The influence of contextual aspects on New Zealand Muslim males' environmentally ethical behaviour (EEB): a preliminary analysis of survey data

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ABSTRAK

Kajian-kajian lepas menggunakan aspek kontekstual bersama-sama dengan aspek sikap dalam mengukur pengaruh ke atas tingkah laku beretika alam sekitar (EEB). Hasil kajian mereka menunjukkan bahawa aspek sikap adalah pengaruh yang dominan ke atas EEB. Aspek kontekstual pula dilihat hanya sebagai pengaruh tidak langsung ke atas EEB. Penggunaan kedua-dua jenis aspek ini secara bersama dalam satu kajian menjadikan tahap kebolehpercayaan, kesahan dan signifikan setiap satu aspek kontekstual ke atas EEB sukar dijelaskan sedangkan kejelasan tentang kebolehpercayaan dan kesahan setiap satu aspek kontekstual ini adalah lebih berguna untuk pembentukan polisi EEB berbanding dengan aspek sikap. Keadaan ini juga menyebabkan tahap signifikan aspek demografi ke atas EEB dan ke atas setiap satu aspek kontekstual tidak jelas. Kertas ini mencadangkan supaya aspek kontekstual diukur secara berasingan daripada aspek sikap. Ini bagi membolehkan tahap kebolehpercayaan, kesahan dan signifikan setiap satu aspek kontekstual ke atas EEB dapat dijelaskan. Ini juga akan membolehkan tahap signifikan aspek demografi ke atas EEB dan ke atas setiap satu aspek kontekual dilihat dengan lebih jelas. Bagi menguji cadangan ini, satu analisis awal ke atas data-data soal selidik tentang pengaruh aspek sosial, agama, ekonomi, politik dan demografi terhadap tingkah laku beretika alam sekitar populasi lelaki Muslim New Zealand dilakukan. Analisis awal ini melibatkan ujian kebolehpercayaan skala dan ujian kesahan skala. Di samping itu, ujian generalisasi sampel dan ujian saiz sampel dilakukan bagi melihat tahap signifikan. Analisis awal ini menunjukkan bahawa tahap kebolehpercayaan dan kesahan setiap satu aspek kontekstual ke atas EEB adalah tinggi dan aspek ekonomi merupakan aspek yang paling signifikan dalam hubungannya dengan EEB. Analisis ini juga menunjukkan pelbagai tahap signifikan aspek demografi ke atas EEB dan ke atas setiap satu aspek kontekstual. Jelasnya, tahap kebolehpercayaan, kesahan dan signifikan setiap satu aspek kontekstual ke atas EEB dapat dilihat dengan lebih jelas apabila aspek kontekstual diukur secara berasingan daripada aspek sikap.

INTRODUCTION

Although this paper acknowledged that environmentally ethical behavior (EEB) is largely based on attitudinal variables, found by many previous studies (e.g. Ajzen 1985, Huebner & Lipsey 1981, Oom Do Valle et al. 2005, Schwepker & Cornwell 1991, Shrum et al. 1994, Wall 1995), it is important for the findings of such studies to effectively facilitate EEB policy making processes and the implementation of such policies. Attitudinal variables such as internal locus of control, alienation and personal norms, although found by many studies to be statistically significantly related to EEB, are not only harder to incorporate into EEB policies, but also difficult to implement/enforce compared to contextual aspects such as price, taxes, and subsidies.

It is found that none of the previous empirical studies tested the influence of contextual aspects on EEB independently from attitudinal aspects. The influence of attitudinal aspects, more often than not, overshadowed the influence of contextual aspects on EEB. This has caused contextual aspects to be seen as only producing indirect influence on EEB, and more importantly the reliability, validity and significant level of each of the contextual aspects on EEB was not clearly defined. In addition, the significant level of the demographic aspect on EEB and on each of the contextual aspects was also not clear.

