



Pilot study of the home observation for measurement of the environment for Infant/toddlers (IT-HOME) in Thailand

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Abstract

An extensive literature documents the importance of the home environment for child development. However, only one previous study in 2003 reported the use of the Infant/Toddler HOME (IT-HOME) with rural children in Thailand. The study of the IT-HOME with extended socioeconomic groups would benefit researchers to assess child home environment systematically and relevantly for the Thai culture. In this study, psychologists administered the Thai-translated IT-HOME to a convenience sample of 89 dyads of caregivers and children, 12–35 months, from Urban/High SES ($N = 30$), Urban/Low SES ($N = 30$), and Rural/Low SES ($N = 29$) groups in Thailand. The internal consistency of the overall Thai-translated IT-HOME was .82. The high percent “yes” response of each item across all groups showed that all items were relevant to Thai families and culture. Among the Thai samples, the IT-HOME score of Urban/High was significantly higher than both Urban/Low and Rural/Low. Interestingly, Rural/Low had significantly higher scores than Urban/Low in the total score and some content domains. The overall results for the Thai participants were similar to a 1997-US sample from Washington State, but were significantly higher than the 1972-US normative data and previous 2003-rural data from northeastern Thailand. Our study suggests that the Thai-translated IT-HOME is culturally appropriate for Thai children and families. Therefore, the use of the Thai-translated IT-HOME is recommended for the standard assessment of overall quality of home environment for children in Thailand.

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Introduction

The Bioecological Model (Bronfenbrenner & Morris, 2006) emphasizes the importance of bidirectional interactions between individual biological factors (e.g., age, gender) and environmental factors (e.g., home environment, neighborhoods, social culture) in influencing human development throughout the lifespan. Extensive literature globally supports the importance of the environment, especially immediate environments such as the family and stimulating home environment, in child development from early stages of life (Andrade et al., 2005; Bradley, 2015). In addition to conduct a study assessing the home environmental factors at the early age, several studies have used the Infant/Toddler version of Home Observation for Measurement of the Environment (IT-HOME; Caldwell & Bradley, 2003).

The IT-HOME is developed as a systematic assessment to indicate quality of environmental stimulations at home for infants and toddlers aged newborn to 3 years old. It was designed not only to assess stimulating environments within the home, but also evaluate various aspects of child environments, for example, parent-child interactions, safety outside area, and opportunities to enriching experience outside the home. These aspects were assessed by observing the child and parent at home alongside a semi-structured interview.

Studies have reported reliability and validity of the IT-HOME in many countries (e.g., Findik & Aral, 2023; Lee et al., 2015), and have used the IT-HOME for several purposes of research studies. For example, Rijlaarsdam et al. (2013) studied associations between IT-HOME and child development. They found that lower Play Material score of IT-HOME was associated with later expressive language delays, and more internalizing problems. Moreover, some studies have evaluated IT-HOME as an outcome measure for early intervention or home-based intervention promoting child home environment, development, and parenting practices, particularly in high-risk populations such as those affected by poverty or low birth weight (Toma & Puiu, 2016; Walker et al., 2004). These studies suggest that the IT-HOME is a reliable and valid tool used in studying and promoting child development in several countries. Even though the IT-HOME has been used and established in several countries, Bradley (2015) suggested that the HOME inventory should be interpreted considering cultural context in which it was observed, rather than universal interpretation.

Upon reviewing studies on home environment and child development literature, they appeared that there were relatively fewer studies that observe the child's home environment in Thailand. Particularly, there was only one report involving

the use of IT-HOME to assess the home environment in rural Thailand over the past 20 years (Williams et al., 2003). Williams et al. (2003) reported the use of the IT-HOME in their pilot study in two rural districts of Mahasarakham Province in Northeastern Thailand. Most parents participating in the study were considered low socioeconomic status (SES), with less than high-school education, and occupations as manual laborers, farmers, or unemployed. They reported cultural differences between their rural Thai sample and data from studies in the US. They reported that the rural Thai sample had lower parental responsivity than the US participants, even when compared to Eskimo and Native American. Additionally, they suggested the need for further studies with more diverse populations in Thailand (e.g., urban/rural settings, and high/low SES).

