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Valuing Australian Cultural Institutions: Developing a Cultural Worldview Scale*

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Abstract

This paper explores the relationship between cultural attitudes and estimates of the economic value of cultural institutions. The relationship is tested with preliminary findings from an empirical study of the economic value of two national cultural institutions in Australia—the National Museum of Australia and Old Parliament House (the historic former national parliament building). The two institutions are the subject of separate choice modelling surveys aimed at estimating their economic value. An innovative element of the study is the development of a cultural worldview (CW) scale, similar in concept to the new ecological paradigm scale, to measure the latent characteristics of respondents. The study enables the testing of relationships between the CW scale, socio-demographic variables, and the stated economic values.

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Keywords: Nonmarket valuation, cultural value, cultural worldview scale, attitude-behaviour, factor analysis, choice modelling

1. Introduction

Effective measurement of cultural value is often elusive. Although nonmarket valuation techniques such as contingent valuation methods (CVM) and choice modeling (CM) have attracted increasing interest over the past two decades, there is an argument that such techniques are unable to encapsulate the full value of cultural goods (Throsby 2003:85). According to Throsby (2001:31-2; 2003:280), the standard neoclassical model is unable to offer an appropriate, adequate estimation of cultural value. This is mainly because cultural value is 'multidimensional, unstable, contested, lacks a common unit of account, and may contain elements that cannot be easily expressed according to any quantitative or qualitative scale' (Throsby 2003:279-80).

While there is no easy solution to the totality of the problem raised by Throsby, it may be possible to address at least some of the issues arising from the multidimensional nature of cultural value. It may be possible, for example, to consider dimensions as latent variables that can help to improve statistical estimation, a better representation of theoretical concepts, and

specification of measurement errors (Hair *et al.* 2005:712-3). However, existing cultural economics literature is relatively silent on the dimensional structure of people's cultural values. But it may be possible to draw some insights from the literature on environmental valuation that, as in the past, has provided much guidance on the use of nonmarket valuation techniques to estimate cultural values.

This paper outlines some preliminary work on the relationship between cultural attitudes and estimates of cultural value. The ultimate aim is to develop a scale for the measurement of cultural beliefs or general cultural attitudes of a population and examine how those beliefs or attitudes impact on the determination of cultural value. Many scales have been developed to measure diverse attitudes, opinions, and perceptions of populations in order to 'examine *a priori* hypothesised relationships with other constructs or behaviours' (Hinkin 1995: 967). Scales are measurement instruments that are collections of items or statements. These items are expected to represent 'theoretical variables' that are 'not readily observable by direct means' (DeVellis 1991: 8). These variables are also known as 'latent constructs', 'latent variables', or factors, which determine values of the items. Latent variables are the underlying constructs or phenomena that scales are expected to represent (DeVellis 1991: 12). The underlying assumption is that people's attitudes influence their cultural preferences (Ajzen 1991; Boxall and Adamowicz 2002; Dunlap and Van Liere 1978). The development of the scale draws significantly on the work of Dunlap and Van Liere (1978) and Dunlap *et al.* (2000) and their new ecological paradigm (NEP) scale.

This paper contains four major sections. The following section reviews the psychology of choice behaviour and its linkages to latent variables. The development of the CW scale is then outlined. The subsequent section is used to illustrate a preliminary application of the CW scale using data from a survey on the cultural value of Old Parliament House in Canberra, followed by a brief conclusion and discussion.

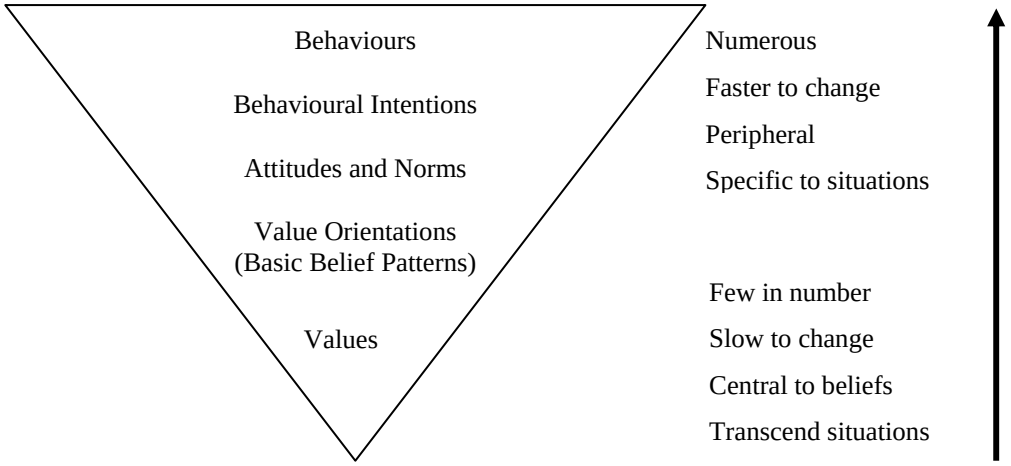
2. Cultural Goods and the Psychology of Choice Behaviour

