Original Article

Cross-cultural equivalence of materialistic values scale (MVS): An exploratory study between the United States and Thailand

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ABSTRACT Owing to the theoretical and managerial importance of materialism, several attempts have been made to cross-culturally examine Richins and Dawson's Materialistic Values Scale (MVS). However, the foreign applicability of the scale remains inconclusive. The current research responded to calls related to the use of reverse-worded items and the development of a shorter version of a single scale that can be cross-culturally applicable by examining Richins and Dawson's MVS in two different countries that possess different socioeconomic conditions and cultural values. The United States ($n=276$) and Thailand ($n=262$) were examined through the use of multigroup confirmatory factor analysis to assess measurement invariance. The findings revealed a reduced 10-item three-factor model of materialism that might be applicable in cross-cultural studies. Implications and future research directions are also addressed.

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Keywords: cross-cultural equivalence; materialistic values scale; the United States; Thailand

INTRODUCTION

Materialism is a global phenomenon that has received significant attention from cross-cultural and business scholars due to its ability to help explain consumption behavior and well-being at both individual and societal levels.¹ As Belk² stated, materialism is the dominant concept of 'consumer ideology and the most significant macro development in modern consumer behavior' (p. 26). The combined impact

of world market globalization and technological advancement has led to the development of consumer culture, implying, among other things, the materialistic ideology has now spread beyond the United States and Western Europe.^{3,4} Reflecting this transition to a global consumer culture, Belk⁵ stated that consumers in less developed countries (for example, Thailand) are even 'attracted to and indulged in aspects of conspicuous consumption before they have secure adequate food, clothing, and shelter' (pp. 104–105). The emphasis these consumers place on the acquisition and possession of material assets¹ may provide 'the greatest

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source of satisfaction and dissatisfaction in life' (Belk, p. 291)⁶. The globalization of cultures and values, therefore, makes it imperative for us to understand materialistic values cross-culturally in order to determine whether the standardization of marketing mixes and strategies is warranted.

Given the importance that academic and business scholars ascribe to materialism, the general consensus on both conceptualization and measurement of the materialistic construct remains inconclusive,⁷ particularly with regard to the Richins and Dawson's¹ multidimensional Materialistic Value Scale (MVS) that has been widely employed in the literature. Recently, several researchers have reported threats to the measurement applicability of cross-cultural studies related to MVS containing reverse-worded items (that is, items that were worded in the direction opposite to that of other items) because people in different cultures have their own ways of comprehending and responding to reverse-worded statements. Thus, it has been suggested that either remove reverse-worded items from the scale⁷ or replace items posed as statements with items framed as questions.⁸ Thus, attempts to establish the cross-cultural applicability of MVS are still necessary; a single, shorter scale that is applicable to several countries is desirable because it can be employed to identify similarities and differences between countries and help to enhance comparability.⁹

In addition, several scholars contend that, to make cross-cultural comparisons related to a specific construct valid and meaningful, measurement equivalence is required.^{10–12} Measurement equivalence represents 'whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attributes' (p. 117).¹³ If there is no evidence of measurement equivalence, conclusions drawn on cross-cultural differences related to materialism can be ambiguous and erroneous.¹¹ Thus, in response to these concerns, the primary purpose of the study is to investigate whether MVS measures are equivalent across two countries that possess different socioeconomic conditions and cultural

values (the United States and Thailand). Specifically, if the measurement equivalence of MVS has been established, the second objective is to examine the mean differences in materialism and its dimensions in relation to culture and gender using a comprehensive procedure recommended by Steenkamp and Baumgartner.¹¹

LITERATURE REVIEW

Materialism and its dimensions

Researchers commonly agree that values such as materialism are cultural products that may have resulted from the impact of market globalization and have been recognized as an important factor in the study of cultural variability in consumption behavior and thought patterns. Individuals may acquire these cultural values through mental programming in the enculturation process.¹⁴ It is believed that materialistic values are common traits that exist in individuals across cultures. The degree of materialism tends to vary across cultures due to differences in such factors as the economic environment, infrastructure and cultural values; thus, consumers in some countries may be, on average, higher in materialistic value than consumers in other countries.^{7,8} As such, it is important to examine the cultural differences related to materialistic values because members of a specific society may rely on materialistic values as their criteria to determine appropriate behaviors, to guide self-presentation and to justify their choices to others.¹⁵

Richins¹⁵ stated that materialism is related to 'the idea that goods are a means to happiness; that satisfaction in life is not achieved by religious contemplation or social interaction, or a simple life, but by possession and interaction with goods' (p. 353). Later, Richins and Dawson¹ described materialism as a value that individuals adopt to guide their thoughts, feelings and behaviors at both the sociological and psychological levels of analysis¹⁶ and defined materialism as a set of centrally held beliefs regarding the desirability of the acquisition and possession of material assets. Thus, Richins and Dawson¹ developed an 18-item materialistic values scale (MVS) to

measure ‘the importance a person places on possessions and their acquisition as a necessary or desirable form of conduct to reach desired end states, including happiness’ (p. 307). Through rigorous analysis of data from US urban and rural areas as well as data from different US geographical regions, Richins and Dawson¹ reported that materialism consists of three dimensions: (1) possession in defining success (that is, individuals evaluate success based on the number and quality of possessions they accumulate); (2) acquisition centrality (that is, the importance individuals place on the acquisition and possession of items they consider meaningful in their lives); and (3) acquisition as the pursuit of happiness (that is, individuals believe that owning the right possessions is essential to their well-being, which consequently will result in happiness). See Table 1 for descriptions of these items.

Measurement applicability of original MVS

During the initial stages of development of MVS, Richins and Dawson¹ stated that, an important issue in ‘deriving a measure of materialism is that it should strive to transcend cultures, subcultures and economic systems’ (p. 170). In response, several scholars have attempted to examine the applicability of the original MVS across cultures.^{7,8,17,18} While some scholars have examined differences and similarities related to MVS in a cross-cultural context by performing various mean, variance or correlation tests,^{17,18} others have attested that such an approach may be inappropriate for studying a universal marketing construct because it dismisses measurement issues, particularly measurement equivalence.^{7,8} Without evidence of measurement equivalence, one cannot make valid inferences about differences among cultures or genders because it is not clear whether observed mean differences are based on ‘true’ differences or if they are due to differential item functioning across groups.¹¹

Despite growing interest from scholars in cross-culturally validating the original 18-item MVS, measurement equivalence is still less

evident.^{7,8} For example, Griffin *et al*⁷ reported that although the original 18-item MVS seemed to be applicable to a Danish sample, its psychometric properties are less likely to be established when applied to French and Russian samples. Likewise, Wong *et al*⁸ found that cross-cultural applicability of MVS was problematic (that is, lack of invariance of factor structure across samples), particularly with East Asian samples (that is, Japan, Korea, Singapore and Thailand). These cross-cultural scholars have contended that the original 18-item MVS relies on mixed-worded scales containing both positive-worded and reverse-worded items, a common practice when measuring consumer behavior in the United States that may pose measurement problems (for example, lessen a scale’s reliability, interrupt a scale’s dimensionality) in foreign applications.^{18,19} Since the primary objective of the study is to examine whether the MVS is cross-culturally applicable, it is critical that the scales support measurement equivalence before conducting mean comparisons across cultures and gender. Therefore,

Hypothesis 1: The MVS is invariant across American and Thai consumers.