In sum, there is still a lack of a reliable method for assessing the quality of the child's home environment in Thailand. The latest study on Thai IT-HOME, which reported 20 years ago, studied in rural Thai sample only. Therefore, the purpose of our study was to: (1) investigate the internal consistency of the updated Thai-translated IT-HOME, as well as modifying the cultural relevance of its items in more recent years; (2) include diverse Thai participants and compare the IT-HOME scores among urban/rural and high/low SES groups; and (3) compare mean scores of the IT-HOME with previous study of the US normative sample reporting in HOME inventory manual (Caldwell & Bradley, 2003) and a sample from Washington State (Boffman et al., 1997), because these data are available to access and presented normative IT-HOME data from diverse characteristics of populations. We also compare our present IT-HOME scores with Williams et al. (2003) to discuss differences between the present Thai IT-HOME and the previous Thai IT-HOME data. Establishing Thai IT-HOME will aid in researching the impact of the home environment on child development, potentially leading to the development of intervention programs.

Methodology

Participants

A convenience sample of participants was recruited by psychology graduate students and health volunteers in central Bangkok and Chom Thong district in Chiangmai. The health volunteers in Bangkok and Chom Thong received documents describing the study and were trained by researchers to perform recruitment. They recruited participants according to the inclusion criteria, which included families residing in one of the study areas, using

Thai language, and having at least one healthy child between the ages of 1 and 3. Additionally, this study determined the SES by the level of education of the primary financial provider for the family (High SES: ≥ 16 years of education, equivalent to a college or university degree; Low SES: < 16 years of education, equivalent to up to high school). When recruiting participants in Chom Thong, we rarely came across rural parents with higher education levels beyond high school. As a result, the High SES/rural group was not available for inclusion in this study.

Eighty-nine families with 12- to 35-month-old healthy infants, representing Urban/High SES from Bangkok ($N = 30$), Urban/Low SES from Bangkok ($N = 30$) and Rural/Low SES from Chom Thong ($N = 29$), were recruited for the study.

Data collection

The data were collected, during May to September 2017, using 45 Yes/No items of the IT-HOME. The scale includes six content domains; (1) Parental Responsivity, (2) Acceptance of Child, (3) Organization of the Environment, (4) Play Materials, (5) Parental Involvement, and (6) Variety of Stimulation. A total IT-HOME score is the sum of all content domain scores.

The IT-HOME items were translated into Thai by the principal investigator, an experienced developmental psychologist at Chulalongkorn University. Back translation was performed by another faculty member who is equally proficient both in Thai and English.

Item 33 in the Play Materials was modified to reflect present Thai culture, changing from “toys for literature and music” to “Toys for literature and music (including mobile device and tablet)” to reflect the common use of these devices by Thai parents as a means of displaying stories, songs, and games to their children.

The IT-HOME assessment was administered in pairs by 10 graduate students in developmental psychology from Chulalongkorn University, trained by the principal investigator. One rater in each pair served as the primary evaluator, obtaining consent, conducting the interview, and assessing the IT-HOME. At the same time, another rater observed the interview and independently assessed the IT-HOME. The percent agreement during practice ranged from 91.1 to 100 percent. During data collection, the inter-rater reliability was 100 percent agreement.

Procedure

When a participant met inclusion criteria, the home visit was scheduled at a time convenient for the caregiver and

infant. During the home visit, the IT-HOME assessors introduced themselves and spent time with the caregiver and infant to ensure that they were comfortable before beginning the IT-HOME interview. The primary assessor gave the consent form to the caregiver to read and sign. All questions were answered according to procedures approved by Institutional Review Boards (IRB) of Chulalongkorn University and Rutgers University responsible for review and approval of the study. All infants were at home and actively awake during the interview. The IT-HOME interview took about 45 minutes for each family. After the interview was completed, any remaining questions were answered, and each family was paid 300 baht.

Data Analysis

1. To examine the internal consistency reliability of the Thai-translated IT-HOME and examine the cultural relevance of the items in Thai culture: (1) alpha coefficients were calculated to assess internal consistency; (2) corrected item-total correlations (CITC) of the items under each content domain were examined on how the items in the content domain correlate with each other; (3) The percent of “yes” responses across all three groups of different urban/rural/SES in this study were examined.

2. To examine differences of the IT-HOME mean scores among three rural/urban SES groups in this study, one-way ANOVA and Scheffe post-hoc test were utilized.

3. To evaluate differences in scores between the Thai-translated IT-HOME reported in this study and those reported in previous research, *t*-tests were conducted.

