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Purifying a Television Viewing Measure for Use in Consumer Socialization Research

Eric V. Bindah^{1*} and Md Nor Othman²

¹PhD Scholar, Department of Marketing, University of Malaya, Malaysia.

²Professor and Head of Department of Marketing, Faculty of Business and Accountancy,
University of Malaya, 50603 Kuala Lumpur, Malaysia.

Authors' contributions

This work was carried out in collaboration between the two authors. All authors read and approved the final manuscript.

Research Article

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ABSTRACT

Aims: The purpose of this study is to report confirmatory factor analysis on existing previously validated scales, by means of validating a television viewing scale.

Study Design: Survey.

Place and Duration of Study: A survey was conducted in the Klang Valley in Malaysia for a period of four consecutive months.

Methodology: The target population were college students (age ranged 19-30 above) in public and private institution of higher learning. College students were chosen because generally they represented the future of a country as with a good education, they would become middle-class professionals. Of the 1,200 randomly selected university and college students 956 completed questionnaires were usable for the data analysis. A television viewing scale was modified and adapted for the study.

Results: Using a combination of exploratory and confirmatory factor analytic approaches, this research replicated a television viewing measure. Initially, an exploratory factor analysis (N=956.) evaluated two solutions, ranging from 1 to 2 factors. Next, a confirmatory factor analyses, was used to examine the two-factor model identified by the exploratory factor analysis. A number of indices were used to evaluate the model fit. A confirmatory factor analysis of the factor structure of the adapted television viewing scale was conducted to assess whether the scale's purported 2 factors emerged. The findings of alternative model comparison converge with the results obtained from factor analysis, which demonstrated that television

*Corresponding author: Email: bindahe@yahoo.co.uk;

viewing constructs performed better when modelled as a disaggregated two-factor structure. Overall, the required reliability and validity assessment demonstrated strong support for satisfactory convergent validity and discriminant validity and proved to fit the data even better.

Conclusion: Researchers and marketers in the area of mass communication could consider adapting the television viewing scale of this study in a different multi-ethnic and cultural context to further examine how the instrument would perform.

Keywords: Television viewing; exploratory factor analysis; confirmatory factor analysis.

1. INTRODUCTION

Factor analysis is less frequently used on existing scales, with researchers only reporting scale reliability [1]. This is due to the fact that in most cases, it is assumed that the particular instrument used has been validated elsewhere, and thus does not require the use of factor analysis. This is unfortunate, and the view that a once-validated scale can or should be treated as an always-valid scale is neither reasonable nor consistent with good scientific practice.

In practice, many researchers believed that a particular instrument used for a study should not be factor analyze “validated,” “standardized,” or “published” scales, arguing that if the scale is subjected to factor analysis and items are dropped, then findings are based on different measures, and cross-study comparisons are not possible [1]. That is, some believe that the practice of assessing a measurement model inhibits valid cross-study conclusions [1]. The researchers argue that this reasoning may be faulty, as factor analyzing existing scales and discarding problematic items is a desirable practice that should be both accepted and encouraged by editors or reviewers.

The extent to which a scale remains valid across applications is an issue of measurement invariance (or lack thereof), which means that a measure retains its factor structure across different applications and samples [1].

The extent to which a scale has invariance across researchers, time, settings, and participants is best thought of as an empirical question [1]. Recent investigations of measurement invariance shows that previously validated measures often do not generalize across populations [2,3,4,5].

Among the reasons that measures may not be invariant are that the meaning of the construct varies between different groups of respondents, methods of measurement and response may differ, and the meanings of the specific items used to measure the constructs may vary [2]. One readily identifiable source of difference in communication research is attributable to subtle changes in item wording from study to study. Minor changes in item wording are made to fit the needs of a specific research project [1].

The present study adopts a television viewing scale which has mostly been previously utilized in Western cultural context to apply it in an Eastern cultural environment. The fact that previously validated measures often do not generalize across populations, it is good scientific practice to confirm the need of reporting Confirmatory Factor Analysis (CFA) on existing previously validated scales [1]. Thus, the purpose of this study is to report CFA on existing previously validated scales, by means of validating a television viewing scale.

2. RESEARCH ON TELEVISION VIEWING MEASURE IN CONSUMER SOCIALIZATION: A REVIEW

No one questions that mass media influence our lives in postmodern society because mass media are ubiquitous. How mass media exert their political, social, psychological and behavioural effects on media audiences is the central concern of media effects scholarship. A tradition of mass communication research examines mass media's contribution to the audience's conceptions and perceptions of social reality that in turn guide people's behaviour. The tradition can also be considered as a social cognitive perspective of mass communication. It is represented by the cultivation analysis and social cognitive theory of mass communication [6,7].