The intangible nature of culture and the public good characteristics of many cultural goods and services inhibit the operation of the standard price mechanism and hence market determination of their value. To mitigate this difficulty nonmarket valuation methods, initially developed to estimate environmental values, are used extensively to estimate the value of certain cultural goods and services, including the cultural value of museums, theatres, heritage buildings, monuments and other landmarks (Mazzanti 2003; Morey *et al.* 1997; Navrud and Ready 2002; Noonan 2003; Rolfe and Windle 2003). Stated preference (SP) nonmarket valuations rely on surveys that use a hypothetical market to elicit preferences which are used to estimate values of both users and non-users of the good or service of interest (Bateman *et al.* 2002:22-3).

In essence, SP techniques reveal a behavioural intention, not an actual behaviour (Barro *et al.* 1996; Bateman *et al.* 2002:113; Heberlein and Bishop 1986; Mitchell and Carson 1989:186). It is useful, therefore, to briefly examine the causal linkage between behavioural intentions and actual behaviours (choices).

Fulton *et al.* (1996) use an inverse pyramid shape to illustrate the relationship between basic values (what individuals consider to be important) and behaviour (see Figure 1). Value orientations are expressed as basic belief patterns and reflect the values of individuals. In turn, value orientations provide the foundations for attitudes and norms that guide behavioural intentions and actual behaviour. Values are limited in number, take time to change, are fundamental to beliefs, and are not directly related to specific situations. Moving upward in the inverse pyramid, attitudes and norms are numerous and rapidly evolving, are of limited significance to beliefs (lower components), and are behaviour-specific. Behavioural intentions are known as the immediate precedents to actual behaviours (Ajzen 1991), or as their 'most direct predictor' (Vaske and Donnelly 1999:527).

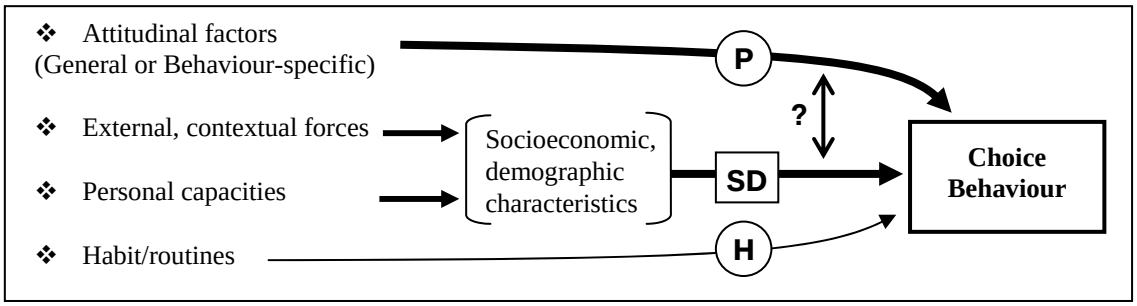
Figure 1: The cognitive hierarchy model of human behaviours



Source: Fulton, D.C., Manfredo, M.J. and Lipscomb, J., 1996. 'Wildlife value orientations: A conceptual and measurement approach', *Human Dimensions of Wildlife*, 1(2):24-47.

The hierarchical model of Fulton *et al.* (1996) is common in more detailed psychological constructs of choice behaviour. Some examples are the attitude-behaviour model developed by Eagly and Chaiken (1993), the psychological construct developed for the value-belief-norm (VBN) theory of Stern (2000), and Ajzen's (1991) theory of planned behaviour (TPB).

Figure 2: Causal relationships of choice behaviours



A review of relevant psychological literature suggests that there are three separate causal relationship paths that impact on choice behaviour. These paths are summarized in Figure 2. The first path (P) denotes the behavioural influence of attitudinal factors such as values[1], beliefs[2], and attitudes[3]. These are either general or behavior-specific. The second path (SD) represents the influence of socioeconomic, demographic forces such as income, age, gender, and education levels. The final path (H) symbolizes the behavioural influence of habits or routines.

According to Stern (2000), these causal factors work differently for particular behaviours, and are not independent from each other. In particular, the predictive power of P is stronger when that of SD is weaker. This is consistent with Tyler *et al.* (1982), Ajzen (1991), Stern (1992:279), and Bamberg (2003:22). Stern concludes that behaviours are dependent on 'a broad range of

[1] Values are the most abstract form of social cognitions, which 'serve as prototypes from which attitudes and behaviour are manufactured' (Vaske and Donnelly 1999:524).
[2] Beliefs are the prevailing determinants of a person's intentions and actions, which are antecedent to behaviour-specific attitudes (Ajzen 1991:189).
[3] Attitudes are 'mental state' and must refer to some object to which individuals respond favourably or unfavourably (Eagly and Chaiken 1993; Vaske and Donnelly 1999:526-7).

causal factors, both general and behaviour-specific'; that 'each target behaviour should be theorized separately'; and that attitudinal factors show the greatest predictive power when behaviours are not seriously constrained by context or personal capacities (Stern 2000:421-2).