Results

Demographic Data

The demographic data are presented in Table 1 and 2. Analysis of variance revealed a significant overall difference in age among the three groups [$F(2, 86) = 3.10, p = .05$]. However, post hoc tests showed no significant differences in bivariate comparisons of the groups. Significant differences in parental education [$F(2, 86) = 67.53, p < .001$] and income [$F(2, 82) = 9.97, p < .001$] were observed among the three groups. Urban/High had the highest levels of parental education and income, while Urban/Low had lower parental education than Rural/Low, but no significant difference in income.

Table 1 Demographic information on infant age, parental education, and household income

Variables	Urban/High (<i>N</i> = 30)		Urban/Low (<i>N</i> = 30)		Rural/Low (<i>N</i> = 29)		Post Hoc		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Urban/ High - Urban/ Low	Urban/ High - Rural/ Low	Rural/ Low - Urban/ Low
							Mean difference	Mean difference	Mean difference
Child age (month)	17.83	5.63	17.93	6.44	21.21	5.58	-.10	-3.37	3.27
Average parental education	16.27	1.64	8.51	3.94	10.98	2.62	7.58***	5.31***	2.26*
- Mother's education (year)	16.93	1.01	8.57	4.00	11.00	3.42	8.37***	5.93***	2.43*
- Father's education (year)	15.59	1.88	8.44	3.95	10.96	1.43	7.15***	4.62***	2.52*
Income (x1,000 baht)	137.07	194.00	20.19	13.73	20.90	16.45	116.88**	116.17**	0.71

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2 Demographic information on infant gender, primary caretaker, mother's education level, mother's occupation, father's education level, and father's occupation in the study

Variables	Urban/High (<i>N</i> = 30)		Urban/Low (<i>N</i> = 30)		Rural/Low (<i>N</i> = 29)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Infants						
Boy	15	50.0	13	43.3	17	56.7
Girl	15	50.0	17	56.7	12	43.3
Primary caretaker						
Mother/father	29	96.7	28	93.3	28	96.6
Others (grandparent, aunts)	1	3.3	2	6.7	1	3.4
Mother's education level						
No education	-	-	4	13.3	1	3.4
Elementary	-	-	3	10.0	1	3.4
High school	-	-	23	76.7	22	75.9
College	-	-	-	-	-	-
University	30	100	-	-	5	17.2
Mother's occupation						
Unemployed	11	36.7	9	30.0	10	34.5
Business owner	3	10.0	-	-	-	-
Farmer	-	-	-	-	-	-
Clerical/office worker	13	43.3	10	33.3	12	41.4
Sales worker	-	-	7	23.3	4	13.8
Manual laborer	-	-	1	3.3	2	6.9
Professional	2	6.7	1	3.3	-	-
Missing	1	3.3	2	6.7	1	3.4
Father's education level						
No education	-	-	3	10.0	-	-
Elementary	-	-	5	16.7	-	-
High school	5	16.7	17	56.7	28	96.6
College	1	3.3	-	-	-	-
University	23	76.7	-	-	-	-
Missing	1	3.3	5	16.7	1	3.4
Father's occupation						
Unemployed	1	3.3	-	-	-	-
Business owner	7	23.3	-	-	1	3.4
Farmer	-	-	-	-	2	6.9
Clerical/office worker	13	43.3	16	53.3	12	41.4
Sales worker	1	3.3	-	-	2	6.9
Manual laborer	1	3.3	8	26.7	9	31.0
Professional	5	16.7	1	3.3	1	3.4
Missing	2	6.7	5	16.7	2	6.9

There was no difference in numbers of boys and girls among the three groups ($p > .05$). The primary caretakers for all the participants in this study were the mother and/or father. All the mothers in the Urban/High group had completed at least a bachelor's degree, while most mothers in the low SES groups had finished at least high school. Most fathers in the Urban/High group had completed at least a bachelor's degree, but the fathers in both the Urban/Low and Rural/Low groups mostly had finished at least high school. The parents in this study have varied occupations, with the majority working as clerical or office workers.

The Internal Consistency Reliability of the Thai IT-HOME, And the Cultural Relevance of the Items in Thai Culture

The internal consistency of the present Thai IT-HOME compared with alpha coefficients of the IT-HOME manual, and the rural Thai IT-HOME are presented in Table 3. The mean inter-item correlations of each content domain are shown only for our Thai study.

The internal consistency of the present Thai IT-HOME was considered good with alpha of .82, similar to the IT-HOME manual, and the rural Thai IT-HOME (See Table 3). Of all 6 content domains of the IT-HOME in this study, five content domains, including Parental

Responsivity, Acceptance of Child, Play Materials, Parental Involvement, and Variety of Stimulation had low to moderate internal consistencies ($\alpha = .42-.64$). The mean inter-item correlations of these five content domains are between .13–.17.