Television viewing was operationally defined as young adult's frequency of viewing specific program categories [8]. In this study, young adults' media use was measured with the "weekly" method practiced by mass communication scholars [9]. This method focus moves respondents from the almost impossible task of trying to estimate the complex effects of mass media on their lives to the simpler task of merely reporting what they did throughout the week.

Previous studies have offered a general conceptual framework of socialization to serve as a blueprint for discussing variables and hypotheses in the specific context of consumer socialization [10]. Studies have examined the development of several consumption-related skills as a function of variables derived from sociological and developmental theories of socialization. Television viewing was measured with seven items representing adolescent's frequency of viewing specific program categories on a 5-point Likert-type scale ranging from (1) "Everyday" to (5) "Never." The programmes categories included items such as "movies" and "cartoons." The reliability coefficient of the scale was .67 [10].

Studies have also examined the short-term and long-term effects of television advertising on the development of specific consumption-related orientations in four areas: consumer role perceptions, normative consumer activities, materialistic values, and sex-role perceptions [11]. In their research, one question was used to tap both advertising viewing frequency and motivations for viewing. Television advertising viewing was a direct measure of the adolescent's frequency of viewing TV commercials for the motives of gathering information for consumer decision making as well as information about life styles and behaviours associated with consumer products. Respondents were asked to indicate not only whether they watch television ads for various reasons (motivations) but also how often they watched ads for such reasons (frequency). They were asked to indicate on a four-point scale ranging from (1) "Very often" to (4) "Never", the extent to which they watched television ads for seven reasons, such as "to find out how good a product is" and "to find out what things to buy to impress others." The measure of frequency along with motivations for interaction with the medium was suggested by previous socialization researchers as a better measure of television advertising than gross measures of "time spent with" or "frequency of viewing" television [12]. Responses were summed across the seven items to form a 7-to-28 point index, which had a reliability coefficient of 0.83. External validation of this measure was performed by correlating it with television viewing frequency as measured in previous studies [8].

Other studies have presented the results of a two-study inquiry into a particular type of consumer socialization [13]: the construction of consumer social reality via exposure to television. In the study, television viewing was assessed by having respondents to indicate

the number of hours per week they view particular program categories and then summing across categories. These categories were soap operas, news, sports, movies, comedy, action/adventure, and drama. In terms of television viewing, the sample results were lower than the national average ($X = 23$ hours vs. 28 hours).

Other studies have conducted surveys and experiments to examine whether cultivation effects generalized to consumer values such as materialism and (2) whether these values judgments were also processed in a heuristic manner. The amount of television viewing was measured using a six-item Likert-type scale. In the survey the level of television viewing was measured by three items, namely "I often watch television on weekends," "I spend time watching television almost every day," and "I hardly ever watch television." The reliability coefficient of the scale was .80 [14].

Participants were told that the program was a movie edited for television and were randomly assigned to view either a segment of *Wall Street* (high materialism) or *Gorillas in the Mist* (low materialism). Pretests indicated that *Wall Street* was rated as more materialistic than *Gorillas in the Mist* ($M = 5.11$ vs. 1.62, $f(61) = 12.45$, $p < .001$), but the programs did not significantly differ on interest, excitement, intelligence, or persuasiveness. Each program was 19 min. long, followed by 2 min. of ads. Immediately after viewing, participants listed the thoughts they had during viewing. They then completed scales that measured how much television they generally watch. They also completed a scale measuring the extent to which they were absorbed in the program. Participants were then debriefed [14].

Another study in the United States has proposed an integrated model of consumer materialism. In the study, teenagers had to complete a questionnaire and were asked to answer a few questions that measured the amount of TV viewing. Two items on TV viewing included, "During an average week, on how many days on average do you personally watch television?" and "On a day when you personally watch television for about how many hours do you view on average?" These were combined to provide a weekly viewing figure for each respondent [15].

Generally speaking, the various scales adopted and adapted to measure television viewing have mostly been reliable across various cross-study settings. Instruments used to measure television viewing have generally been simplified and as a result of that, they have facilitated respondents' task in reporting the effect of television in their lives. However most studies which have adopted a television viewing scale did not report CFA on existing previously validated scales, by means of validating the television viewing scale, but instead they relied mostly on the reliability coefficient of the scales.