This paper suggests that should the contextual aspects were used separately from attitudinal aspects the reliability, validity and significant level of each of the contextual aspects on EEB would be better defined, and the significant level of the demographic aspect on EEB and on each of the contextual aspects would also be better explained. To test this suggestion a preliminary analysis on survey data of the influence of social, religious, economic, political and demographic aspects on the EEB of New Zealand Muslim males was conducted. The preliminary analysis of the survey data covers test of reliability of scale and test of validity of scale. In addition, test of representativeness of the sample, and test of sample size were also conducted to obtain results on levels of significance.

TESTS OF RELIABILITY

SCALES USED

Five summated scales, each of 21 items, were included. The first measured frequency of EEB and the other four measured the influence, on that frequency, of social aspect, religious aspect, economic aspect, and political aspect.

SCORE POINT

For each item of each EEB scale respondents were asked to indicate frequency of EEB by marking their score on a five-point scale ranging from '(4) Always' to '(0) Never.' The remaining measures (contextual aspects: social, religious, economic, and political) consisted of statements scored on a five-point scale ranging from '(4) Very strong influence' to '(0) No influence.' Each item was scored in the same direction, with a high score indicating either a high frequency of EEB or a high influence of the contextual aspects. Each scale had a minimum range of score of 0 (least frequent or least influential) to a maximum range of score of 84 (most frequent or most influential). Since all the variables had the same score range, each of the scale items contributed equally to the final scale. Thus a summated scores scale was created by adding together the already weighted scores for each item in the scale.

RESULTS

Check of unidimensionality indicates some items with an item-total correlation below 0.3 but the items were not deleted because Cronbach's Alpha showed no significant increase even if the items were deleted. Thus, it can be said that item-total correlations indicate unidimensionality of each scale, meaning that (1) each item/variable in scale was scored in the same direction, (2) the scoring did not bias the overall scale, and (3) the items in each scale belonged together. Cronbach's alpha (an index of the internal consistency among items in a scale) for each scale indicates that for each scale the alpha coefficient was well above 0.7 (see Table 1), ranging from 0.808 to 0.954. Means and standard deviations were also computed for all of the scales, and reported in Table 1. Thus, the results show that the scales (i.e. EEB, social, religious, economic, and political) used are reliable constructs.

TABLE 1: Means, standard D=deviations, & internal consistency
R=reliabilities for subscales

Scale	Items	Means	Standard deviations	Coefficient alpha
EEB frequency	21	2.102	0.489	0.808
Contextual aspects:				
Social	21	1.726	0.865	0.925
Religious	21	1.034	0.895	0.954
Economic	21	2.011	0.850	0.922
Political	21	1.400	0.867	0.940

TESTS OF VALIDITY

PURPOSE

Given that one environmentally ethical scale and four contextual aspect scales were developed for this research, exploratory factor analysis that incorporated principal components extraction was conducted to determine if the scales represented the proposed underlying EEB and contextual aspects' constructs.

RESULTS - PRESENTED IN TABLE 2

An unrotated component matrix resulted in 2 factors. The two factors composed of 8 (i.e. factor 1) and 2 (i.e. factor 2) items each, emerged in which all items loaded above 0.30 cut-off value (established as the minimum acceptable loading (De Vaus, 2002), and each item loaded with its proposed constructs. Moreover, no item loading on any one factor loaded heavily on any other factor. Items EEBSectA (Pre-cycling) and EEBSectB (Re-use & Recycling) loaded on both factors but were heavier on one of the factors (i.e. factor 2). The 2 factors jointly accounted for 68.243% of the variance (see Table 2). Table 2 displays the two major kinds of regularity in the interrelationships between the factors/patterns: Contextual Aspects and EEB. They involve respectively, 55.101% and 13.142% of the variance in the 21,420 pieces of information given by 204 respondents on 105 Contextual Aspects and EEB variables asked in the questionnaire. This indicates that 68.243% of this information has an underlying regularity. The

number of factors reveals two independent patterns of relationship in the data. This could reflect either two different kinds of influence on the data, or two empirically different concepts for describing EEB and contextual aspects (Rummel 1967). From Table 2, contextual items loaded more highly on Factor 1 than they did on Factor 2 for the unrotated solution, while EEBSectA and EEBSectB loaded made up almost all of Factor 2, although they also loaded quite heavily on Factor 1. All the Contextual Aspects loaded on Factor 1 except that RelinfSectA loaded negatively on Factor 2 also, although primarily on Factor 1.