Hypothesis 2: The MVS is invariant across male and female consumers.

Materialism and cross-cultural differences

The cultural value of individualism versus collectivism has been employed to explain differences in social behavior between Westerners and Easterners. While the United States is an individualistic culture where people view themselves as independent of others, Thailand is a collectivist society where individuals view themselves as interdependent with others and their behaviors are mainly driven by social norms.²⁰ Individualist consumers tend to place greater emphasis on material possessions, personal achievement and happiness than collectivist consumers.²¹ Generally, Americans

Table 1: Standardized confirmatory factor analysis loading estimates for the original 3-factor model of materialism between the United States and Thailand (N=538)

Items' abbreviation	Items' description	Countries					
		USA (n=276)			Thailand (n=262)		
		Factor loadings (t-values)	CR	AVE (%)	Factor loadings (t-values)	CR	AVE (%)
	<i>Dimension 1: Success</i>						
S1	I admire people who own expensive homes, cars and clothes.	0.64 (10.87)	0.77	36.5	0.66 (10.58)	0.59	25.3
S2	Some of the most important achievements in life include acquiring material possessions.	0.72 (12.79)			0.65 (10.47)		
S3	I don't place much emphasis on the amount of material objects people own as a sign of success. ^a	0.38 (6.04)			0.03 (0.37)		
S4	I like to own things that impress people.	0.73 (13.05)			0.61 (9.72)		
S5	I don't play much attention to the material objects other people own. ^a	0.49 (7.85)			0.07 (1.06)		
S6	The things I own say a lot about how well I am doing in life.	0.59 (9.85)			0.53 (8.13)		
	<i>Dimension 2: Centrality</i>		0.77	36.2		0.55	23.4
C1	I usually buy only things I need. ^a	0.63 (10.66)			0.29 (3.91)		
C2	I try to keep my life simple, as far as possessions are concerned. ^a	0.59 (9.96)			0.13 (1.94)		
C3	Buying things gives me a lot of pleasure.	0.68 (11.83)			0.70 (11.56)		
C4	I like a lot of luxury in my life.	0.81 (15.03)			0.88 (15.57)		
C5	I put less emphasis on material things than most people I knew. ^a	0.42 (6.67)			0.02 (0.35)		
C6	I enjoy spending money on things that aren't practical.	0.69 (11.97)			0.53 (8.27)		
C7	The things I own aren't all that important to me. ^a	0.04 (0.65)			0.03 (0.04)		
	<i>Dimension 3: Happiness</i>		0.74	40.2		0.61	32.4
H1	I have all the things I really need to enjoy life. ^a	0.44 (6.98)			0.12 (1.72)		
H2	My life would be better if I owned certain things I don't have.	0.75 (13.53)			0.66 (10.74)		
H3	I wouldn't be happier if I owned nicer things. ^a	0.18 (2.78)			−0.01 (−0.21)		
H4	I'd be happier if I could afford to buy more things.	0.84 (15.60)			0.79 (13.71)		
H5	It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like.	0.72 (12.82)			0.74 (12.56)		
	<i>Indicators of model fit</i>						
	χ^2 , DF	410.43, 132***			415.59, 132***		
	χ^2 /DF	3.11			3.15		
	RMSEA	0.093			0.101		
	CFI	0.91			0.86		
	GFI	0.85			0.81		
	AGFI	0.80			0.75		

^aIndicates reverse items.

*** $P < 0.001$.

Note: CR=Construct reliability; AVE=Average variance extracted.

view achievement as a matter of individual effort. Among Americans, status is evaluated by how successful an individual is and how much of his/her success is a result of individual effort.²²

In addition, individualistic people tend to emphasize the conventional 'ideal-types' of management practice, where the focus is on maximizing productivity, efficiency,

competitiveness and profitability.²³ Such characteristics seem to legitimate the positive link between individualism (that is, competitiveness) and materialism (that is, productivity, efficiency and profitability).²⁴ Rudman and Kilbourne²⁵ also asserted that, industrialized capital economics tend to 'transform people's virtuous restriction of consumption into involuntary affluence' (p. 183), implying that 'material goods have gained an increasing and finally inexorable power over the lives of men' (p. 181)²⁶ and materialism wealth has become a sign of a person's eventual salvation.²⁷ Belk and Pollay²⁸ also suggested that, as compared with a society with less economic growth and fewer job opportunities (for example, Thailand), a society with higher economic growth and burgeoning job opportunities (for example, the United States) might be anticipated to rely on material objects as a sign of status and wealth. Echoing the above notions, one recent report stated that 93 per cent of Americans agree that they put too much emphasis on working and making money and less emphasis on family and community.²⁹ In addition, many reports note that Americans have chosen to maximize their materialistic assets rather than search for balance among social, physical, ecological, aesthetic, spiritual and intellectual spheres.^{30,31}

Although it has been acknowledged that materialism is a core value in the United States,³² others have suggested that the impact of globalization and modernization may have turned many Asian countries into consumer societies where one can accumulate and consume more products/services than ever before.⁴ As such, materialism is more likely to be evident among East Asians today. Wong and Ahuvia³³ also speculated that since East Asian consumers seem to be attracted to products associated with a positive image and high prestige, they may be more materialistic than their Western counterparts. Webster and Beatty¹⁸ later empirically examined cross-cultural differences of materialism between Thai and American consumers and reported that Thais were more materialistic than their American counterparts. Likewise, Swinyard *et al*³² found that Singaporeans valued materialism higher than Americans.

The aforementioned findings suggest that East Asian consumers, whose collectivism is highly valued, are more materialistic than Western consumers. However, others have reported opposite results. For example, Schaefer *et al*³⁴ found that Chinese teens were the least materialistic as compared with Japanese and American teens. Clarke and Micken³ noted that individualist consumers (that is, Australians and Americans) placed a greater emphasis on materialism than Mexicans (whose collectivism is emphasized). Burroughs and Rindfleisch³⁵ reported a negative relationship between materialism and collectivist values regarding family, religion and community. Watchravesringkan and Yurchisin³⁶ also reported that, among Koreans, collectivism was negatively associated with high-priced products that tended to signal status and prestige. Despite modernization, Confucian collectivism may still play a vital role regulating consumption behavior.^{20,37} Conformity to the group is viewed positively among East Asians and thus may suppress the independent construction of the self and inner self. In addition, in a collectivist culture, modesty and humility in consumption may triumph personal material achievement.³⁸ While values of frugality and thrift that have been highly regarded among East Asians may suppress their materialistic desires, consumption trends like 'keeping up with the Joneses' found among Americans seem to be placed above values of thrift that may pressure materialistic consumption among Americans.³⁹ Weber²⁶ also stated that collectivist individuals are too socially conservative to allow the development of modern capitalism. As such, this previous research might seem to suggest that East Asian consumers would be less likely to be materialistic as compared with Western consumers. Therefore,

Hypothesis 3: American and Thai consumers differ in materialism.