These hierarchical relationships provide a basis for the development of value scales. In essence, the likely existence of such hierarchical relationships supports expectations that an individual's value orientation can be used to predict the individual's attitude toward cultural preservation and consequently may be used as the foundations for the construction of a CW scale. The development of such a scale is described in the following section.

3. Developing a Cultural World View Scale

The aim of developing a cultural world view scale is to measure how cultural beliefs impact on the determination of cultural value. The development of scales to measure the effect of attitudes and perceptions on actual behaviours is not unusual, and DeVellis (1991) sets out guidelines for the process. Seven steps are involved:

Step 1: Determine clearly what it is you want to measure

Step 2: Generate an item pool

Step 3: Determine the format for measurement

Step 4: Have initial item pool reviewed by experts

Step 5: Consider inclusion of validation items[4]

Step 6: Administer items to a development sample

Step 7: Evaluate the items

Step 8: Optimise scale length

The generation of the 'item pool' is a critical element of the process. DeVellis (1991:54-60) recommends the following considerations:

- What to include?: Choose items that reflect the scale's purpose.
- How many?: 'The larger the item pool, the better'. Three to four times larger number of items than the expected final scale. 50% larger is enough when there is empirical evidence for internal consistency.
- What to avoid?: Ambiguous, double-barreled, lengthy items, and ambiguous pronouns. Make equal numbers of positively and negatively stated items to avoid 'acquiescence, affirmation, or agreement bias'.

Review by experts is also important. DeVellis (1991:75) suggests that experts should be drawn from 'colleagues who have worked extensively with the construct in question or related phenomena'.

The NEP scale of Dunlap *et al.* (2000) provided an example of a scale that could be used to guide the development of a cultural worldview (CW) scale. As a first step the basic structure of the environmental worldview was transformed into a cultural worldview. The transformation had to take account of the different relationship that humans have with the environment and

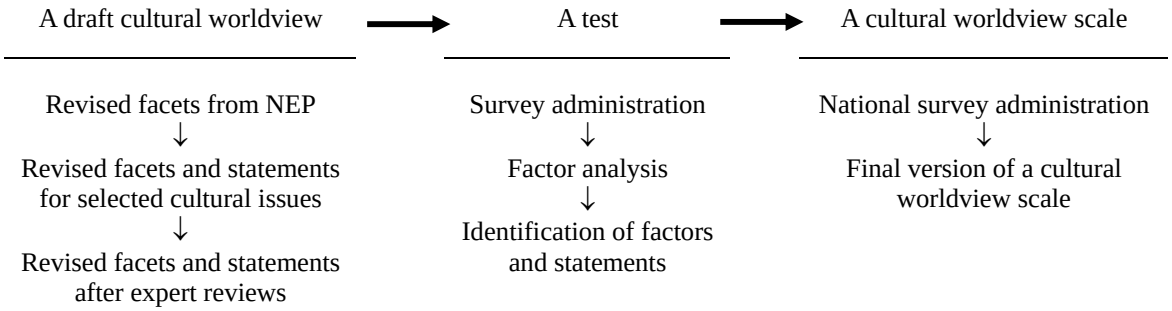
[4] Validation items were not included in this study.

with culture. In particular, the five facets[5] of the NEP scale reflect the tension between human exploitation of environmental resources and the risk of environmental damage from overexploitation. With culture the analogous tension would arise from a failure to protect the cultural heritage and provide sufficient support for continued cultural development. On the basis of this analogy, and lessons derived from the existing literature, the following four facets were formulated for the CW scale:

- Loss of cultural heritage: We are continuously losing our cultural heritage and values.
- Materialism: Material satisfaction can substitute for cultural heritage.
- The possibility of an identity crisis: Development and globalisation cause people to lose their cultural identity.
- Significance of cultural heritage: Human beings are cultural animals. Without cultural and historic records, current civilization is not that meaningful.

An initial draft pool with 35 statements of cultural worldview related to these facets was constructed and sent for review by relevant experts. Eleven experts were approached by email and five (a cultural economist, two sociologists in crosscultural studies, and two tourism experts) provided their opinions[6]. On the basis of the experts' advice, an expanded draft pool containing 48 statements[7] was prepared. The validity of the draft scale was then tested with a sample of 200 respondents[8] (mainly students) on the campus of the Australian National University. Following factor analysis of the collected data, a final set of statements[9] was determined for testing in a nationwide survey. The process is summarized in Figure 3. The analysis of the national survey data is described in detail in the following section.