3. METHODOLOGIES

3.1 Sample and Procedures

A survey was conducted in the Klang Valley in Malaysia for a period of four months. The target population were college students in public and private institution of higher learning. College students were chosen because generally they represent the future of a country as with a good education, they will become middle-class professionals at least. The questionnaire was given to 1,200 randomly selected university and college students. Of which, 956 completed questionnaires were usable for the data analysis.

3.2 Measurement of Constructs

In this section, the measurement of television viewing construct for the study is presented. This study adapted and modified the original scale from a previous study [8] which measured mass media use, particularly television viewing. The original scale consisted of various program categories, where respondents indicated on a 5-point Likert-type scale ranging from (1) 'Never' to (5) 'Everyday' how frequently they watched specific program categories. In the original study, these program categories were classified as national and local news, sports events, movies, variety shows, cartoons, police shows, and adventure shows. The reason for adapting the scale is because the scale has proved to be reliable in many studies of consumer socialization and mass media. In this study, young adults' media use was measured with the "weekly" method practiced by mass communication scholars [9].

For the purpose of this study, the measurement scale from a previous study was modified and adapted, by asking respondents "how many hours per week do they watched specific program categories [8]. These program categories were classified as news, sports events, movies, soap dramas/dramas shows, documentaries, comedy shows, action and adventure shows. For each programme category, we provided some of the most popular programmes aired by the national television stations, as a guide for respondents. Table 1. provides both original items and the items which were adapted for measuring the television viewing dimension.

Rather than asking the respondents how frequently they watched specific programme categories, the scale adapted for this study instead asked respondents to state approximately the number of hours they watched specific programme categories in a week. By summing up the number of hours for each programme category, it allows researcher to retain more specific information on which specific programme categories are most influential for respondents, based on the assumptions that subjects would spent more hours on particular programme categories that they prefer the most.

A pilot test was conducted on 73 respondents at the University of Malaya with young adults from undergraduate and post graduate students across various faculties to check for the item consistency and the reliability of the television viewing scale. The investigation of the Cronbach's Alpha reliability coefficients with a sample of 74 respondents showed that all items forming the television viewing construct had high internal consistency reliability. The Alpha value should be between 0.50 to 0.60 recommended by Nunnally, (1967, p. 226) [16], for constructs in the early stages of research in order to obtain a reliable result. The construct of television viewing was 0.74.

Table 1. Items adapted for measuring television viewing dimension

No. Original Items <i>Churchill and Moschis (1979)</i> <i>5 point Likert type scale ranging from 1 'Never' to 5 'Everyday'</i>	No. Adapted Items <i>Churchill and Moschis (1979)</i>
1. Asking respondents how frequently they watched specific program categories These program categories were; <ul style="list-style-type: none"> • National and local news • Sports events. • Movies, • Variety shows. • Cartoons. • Police shows, and adventure shows. 	1. Asking respondents how many hours per week they watched specific program categories These program categories are; <ul style="list-style-type: none"> • News • Sports events • Movies • Soap dramas/dramas shows • Documentaries • Comedy shows • Action and adventure shows.

4. RESULTS AND DISCUSSION

4.1 Respondent Characteristics

In this section, a general profile of the respondents is discussed. Basically, of the 956 respondents who completed the questionnaire, 39.9% were males and 60.1% were females. In terms of age distribution, 63.6% of the samples were between the aged of 20-29 years old, followed by aged range of 19 years old and below (25.4%) and the remaining of the respondents 11% were aged 30 years old and above. The high percentage (63.6%) of respondents in the aged ranged of 20 to 29 years old, was explained by the fact that the subjects for this study were young adult consumers, and were therefore the main target for response.

In terms of ethnic group, the majority of the sample consisted of Malay respondents (52.2%), followed by Chinese respondents (28.2%) and Indians (10.7%) and other ethnic groups formed (9.0%) of the sample. The respondent characteristics in terms of ethnicity was generally consistent with the Malaysian Population Census (Department of Statistics and Economic Planning Unit, 2008). Consistent with the race composition of Malaysia, in terms of religious faith, the majority of the respondents endorsed Islam (58.2%), followed by Buddhism, (20.4%), Christianity (10.2%), Hinduism (9.4%) and others (2.0%).

It was observed that more than two third of the responding sample were single (87.8%), while (11.3 %) were married. It was noted that there were 7 divorcees involved in the sample group. In terms of education, the majority of the respondent in the sample group possessed a professional qualification (56.9%), and (32.2%) possessed a college diploma while 10.6% have obtained their Sijil Pelajaran Malaysia (SPM) certificate, or the Malaysian Certificate of Education, which is a national examination taken by all fifth-year secondary school students in national school in Malaysia .