Materialism and gender differences

Gender identity theory states that gender is multifactorial,^{40,41} comprised of biological

sex (male versus female), psychological traits (masculinity versus femininity) and gender-role attitudes (men versus women). Generally, males possess masculine (instrumental) traits such as a strong sense of independence, competitiveness and material success. Likewise, females, in general, are supposed to possess feminine (expressive) traits such as being more sensitive to emotion, less competitive and less goal-oriented.^{42–44} In addition, gender-role attitudes may define different responsibilities among men and women. For example, males are frequently expected to provide shelter and safety for women and children by financially providing for their family, whereas women are societally expected to be responsible for nurturing and caring for children.⁴⁵ Beneke⁴⁶ also stated that males have constantly proved their masculinity in all areas, including material pursuits. Men, as compared with women, were more concerned with personal achievement.⁴⁷ Juan *et al*⁴⁸ empirically found that Singaporean men were more money-driven and care more about their financial well-being than Singaporean women. In addition, Singaporean men were more likely to place greater emphasis on the ownership of material assets as an indication of success than women.⁴⁸ Similarly, Kamineni⁴⁹ found that Australian men displayed significantly higher levels of materialism than women. As such, masculinity traits and gender-role attitudes may suggest that males, by nature, have a higher desire for material assets as compared with females.

In contrary, while Workman and Lee⁵⁰ recently found that females exhibited higher scores on materialism than their male counterparts among college students, a number of empirical studies have reported no significant difference between the genders.^{35,51} For example, Burroughs and Rindfleisch³⁵ found that males and females displayed similar level of materialism as measured by the MVS. Similarly, using college student sample, O'Cass⁵¹ reported that there was no significant relationship between gender and materialism. Therefore;

Hypothesis 4: Male and female consumers differ in materialism.

Methodology

There are three issues of equivalence that were empirically addressed in this article to ensure comparability before examining mean differences across cultures and genders: the equivalence of constructs, samples and measurement.^{10,52} Firstly, construct equivalence addresses the question of whether marketing measures (that is, materialism) reveal the same meaning and significance across different cultures. To obtain construct equivalence, then, translation equivalence and questionnaire calibration equivalence must be achieved. Translation equivalence addresses whether a construct can be measured by the same items in different cultures, whereas calibration equivalence addresses whether the units of measurement are the same in different cultures.¹⁰ These two issues provide the evidence that instruments reflect their original meaning after translation. As Mullen¹⁰ states, calibration equivalence should be achieved when the instrument is translated. Secondly, sample equivalence can be achieved when the samples are selected based on certain comparable demographic information (for example, age) as well as interests.⁵² Finally, measurement equivalence, or the relationships between latent variables and their indicators, can be assessed through statistical analysis (for example, confirmatory factor analysis). In addition, as suggested by many cross-cultural researchers,^{11,12} measurement equivalence issue needs to be addressed before conducting any cross-cultural comparison studies.

Measure and translation procedure

In this research, the English version of the questionnaire using the original 18-item 3-factor MVS developed by Richins and Dawson¹ was adopted, including six items that measure the success dimension (for example, 'I admire people who own expensive homes, cars, and clothes'); seven items to measure the centrality dimension (for example, 'Buying things gives me a lot of pleasure'); and five items to measure the happiness dimension (for example, 'My life would be better if I owned certain things I don't have') (see Table 1). Responses to

these items were made on a 7-point Likert-type scales ranging from 1 ('strongly disagree') to 7 ('strongly agree').

To develop a Thai version of the MVS, a back translation method was employed.⁵³ First, a doctoral student who was fluent in both Thai and English translated the English version of the MVS into Thai; then, a Thai professor who was fluent in both Thai and English translated the Thai version into English. They both worked independently. The original English version and the back-translated Thai version were compared and analyzed to ensure translation accuracy. No major translation inconsistencies were found in the two survey versions.

Participants and procedure

The data were collected from two distinct countries: the United States and Thailand, via a self-report questionnaire administered to convenience samples of college students with a business-related major at mid-size universities located in the southwest United States and central Thailand, respectively. Students were recruited for the purpose of sample comparability.^{54,55} Although a college student sample cannot be viewed as nationally representative, students provide a homogeneous sample desirable for a cross-cultural study.^{56,37} Hofstede and Bond³⁷ also contended that, for a cross-cultural study, ensuring a matched sample via the use of college students offsets any risk related to extraneous variables (for example, age, education).

The final sample included a total of 538 young adults (276 Americans and 262 Thais). The US student sample consisted of 31 per cent males and 69 per cent females ranging in age from 18 to 23 ($M=19.3$ years); the majority were freshmen and sophomores (35 per cent and 32 per cent, respectively). The Thai student sample consisted of 36 per cent males and 64 per cent females ranging in age from 18 to 22 ($M=18.7$ years); the majority were freshmen and sophomores (40 per cent and 30 per cent, respectively). The questionnaires were distributed in class and the participants were asked to voluntarily complete the questionnaire in class in both samples. In addition, no extra credit was given for participation in both countries.

RESULTS

Assessing psychometric properties of the original 18-item 3-factor MVS

Several reports related problems with the psychometric properties of the original MVS, such as low reliability and dimensional inconsistency,^{7,8} that may threaten its applicability cross-culturally. Despite this, an initial attempt was made to assess the psychometric properties of the original 18-item 3-factor MVS in the US and Thai samples.

Reliability was assessed on the original 18-item MVS for an individual sample using Cronbach's alpha. We first examined the reliability of the overall materialism for both samples. Results revealed an acceptable level of reliability for both samples ($\alpha=0.81$ for the US sample and $\alpha=0.75$ for the Thai sample, respectively). According to Nunnally and Bernstein,⁵⁷ a coefficient alpha reliability of at least 0.70 is considered acceptable. We then further examined the reliability of the individual subscale of materialism (six items for success, seven items for centrality and five items for happiness) for an individual sample. The results revealed that coefficients ranged from 0.73 (happiness dimension) to 0.75 (centrality dimensions) for the US sample and from 0.54 (centrality dimension) to 0.60 (happiness dimension) for the Thai sample. Reliability level for all three subscales of materialism was very low for the Thai sample. For the Thai sample, we proceeded to determine which items on the corresponding construct displayed low loadings by factor analyzing each *a priori* specified subscale. This procedure revealed a total of eight items with low loadings (≤ 0.40) for elimination on three subscales (two items from success, four items from centrality and two items from happiness dimensions). We also speculated that these eight items were all reverse-worded items (see Table 1).