Only Organization of the Environment, showed very low internal consistency ($\alpha = .19$) and the mean inter-item correlation was very low at .04. The low internal consistency in this content domain was also reported by Williams et al. (2003) with a negative alpha of -.15.

Table 4 shows the corrected item-total correlation (CITC) of the items under each content domain of the Thai IT-HOME in this study. Of 45 items, there are 17 items with CITC less than critical r of 0.175. Among these, five items have negative CITC values.

As previously mentioned, we also examined specific concerns of IT-HOME items in the context of Thai families, focusing on items with 100 percent and less than 20 percent “yes” responses across all three groups of rural/urban/SES in our study. Frequency of individual item response “yes” (Table 4) showed that every group reported 100 percent “yes” for item 23: Child is taken regularly to doctor's office or clinic. There were 2 items with less than 20 percent “yes” response for Urban/Low groups, including item 37: Parent invests maturing toys with values via personal attention and item 42: Parent reads stories to child at least 3 times weekly.

Table 3 Internal consistency of the Thai IT-HOME, original IT-HOME, and Rural Thai IT-HOME

Content domain	Thai IT-HOME ^a (<i>N</i> = 89)		IT-HOME Manual ^b (<i>N</i> = 172)		Rural Thai IT-HOME ^c (<i>N</i> = 36)	
	alpha	Mean Inter-item correlations	alpha	Mean Inter-item correlations ^d	alpha	Mean Inter-item correlations ^d
Parental Responsivity	.59	.13	.72	-	.76	-
Acceptance of Child	.43	.16	.67	-	.74	-
Organization of the Environment	.19	.04	.89	-	-.15	-
Play Materials	.64	.17	.77	-	.82	-
Parental Involvement	.59	.16	.69	-	.57	-
Variety of Stimulation	.42	.13	.44	-	.14	-
TOTAL Score	.82	.09	.89	-	.81	-

Note: ^a This Thai study

^b Reported in IT-HOME manual by Caldwell and Bradley (2003)

^c Rural Thai data reported by Williams et al. (2003)

^d No data available for the mean inter-item correlations of the original IT-HOME, and rural Thai IT-HOME.

Table 4 Corrected item-total correlation (CITC) and frequency of individual item response “yes” on IT-HOME scale of Urban/High, Urban/Low, and Rural/Low groups

High, Urban/High, and Rural/Low Groups								
No.	Items	CITC	Urban/High (N = 30)		Urban/Low (N = 30)		Rural/Low (N = 29)	
			Yes	%	Yes	%	Yes	%
Parental Responsivity ($\alpha = .59$)								
1.	Parent permits child to engage in “messy” play.	-.108	25	83.33	22	73.33	26	89.66
2.	Parent spontaneously vocalizes to child at least twice.	.520*	27	90.00	25	83.33	23	79.31
3.	Parent responds verbally to child’s vocalizations or verbalizations.	.502*	27	90.00	25	83.33	26	89.66
4.	Parent tells child name of object or person during visits.	.308*	22	73.33	16	53.33	12	41.38
5.	Parent’s speech is distinct, clear, and audible.	.084	30	100.00	29	96.67	29	100.00
6.	Parent initiates verbal interchanges with Visitor.	.380*	24	80.00	13	43.33	14	48.28
7.	Parent converses freely and easily.	.084	30	100.00	29	96.67	29	100.00
8.	Parent spontaneously praises child at least twice.	.319*	25	83.33	21	70.00	27	93.10
9.	Parent’s voice conveys positive feelings toward child.	.353*	30	100.00	29	96.67	29	100.00
10.	Parent caresses or kisses child at least once.	.470*	30	100.00	27	90.00	28	96.55
11.	Parent responds positively to praise of child offered by Visitor.	.178*	26	86.67	24	80.00	25	86.21
Acceptance of Child ($\alpha = .43$)								
12.	No more than 1 instance of physical punishment during past week.	.150	27	90.00	15	50.00	24	82.76
13.	Family has a pet.	-.051	14	46.67	11	36.67	22	75.86
14.	Parent does not shout at child.	.023	28	93.33	29	96.67	28	96.55
15.	Parent does not express overt annoyance with or hostility to child.	.544*	30	100.00	27	90.00	27	93.10
16.	Parent neither slaps nor spanks child during visit.	.544*	30	100.00	28	93.33	28	96.55
17.	Parent does not scold or criticize child during visit.	.459*	30	100.00	28	93.33	27	93.10
18.	Parent does not interfere with or restrict child more than 3 times during visit.	.143	29	96.67	27	90.00	22	75.86
19.	At least 10 books are present and visible.	.221*	28	93.33	13	43.33	14	48.28
Organization of the Environment ($\alpha = .19$)								
20.	Child care, if used, is provided by one of 3 regular substitutes.	.053	30	100.00	21	70.00	27	93.10
21.	Child is taken to grocery store at least once a week.	.009	26	86.67	28	93.33	24	82.76
22.	Child gets out of house at least 4 times a week.	-.035	26	86.67	29	96.67	25	86.21
23.	Child is taken regularly to doctor’s office or clinic.	.000	30	100.00	30	100.00	29	100.00
24.	Child has a special place for toys and treasures.	.218*	29	96.67	21	70.00	27	93.10
25.	Child’s play environment is safe.	.191*	30	100.00	21	70.00	15	51.72
Play Materials ($\alpha = .64$)								
26.	Muscle activity toys or equipment.	.307*	30	100.00	24	80.00	28	96.55
27.	Push or pull toy.	.250*	27	90.00	25	83.33	27	93.10
28.	Stroller or walking, kiddie car, scooter, or tricycle.	.464*	27	90.00	20	66.67	28	96.55
29.	Cuddly toy or role-player toys.	.153	26	86.67	27	90.00	29	100.00
30.	Learning facilitators - mobile, tablet, chair, high chair, play pen.	.510*	28	93.33	19	63.33	24	82.76
31.	Simple eye-hand coordination toys.	.448*	28	93.33	13	43.33	19	65.52
32.	Complex eye-hand coordination toys.	.353*	28	93.33	10	33.33	14	48.28
33.	Toys for literature and music.	.365*	30	100.00	24	80.00	25	86.21
34.	Parent provides toys for child to play with during visit.	.108	15	50.00	11	36.67	13	44.83