In addition to that, it was also observed from the sample that 65.8% of respondents were earning an income ranged of less then RM 1,000 which formed the largest category,

followed by those earning between RM 2,000 to RM 3,999 formed 14.1% of the respondents. 13.5% of the sample group were earning an income in the ranged of between RM 1, 000 to RM 1, 999. One possible reason for such findings was due to the predominantly younger aged respondents who were still in the early stage of their career path.

4.2 Exploratory Factor Analysis

In order to determine the underlying dimensions of the multi-item measurement scale, exploratory factor analysis was performed separately on the statements. The purpose for performing factor analysis was to determine whether the data could be condensed or summarised into smaller set of factors [17]. The dimensions of the scales were examined by factor analysing the items using the principal components analysis with Varimax rotation. Minimum eigenvalues of 1.0 helped determined the number of factors or dimensions for each scale [18]. Although factor loadings of 0.30 to 0.40 was considered acceptable, however, factor loadings greater than 0.50 was generally necessary for practical significance [18]. Hence, the items for a factor were retained only when the absolute size of their factor loading was above 0.50.

4.2.1 Factor analysis of television viewing construct

The 7-item television viewing scale was factor analysed to identify the dimensionality. Similarly, principal component analysis with Varimax rotation method was used to assess the factor loadings of each item on different television viewing factors. Table 2. presents the results of Kaiser-Meyer-Olkin (KMO), Bartlett's test of sphericity and total variance explained.

Table 2. Kaiser-Meyer-Olkin (KMO), Barlett's test and total variance explained for television viewing construct

Bartlett's test of sphericity			
Approx. Chi-Square= 1.6653, d.f=21, p=0.000			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy=0.826			
Extraction sums of squared loadings			
Factor	Eigenvalue	Percentage of variance	Cumulative percentage of variance
1	3.090	44.141	44.141
2	1.031	14.731	58.872

The Bartlett's test of sphericity was significant ($\chi^2= 1.6653$, $p = 0.000$) and the KMO value of 0.826 indicated that factor analysis was appropriate to be used for analysing the television viewing factor [18]. The rotated factor matrix in Table 3. showed that two factors were identified to explain the underlying characteristics of television viewing factor. Together, the two factors accounted to more than 50% of the variance in responses. Factor 1 included four items related to television viewing with the factor loadings ranging from 0.693 to 0.772, accounting for 44.141% of the total variance. Only factor loading 0.5 and above were taken into consideration. Factor 2 consisted of three items ranging from 0.586 to 0.845, explaining 14.731% of the total variance.

Table 3. Rotated factor analysis for television viewing construct

Items	Component	
	1	2
NEWS: About how many hours per week do you watch news on television?	0.274	0.612
SPORTS: About how many hours per week do you watch sports on television?	-0.043	0.845
MOVIES: About how many hours per week do you watch movies on television?	0.693	0.214
DRAMA: About how many hours per week do you watch drama series on television?	0.772	-0.097
DOC: About how many hours per week do you watch documentaries on television?	0.457	0.586
COMEDY: About how many hours per week do you watch comedy shows on television?	0.698	0.366
ACTION: About how many hours per week do you watch action movies on television?	0.732	0.339
Eigenvalues	3.090	1.031
Total Variance Explained (%)	44.141	14.731
Cumulative Variance Explained (%)	44.141	58.872

4.3 Item Analysis and Scale Reliabilities

The internal consistency reliabilities of the scale were next assessed after the factor analyses. Cronbach's alpha coefficient which was the most popular indicator of internal consistency was employed in the present study to assess the reliabilities of measurement scales adopted [17]. By convention, an acceptable level of coefficient alpha to retain an item in a scale is at least 0.50 [19]. The present study was based on recommendation [19] when assessing the reliability of each scale. The reliability analysis and descriptive statistics for individual items of the television viewing measure, are presented in Table 4.

The mean scores for television viewing items varied from 2.52 to 4.44. Overall, the subjects in the present study were somewhat agreed with television viewing measures. Internal consistency for this 7-item scale was the highest ($\alpha = 0.779$).

In conclusion, the present study have demonstrated a high internal consistency reliability. Television viewing ($\alpha = 0.779$) scored a high Cronbach's alpha value. The measure of alpha coefficients for the scale used was above 0.50. This indicated satisfactory reliability for the measure used. Subsequently, summated mean scores of multiple indicators were created for the research construct and used in further analyses. Nevertheless, there were several limitations associated with the use of Cronbach's alpha, including the fact that the alpha value was inflated as the larger number of items included in a scale [20]. Additionally, satisfactory Cronbach's alpha value did not indicate unidimensionality of a particular scale [21]. Hence, confirmatory factor analysis was employed for the assessment of unidimensionality of scale adopted.