In addition, we also performed confirmatory factor analysis (CFA) on the original 18-item 3-factor MVS to validate the applicability of scales on an individual sample. As reported in Table 1, the original 18-item 3-factor model of materialism for the US sample revealed

a significant χ^2 value of 410.43, DF of 132, χ^2 /DF of 3.11, a root-mean-square of approximation (RMSEA) of 0.093, a comparative-fit-index (CFI) of 0.91, a goodness-of-fit index (GFI) of 0.85 and an adjusted goodness-of-fit index (AGFI) of 0.80. These fit indices seem to suggest that the model has an 'adequate fit' to the data, despite the conventional standard of a 'good fit' (that is, χ^2 /DF $\leq$ 3.0; RMSEA $\leq$ 0.080; CFI $\geq$ 0.90; GFI $\geq$ 0.90 and AGFI $\geq$ 0.80).⁵⁸⁻⁶⁰ The composite reliability (CR), which is analogous to internal reliability,⁶¹ ranged from 0.74 (happiness dimension) to 0.77 (both success and centrality dimensions) and proportion of variance extracted (AVE) ranged from 36.2 per cent (centrality dimension) to 40.2 per cent (happiness dimension). The results seem to show that subscales of materialism displayed an acceptable level of reliability and convergent validity (that is, significant indicator's estimated path coefficient).⁶² However, the original 18-item 3-factor model of materialism for the Thai sample revealed an inferior fit to the data (χ^2 = 417.59, DF = 132, P < 0.001, χ^2 /DF of 3.16, RMSEA = 0.101, CFI = 0.86, GFI = 0.81, AGFI = 0.75). The values of CR ranged from 0.55 (centrality dimension) to 0.61 (happiness dimension), suggesting low reliability. Furthermore, the values of AVE were quite low, ranging from 23.4 per cent (centrality dimension) to 32.4 per cent (happiness dimension), suggesting that convergent validity may not be established. Further speculation revealed a total of seven items displaying insignificant factor loadings: two items from the success dimension, three items from the centrality dimension and three items from the happiness dimension (see Table 1). Again, all seven items were reverse-worded items. Although one reverse-worded item capturing centrality dimension ('I usually buy only things I need') revealed significant factor loading, the value of loading was not as strong (0.29, t = 3.91). In addition, such a statement may reflect poverty issues and budget constraints among Thai college participants who, unlike their American counterparts, do not have after-school jobs to gain additional income.

Therefore, results from these two initial analyses suggested that, before conducting the final analysis of MVS, all reverse-worded items should be removed, resulting in a reduced MVS that contains 10-item 3-factor materialism.

Validating the reduced 10-item 3-factor MVS

To find a common set of scale items between these two samples, we removed these reverse-worded eight items from the two samples and reassessed their psychometric properties. After removing the eight items in the Thai sample, results showed an improvement of the coefficients for the overall materialism (10-item) and for an individual subscale of materialism (4-item for success, 3-item for centrality and 3-item for happiness) (alpha: overall materialism = 0.86; success = 0.71; centrality = 0.73 and happiness = 0.77). To ensure data comparability, we also performed the same procedure with the US sample. After deleting eight reverse-worded items as suggested in the Thai sample, the results revealed an improvement of the coefficients for the overall materialism (10-item) and for an individual subscale of materialism (4-item for success; 3-item for centrality and 3-item for happiness) in the US sample (alpha: overall materialism = 0.86; success = 0.77; centrality = 0.77 and happiness = 0.82) (see Table 2). Thus, the reduced 10-item 3-factor MVS seems to possess an acceptable degree of psychometric properties and can thus be employed for the final analysis.

Table 2 revealed the results of CFA, showing an improvement of the model fit of the reduced MVS to both samples. The fit indices suggested that the model has a 'good fit' to the data in the US and Thai samples (for the US sample: χ^2 = 94.85, DF = 32, P < 0.001; χ^2 /DF = 2.96, RMSEA = 0.084, CFI = 0.96, GFI = 0.93, and AGFI = 0.88; and for the Thai sample: χ^2 = 77.06, DF = 32, P < 0.001; χ^2 /DF = 2.41, RMSEA = 0.076, CFI = 0.97, GFI = 0.94 and AGFI = 0.90). All values of composite reliability displayed a satisfactory level ($\geq$ 0.70) in both samples. In addition, all values of AVE have improved in both samples to imply an evidence of convergent validity.

Table 2: Descriptive statistics and standardized CFA loading estimates for the reduced 10-item 3-factor MVS by country: United States ($n=276$) versus Thailand ($n=262$)

Items abbreviation	Items' description	USA		Thailand	
		Means (Std.)	Factor loadings (t-value)	Means (Std.)	Factor loadings (t-value)
Dimension 1: Success					
S1	I admire people who own expensive homes, cars and clothes.	4.31 (1.68)	0.65 (11.07)	2.88 (1.56)	0.65 (10.50)
S2	Some of the most important achievements in life include acquiring material possessions.	3.32 (1.64)	0.74 (13.20)	3.72 (1.68)	0.66 (10.53)
S3	I like to own things that impress people.	3.77 (1.55)	0.72 (12.63)	3.62 (1.63)	0.61 (9.72)
S4	The things I own say a lot about how well I am doing in life.	3.61 (1.61)	0.59 (9.73)	3.59 (1.67)	0.54 (8.27)
	Composite reliability	0.77		0.71	
	Proportion of variance extracted	46.00%		38.00%	
Dimension 2: Centrality					
C1	Buying things gives me a lot of pleasure.	5.07 (1.45)	0.67 (11.40)	4.36 (1.53)	0.71 (11.71)
C2	I like a lot of luxury in my life.	4.81 (1.54)	0.89 (15.88)	3.30 (1.63)	0.86 (14.85)
C3	I enjoy spending money on things that aren't practical.	3.66 (1.67)	0.63 (10.67)	2.66 (1.55)	0.52 (8.04)
	Composite reliability	0.78		0.75	
	Proportion of variance extracted	54.70%		50.30%	
Dimension 3: Happiness					
H1	My life would be better if I owned certain things I don't have.	3.88 (1.63)	0.73 (12.92)	4.20 (1.70)	0.66 (10.76)
H2	I'd be happier if I could afford to buy more things.	4.27 (1.67)	0.87 (16.16)	3.97 (1.67)	0.79 (13.63)
H3	It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like.	4.02 (1.75)	0.72 (12.70)	4.04 (1.65)	0.74 (12.64)
	Composite reliability	0.82		0.78	
	Proportion of variance extracted	60.30%		53.70%	
Phi matrix					
	Success – Centrality	0.68 (0.05)		0.78 (0.07)	
	Success – Happiness	0.73 (0.04)		0.87 (0.10)	
	Centrality – Happiness	0.45 (0.06)		0.75 (0.06)	
Model fit indicators					
	χ^2	94.85***		77.06***	
	DF	32		32	
	χ^2 /DF	2.96		2.41	
	RMSEA	0.084		0.076	
	CFI	0.96		0.97	
	GFI	0.93		0.94	
	AGFI	0.88		0.90	

*** $P < 0.001$.

We further assessed discriminant validity of the reduced 10-item 3-factor MVS using the confidence interval test.⁶² This test was performed by examining correlations among the three factors of reduced MVS and the associated standard errors in each individual sample. For any pair of materialism subscales to be distinct and possess discriminant validity, the confidence interval around phi values (that is, $\phi \pm 2 \times \text{std. errors}$) should not contain a value of 1.0. Results indicated that discriminant validity of the

three factors of reduced MVS was established in both US and Thai samples. Therefore, it seems appropriate to note that the reduced MVS consisted of three separate but correlated dimensions across two samples.