Table 4 Continued

No.	Items	CITC	Urban/High (N = 30)		Urban/Low (N = 30)		Rural/Low (N = 29)	
			Yes	%	Yes	%	Yes	%
Parental Involvement ($\alpha = .59$)								
35.	Parent talks to child while doing household work.	-.100	21	70.00	20	66.67	26	89.66
36.	Parent consciously encourages developmental advance.	.285*	26	86.67	17	56.67	19	65.52
37.	Parent invests maturing toys with values via personal attention.	.673*	23	76.67	5	16.67	12	41.38
38.	Parent structures child's play periods.	.485*	25	83.33	7	23.33	12	41.38
39.	Parent provides toys that challenge child to develop new skills.	.549*	24	80.00	13	43.33	12	41.38
40.	Parent keeps child in visual range, looks at often.	.064	29	96.67	29	96.67	27	93.10
Variety of Stimulation ($\alpha = .42$)								
41.	Father (or father figure) provides some care daily.	.263*	28	93.33	27	90.00	29	100.00
42.	Parent reads stories to child at least 3 times weekly.	.528*	22	73.33	5	16.67	11	37.93
43.	Child eats at least one meal a day with mother and father (or father figure).	.046	16	53.33	17	56.67	19	65.52
44.	Family visits relatives or receives visits once a month or so.	-.002	22	73.33	20	66.67	25	86.21
45.	Child has 3 or more books of his/her own.	.353*	25	83.33	7	23.33	8	27.59

Note: * > Critical - r : $r(87) = .175$.

$p < .05$.

The Differences of the Thai-Translated IT-HOME Mean Scores among Three Rural/Urban SES Groups of Thai Participants

The analysis of variance in Table 5 shows significant differences in total IT-HOME scores, and all content domain scores among the three groups. Scheffe tests indicated that all the IT-HOME scores of Urban/High were significantly higher than those of Urban/Low. Additionally, Urban/High had significantly higher scores than Rural/Low in the Organization Environment, Parental Involvement, and Total HOME. On the other

hand, Rural/Low had significantly higher scores than Urban/Low in the Play Materials, and Total HOME.

Comparison of Mean Scores of the Thai IT-HOME with Three Data Sets Reported In the Literature

Table 6 shows the mean scores and standard deviations of the total IT-HOME and each content domain of the two Thai samples and two US samples reported in the literature. Three pairs of t -test between the Thai IT-HOME in this study and each version of IT-HOME in the US and Thai rural participants were obtained.