Figure 3: Overall process of developing a cultural worldview scale



4. Application of the Scale

The CW scale was developed for inclusion in separate choice modelling surveys on the cultural value of Old Parliament House (OPH) and the National Museum of Australia (NMA) in Canberra, Australia. The preliminary analysis presented here relates to data collected in the OPH

[5] The five facets of the NEP scale are limits to growth, anthropocentrism, the fragility of nature's balance, rejection of exemptionalism, and the possibility of an ecocrisis.
[6] The development of the CW scale would not have been possible without the contributions from these experts.
[7] The final pool of 48 items for a test survey is available by contacting the corresponding author.
[8] 150 to 200 respondents are recommended (Hinkin 1995:973; Russell 2002:1632). Respondents were asked to express agreement/disagreement with each statement, using a five-point Likert scale: (1) Strongly disagree, (2) Mildly agree, (3) Unsure, (4) Mildly disagree, and (5) Strongly disagree.
[9] This version of the scale included 18 items representing four factors.

survey. In that survey, questionnaires were sent to 4000 randomly selected people (nationwide) between March and May 2006, and 842 useful responses were obtained.[10] Analysis of both the OPH and NMA data is continuing. Consequently, the results presented here remain tentative and may well change following more complete detailed analysis of the data from the two surveys.

4.1. Case Study

The characteristics of the sample population are shown in Table 1. Compared with the demographic figures from Australian Bureau of Statistics (ABS) (2006), the sample over-represented female (60 per cent) and old (51 per cent aged over 55 years) Australians. Income and education levels were not distinctively biased.

Table 1: Characteristics of the OPH sample for a cultural worldview

		Number	%	ABS			Number	%	ABS
Gender	Male	339	40.5	49.5	Education	No schooling	1	0.1	
	Female	499	59.5	50.5		Primary only	42	5.0	
Age	17-14	19	2.3	9.8		Junior/Year 10	146	17.5	
	25-34	91	10.8	19.6		Senior/Year 12	192	23.0	
	35-44	144	17.2	20.5		Diploma/certificate	194	23.2	51.5[a]
	45-54	155	18.5	19.1		University/Tertiary	225	26.9	
	55-64	181	21.6	15.0		Other	36	4.3	
	65-74	157	18.7	9.6	Income	Under 10,399	43	5.4	2.7
	75+	92	11.0	6.5		$10,400-15,599	98	12.3	9.4
Household	1	249	30.4			$15,600-20,799	26	3.3	7.4
size	2	309	37.7			$20,800-25,999	83	10.4	7.8
	3	102	12.4			$26,000-31,199	34	4.3	6.0
	4	91	11.1			$31,200-41,599	92	11.5	10.4
	5	49	6.0			$41,600-51,999	124	15.5	10.3
	6	17	2.1			$52,000-103,999	219	27.4	33.0
	7	3	0.4			> 104,000	81	10.1	13.0

[a]: This is the percentage of people with higher educational qualifications (tertiary degrees or diploma/certificate) of all persons aged 15–64 years in 2005. The sample has 51.0 per cent.

Factor analysis was used to delineate the 18 selected CW scale items (see Table 2) into a smaller number of factors, using SPSS 12.0.1 for Windows. Each of the identified factors then represents a scale based on the empirical relationship among the items. Principal axis factoring[11] (exploratory factor analysis) and the varimax rotation procedure were used to identify a small number of unobserved latent variables (factors) that underlie a set of items (DeVellis 1991:92; Landau and Everitt 2003:284; Russell 2002). The correlation matrix was used for the analysis.

Several criteria are widely used to reduce the number of items and determining factors. Following (Hinkin 1995:975; Landau and Everitt 2003:299), only items having a high factor loading (greater than 0.4) were retained. Items with a factor loading less than 0.4 or with more than one factor loading greater than 0.4 were discarded. The reliability coefficient (Cronbach's alpha) of a factor, reflecting the internal consistency of the items in forming a scale (that is, an item-total correlation to form a factor) must be greater than 0.7 (DeVellis 1991; Hinkin 1995:977).

[10] Although, most of these data were useful for the CW scale, only 776 questionnaires were valid for the CM study because of incomplete choice sets.

[11] Russell (2002:1632) and Landau and Everitt (2003:296) clarify that principal axis analysis and principal component analysis are different, and the former is the recommended factor analysis.