TESTING HYPOTHESES

Assessing measurement equivalence

Several cross-cultural researchers have suggested that evidence of measurement equivalence should

be established before comparing latent means across cultures.^{10,11} Thus, the reduced 10-item MVS was subjected to examine whether the same operational models of theoretical constructs are invariant across different groups⁶³ using multiple-group confirmatory factor analysis (MGCFA) of LISREL 8.51.⁶⁴ This approach has been viewed as superior over the traditional MANOVA and univariate ANOVA approaches that depend on raw factor means comparison because it accounts for systematic response bias and random measurement errors.⁶⁵

Given the objective of the study in comparing construct means across groups, we followed Steenkamp and Baumgartner's¹¹ three-hierarchical-step approach to test measurement equivalence: (1) a configural invariance model, assessing whether the factor structure is the same across groups; (2) a full metric invariance model, assessing whether the factor loadings are the same for each scale item across groups; and (3) full scalar invariance model, assessing whether the factor loadings and intercepts are the same for each scale item across groups. Each model serves as a basis for comparison with the preceding model because the configural, full metric and full scalar models are 'nested'.^{11,66} If the full scalar invariance is evident, cross-cultural comparison of latent mean constructs is valid and meaningful. However, it has been stated that the full scalar invariance is difficult to achieve in practical applications; thus, several researchers have suggested acceptance of partial scalar invariance.^{11,66}

Hypothesis 1: Examining measurement invariance of MVS across cultures

We began by first specifying for each group (United States and Thai) that the materialism model consists of three correlated first-order factors, each corresponding to a four-item success, three-item centrality and three-item happiness factor, respectively. Next we examined the hierarchical sequence of multiple-group measurement invariance models with the least restrictive model in which only the form of the model is invariant (that is, configural model).

This model is totally noninvariant and serves as a baseline for comparison of more restricted constrained tests of invariance. As reported in Table 3, the results revealed that, despite the significant chi-square, the two-group model with free factor loadings provided satisfactory fit to the data: $\chi^2=176.73$, $DF=64$, $P<0.001$; $\chi^2/DF=2.76$, $RMSEA=0.083$, $CFI=0.97$ and TLI (Tucker-Lewis Index)=0.96, indicating that these two groups had the same factor structure and all factor loadings to their respective latent constructs were significant. Thus, it is concluded that configural invariance exists across the US and Thai samples.

We then proceeded to test the full metric invariance model by constraining all factor loadings to be invariant between the US and Thai samples. As reported in Table 3, the results revealed that the two-group model provided a satisfactory fit to the data: $\chi^2=182.12$, $DF=71$, $P<0.001$; $\chi^2/DF=2.56$, $RMSEA=0.077$, $CFI=0.97$ and $TLI=0.96$, indicating that the factor loadings were identical for each scale item between the US and Thai samples. Evidence of full metric invariance represents a higher degree of measurement invariance as compared with configural invariance and this model is hierarchically nested on the configural invariance model. Thus, the chi-square difference test was carried out to examine which models fit the data better. The results showed no significant difference between these two models ($\chi^2_{diff}=5.39$, $DF_{diff}=7$, $P>0.05$). Thus, it is concluded that the full metric invariance has been achieved across the US and Thai samples.

Since the other major objective of the current study is to examine latent mean differences between the US and Thai samples, we next examined full scalar invariance by constraining all factor loadings and intercepts to be invariant between the US and Thai samples. Scalar invariance addresses the question of consistency between cross-cultural differences in latent means and observed means. As reported in Table 3, the results revealed that the two-group model provided an inferior fit to the data: $\chi^2=366.20$, $DF=78$, $P<0.001$; $\chi^2/DF=4.70$, $RMSEA=0.118$, $CFI=0.92$ and $TLI=0.91$,

Table 3: Tests of measurement equivalence for the reduced 10-item 3-factor MVS by country: United States (N=276) versus Thailand (N=262)

Test	Model	χ^2	DF	χ^2/DF	RMSEA	CFI	TLI	χ^2_{diff}	DF _{diff}	P-value
<i>10-item 1-factor overall materialism</i>										
1.	Configural equivalence	445.46	70	6.36	0.151	0.90	0.87	—	—	—
2.	Full metric equivalence	458.23	79	5.80	0.140	0.90	0.88	12.77 ^a	9	> 0.05
3.	Full scalar equivalence	804.98	88	9.15	0.202	0.81	0.80	359.52 ^a	18	< 0.001
	3.1 Partial scalar equivalence (6 and 7 invariant)	458.41	81	5.66	0.138	0.90	0.89	12.95 ^a	11	> 0.05
4.	Factor mean equivalence (M _{United States} =4.07 versus M _{Thailand} =3.63)	604.87	82	7.38	0.162	0.86	0.85	146.46 ^b	1	< 0.001
<i>10-item 3-factor materialism</i>										
1.	Configural equivalence	176.73	64	2.76	0.083	0.97	0.96	—	—	—
2.	Full metric equivalence	182.12	71	2.56	0.077	0.97	0.96	5.39 ^a	7	> 0.05
3.	Full scalar equivalence	366.20	78	4.70	0.118	0.92	0.91	184.08 ^b	7	< 0.001
	3.1 Equal intercepts on success (ξ_1) dimension	333.74	74	4.51	0.111	0.93	0.92	157.01 ^a	10	< 0.001
	3.1.1 With τ_2 equivalence	319.12	72	4.43	0.108	0.93	0.92	142.39 ^a	8	< 0.001
	3.1.2 With τ_3 equivalence	241.26	72	3.35	0.094	0.95	0.94	64.53 ^a	8	< 0.001
	3.1.3 With τ_4 equivalence	222.63	72	3.23	0.091	0.96	0.95	45.90 ^a	8	< 0.001
	3.2 Equal intercepts on centrality (ξ_2) dimension	191.93	73	2.64	0.078	0.97	0.96	15.20 ^a	9	> 0.05
	3.3 Equal intercepts on happiness (ξ_3) dimension	203.71	73	2.79	0.082	0.96	0.96	26.98 ^a	9	< 0.01
	3.3.1 With τ_9 equivalence	202.81	72	2.82	0.083	0.96	0.96	26.08 ^a	8	< 0.001
	3.3.2 With τ_{10} equivalence	186.65	72	2.59	0.077	0.97	0.96	9.92 ^a	8	> 0.05
4.	Factor means equivalence	277.94	73	3.81	0.104	0.94	0.93	60.62 ^b	1	< 0.001
	4.1 Equal factor means on success (M _{United States} =3.75 versus M _{Thailand} =3.45)	297.78	74	4.02	0.103	0.94	0.92	104.85 ^c	1	< 0.001
	4.2 Equal factor means on centrality (M _{United States} =4.51 versus M _{Thailand} =3.44)	188.24	73	2.57	0.077	0.97	0.96	1.59 ^d	1	> 0.05
	4.3 Equal factor means on happiness (M _{United States} =4.06 versus M _{Thailand} =4.07)									

^aCompared with Test 1.^bCompared with Test 3.1.^cCompared with Test 3.2.^dCompared with Test 3.3.2.