Table 4. Descriptive statistics and reliability analysis of television viewing measure

Scale items	Mean	St. Dev.	Cronbach's alpha
Television viewing			0.779
NEWS: About how many hours per week do you watch news on television?	3.84	3.75	
SPORTS: About how many hours per week do you watch sports on television?	2.52	3.33	
MOVIES: About how many hours per week do you watch movies on television?	4.44	4.72	
DRAMA: About how many hours per week do you watch drama series on television?	3.96	4.58	
DOC: About how many hours per week do you watch documentaries on television?	2.65	3.15	
COMEDY: About how many hours per week do you watch comedy shows on television?	3.07	3.93	
ACTION: About how many hours per week do you watch action movies on television?	3.41	4.78	

4.4 A Summary Statistics of the Television Viewing Construct

The proportional mean scores for the television viewing construct was computed by summing the items and dividing by its respective number of items. The mean scale scores and distributional statistics are presented in Table 5.

The summary statistics for television viewing construct consisted of seven from the exploratory measurement assessment using factor analysis.

Overall, the respondents had high score on television viewing ($M = 21.35$, $SD = 1.74$). Exploratory factor analyses was initially employed to purify the multi-item scale (As discussed earlier). Only indicators exhibiting satisfactory loadings on the intended factor and indicators with no cross-loadings were retained. Based on the theoretical and empirical justifications, the constructs of television viewing was subjected to confirmatory factor analyses using AMOS 16.0 version.

Table 5. Summary descriptive and distributional statistics of the television viewing construct

Constructs	Mean	Std. Dev.	Kurtosis	Skewness
Television Viewing *	21.35 (3.56)	1.74281	10.122	2.604

*Notes: Figures in parenthesis are proportional means; for television viewing construct; *open scale ranges from 0 to 48.*

4.5 Confirmatory Factor Analysis

Studies have highlighted the importance of unidimensionality in the scale development process [21]. Traditional exploratory analyses (e.g., factor analysis) were not theory based analysis and hence they failed to assess unidimensionality directly [21]. To overcome this limitation, confirmatory factor analysis (CFA) was employed for the assessment of

measurement model fit and unidimensionality. This section covered important discussion relating to CFA which included identification issues, model specification and the testing of single versus multi-component measures employed for the study.

4.5.1 Identification issues

In SEM, identification was about whether there were enough pieces of information to identify a solution for a set of structural equations [18]. It was important to determine the identification status of a hypothesised model by checking the number of degrees of freedom associated with the model [22].

As the sample size of the present study was sufficiently large ($n=956$), it was believed that the hypothesised model would converge and produce reliable results [18].

4.5.2 Model specification

For specification of the latent constructs, the loading for one of the indicator of each construct was fixed to 1.0 in the model to create a scale for the latent construct. This process was done automatically with the features in AMOS 16.0 software.

4.5.3 Comparing the disaggregated multi-component structure to a traditional unidimensional measure

There were no debates regarding the conceptualization of television viewing on whether each of these predictors should be modeled as a single concept or a disaggregated multi-components structure. To date there were no recent studies that supported the disaggregated multi-components of television viewing structure. In order to determine whether television viewing was best represented as single concept or multi-component constructs, both exploratory factor analysis and confirmatory factor analysis were conducted.

The exploratory factor analysis results indicated that television viewing comprised of two distinct components. Subsequently, CFAs were employed to test and confirmed these findings as reported in the exploratory factor analyses. It was acknowledged that the hypothesized alternative models could not be compared using chi-square difference test if these models were not nested [23]. However, comparison could still be made by looking at the normed χ^2/df value and other fit indices.

Following the exploratory factor analysis results, a disaggregated two-factor television viewing measure was tested against a single television viewing concept to reflect the global television viewing construct (Fig. 1). Consequently, if these tests indicated a significantly better χ^2 and model fit indices when modelled as two disaggregated concepts would suggest discriminant validity.

Based on empirical findings obtained from factor analysis, television viewing structure was best represented through disaggregated multi-component concepts.