Table 5 Mean comparison, ANOVA, and Scheffe tests of IT-HOME scores among Urban/High, Urban/Low, and Rural/Low groups

Content domain	Urban/High (<i>N</i> = 30)		Urban/Low (<i>N</i> = 30)		Rural/Low (<i>N</i> = 29)		<i>F</i>	Scheffe tests		
								Urban/High	Urban/High	Rural/Low
								Urban/Low	Rural/Low	Urban/Low
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		mean difference	mean difference	mean difference
Parental Responsivity	9.87	1.38	8.67	1.89	9.24	1.33	4.31*	1.20*	0.63	0.57
Acceptance of Child	7.20	0.70	5.93	1.29	6.62	1.27	9.30**	1.27**	0.58	0.69
Organization Environment	5.70	0.46	5.00	0.93	5.07	0.91	6.81**	0.70*	0.63*	0.07
Play Materials	7.97	1.14	5.77	1.99	7.14	1.25	15.62**	2.20**	0.83	1.37*
Parental Involvement	4.93	1.12	3.03	1.25	3.72	1.51	15.83**	1.90**	1.21*	0.69
Variety of Stimulation	3.77	1.31	2.53	1.02	3.17	0.91	9.18**	1.23**	0.59	0.64
Total HOME	39.43	4.05	30.93	5.11	34.97	4.08	26.53**	8.50**	4.47**	4.03*

Note: * $p < .05$, ** $p < .001$.

Table 6 Mean IT-HOME scores and t-test comparing this present Thai sample with two US samples and one Thai rural sample

Content domain	TH sample ^a present study (N = 89)		US Norm ^b 1972 (N = 174)		US Washington ^c 1997 (N = 180)		TH Rural ^d 2003 (N = 36)		t-test		
									a/b	a/c	a/d
	M	SD	M	SD	M	SD	M	SD	t (Cohen's d)	t (Cohen's d)	t (Cohen's d)
Parental Responsivity	9.26	1.63	8.0	2.2	9.53	1.71	8.94	1.93	5.24** (.651)	-1.26 (.162)	0.88 (.179)
Acceptance of Child	6.58	1.23	5.3	1.6	6.40	1.22	6.56	1.05	7.18** (.897)	1.13 (.147)	0.09 (.017)
Organization of the Environment	5.26	0.85	4.9	1.2	5.24	0.91	4.17	0.66	2.81* (.346)	0.18 (.023)	7.67** (1.432)
Play Materials	6.96	1.77	6.4	2.4	6.58	2.62	2.33	2.00	2.14* (.266)	1.40 (.170)	12.10** (2.452)
Parental Involvement	3.90	1.52	3.3	1.6	4.75	1.59	5.25	0.84	2.98* (.384)	-4.25** (.546)	-6.32** (1.099)
Variety of Stimulation	3.16	1.21	3.0	1.1	3.15	1.33	1.67	0.68	1.05 (.138)	0.06 (.008)	8.71** (1.518)
Total Score	35.11	5.65	30.9	7.6	35.60	6.87	28.92	3.92	5.07** (.628)	-0.62 (.078)	6.98** (1.272)

Note: a/b = study a and b, a/c = study a and c, a/d = study a and d

^aThis Thai study with data collected in 2017

^bUS normative data during 1970-1972, reported in IT-HOME manual with one-digit number (Caldwell & Bradley, 2003)

^cUS Washington normative data bank (Boffman, et al., 1997)

^dRural Thai data (Williams et al., 2003)

* $p < .05$, ** $p < .001$.

Results showed that the mean scores of the present Thai sample were significantly higher than 1972 US normative data for total IT-HOME scores and five content domain scores. No difference was found on content domain Variety of Stimulation. Compared to the US Washington data bank (Boffman et al., 1997), our Thai sample shows similar mean scores for the total IT-HOME scale and most content domain scores. Only Parental Involvement was significantly higher for the US Washington sample relative to our Thai sample. Mean scores of our Thai sample were significantly higher than the rural Thai data from Williams et al. (2003) for the total IT-HOME scores and three content domain scores, Organization of the Environment, Play Materials, and Variety of Stimulation. The Parental Involvement of the rural Thai data was significantly higher than our Thai data. No difference between the two Thai samples was found in Parental Responsivity and Acceptance of Child content domains.