indicating that intercepts were not identical for each scale item between the US and Thai samples. The chi-square difference test between the full scalar invariance model and the full metric invariance model was also significant ($\chi^2_{\text{diff}}=184.08$, $DF_{\text{diff}}=7$, $P<0.001$). Thus, the full scalar invariance model did not exist. Additional tests were carried out to determine which latent construct (that is, success, centrality and happiness) possessed scalar invariance through a series of MGCFA models. That is, we performed individual tests for scalar invariance on each latent construct, resulting in three separate evaluations of scalar invariance models. For each scalar invariance model, the intercepts of one latent construct were subjected to be invariant across groups, while allowing the intercepts of other constructs to vary. Table 3 shows that only scalar invariance for the centrality dimension was accepted between two groups ($\chi^2_{\text{diff}}=15.20$, $DF_{\text{diff}}=9$, $P>0.05$); others were rejected (success: $\chi^2_{\text{diff}}=157.01$, $DF_{\text{diff}}=10$, $P<0.001$; happiness: $\chi^2_{\text{diff}}=26.98$, $DF_{\text{diff}}=9$, $P<0.01$; respectively). Although it is ideal to have scalar invariance, a partial scalar invariance model with at least two scale items that exhibit intercept invariance between two groups is acceptable.¹¹

We then proceeded to examine the partial scalar invariance for two latent constructs, success and happiness to determine which scale items for each latent construct were invariant. Table 3 showed that for the success dimension, no intercept (τ) was invariant, despite the substantial improvement in fit as compared with the full scalar invariance when we relaxed τ_2 and τ_3 to vary ($\chi^2_{\text{diff}}=45.90$, $DF_{\text{diff}}=8$, $P>0.001$). Thus, the partial scalar invariance model did not exist for the success dimension between two groups. However, the results showed that we were able to achieve partial scalar invariance for the happiness dimension when we relaxed τ_9 to vary ($\chi^2_{\text{diff}}=9.92$, $DF_{\text{diff}}=8$, $P<0.05$). Thus, it is concluded that the partial scalar invariance model existed for the happiness dimension across the US and Thai samples.

Based on the above reports, only four items out of the total 10 were not invariant; this may imply that partial scalar invariance for the overall

materialism (10-item one-factor) may exist across the US and Thai samples. To ensure the existence of the partial scalar invariance model for the overall materialism, we then performed the measurement invariance test for the overall materialism. As reported in Table 3, this partial scalar invariance showed an insignificant increase in χ^2_{diff} compared with both the baseline configural invariance model ($\chi^2_{\text{diff}}=12.95$, $DF_{\text{diff}}=11$, $P>0.05$) and the full metric invariance model ($\chi^2_{\text{diff}}=0.18$, $DF_{\text{diff}}=2$, $P>0.05$). The other fit indices also indicated that the partial scalar invariance model fit the data satisfactorily. Thus, Hypothesis 1 was accepted, indicating that latent mean constructs can be compared meaningfully between the US and the Thai samples.

Hypothesis 2: Examining measurement invariance of MVS across gender

We followed the procedure recommended by Steenkamp and Baumgartner¹¹ in testing measurement invariance across gender in both the US and the Thai samples. Results revealed that, despite a significant χ^2 , the two-group model with free factor loadings provided an adequate fit to the data: $\chi^2=207.33$, $DF=64$, $P<0.001$; $\chi^2/DF=3.25$, $RMSEA=0.097$, $CFI=0.96$ and $TLI=0.94$, indicating that these two groups had the same factor structure and all factor loadings to their respective latent constructs were significant (see Table 4). Thus, it is concluded that configural invariance exists across both the male and female samples.

Next, the full metric invariance model was examined and the results revealed that the two-group model provided an adequate fit to the data: $\chi^2=213.02$, $DF=71$, $P<0.001$; $\chi^2/DF=3.00$, $RMSEA=0.092$, $CFI=0.96$ and $TLI=0.95$, indicating that the factor loadings were identical for each scale item between male and female samples (see Table 4). In addition, when comparing the increase in chi-square statistics between the full metric invariance model and the previous model, the results revealed no significant difference between these two models ($\chi^2_{\text{diff}}=5.69$, $DF_{\text{diff}}=7$, $P>0.05$).

Table 4: Tests of measurement equivalence for the reduced 10-item 3-factor MVS by gender: Male (N=181) versus female (N=357)

Test	Model	χ^2	DF	χ^2/DF	RMSEA	CFI	TLI	χ^2_{diff}	DF _{diff}	P-value
10-item 1-factor overall materialism										
1.	Configural equivalence	514.98	70	7.36	0.171	0.88	0.84	—	—	—
2.	Full metric equivalence	526.74	79	6.67	0.161	0.88	0.86	11.76 ^a	9	>0.05
3.	Full scalar equivalence	612.06	88	6.96	0.163	0.86	0.85	97.08 ^a	18	<0.001
3.1	Partial scalar equivalence (2,3,4,7,9, and 10 invariant)	537.76	85	6.33	0.161	0.88	0.87	22.78 ^a	15	>0.05
4.	Factor mean equivalence (M _{Male} =3.83 versus M _{Female} =3.87)	537.79	86	6.25	0.159	0.88	0.87	0.03 ^b	1	>0.05
10-item 3-factor materialism										
1.	Configural equivalence (equal factor structure)	207.33	64	3.25	0.097	0.96	0.94	—	—	—
2.	Full metric equivalence (equal factor loadings)	213.02	71	3.00	0.092	0.96	0.95	5.69 ^a	7	>0.05
3.	Full scalar equivalence (equal intercepts)	272.32	78	3.49	0.101	0.94	0.94	59.30 ^b	7	<0.001
	3.1 Equal intercepts on success (ξ_1) dimension	217.71	74	2.94	0.090	0.96	0.95	10.38 ^a	10	>0.05
	3.2 Equal intercepts on centrality (ξ_2) dimension	249.33	73	3.42	0.099	0.95	0.94	42.00 ^a	9	<0.001
	3.2.1 With τ_6 equivalence	249.15	72	3.46	0.099	0.95	0.94	41.82 ^a	8	<0.001
	3.2.2 With τ_7 equivalence	222.26	72	3.09	0.094	0.96	0.95	14.93 ^a	8	>0.05
	3.3 Equal intercepts on happiness (ξ_3) dimension	231.30	73	3.17	0.095	0.95	0.94	23.97 ^a	9	<0.001
	3.3.1 With τ_9 equivalence	222.50	72	3.09	0.094	0.96	0.95	15.17 ^a	8	>0.05
	3.3.2 With τ_{10} equivalence	231.14	72	3.21	0.096	0.95	0.94	23.81 ^a	8	<0.001
4.	Factor means equivalence	217.69	75	2.90	0.090	0.96	0.95	0.02 ^b	1	>0.05
	4.1 Equal factor means on success (M _{Male} =3.62 versus M _{Female} =3.60)	240.07	72	3.33	0.099	0.95	0.94	9.26 ^c	1	<0.001
	4.2 Equal factor means on centrality (M _{Male} =3.74 versus M _{Female} =4.11)	226.35	73	3.10	0.094	0.96	0.95	3.85 ^d	1	<0.05
	4.3 Equal factor means on happiness (M _{Male} =4.20 versus M _{Female} =4.01)									

^aCompared with Test 1.^bCompared with Test 3.1.^cCompared with Test 3.2.^dCompared with Test 3.3.2.