Table 2: Descriptive statistics of data for a cultural worldview scale with 18 items

Items	Mean	Std. Dev.	Number	Statements
Item 1	4.52	0.72	838	I am glad because cultural heritage is available to me.
Item 2	2.70	1.32	831	Our traditional style of dress is not important to me.
Item 3	4.70	0.65	839	The present cultural heritage should be available for my children's children.
Item 4	2.98	1.31	837	We are not losing our cultural heritage.
Item 5	4.52	0.76	840	Cultural heritage must be a part of our life.
Item 6	4.00	1.20	839	Culture does not help us to understand the world.
Item 7	4.37	0.87	838	The cultural values of our forefathers are important to me.
Item 8	3.26	1.23	839	Cultural heritage is not disappearing.
Item 9	4.64	0.70	839	Future generations have the right to enjoy the present cultural heritage.
Item 10	3.61	1.32	837	Culture does not help me to identify myself.
Item 11	4.11	1.00	838	I want to know the foods our grandmothers made.
Item 12	4.45	1.03	839	Students do not need to learn what their culture is.
Item 13	3.58	1.30	838	If things continue on their present course, we will soon experience a major cultural loss.
Item 14	4.44	1.01	839	We do not need to care about cultural heritage.
Item 15	4.42	0.90	839	Culture is important to understand each other.
Item 16	4.26	1.07	838	We do not need to conserve more cultural heritage for future generations.
Item 17	3.97	1.08	837	The foods our grandmothers made are important to me.
Item 18	4.64	0.80	839	We have the right to destroy cultural heritage to suit our needs.

Table 3: Result from factor analysis with 16 items

	Items and factors	Factor loading	Initial Eigenvalue	Variance explained (%)	Reliability coefficient[a]
Factor 1: Linkages			5.02	15.71	0.81
Item 1	I am glad because cultural heritage is available to me.	0.57			
Item 3	The present cultural heritage should be available for my children's children.	0.55			
Item 5	Cultural heritage must be a part of our life.	0.67			
Item 7	The cultural values of our forefathers are important to me.	0.60			
Item 9	Future generations have the right to enjoy the present cultural heritage.	0.68			
Item 15	Culture is important to understand each other.	0.48			
Factor 2: Recognition of cultural values			1.93	13.38	0.75
Item 6	Culture does not help us to understand the world.	0.40			
Item 10	Culture does not help me to identify myself.	0.49			
Item 12	Students do not need to learn what their culture is.	0.64			
Item 14	We do not need to care about cultural heritage.	0.66			
Item 16	We do not need to conserve more cultural heritage for future generations.	0.56			
Item 18	We have the right to destroy cultural heritage to suit our needs.	0.46			
Factor 3: Preservation of traditions and customs			1.35	9.49	0.83
Item 11	I want to know the foods our grandmothers made.	0.71			
Item 17	The foods our grandmothers made are important to me.	0.87			
Factor 4: Cultural loss			1.07	8.75	0.80
Item 4	We are not losing our cultural heritage.	0.74			
Item 8	Cultural heritage is not disappearing.	0.86			
Total variance explained				47.33	

[a]: The number of observations for reliability analysis of Factors 1, 2, 3 and 4 were respectively 829, 830, 834, and 835.

Following the multi-item principle to increase reliability and reduce measurement errors, only extracted factor with more than one item were included. The scree test also provides a visual examination of the number of significant factors. Two of the original 18 items (Items 2 and 13) were excluded on the basis of these criteria, and four factors were extracted from the remaining 16 items using the scree test[12]. Each factor is usually assigned a name by the analyst that attempts to reflect a feature likely to be shared by the component items. The results of the analysis are presented in Table 3.

4.2. Population Segmentation

The four factors of the CW scale can be used for diverse methodological frameworks and purposes. As an example, a population segmentation analysis using the CW scale was carried out. Using SPSS 12.0.1 for Windows, hierarchical cluster analysis was adopted. Ward's method and the squared Euclidean distance method were used to determine the number of clusters and their memberships[13]. To reduce difficulties in the interpretation of characteristics between clusters, it was desirable to limit the number of clusters to between three and five. Clusters with a small number of members should be also avoided whenever possible because of potential outlier. The acceptable minimum cluster size was set at 10 per cent of the sample population. This resulted in four acceptable clusters. Further aggregations to reduce the number of clusters to three resulted in a big jump in the measured distance (or similarity) for a newly combined cluster. Thus four was deemed to be the optimal number of clusters.

The cluster profiles are shown in Table 4. The sample population of 834 valid responses as a whole shows a very strong inclination toward cultural linkages (F1), recognises diverse cultural values (F2), has a desire to preserve traditions and customs (using foods grandmothers made as a proxy; F3), and are unsure of whether we are losing cultural heritage (F4).