TABLE 2: Factor results for environmental ethical behaviour (EEB) measures and contextual measures

Variable (Group)	Factor 1 (Contextual Aspects)	Factor 2 (EEB)
	Unrotated	Unrotated
EEB:		
EEBSectA (Pre-cycling)	0.473	0.642
EEBSectB (Re-use & Recycling)	0.499	0.632
Contextual aspects:		
Social:		
SocinfSectA	0.792	**
SocinfSectB	0.828	**
Religious:		
RelinfSectA	0.712	-0.422
RelinfSectB	0.794	**
Economic:		
EconinfSectA	0.732	**
EconinfSectB	0.795	**
Political:		
PolinfSectA	0.829	**
PolinfSectB	0.857	**

Factor	Eigenvalue	% of Variance	Cumulative %
Contextual Aspects	5.510	55.101	55.101
EEB	1.314	13.142	68.244
Determinant of Correlation Matrix:			00.001
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy:			00.804

*Exploratory Principal Components Analysis with Unrotated Component Matrix.
 **Absolute value less than 0.30 (suppressed).

UNIDIMENSIONALITY

To assess the unidimensionality of each construct (EEB, and Contextual Aspects), separate factor analyses were conducted for the items in each scale (EEB, Social Aspect, Religious Aspect, Economic Aspect, and Political Aspect). The first 2 factors in the scales (except for social scale in which only the first factor had eigenvalue over 1.5) had eigenvalue above 1.5. But the eigenvalue of the second factor in the scales were all just slightly above 1.5. Therefore, the researcher decided to present just the first factor. The odd variables, whose variance the main factor account for the least, were not eliminated because none of them had a negative value.

REPRESENTATIVENESS OF THE SAMPLE

CHECKS OF REPRESENTATIVENESS

Two checks were made on the representativeness of the survey sample (1) respondent demographics were compared with those of male Muslims in New Zealand aged 20 and above, and (2) the scores of those who responded early to the questionnaire were compared with those who responded later.

CHARACTERISTICS OF THE SAMPLE AGAINST MUSLIM MALE POPULATION

Overall, the sample tended to be older; better educated; more blue collar workers; had a higher income; more house owners; and a terrace house, apartment and flat dwellers than the actual Muslim male population, but in other respects it was closely representative of the actual population. Although many of the demographic characteristics of the sample differed from those of the actual

population, this was not of concern because demographic characteristics had been shown by the majority of previous studies not to be significant determinants of responses to the environmental behavioural questions. In addition, the difference for most of the household characteristics between the sample and the actual Muslim male population were quite small. Moreover, for most of the household characteristics, the sample was quite diverse and fairly representative of the Muslim male population.

COMPARISON OF EARLY & LATE RESPONDERS

In order to judge the representativeness of the survey sample, a comparison would have been made between those who responded and those who did not. This was of course not possible. However, to gain an indication of the direction of any such difference, a comparison was drawn between those who responded immediately, and those who responded only after two or three requests and reminders. The two groups were compared to determine if they differed in their self-reported frequency of EEB, contextual influence, and socio-demographic characteristics. Differences in responses for the two groups to continuous variables were assessed using t-tests, and for frequency variables using chi-square. These showed that they did not differ significantly at the 5% level to questionnaires that measured self-reported frequency of EEB, contextual influence, or demographic characteristics (i.e. interval variables: age, income and work involvement with the environment). Based on the lack of difference between early and late respondents and small differences between sample data and census data proportions (particularly in the household characteristics), it was concluded that lateness of response did not affect the results of the study, and that the survey respondents were therefore probably similar to the non-respondents. In addition, the low response rate derived essentially from the questionnaire being too long, and a lack of time to complete it, rather than from any negative attitude toward the research itself. Thus, it is argued that the sample population and its responses were reasonably representative of the Muslim male population of New Zealand as a whole, as far as EEB - or lack of it - was concerned.