Thus, it is concluded that the full metric invariance has been achieved across both male and female samples. We then proceed to the full scalar invariance and results revealed that the two-group model provided an inferior fit to the data: $\chi^2=272.32$, $DF=78$, $P<0.001$; $\chi^2/DF=3.49$, $RMSEA=0.101$, $CFI=0.94$ and $TLI=0.94$, indicating that intercepts were not identical for each scale item between male and female samples (see Table 4). The chi-square difference test between the full scalar invariance model and the full metric invariance model was also significant ($\chi^2_{diff}=59.30$, $DF_{diff}=7$, $P<0.001$). Thus, the full scalar invariance model did not exist across both male and female samples.

We also performed additional tests for scalar invariance on each latent construct to determine which latent construct possessed scalar invariance. Table 4 showed that only scalar invariance for the success dimension was accepted between two groups ($\chi^2_{diff}=10.38$, $DF_{diff}=10$, $P>0.05$); others were rejected (centrality: $\chi^2_{diff}=42.00$, $DF_{diff}=9$, $P<0.001$; and happiness: $\chi^2_{diff}=23.97$, $DF_{diff}=9$, $P<0.01$, respectively). We then proceeded to examine the partial scalar invariance for two latent constructs, centrality and happiness, to determine which scale items for each latent construct were invariant. Table 4 showed that we were able to achieve partial scalar invariance for both centrality (relaxed τ_6 to vary, resulting in $\chi^2_{diff}=14.93$, $DF_{diff}=8$, $P<0.05$) and happiness (relaxed τ_{10} to vary, resulting in $\chi^2_{diff}=15.17$, $DF_{diff}=8$, $P<0.05$) dimensions. Thus, it is concluded that the partial scalar invariance model existed for both centrality and the happiness dimensions across both male and female samples.

Based on the aforementioned reports, only two of the total 10 items were not invariant; this may imply that partial scalar invariance for the overall materialism (10-item one-factor) may exist across both male and female samples. We also performed the measurement invariance test for the overall materialism to ensure that the partial scalar invariance model exists. As reported in Table 4, this partial scalar invariance showed an insignificant increase in χ^2_{diff} compared with both the configural invariance model ($\chi^2_{diff}=22.78$,

$DF_{diff}=15$, $P>0.05$) and the full metric invariance model ($\chi^2_{diff}=11.02$, $DF_{diff}=6$, $P>0.05$). The other fit indices also indicated that the partial scalar invariance model fit the data satisfactorily. Thus, Hypothesis 2 was accepted, indicating that latent mean constructs can be compared meaningfully between male and female samples.

Hypothesis 3: Examining cross-cultural differences of materialism

With evidence of partial scalar invariance of MVS across both the US and Thai samples, we then proceeded to conduct latent mean comparisons using MGCFA. This technique is more rigorous and superior as compared with *t*-tests or analysis of variance (ANOVA) techniques because it parcels out the effects of measurement errors in the estimations of the standard deviations of the latent construct.⁶⁷

We first examined the cross-cultural comparison of latent means of overall materialism. Table 3 showed that the factor mean model demonstrated an inferior fit compared with the partial scalar invariance model ($\chi^2_{diff}=146.46$, $DF_{diff}=1$, $P<0.001$), suggesting that the mean of the overall materialism differs significantly between the US and Thai samples. That is, the latent mean for the overall materialism was higher for the US sample ($M_{United\ States}=4.07$) than for the Thai sample ($M_{Thai}=3.63$). Thus, it is concluded that American participants were more materialistic than their Thai counterparts, supporting Hypothesis 3.

We further explored cross-cultural differences on an individual latent means of materialism (success, centrality and happiness) between the US and Thai samples. Table 3 showed that there were significant differences in means between the US and Thai samples related to the success and the centrality dimensions ($\chi^2_{diff}=60.62$, $DF_{diff}=1$, $P<0.001$; $\chi^2_{diff}=104.85$, $DF_{diff}=1$, $P<0.001$; respectively). That is, the latent mean for the success dimension was higher for the US sample ($M_{United\ States}=3.75$) than for the Thai sample ($M_{Thai}=3.45$). Likewise, the latent mean for the centrality dimension was also higher for the US

sample ($M_{\text{United States}} = 4.51$) than for the Thai sample ($M_{\text{Thai}} = 3.44$). However, there was no significant difference in means between these two samples as related to the happiness dimension ($\chi^2_{\text{diff}} = 1.59$, $DF_{\text{diff}} = 1$, $P > 0.05$; $M_{\text{United States}} = 4.06$ versus $M_{\text{Thai}} = 4.07$). Thus, it is concluded that while American participants tended to regard materialism as a sign of success and central to their lives more often than their Thai counterparts, participants from both cultures tended to similarly view materialism as the pursuit of happiness.

Hypothesis 4: Examining gender differences in materialism

Again, given evidence of partial scalar invariance of MVS across both male and female samples, we then proceed to conduct latent mean comparisons using MGCFA. We first examined group comparison between two genders (male versus female) of latent means of overall materialism. Table 4 showed that the factor mean model demonstrated that an increase in chi-square of the factor mean as compared with the partial scalar invariance model was insignificant ($\chi^2_{\text{diff}} = 0.03$, $DF_{\text{diff}} = 1$, $P > 0.05$), suggesting that the mean of overall materialism did not differ significantly between male and female samples ($M_{\text{Male}} = 3.83$ versus $M_{\text{Female}} = 3.87$). That is, male participants were as materialistic as their female counterparts. Thus, Hypothesis 4 was not supported.

We also further explored gender differences on an individual latent means of materialism (success, centrality and happiness) between male and female samples. Table 4 showed that there were significant differences in means between male and female samples related to the centrality and the happiness dimensions ($\chi^2_{\text{diff}} = 9.26$, $DF_{\text{diff}} = 1$, $P < 0.001$; $\chi^2_{\text{diff}} = 3.85$, $DF_{\text{diff}} = 1$, $P < 0.05$; respectively). That is, the latent mean for the centrality dimension was higher for the female sample ($M_{\text{Female}} = 4.11$) than that for the male sample ($M_{\text{Male}} = 3.74$). However, the latent mean for the happiness dimension was significantly higher for the male sample ($M_{\text{Male}} = 4.20$) than for the female sample ($M_{\text{Female}} = 4.01$). There was no significant difference in means between these two samples related to the success dimension

($\chi^2_{\text{diff}} = 0.02$, $DF_{\text{diff}} = 1$, $P > 0.05$). That is, the latent mean for the success dimension was not significantly higher for the male sample ($M_{\text{Male}} = 3.62$) than for the female sample ($M_{\text{Female}} = 3.60$). Thus, it is concluded that while female participants were more likely to view materialism as central to their lives than their male counterparts, male participants placed more emphasis on viewing materialism as the pursuit of happiness than female participants. In addition, these two genders tended to similarly regard materialism as a sign of success.

