substantively on their respective latent constructs (standardised loadings > 0.60). This provides evidence for convergent validity, indicating that the items proposed to assess parental involvement, motivation, self-efficacy, and English achievement are indeed measuring theory-based constructs (Hair et al., 2019; Kline, 2016). Scores for Average Variance Extracted (AVE) were greater than 0.50 across all constructs, indicating that the latent variables accounted for more than half of the variance in the indicators (Fornell & Larcker, 1981). Additionally, discriminant validity was confirmed as the square root of the AVE of each construct was larger than the correlations between it and other constructs, indicating that the constructs of parental involvement, motivation, and self-efficacy were related but conceptually disparate (Byrne, 2016; Fornell & Larcker, 1981).

The reliability analyses also supported the robustness of the measurement model. Cronbach's alphas ranged from 0.82 to 0.91, exceeding 0.70, and CR estimates all exceeded 0.80. These results demonstrate high internal reliability, indicating that the scales provide stable and reliable indices of the constructs (Cronbach, 1951; Hair et al., 2019; Nunnally & Bernstein, 1994).

More importantly, in addition to the robustness of the statistic, the confirmed measurement model has several theoretical and other methodological implications. Theoretically, the results suggest that it is possible to reliably operationalise parental involvement, motivation, and self-efficacy in a primary school EFL context, where opportunities for authentic language use outside the classroom are scarce. This expands the grounds for applying Bandura's (1997, 2001) Social Cognitive Theory and Ryan and Deci's (2000, 2020) Self-Determination Theory to young EFL learners, confirming the significance of psychological and family-level variables in predicting language learning outcomes. From a methodological perspective, the research makes an essential contribution by creating scientifically validated measurement instruments that are contextualised to Thailand. This study's data, therefore, provide evidence about the stability of these relationships across Western and non-Western contexts, as well as the validity or lack thereof of the instruments commonly used to measure the identity and motivation of English language learners.

All in all, these findings suggest that the measurement model is consistent and accurate, and that it can be reliably employed as a methodology to explore structural relationships among family, motivational, and achievement constructs in subsequent research.

VI. Conclusion

The purpose of this study was to verify the measurement model of parental involvement, motivation, and self-efficacy in the Thai primary EFL context by means of a two-step analytical procedure, i.e., EFA followed by CFA. The results provide robust pedagogical support for the reliability and validity of the adapted instruments, suggesting that the constructs tap into coherent and separate dimensions of learners' educational experiences. This methodological stringency has been established to pave the way for future research on family and psychological influences on English language learning achievement to be based on a sound and reliable measurement ground. Through the creation of instruments that are sensitive to convergent and discriminant validity, along with strong internal consistency, the present study contributes to the ELT field by providing context-specific instruments for researching the intricate relationship between parental support, learner motivation, and self-beliefs. The practical implications of the validated dimensional measurement model for schools and policymakers are that it provides tools to measure students' motivational resources and parental engagement, which in turn can help inform language learning interventions. Ultimately, the study emphasises the necessity of robust validation of measurement as a precursor to downstream structural and theoretical testing. The findings of this study not only provide robust empirical evidence for the proposed model in terms of the methodological aspects of SEM studies but also have practical implications for how teachers and administrators can utilise focused engagement and motivational strategies to support the language development of young learners.

The results of this research have significant implications for research and practice in educational settings. The validation of the parental involvement, motivation, self-efficacy, and English achievement scales provides a trustworthy and culturally relevant measurement construct for the Thai EFL context from a research perspective. This is particularly helpful because several other studies currently being conducted in language education use instruments created in Western societies, which may not adequately account for the sociocultural experiences of Asian students. Because the reliability and validity of these measures have been empirically established in this research, subsequent studies using the same measures can generate methodologically sound and culturally sensitive results. Moreover, the validated model provides a solid empirical foundation for subsequent SEM analyses (addressed in the following article), which enable researchers to identify causal paths with confidence in measuring latent variables. The instruments could also be used and modified

by researchers in other EFL and ESL settings, thereby supporting cross-cultural validation and comparative studies in English language learning.

Practically, the validated scales provide schools, teachers, and policy makers with diagnostic instruments to measure and track fundamental aspects of students' learning environments. Teachers can use these to identify students who may need additional motivation to feel more confident about themselves, and schools can use them to measure parental engagement, reach, and quality. Policymakers could use the tools to design interventions that facilitate family–school collaboration and enhance learner motivation and self-beliefs in English education. For example, data from these scales might have the potential to direct the use of parent training, motivationally rich classroom practices, and targeted learner support programs.

In short, the validated measurement model enhances methodological quality in EFL research and has practical implications for improving educational practice. It addresses the theory–practice gap by emphasising the importance of accurate measurement in the development of evidence-based interventions that enhance English language learning.

Although this research confirms the internal validity and reliability of the instruments for measuring respondents' parental involvement, motivation, self-efficacy, and emotions related to English achievement within the Thai EFL classroom, it also highlights some limitations. First, our study only sampled a relatively homogeneous group of Thai young primary school ESL learners in one part of the country. While the sample was large enough for factor analysis, the results may not be representative of students in different areas, grades, and education systems. Validation of the instrument needs to be replicated with larger and more variable samples of secondary and tertiary learners to achieve better generalisability of the results.

Second, the study does not include any objective measures, relying solely on self-report questionnaires and standardised test scores. Although this is not unusual in educational research, it is open to response bias and may not adequately reflect the dynamic nature of parental involvement or motivational beliefs. Such an investigation could be supplemented with other research methodologies, such as interviews or classroom observations, to gain a fuller understanding of them. The cross-sectional nature of this design also precludes the assessment of stability and change in construct measurement over time. Recommendations are made for future (longitudinal) validation studies to investigate the invariance of the measurement model across different developmental stages, and examine how parental involvement and learner psychology change over time if students continue to learn the English language. Finally, although we found strong evidence for the psychometric properties of the model, it would be interesting to test the measurement invariance across cultures. Cross-validating these instruments across varied EFL and ESL contexts would enhance their utility and facilitate comparisons across studies on the influences of language learning.

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