SAMPLE SIZE

SAMPLING ERROR CALCULATIONS

The survey sample size drawn for this study was 204 cases. Margins of error therefore ranged from 2.43 to 3.50 on key variables. There was therefore a 95 percent chance that between 57.5% and 70.9% of the New Zealand Muslim male

population would say that social aspects had little influence on their EEB and 80.3% to 90.3% would say that religion was not a big influence on such behaviour. The political aspect was not very influential on their EEB according to 67.3% to 79.7% of the population, while only 41.5% to 55.5% of the population would say that economic aspects had little influence on that behaviour. Thus, EEB was considered by the respondents to be most influenced by economic aspects and least by religious aspects.

SIGNIFICANT DIFFERENCE:
DEMOGRAPHIC CHARACTERISTICS ON EEB

Mean differences in effect on EEB of continuous demographic variables with three or more categories (occupation, income, and work involvement with the environment) were compared using analysis of variance (ANOVA). No significant differences were found between the three occupation groups and the four income groups. However the degree to which a respondent's work involved the environment did have a significant effect ($F_{2,201} = 5.34$, $p < .01$) on their EEB scores. Post hoc tests showed that the group whose work had some involvement with the environment (SI) did not differ significantly from those who had none (NI) (NI = 42.05, SI= 43.68, NS), but those whose work was highly involved with the environment (HI) reported significantly more EEB than did either of the other two groups (NI = 42.05, HI = 47.85, t1 = -3.27, p < .01; SI = 43.68, HI = 47.85, t1 = -2.36, p < .05).

SIGNIFICANT DIFFERENCE: DEMOGRAPHIC CHARACTERISTICS
ON CONTEXTUAL ASPECTS

The mean results for Contextual Aspects mean score between groups in all the variables tested indicate that there were differences between the groups in each variable. Mean differences in effect on social, religious, economic and political aspects of continuous demographic variables with three or more categories (occupation, income, and work involvement with the environment) were compared using analysis of variance (ANOVA).

SIGNIFICANT DIFFERENCE: DEMOGRAPHIC CHARACTERISTICS
ON SOCIAL ASPECTS

On the scores of social aspects significant differences were found between the three occupation groups ($F_{2,201} = 5.74$, $p < .01$), the four income groups ($F_{3,200} = 4.87$, $p < .01$), and the three groups of work involvement with the environment ($F_{2,201} = 8.03$, $p < .001$). The post hoc tests on occupation groups showed that the unemployed group (UG) and white collar group (WG) did not differ

significantly (UG = 31.33, WG = 32.31, NS), but blue collar group (BG) reported significantly more social aspects influence than did either of the other two groups (UG = 31.33, BG = 40.28, t1 = -2.93, p < .01; WG = 32.31, BG = 40.28, t1 = -2.67, p < .01). Post hoc tests on income groups showed that the no income group (NIG) and the high income group (HIG) did not differ significantly (NIG = 31.33, HIG = 28.88, NS). The no income group (NIG) also did not differ significantly with low income group (LIG) (NIG = 31.33, IG = 38.90, NS). But LIG reported significantly more social influence than did HIG (LIG = 38.90, HIG = 28.88, t1 = 2.62, p < .05). While middle income group (MIG) did not differ significantly from LIG (MIG = 40.79, LIG = 38.90, NS), it reported significantly more social influence than did NIG and HIG (MIG = 40.79, NIG = 31.33, t1 = 2.74, p < .01; MIG = 40.79, HIG = 28.88, t1 = 3.15, p < .01). Post hoc tests on groups of work involvement with the environment showed that the group whose work had no or little involvement with the environment (NI) did not differ significantly from those who had some direct involvement with the environment (SI) (NI = 30.77, SI = 36.92, NS). While the group whose work was highly involved with the environment (HI) did not differ significantly from those who had some direct involvement with the environment (SI) (HI = 43.26, SI = 36.92, NS) it reported significantly more social influence than did NI (HI = 43.26, NI = 30.77, t1 = 4.37, p < .001).