Discussion

The Internal Consistency Reliability of the Thai-Translated IT-HOME, and the Cultural Relevance of the Items in the Thai Culture

In this study, the internal consistency of the Thai IT-HOME total scale was good, similar to previous findings (Caldwell & Bradley, 2003; Williams et al., 2003). However, the internal consistencies of content domains were generally low to moderate ($\alpha < .70$). Notably, the internal consistency of the Organization of the Environment domain was very low ($\alpha = .19$), which aligns with the findings reported by Williams et al. (2003). The results of CITC analysis suggest that items that do not meet the critical- r value may not be suitable for grouping together within their respective content domains. The analysis of mean inter-item correlations presented in Table 3 also indicated low correlations among the items within each content domain.

Upon analysis, the items within the Organization of the Environment domain can be categorized into three themes: (1) childcare, (2) regular outdoor activities for the child, and (3) organized and safe play environments. It is important to consider that some items within the

Organization of the Environment domain may be influenced by the rural or urban residential characteristics, such as proximity to roads or access to farming equipment, which can affect the score for safety in the child's play area. Additionally, within the Thai context, the organization of childcare, and opportunity for outside activities may differ due to extended family households or the involvement of babysitters in contrast to the Western cultural perspective of parental organization. These factors could contribute to the observed low internal consistency within the Thai cultural context.

Findings of low internal consistency among IT-HOME content domains have been observed in studies conducted in other Asian countries, including Indonesia (Zevalkink et al., 2008) and Korea (Lee et al., 2015). However, it is worth noting that the HOME inventory was not originally developed using scale construction methods, but rather based on developmental psychological theories and research indicating certain experiences as beneficial for child development (Bradley, 2015). In sum, the HOME inventory should be considered an index of home environment quality rather than a reflective scale. Eliminating items based solely on internal consistency may overlook essential indicators for child development (Bradley, 2015).

The analysis of the percent “yes” responses indicates that all items of the Thai IT-HOME are applicable for Thai families and can capture diverse responses across different socioeconomic groups. Notably, one item (item 23) received a 100 percent “yes” response from every family across the three groups, indicating the common practice among Thai parents of regularly taking their children to doctor's offices or clinics for vaccinations and well-baby check-ups. This item serves as an indicator of a high-quality environment where families prioritize their children's healthcare.

In contrast, the Urban/Low group reported less than 20 percent “yes” responses on two items: *parental investment in maturing toys with values through personal attention* (item 37), and *reading stories to the child at least three times weekly* (item 42). These low “yes” response rates suggest limited support for child development among Urban/Low families.

These findings reveal disparities in parental support for child development among socioeconomic groups in Thailand, emphasizing the importance of targeted interventions and support for Urban/Low families to improve their home environments.

In summary, we maintained the original items of the IT-HOME without elimination or rearrangement to

ensure data consistency for cross-cultural and meta-analysis studies. However, caution is advised for Thai researchers using the Thai IT-HOME due to the low internal consistency observed in the Organization content domain. Future studies could report both the original content domain scores and modified versions tailored to address specific research questions. Nonetheless, the Total IT-HOME score remains a valuable tool for evaluating the overall quality of the home environment for Thai children.

Differences of the Thai-Translated IT-HOME Mean Scores among Three Rural/Urban SES Groups of Thai Participants in This Study

The present study found that the Urban/High group demonstrated the highest level of advantage in creating a stimulating environment for their children. They were more responsive, supportive, and less punitive towards their children compared to the low SES groups, particularly Urban/Low parents. Additionally, Urban/High parents reported being more involved in child developmental encouragement activities, such as reading books, structuring playtime, and providing challenging toys, compared to the low SES groups. Likewise, we found that Urban/High had more developmentally-supportive toys.

Studies in Western and Asian cultures have shown associations between parental education, SES, and parenting practices and the quality of child environment (Ng & Wang, 2019). Children from low SES families tended to have less developmental support and learning resources. Williams et al. (2000) revealed that Indonesian urban mothers and rural mothers with high education expected their children to attain developmental milestones earlier than rural mothers with low education. Similarly, our rural mothers reported a wide variability in childrearing, but overall results revealed that urban mothers with higher education had more interactions in childrearing, such as begin talking to their babies, telling stories, reading books to their children, or letting their babies feed themselves, earlier than rural mothers, and those with less education. Additionally, low SES families have been observed to use harsher and more punitive practices, compared to higher SES families (Tajima & Harachi, 2010).

Comparing between the low SES groups, our study showed that Urban/Low children faced more disadvantages compared to Rural/Low children. The Urban/Low group showed higher frequencies of lacking toys and learning materials, indicating greater financial limitations.