Table 4: Frequency and factor means for the five clusters based on Ward's method

Cluster name	Frequency	F1 Linkages	F2 Recognition	F3 Traditions	F4 Loss
1. Procultural	298 (36%)	4.67	4.54	4.34	4.36
2. Satisfied but culture friendly	353 (42%)	4.65	4.45	4.29	2.36
3. Indifferent but connected	94 (11%)	4.10	3.08	4.00	2.32
4. Culture averse	89 (11%)	3.99	3.64	2.09	2.90
Total	834 (100%)	4.53	4.24	4.04	3.13

Cluster 1: Procultural This segment represents 36 per cent of the sample, exhibiting a strong procultural worldview. The members rank highest in all factors. They strongly agree with the cultural linkage concept (F1), clearly recognise the diverse values of culture (F2), are keen to preserve traditions and customs (F3), and agree that loss of cultural heritage is occurring (F4).

Cluster 2: Satisfied but culture friendly Members of this cluster (the largest with 42 per cent of the sample), have relatively strong procultural characteristics in Factors 1, 2, and 3, but are weak in Factor 4. Other than for complacency or lack of concern about cultural loss (F4), they are similar to procultural people (Cluster 1). Above all, this group is 'culture friendly'.

Cluster 3: Indifferent but connected A relatively small cluster with 11 per cent of the sample

[12] The scree test showed an 'elbow shape' with four factors (Landau and Everitt 2003:291).
[13] Summated mean values were used. . This approach is advantageous when researchers want to compare results between different populations and to use centroids in cluster analysis (Hair *et al.* 2005)

population. They are the least concerned about cultural loss (F4) and are uncertain about the presence of diverse cultural values (2). However, people in this cluster exhibit a relatively weak but apparent belief in the cultural linkage concept (F1) and have a mild desire for the preservation of traditions and customs (F3). They appear to be indifferent to cultural loss and cultural values, but are aware of the linkages.

Cluster 4: Culture averse Another relatively small group with 11 per cent of the sample. Members of this cluster are ranked lowest in relation to cultural linkages (F1) and preservation of traditions and customs (F3). They show the weakest agreement with Factor 1 and clear disagreement with Factor 3. They moderately agree with statements on diverse cultural values (F2) and mildly agree with statements that cultural heritage is not being lost (F4).

4.3. Factors and Clusters

The four factors and clusters of the CW scale were further compared with other motivational questions and sociodemographic variables. Respondents to the questionnaire were asked to express how they felt about the following two questions:

B1. Having national institutions acknowledging our history and culture gives Australians a sense of pride.
Strongly Agree (1) Mildly Agree (2) Unsure (3) Mildly Disagree (4) Strongly Disagree (5)

B2. All Australians should contribute to the establishment and upkeep of the national cultural institutions.
Strongly Agree (1) Mildly Agree (2) Unsure (3) Mildly Disagree (4) Strongly Disagree (5)

Table 5: Correlations between the factors of the CW scale and other variables

	B1	B2	F1	F2	F3	F4	Gen	Age	Mem	Uni	Income
B1	1										
B2	***0.36	1									
F1	***-0.37	***-0.29	1								
F2	***-0.26	***-0.31	***0.52	1							
F3	***-0.22	***-0.16	***0.48	***0.35	1						
F4	-0.02	-0.03	0.05	***0.28	**0.09	1					
Gen	-0.05	***0.10	**0.08	**0.07	***0.14	0.00	1				
Age	***-0.11	**-0.08	***0.19	-0.05	0.05	-0.03	***-0.11	1			
Mem	0.06	*0.06	***-0.09	*0.07	0.03	-0.04	0.03	***-0.47	1		
Uni	0.01	-0.11	-0.01	***0.20	*-0.06	*0.06	-0.03	***-0.23	***0.09	1	
Income	0.05	-0.10	-0.03	***0.14	**-0.08	**0.07	*-0.07	***-0.43	***0.32	***0.30	1

*: Significant at the 0.1 level, **: Significant at the 0.05 level, and ***: Significant at the 0.01 level.

Both questions elicited overwhelming majority support. In response to B1, some 95 per cent agreed with the statement (‘Strongly Agree’: 69%; ‘Mildly Agree’: 26%) and 3 per cent were ‘Unsure’. Agreement with B2 was somewhat lower (77%) and less intense (‘Strongly Agree’: 44%; ‘Mildly agree’: 33%), 13 per cent were ‘Unsure’, 7 per cent ‘Mildly Disagree[d]’, and 4 per cent ‘Strongly Disagree[d]’.

Table 5 shows the correlations between these statements and the four factors of the CW scale. Considering lower numbers for B1 and B2 represent procultural positions, negative correlations between the factors and the statements are reasonable. B1 and B2 are significantly correlated with Factors 1 (Linkages), 2 (Recognition) and 3 (Traditions and customs), at the 0.01 level of significance. However, this is not the case for F4 (Cultural loss).