SIGNIFICANT DIFFERENCE: DEMOGRAPHIC CHARACTERISTICS ON RELIGIOUS ASPECTS

On the scores of religious aspects significant differences were found between the three occupation groups ($F_{2,201}$ = 4.03, p < .05). However, the post hoc tests did not show any significant difference between the occupation groups (BG = 25.22, WG = 17.50, NS). Significant differences were also found between the four income groups ($F_{3,200}$ = 3.55, p < .05), and the three groups of work involvement with the environment ($F_{2,201}$ = 7.00, p < .01). The post hoc tests on the income groups showed that HIG did not differ significantly from NIG and LIG (HIG = 14.30, NIG = 18.42, LIG = 23.57, NS). While MIG did not differ significantly from NIG and LIG (MIG = 26.00, NIG = 18.42, LIG = 23.57, NS) it reported significantly more religious influence than did HIG (MIG = 26.00, HIG = 14.30, t1 = 2.95, p < .01). The post hoc tests on groups of work involvement with the environment showed that NI differ significantly from SI and HI (NI = 15.91, SI = 23.54, t2 = -2.71, p < .01; NI = 15.91, HI = 27.58, t2 = -3.53, p < .01). However, HI did not differ significantly from SI (HI = 27.58, SI = 23.54, NS).

SIGNIFICANT DIFFERENCE: DEMOGRAPHIC CHARACTERISTICS ON ECONOMIC ASPECTS

On the scores of economic aspects significant differences were found between the three occupation groups ($F_{2,201} = 7.63$, $p < .01$), the four income groups ($F_{3,200} = 7.65$, $p < .001$), and the three groups of work involvement with the environment ($F_{2,201} = 4.05$, $p < .05$). The post hoc tests on the occupation groups showed that UG did not differ significantly from BG and WG   (UG = 41.23, BG = 46.32, WG = 35.16, NS). However, BG reported significantly more economic influence than did WG (BG = 46.32, WG = 35.16, $t_1 = 4.04$, $p < .001$). The post hoc tests on the income groups showed that NIG did not significantly differ from LIG and MIG (NIG = 41.23, LIG = 47.58, NS; NIG = 41.23, MIG = 43.48, NS), but HIG reported significantly less economic influence than did each of the other three groups (HIG = 30.42, NIG = 41.23, $t_2 = -2.79$, $p < .01$; HIG = 30.42, LIG = 47.58, $t_1 = -4.94$, $p < .001$; HIG = 30.42, MIG = 43.48, $t_1 = -3.90$, $p < .001$). The post hoc tests on the groups of work involvement with the environment showed that NI did not differ significantly from SI (NI = 41.12, SI = 39.28, NS). However, HI reported significantly more economic influence than did either of the other two groups (HI = 48.00, NI = 41.12, $t_1 = 2.32$, $p < .05$; HI = 48.00, SI = 39.28, $t_1 = 2.85$, $p < .01$).