Additionally, we observed that Urban/Low parents had less interaction with their children, with less than 20% reading stories to their child more than three times a week. These disparities could be attributed to variations in parents' occupations, work hour flexibility, and commuting distances between the two groups. Rural parents, often engaged in agriculture, tend to have more flexible schedules and shorter commutes, allowing for more time spent with their children. On the other hand, Urban/Low parents often have fixed work hours and longer commutes, limiting their availability. Interestingly, a study conducted in Brazil found that living in a rural area can offer greater benefits for child cognitive development compared to an urbanized area (Freitas et al., 2022). However, we have not come across any reports comparing child development among urban/rural and high/low SES groups specifically in Thailand.

These findings highlight the need for targeted interventions and support systems to bridge the gaps between urban and rural areas, as well as address the disparities faced by families with low socioeconomic status. Further research is warranted to explore the specific factors influencing child developmental outcomes in different regions and socioeconomic contexts within Thailand. In addition to support parents, especially those with low SES, we recommend parenting intervention programs and healthcare services to raise awareness of child developmental milestones. Access to learning materials and toys for urban/low SES parents is crucial and can be facilitated through community sharing systems, or toy workshops, where parents can borrow or exchange educational materials and toys. Such initiatives promote affordability and inclusivity, enabling all parents to provide a stimulating environment for their children. Comparative studies on the Thai home environment and child development among different socioeconomic groups would provide valuable insights for researchers and policymakers to support parents and children in Thai society.

Difference between the Thai-Translated IT-HOME and the Three Previously Reported Data Sets of IT-HOME in the Literature

The results show that, regarding the mean scores, our Thai sample exhibited similarities to the US-Washington data (Boffman et al., 1997), but significantly higher scores compared to the US normative data collected between 1970–1972 (Caldwell & Bradley, 2003) and the Thai rural data (Williams et al., 2003). The variance

in scores when compared to the 1972 US normative data may reflect societal and parenting disparities that existed 50 years ago in contrast to more recent data from the 1997 US Washington study.

When comparing the two Thai studies, our study showed higher mean scores in the Total score as well as the Organization, Play Materials, and Variety content domains compared to the 2003 rural Thai data by Williams et al. (2003). Both studies, however, revealed similar levels of parental responsiveness and acceptance. Notably, our study demonstrated that rural participants had a higher quality of home environment compared to the participants in Williams et al.'s study in 2003. This suggests potential improvements in resource accessibility, child-rearing knowledge, and social support in Thai rural areas over the years.

However, it is worth noting that Thai parents in our study exhibited lower levels of involvement with their children compared to the participants in the US-Washington study and Williams et al.'s study. This discrepancy could potentially be attributed to the increased use of social media among parents, resulting in less time dedicated to their children (Knitter & Zemp, 2020). These findings underscore the importance of promoting and enhancing parent-child interaction within present-day Thai families.

Suggestion for Future Research

Since this study is a pilot study with a relatively small sample size, there is a need for further research to expand the sample size and diversify the participants to represent the larger Thai population more accurately. Additionally, future studies should consider including a wider age range, from newborns to three-year-olds, to cover the full age spectrum addressed by the IT-HOME. This broader age range would contribute to the generalizability of the Thai-translated IT-HOME.

Moreover, future research should examine the predictive validity of the Thai IT-HOME, specifically investigating whether the total score or specific content domains can predict later child development within the context of Thai culture. Such investigations would provide valuable insights into the potential effectiveness of the Thai-translated IT-HOME as an early identification tool and guide for promoting positive child development.

Conclusion and Recommendation

Researchers and healthcare personnel are advised to use the Thai-translated version of IT-HOME with caution to evaluate the quality and scope of the stimulating environment in Thai culture. The presence of low internal consistency in certain content domains of the Thai-translated IT-HOME suggests that the interpretation of home environment quality as a distinct scale should be approached with caution when applied to Thai families. Nevertheless, we recommend utilizing the Total score of the Thai-translated IT-HOME as a standardized assessment tool to evaluate the overall environment quality for Thai infants in their homes.

Our study suggests that SES, particularly maternal education, plays a crucial role in creating a nurturing environment for children in Thailand. Intriguingly, children from low SES backgrounds and parents having lower educational attainment tend to have access to a more enriching developmental environment when residing in rural areas, as opposed to urban areas.

To promote positive child development, it is essential for researchers and policymakers to prioritize the dissemination of information regarding typical child development and ensure accessibility to resources that stimulate developmental growth, particularly among low-SES families residing in urban areas.

Conflict of Interest

The authors declare that there is no conflict of interest.

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