The relationship between the factors and socioeconomic characteristics of the sample were also considered (see Table 5). Gender (0=male and 1=female) is positively and significantly

correlated to F1, F2, and F3. Age (continuous) is positively and significantly correlated to F1 only. The household size[14] (Mem) has a negatively significant correlation with F1: the smaller the household size, the more cultural linkages recognise its members. Uni (0=no tertiary education and 1=tertiary education) is positively and significantly correlated to F2. Income levels (Inc) show a negatively significant correlation with F3 and positively significant correlations with F2 and F4: the wealthier the household, the less traditions, and the more cultural values and cultural loss recognise its members.

Furthermore, the four clusters were analysed using contingency tables[15]. They are significantly different in terms of gender ratio[16] (0.01 level), age (0.05 level), household size (0. level), education level (0.05 level), and household income (0.1 level).

4.4. The CW Scale and Choice Modelling

A measure of the usefulness of the CW scale is its capacity to assist researchers in estimating nonmarket values. To assess its likely capability in this regard, the CW scale was incorporated into choice modelling valuation questionnaires for OPH and the NMA. In the questionnaires, the CW scale statements preceded the choice sets presented to respondents. Data from the NMA survey, however, are not yet available for analysis. Table 6 provides the set of attributes and their levels used in the choice modelling for the OPH study. Attributes and their levels were identified in close consultation with OPH and three focus groups. Efficient design was used to prepare 20 choice sets of four alternatives including a 'no choice' option. Each questionnaire included five choice sets.

Table 6: Attributes and their levels for the case study (OPH)

Attributes	Issues	Levels	Variable
Replication	Preservation through replication	0%[c], 10%, 30%, 50%	REP
NPG	The National Portrait Gallery (NPG)	0, 1[c]	NPG
Temporary	Frequency of temporary exhibitions	every 8[c], 6, 4, 2 month	TEM
Interaction	Exhibition styles: normal display or interactive.	0[c], 1	INT
Traveling	Travelling exhibitions to include all exhibitions	0[c], 1	EXH
Events	Events include talks, special tours, and music performances	0, 1[c]	EVE
Facilities	Options: no facility; shop and café; shop, café, and fine dining restaurant; and shop and café, fine dining restaurant, and conference rooms	0, 1, 2, 3[c]	FAC
Funding	Average Australians contribute about $2 per household to OPH in 2005, as a form of the government tax revenue. Also, there is $2 entrance fee.	$1, $2[c], $4, $6, $8, $10	TAX

[c]: Current levels of the attributes.

Simple multinomial logit (MNL) models with (Models B and C) and without (Model A) the CW scale factors were estimated using NLOGIT 3.0 (See Table 7). As to Model A (basic model), the marginal values for the marginal changes in four attributes were estimated. Increasing the replicated portion (REP) by 10 per cent has a value of $8.85 per household. Likewise, the marginal values for decreasing the frequency of temporary exhibitions (TEM) by one month, increasing the level of facilities (FAC), and having an interactive, audio-visual display were $2.83, $6.98, and $5.64 per household, respectively. When the TAX variable was interacted with

[14] The majority households (68 %) have less than 2 family members.
[15] Socio-demographic variables were coded to be categorical.
[16] Procultural or culture friendly clusters are female dominant, whereas culture averse cluster is male dominant.

the CW scale factors (Model B), the overall performance of the model was improved in terms of the significance for the monetary attribute (TAX) and log likelihood values. The WTP estimates are much lower (about one tenth) than those of Model A. The differences are mainly caused by the different parameter estimates for TAX. Then, the CW scale factors were allowed to interact with other variables (Model C). Most parameter estimates are much different from those of Models A and B, except for TEM[17]. In particular, the signs for the coefficients of REP and INT in Model C were found to be opposite (negative) to those (positive) in Models A and B. Some of these effects are somewhat concerning and further analysis of likely causes is being undertaken.