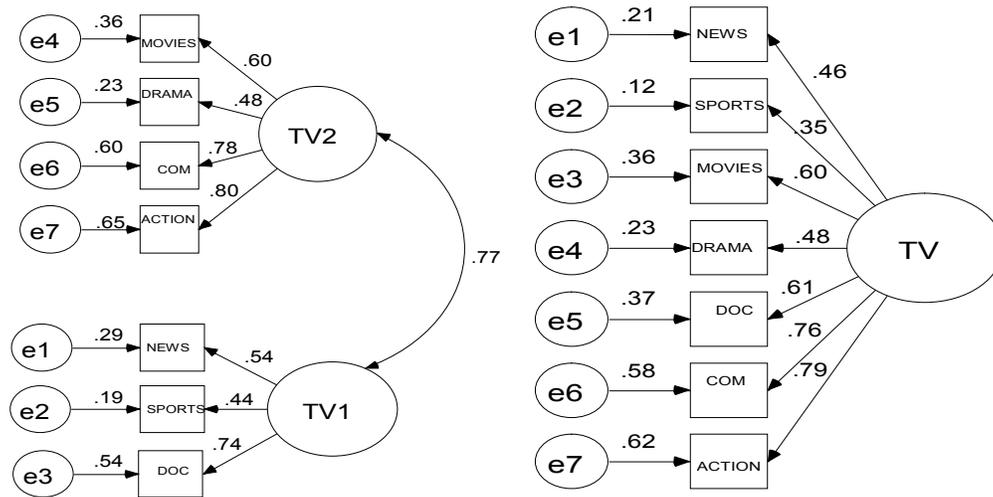


Fig. 1. Disaggregated multi-components versus single television viewing concept

Table 6. Alternative model testing results

Alternative model	χ^2	f	P	Ratio	GFI	TLI	CFI	RMSEA
Television viewing								
Single Concept	128.162	14	.000	.667	.962	.896	.931	.092
Two concept	61.959	13	.000	.619	.983	.952	.970	.063

Based on Table 6, the χ^2 GOF for single television viewing model was compared to χ^2 GOF for the disaggregated multi-components television viewing model. The results showed that the hypothesised disaggregated multi-components television viewing model ($\chi^2 = 61.959$) performed better than the single television viewing model ($\chi^2 = 128.162$). The incremental fit measures also indicated great improvement to the hypothesised model (i.e., disaggregated multi-components television viewing structure).

4.6 Construct Validity

There exists many ways to test construct validity in the literature. This study adopted Staub's (1988) [24] measurement validation procedures to test construct validity in terms of convergent validity and discriminant validity. Prior to structural model testing, the construct validity and reliability were tested by checking the convergent validity, discriminant validity, and composite reliability of the data. The whole process of scale validation is delineated in the following sub-sections.

4.6.1 Convergent validity

The measurement model specified how the observed indicators were related to unobserved constructs [25]. Having fulfilled the goodness-of-fit indices assessment, the next step was to test convergent validity of the data. The convergent validity was assessed by checking the loading of each observed indicators on their underlying latent construct [26]. Table 7

presents the CFA results, which included the unstandardised and standardised factor loadings as well as the item reliability for each indicator.

Firstly, the factor loadings (i.e., the path estimate linking construct to indicator) were examined to identify potential problem with the CFA model. The standardised factor loading should be significantly linked to the latent construct and have at least loading estimate of 0.5 and ideally exceed 0.7 [18]. Hence, insignificant loading with low loading estimate indicated potential measurement problem.

The CFA results (see Table 7.) indicated that each factor loadings of the reflective indicators were statistically significant at 0.001 level. The factor loadings ranged from 0.446 (SPORTS) to 0.803 (ACTION). Following this, the squared multiple correlations (also called item reliability) in the CFA model was examined.

Item reliability refers to the value that represented the extent to which an observed indicator's variance was explained by the underlying construct [18]. The majority of the squared multiple correlations of indicators in the measurement model were lower than the acceptable level of 0.50 [27].

Although the items did not meet the 0.50 cut-off, these items were retained considering that they were important indicators and the content validity associated with these items was high [18]. This was also because other estimate such as factor loading, variance extracted and composite reliability remained satisfactory. Further, deleting these items would leave fewer items than three on some constructs that might lead to subsequent identification problem [2].