DISCUSSION AND CONCLUSIONS

The primary purpose of the study was to examine the cross-cultural measurement equivalence of Richins and Dawson's¹ MVS across United States and Thailand using the restrictive criteria of hierarchical invariant approaches via MGCFA. In line with that purpose, our findings confirmed that scales such as MVS that contains reverse-worded items tended to impose a threat to measurement applicability.^{7,8} However, once eight reverse-worded items were removed from the original MVS, we found, with the support of partial scalar invariance and sound psychometric properties, the reduced 10-item 3-factor model of MVS to be invariant across both cultures (United State versus Thailand) and genders (male versus female). That is, Americans and Thais tended to agree on the dimensionality of materialism and items employed to capture each dimension of materialism (that is, configural invariance) as well as the strength of the relationship between scale items and its underlying dimension (that is, full metric invariance). Furthermore, with evidence of partial scalar invariance, our findings suggested that Americans and Thais may possess different acquiescence response styles (ARS), which occur when participants in one group systematically rate certain items higher or lower than another group.⁶⁸ ARS can cause scale displacement, when responding to items like S2 ('Some of the most important achievements in life include acquiring material possessions'), S3 ('I like to own things that impress people'), S4 ('The thing I own say a lot about how well I am doing in life'), and

Hypothesis 2 ('I'd be happier if I could afford to buy more things'). As such, further revision or modification is needed for these four items because it is obvious that Americans and Thais tend to respond to these items differently. The only three-item measure of centrality revealed evidence of equal intercepts suggesting that the measure was isometrically calibrated across United States and Thailand.

Likewise, the reduced 10-item 3-factor model of materialism also revealed evidence for measurement invariance, with a support of partial scalar invariance across both genders. That is, male and female participants agreed on the three-dimensional construct of materialism (that is, success, centrality and happiness) and items employed to capture each dimension of materialism as well as the strength of the relationship between scale items and their underlying dimensions. However, with evidence of partial scalar invariance, this further suggested that male and female participants may respond to certain items differently like C2 ('I like a lot of luxury in my life'), and Hypothesis 3 ('It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like'). As such, additional attention is needed to revise or modify these two items if one wants to test the foreign applicability of the reduced 10-item three-factor model across genders. The only four-item measure of success revealed evidence of equal intercepts, suggesting that the measure was isometrically calibrated across administrative modes related to gender.

Having established partial scalar invariance and psychometric properties across both cultures and genders, the study warrants the use of the reduced 10-item three-factor model of materialism to directly compare differences in materialism and its dimensions across both cultures and genders. Without evidence of psychometric justification of measurement invariance, group-latent mean comparison will not be meaningful.¹¹ As expected, our findings support previous studies noting that individualistic cultures such as the United States were likely to display a higher degree of overall materialism than collectivist cultures such as Thailand.^{3,35,36,38}

Since 95 per cent of all Thais are Buddhists, this finding may be due partly to the impact of Buddhist teaching about 'the middle way' of life among Thais that instructs them not to be greedy and accept what they have, not what they can have. Such a notion may be reflected when examining differences specific to dimensions of materialism, which reveal that Americans were likely to view the possession of material assets as a sign of success and central to one's lives more often than Thais. It is noted that one needs to be cautious when interpreting the latent means differences between Americans and Thais related to the success dimension of materialism due to the unsuccessful attempt to establish partial scalar invariance associated with the success dimension. However, participants from both cultures tended to similarly regard possession of material assets as the pursuit of happiness. It may be possible that consumers from these two cultures tend to have similar beliefs that material desire does not lead to happiness; rather, material greed may provoke potentially destructive envy⁵⁶ that may eventually harm one's well-being and social welfare.³⁵

We further explored differences in the overall materialism and its dimensions across genders. Although the study revealed results contrary to previous studies,^{48–50} the study's results were in line with other previous studies.^{35,51} That is, we found no significant difference in overall materialism between males and females. Despite gender-identity differences related to material possessions or gender-role attitudes, significant gains in access to higher education and other forms of equal opportunity seem to be more pronounced among these young modern consumers who tend to believe that everyone has an equal chance to strive for success and material gains. These young modern consumers may also seem to move away from traditional beliefs that males are achievement-oriented financial providers, particularly because many successful females hold executive positions in corporations today. However, further investigation on three dimensions of materialism revealed significant differences between male and female consumers related to centrality and happiness dimensions,

but not the success dimension. That is, female consumers were more likely to regard the possession of material assets as central to their lives as compared with their male counterparts but were less likely to believe that such possession will lead to happiness as compared with their male counterparts. It may be possible to expect that these young modern females regard the acquisition and possession of material assets as helping them form a sense of financial independence apart from their male counterparts whose traditional beliefs seem to reflect that females must depend financially on males. In addition, viewing material possessions as central to one's life may signal risk-cautiousness among females.⁶⁹ Despite the importance these young females place on material possession as central to their lives, however, it is interesting that they are less likely to believe that material desire will lead to happiness as compared with their male counterparts. This may be because female consumers are likely to shop for material assets as a part of their identity construction⁷⁰; they may also be more rational and critical than males when deciding whether material possessions will bring them happiness.

In conclusion, in response to a call related to the development of a single scale,⁹ the findings in the study provide support, with evidence of partial scalar invariance and acceptable levels of psychometric properties, for the utility of the reduced 10-item three-factor of MVS applicable across both cultures and genders. This is among the first studies that examines gender differences in materialism and its dimensions through the use of a rigorous approach, MGCFA, and identifies non-invariant items/dimensions identification. A call for a shorter version of MVS that is applicable to other countries is reflected in the current study as well.⁷¹ In addition, the findings also validate the measurement threat imposed by the use of the reverse-worded item in foreign applications of MVS.^{7,8} The findings revealed that, while differences in overall materialism and its two dimensions (that is, success and centrality) can be culturally specific, differences in gender do not account for the differences in overall materialism. Surprisingly, findings further

suggested that gender may play a specific role in influencing the differences between males and females in two dimensions of materialism (that is, centrality and happiness).

Implications

The current study offers both theoretical and practical implications. From a theoretical standpoint, the current study demonstrates the use of MGCFA to examine measurement invariance across both culture and gender and reveals that the conceptualization and measurement of MVS are tenable given the partial scalar invariance model across both culture and gender. We also acknowledge and extend the importance of measurement invariance in studying cultural and gender differences.¹¹ From a managerial standpoint, understanding the differences in overall materialism and its dimensions across both culture and gender is important and invaluable for marketing communication strategy purposes. For example, portraying material possessions as a sign of success and something central to one's life may be more effective in American culture than in Thai culture, whereas portraying happiness as necessary for material gains may be effective in both cultures. As such, standardized marketing communication across cultures related to the portrayal of happiness from material gains may be warranted. However, when targeting a campaign toward male versus female consumers, possession of material goods as an indicator of success can be standardized in developing marketing communications, whereas portrayal of material consumption related to centrality and happiness in advertising can be gender specific. It is also noted that since the study employed the use of a student sample, practical implications are appropriate if college students are the target market in each country.

Limitations and future research directions

Despite some important strengths of the current study, there are also important limitations. The use of a student sample may or may not be representative of all the consumers in each country, although using student subjects was

considered appropriate for the purpose of sample comparability.^{54,55} Thus, future research needs to replicate the study with different samples to maximize the generalizability of the results. In addition, given the partial scalar invariance of the reduced 10-item three-factor model of materialism, future studies need to validate the reduced MVS through the use of different samples in order to assure the confidence of valid measurement. As discussed earlier, it would be worthwhile for additional work related to items that were problematic in establishing intercept invariance across both cultures (that is, S2, S3, S4 and H10) and genders (that is, C3 and H10). Lastly, a longitudinal study may be worthwhile for future research to examine how the pattern of materialism progresses over time when a country has gone through different stages of economic and social development.

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