Table 7: Results from various MNL models

	Model A		Model B		Model C	
Variable	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
REP	***0.3952	0.1612	***0.4413	0.1626	***-3.0599	0.8208
TEM	***0.1265	0.0199	***0.1238	0.0200	***0.1245	0.0200
INT	***0.3117	0.0629	***0.3001	0.0633	**-0.7572	0.3135
FAC	***0.2521	0.0381	***0.2585	0.0383	-0.0341	0.1049
TAX	*-0.0447	0.0240	***-0.4573	0.0785	***-0.1844	0.0671
TAX*GEN[a]	*0.0274	0.0160	0.0155	0.0164		
TAX*WEAL[a]	*0.0038	0.0023	0.0033	0.0024	***0.0031	0.0023
TAX*F1[a]			0.0207	0.0193		
TAX*F2[a]			***0.0896	0.0148	***0.0893	0.0233
TAX*F3[a]			0.0009	0.0098		
TAX*F4[a]			**-0.0168	0.0071	*-0.0268	0.0139
REP*F2[b]					***0.8222	0.1863
INT*F2[b]					***0.2450	0.0712
FAC*F2[b]					***0.0893	0.0233
FAC*F4[b]					*-0.0268	0.0139
Constant1[c]	-0.0509	0.1144	-0.0618	0.1149	-0.0480	0.1149
Constant2[c]	-0.1282	0.1279	-0.1415	0.1285	-0.1317	0.1284
Constant3[c]	-0.1436	0.2596	-0.1732	0.2611	-0.1694	0.2609
Log likelihood		-4401.01		-4356.19		-4364.88
Log likelihood (constants)		-4749.56	(Model A)	-4401.01	(Model A)	-4401.01
Likelihood Ratio Test		697.11		89.63		72.26
		X^2 (0.05, 7)=14.07		X^2 (0.05, 4)=9.49		X^2 (0.05, 5)=11.07
WTP for REP		$8.85/10% change		$0.96/10% change		$-16.59/10% change
WTP for TEM		$2.83/month		$0.27/month		$0.68/month
WTP for INT		$6.98/change		$0.66/change		$-4.11/change
WTP for FAC		$5.64/level		$0.57/level		$-0.19/level

[a]: Interaction terms between TAX and other variables: gender (0 male and 1 female), household wealth, and Factors 1, 2, 3, and 4.
[b]: Interaction terms between attributes (REP, INT, and FAC) and Factors 2 and 4.
[c]: Constant terms for the estimated models.
*: Significant at the 0.1 level, **: Significance at 0.05 level, and ***: Significant at the 0.01 level.

Using model Model B, economic values were then estimated for each of the five clusters. As shown in Table 8, the WTP estimates are dispersed and are all lower than those of Model A and Model C (in absolute values), but higher then those of Model B (except in Cluster 4). The

[17] No significant interaction effect was found between TEM and the four factors of the CW scale (based on Model A).

parameter estimates in Model C and Cluster 4 were found to have consistent signs.

Table 8: WTP estimates from Model B applied to the four clusters

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Model A	Model B	Model C
WTP for REP ($/10% change)	1.76	1.95	n.a.[a]	-1.26	8.85	0.96	-16.59
WTP for TEM ($/month)	0.43	0.29	n.a.[a]	0.28	2.83	0.27	0.68
WTP for INT ($/change)	1.22	0.97	n.a.[a]	-0.02	6.98	0.66	-4.11
WTP for FAC ($/level)	0.79	0.72	n.a.[a]	0.35	5.64	0.57	n.a.[a]

[a]: Estimates were found not significant at the 0.1 level of significance.

While these estimates suggest that the CW scale can be useful in incorporating the influence of attitudinal variables on the estimates of cultural value, it is important to reiterate the preliminary nature of the analysis presented here. The results are nonetheless encouraging. Forthcoming analysis of the responses to the NMA survey should enable us to reach more considered conclusions.

5. Conclusion and Discussion

The multidimensionality of culture identified by authors such as Throsby and Mazzanti suggests a need for the development of an instrument with the capacity to capture psychological characteristics for use in nonmarket valuation studies. The preliminary CW scale discussed in this paper has some of the characteristics of such an instrument. Results of its testing with data collected in a nonmarket valuation study are encouraging. Further preliminary testing in a second nonmarket survey is underway and will assist the making of a more conclusive assessment of the potential of such a scale. The anticipated more detailed analysis will help in this regard, but even that is unlikely to be sufficient for definite conclusion. Definitive conclusions, however, would require additional testing of the CW scale in different populations and locations to assess the consistency of the latent constructs (four factors). More work is also likely to be required in identifying influential factors for the scale. For example, testing of the third factor in the CW scale presented here (Preservation of Traditions and Customs) was based only on the concept of culinary traditions (that is, grandmothers' foods). The results, therefore, are at best indicative of the likely influence that predisposition to the preservation of traditions and customs generally may have on the determination of cultural value. We are of the view, therefore, that the likely influence of traditions and customs on the determination of cultural value should be explored further with the testing of appropriate additional scale items.

The preliminary results illustrate the possibility of segmenting survey respondents in a series of clusters based on the factors of the CW scale. Clustering on the basis of the CW scale factors enables differentiation of individuals in terms of psychological variables likely to influence their cultural values. As the psychological variables transcend demographic variables, the use of the CW scale provides an extra dimension of analysis in the determination of cultural values with nonmarket valuation instruments.

The development of the CW scale may have some practical potential outcomes for researchers and policy analysts. The additional information created from applications of the scale may assist policy makers in framing demand-oriented, need-based policies. Use of the scale in nonmarket valuation studies could help researchers to better explain the derivation of cultural value estimates. Both as the criteria for population segmentation and as explanatory variables, the factors making up the CW scale may provide additional insights into the motivation of stated preferences.

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