Table 7. Indicator loadings and item reliability (revised measurement model)

Latent construct	Items	Unstandardised factor loading	Standardised factor loading	Standard error ^a	Critical ratio ^b	Item reliability
Television viewing	MOVIE	.736	.598	.043	17.292	.358
	DRAMA	.579	.485	.042	13.909	.235
	COMEDY	.795	.775	.036	21.821	.601
	ACTION	1.000	.803	-	-	.644
	NEWS	.857	.532	.066	12.916	.283
	SPORTS	.638	.446	.057	11.175	.199
	DOC	1.000	.738	-	-	.544

Fit indices: $\chi^2 = 907.624$, $\chi^2/df = 2.125$, $GFI = 0.943$, $TLI = 0.926$, $CFI = 0.936$, $RMSEA = 0.034$. Note: ^a S.E. is an estimate of the standard error of the covariance; ^b C.R. is the critical ratio obtained by dividing the estimate of the covariance by its standard error. A value exceeding 1.96 represented significance level of 0.05; ^c some critical ratios were not calculated because loading was set to 1 to fix construct variance; All item loadings in CFA model were significant at 0.001 level.

4.6.1.1 Construct reliability and variance extracted measures

Other than fulfilling the factor loadings and item reliability criteria, the convergent validity assessment also included the measure of construct reliability and variance extracted. Variance extracted refers "to the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error" [28]. Variance extracted is a more conservative measure than construct reliability [28].

Additionally, two other criterias were assessed to ensure convergent validity: (1) construct reliability should be greater than 0.7 [16], and (2) variance extracted (VE) for a construct should be larger than 0.5 to suggest adequate convergent validity [28]. Table 8. summarises the results of construct reliability and variance extracted for each construct.

In this study, the variance extracted values for the main construct exceeded the cut-off of 0.50 recommended [28]. The measurement model was further assessed to determine the constructs reliability. The results displayed adequate reliability in that the reliability of each construct exceeded the 0.7 threshold [16]. Generally, the present findings indicated that the television viewing has achieved a range of fairly good reliabilities among indicators to measure the latent constructs.

Table 8. Confirmatory factor analysis for convergent validity

Construct	No. of items	Factor loading	Construct reliability	Variance extracted
Television viewing	7	0.446-0.738	0.779	0.588

4.6.2 Discriminant validity

This section presents a common method of assessing discriminant validity. It is to be noted that, a more conservative approach for establishing discriminant validity was employed [18]. Discriminant validity was determined by the variance extracted value, namely whether or not it exceeded the squared inter-construct correlations associated with that construct [28]. It was found that the variance extracted of each construct was all above its squared correlation with other constructs. It was evident that these results lent adequate evidence for discriminant validity of the present measurement model. Overall, the required reliability and validity assessment demonstrated strong support for satisfactory convergent validity and discriminant validity.

5. CONCLUSION

The purpose of this study was to validate a television viewing instrument commonly used in consumer socialization research. The present study adopted a television viewing scale previously utilized in Western cultural context to apply it in an Eastern cultural environment. The purpose was to report CFA on existing previously validated scales, by means of validating a television viewing scale.

Generally speaking, the various scales adopted and adapted to measure television viewing have mostly been reliable across various cross-study settings. However most studies which have adopted a television viewing scale did not report CFA on existing previously validated scales, by means of validating a television viewing scale, but instead relied mostly on reliability coefficient of the scales of the respective studies.

For the purpose of this study, rather than asking the respondents how frequently they would watched specific programme categories, respondents were instead asked to state approximately the number of hours they watched specific programme categories in a week.

A pilot test was conducted among young adults to check for the item consistency and the reliability of the television viewing scale. The Alpha value for the construct of television viewing was above the recommended value recommended.

Using a combination of exploratory and confirmatory factor analytic approaches, this research replicated a television viewing measure. Initially, an exploratory factor analysis (N=956.) evaluated two solutions, ranging from 1 to 2 factors. Next, a confirmatory factor analyses, using the sample (N=956), examined the two-factor model identified by the exploratory factor analysis.

The findings of alternative model comparison converge with the results obtained from factor analysis, which demonstrated that television viewing constructs performed better when modeled as a disaggregated two-factor structure. The two-factor model of television viewing structure was developed as a result of an extensive review of literature, with a sample of young adults in order to test the factorial structure of the scale, and a CFA to confirm the two-factor model and to provide further reliability evidence. Overall, the required reliability and validity assessment demonstrated strong support for satisfactory convergent validity and discriminant validity.