SIGNIFICANT DIFFERENCE: DEMOGRAPHIC CHARACTERISTICS ON POLITICAL ASPECTS

On the scores of political aspects significant differences were found between the three occupation groups ($F_{2,201} = 6.71$, $p < .01$), the four income groups ($F_{3,200} = 6.41$, $p < .001$), and the three groups of work involvement with the environment ($F_{2,201} = 7.75$, $p < .01$). The post hoc tests on the occupation groups showed that UG did not differ significantly from WG (UG = 24.09, WG = 25.16, NS). However, BG reported significantly more political influence than did either of the other two groups (BG = 33.75, UG = 24.09, $t_1 = 3.06$, $p < .01$; BG = 33.75, WG = 25.16, $t_1 = 2.85$, $p < .01$). The post hoc tests on the income groups showed that NIG did not differ significantly from HIG (NIG = 24.09, HIG = 20.58, NS). LIG also did not significantly differ from MIG (LIG = 33.57, MIG = 33.34, NS). However, LIG reported significantly more political influence than did NIG and HIG (LIG = 33.57, NIG = 24.09, $t_2 = 2.75$, $p < .01$; LIG = 33.57, HIG = 20.58, $t_2 = 3.66$, $p < .001$). MIG also reported significantly more political influence than NIG and HIG (MIG = 33.34, NIG = 24.09, $t_1 = 2.79$, $p < .01$; MIG = 33.34, HIG = 20.58, $t_1 = 3.62$, $p < .001$). The post hoc tests on the groups of work involvement with the environment showed that NI did not differ significantly from SI (NI = 24.39, SI = 29.34, NS). However, HI reported significantly more political influence than

either of the other two groups (HI = 36.77, NI = 24.39, t1 = 4.29, p < .001; HI = 36.77, SI = 29.34, t1 = 2.19, p < .05). Thus, it can be concluded that the differences between the mean scores of the groups in each Contextual Aspects variable tested almost certainly reflected a real population difference rather than being due to sampling error.

SIGNIFICANT DIFFERENCE BETWEEN PAIRS OF SUB-GROUPS

To test the significance of differences between pairs of sub-groups of the sample independent t-tests were also conducted. The results showed that the differences between mean scores of EEB and contextual aspects by age, marital status and highest education level were very likely due to sampling error. The differences between mean scores of contextual aspects by households with children or without, number of household members, house ownership status and type of house/dwelling were also very likely due to sampling error. However, the differences between mean scores of EEB by households differing on each of these characteristics were very likely to hold in the actual population. Significant difference between EEB scores was found between households with children aged below 15 (WC) and households with no children aged below 15 (NC) (WC = 45.97, NC = 42.59, t1 = 2.37, p < .05). Significant difference between EEB scores was also found between households with 1-3 (1-3) members and households with 4 and above members (4+) (1-3 = 42.54, 4+ = 45.67, t1 = -2.20, p < .05). Significant difference between EEB scores was also found between those who owned outright the house they lived in (Own) and those who rented the house they lived in (Rent) (Own = 46.36, Rent = 42.84, t1 = 2.39, p < .05). Significant difference between EEB scores was also found between bungalow or semi-detached house dwellers (BSD) and terrace house, apartment block or flat dwellers (TAF) (BSD = 46.10, TAF = 42.00, t1 = 2.91, p < .01).

SUBGROUP

Frequency analysis was also conducted on demographic and household characteristics and demonstrated that there were a sufficient number for meaningful subgroup analysis; with 32 to 144 cases in each subgroup. Although some of the numbers in the subgroups of demographic and household characteristics were imbalanced, this degree of imbalance was not a concern because a majority of previous studies have found demographic and household characteristics to have largely insignificant effects on responses to the environmental behavioural questions.

CONCLUSION

Thus, it is concluded that the five scales (i.e. EEB, social, religious, economic, and political) used in the study are reliable; the scales are valid/represented the proposed underlying EEB and contextual aspects' constructs; and the economic aspect was statistically significantly related to EEB the most. In addition, the significant levels of demographic aspects on EEB and on each of the contextual aspects were clearly explained. Clearly, the levels of reliability, validity and significance of each of the contextual aspects on EEB were better defined when the contextual aspects are measured separately from attitudinal aspects. Similarly, the significant levels of demographic aspects on EEB and on each of the contextual aspects were able to be explained clearer without the inclusion of attitudinal aspects. Furthermore, the sample population and its responses were reasonably representative of the Muslim male population of New Zealand as a whole, as far as EEB - or lack of it - was concerned; and the sample size though small but reasonably accurate for a meaningful multiple linear regression analysis. Finally, the information gathered from the preliminary analysis of survey data, besides providing overall picture of the data gathered, is also giving a foresight on what analysis should be carried out further and what should not.

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