In addition, the results of the CFA also indicated that the two-factor model showed a good fit with high fit indices. The latent structure of television viewing measure seems better represented by two factors with 7 items. To conclude, it appears that these factors and items are essential to being successful in consumer socialization research and commonly suggested in the previous questionnaires. Researchers and marketers in the area of mass communication could consider adapting the television viewing scale of this study in a different multi-ethnic and cultural context to further examine how the instrument would perform. The scale also proves to be useful for researchers interested in studying the important topic of mass communication among young adults.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Levine T, Craig R, Hullett CR, Turner MM, Lapinski MK. The Desirability of Using Confirmatory Factor Analysis on Published Scales Communication Research Reports. 2006;23(4):309-314.
2. Byrne BM, Watkins D. The Issue of Measurement Invariance Revisited. *Journal of Cross-Cultural Psychology*. 2003;34:155–175.
3. Hui CH, Triandis HC. Effects of Culture and Response Format on Extreme Response Style. *Journal of Cross-Cultural Psychology*. 1989;20:296–309.
4. Lubke GH, Dolan CV, Kelderman H, Mellenbergh GJ. Weak Measurement Invariance with Respect to Unmeasured Variables: An Implication of Strict Factorial Invariance. *British Journal of Mathematical and Statistical Psychology*. 2003;56:231–248.
5. Wichert JM, Dolan CV, Hessen DJ. Stereotype threat and group differences in test performance: A question of measurement invariance. *Journal of Personality and Social Psychology*. 2005;89:696–716.
6. Gerbner G, Gross L, Morgan M, Signorielli N. Growing Up with Television: The Cultivation Perspective. In *Against the Mainstream: The Selected Works of George Gerbner*. M. Morgan ed. New York: Peter Lang; 2002.
7. Bandura A. Social Cognitive Theory of Mass Communication. *Media Effects: Advances in Theory and Research*. (2002):121-153.

8. Churchill GA, Moschis GP. Television and Interpersonal Influences on Adolescent Consumer Learning. *Journal of Consumer Research*. 1979;6(1):23-35.
9. Perse E, Dunn DG. The Utility of Home Computers and Media Use: Implications of Multimedia and Connectivity. *Journal of Broadcasting and Electronic Media*. 1998;42:437-456.
10. Moschis GP, Churchill GA. Consumer Socialization: A Theoretical and Empirical Analysis. *Journal of Marketing Research*. 1978;15(4):599-609.
11. Moschis GP, Moore RL. A Longitudinal Study of Television Advertising Effects. *Journal of Consumer Research*. 1982;9(3):279-286.
12. McLeod JM, O'Keefe GJJ. The Socialization Prospective and Communication Behaviour. In *Current Perspectives in Mass Communication Research* ed. Beverly Hills, C.A.: Sage; 1972.
13. O'Guinn TC, Shrum JL. The Role of Television in the Construction of Consumer Reality. *Journal of Consumer Research*. 1997;23(4):278-294.
14. Shrum LJ, Burroughs JE, Rindfliesch A. Television's Cultivation of Material Values. *Journal of Consumer Research*. 2005;32(3):473-479.
15. Flouri E. An Integrated of Consumer Materialism: Can Economic Socialization and Maternal Values Predict Materialistic Attitudes in Adolescents. *Journal of Socio-Economics*. 2000;28:707-724.
16. Nunnally JC. *Psychometric theory*. New York: McGraw Hill; 1978.
17. Malhotra NK. *Marketing Research: An Applied Orientation*. 4th ed. Upper Saddle River, New Jersey: Prentice Hall; 2004.
18. Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL. *Multivariate Data Analysis* 6th ed. Upper Saddle River, NJ: Pearson Prentice Hall; 2006.
19. Churchill GA. Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*. (1979):64-73.
20. Sekaran U. *Research Methods for Business*. 3rd ed. New York: Hermitage Publishing Services; 2000.
21. Gerbing DW, Anderson JC. Improper Solutions in the Analysis of Covariance Structures: The Interpretability and a Comparison of Alternate Respecifications. *Psychometrika*. 1987;52:99-111.
22. Byrne BM. *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates; 2001.
23. Kelloway KE. Structural Equation Modelling in Perspective. *Journal of Organizational Behaviour*. 1995;16(3):215-224.
24. Staub E. The Evolution of Caring and Non-Aggressive Persons and Societies. *Journal of Social Issues*. 1988;44(2):81-100.
25. Kline RB. *Principles and practice of structural equation modeling*. 2nd ed. New York: Guilford Press; 2005.
26. Anderson JC, Gerbing DW. Structural Equation Modeling in Practice: A Review and Recommend Two-step Approach. *Psychological Bulletin*. 1988;103(3):411-423.
27. Bollen KA. Overall Fit in Covariance Structural Models: Two Types of Sample Size Effects. *Psychological Bulletin*. 1990;107(2):256-259.

28. Fornell C, Larcker DF. Evaluating Structural Equations with Unobservable Variables and Measurement Error. *Journal of Marketing Research*. 1981;18(1):39-50.

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