

Journal of New Business Ideas & Trends

2014, 12(2), pp. 22-36.

"<http://www.jnbit.org>"

Consumers' attitudes, green practices, demographic and social influences, and government policies: An empirical investigation of their relationships

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Abstract

Purpose - *The purpose of this paper is to identify consumers' attitudes towards green purchases, their perceptions of social/community influences, government policies in promoting green practices, and green behaviours.*

Design/methodology/approach – *The approach employed in this article was a survey and involved examination by factor analysis and determination of correlations.*

Findings – *The study found that most respondents believe in green purchasing. The results also suggest that there is a positive significant association between consumers' attitudes towards green purchases and various types of green practices. Social influences also have positive significant associations with consumers' environmental habits, their willingness to contribute money and volunteer for the protection and improvement of environment.*

Keywords: *Consumer environmental attitudes; environmental practices; environmental policies*

JEL Classifications: D70

PsycINFO Classifications: 3920

FoR Codes: 1505

ERA Journal ID #: 40840

Introduction

Increased media coverage and pro-activity relating to issues concerning global warming, climate change and sustainability in recent times demonstrate growing recognition of the importance of green practices not only in developed economies but also in emerging economies like India and China. In developed economies, the latest trend in socially responsible investment is to identify green businesses or to look for companies which have strong environmental and management records as they are believed to be more profitable in the long term (Fung et al. 2010). Green businesses not only focus on the economic/profit aspect but also they take into account people, planet and profit or social, environmental and financial aspects in selecting and managing investment portfolios. This is linked with the concept of green development, a term used to describe economic viability in the long term by striking a 'balance between the economic, environmental and social effects of human activity over time' (Goldsmith and Samson 2006).

This economic, environmental and social balance is consistent with the World Commission on Environment and Development Report (1987) which asserts that 'humanity has the ability to make development green - to ensure that it meets the needs of present without compromising the ability of future generations to meet their own needs'. The Commission's report took a global perspective in their assessment of green development issues. The issue of green development has also drawn significant interest of scholars and researchers in Australia; as evidenced by Goldsmith and Samson's (2006) study which presents a framework to investigate the relationship between green development practices (including industry influence, sustainability orientation and business strategy) and long term business success.

The literature also suggests that consumers have a growing tendency towards greener products (Vermillion and Peart 2010). Several theoretical frameworks have been used and developed to explain the link between green practices and other associated factors (Cheng et al. 2014; Stern 2000, Chan 2001, Mainieri et al. 1997), including sociological models; altruism, empathy and pro-social behaviour models; economic models; psychological models; and social marketing models. Likewise, some of the factors considered in explaining the link with individuals' green practices and behaviours include demographic factors; external factors including social, economic, and cultural elements; and internal factors including awareness, values, attitudes, and emotion elements. However, it is difficult to incorporate all factors in the one model as it may not be feasible or useful due to the complexity involved in the process (Kollmuss and Agyeman 2002). Accordingly, the main aims of this study are to identify consumers' attitudes towards green purchases, their perceptions of social influences, their green behaviours, government policies in promoting green practices, and the relationships (if any) between these dimensions.

Literature Review

The literature review focuses on the dimensions of consumers' green purchase attitudes, and social/community and demographic influence, government policies and green practices. Each of them is discussed separately in the following sections.

Consumers' attitudes towards green purchases

Ajzen's Theory of Planned Behaviour 'TPB' is a popular framework which theorises the link between beliefs, attitudes, intentions and behaviour (Ajzen 1991). The theory proposes that individuals consider various alternatives and make an assessment of their pros and cons based on their beliefs (relating to actions and their possible effects) which

determine their attitudes towards an action (Lane and Potter 2007). In other words, attitude is driven by an individual's belief about a particular behaviour which could be favourable or unfavourable (Ajzen and Fishbein 1980). The core beliefs of the TPB include behavioural beliefs related to the consequences of certain actions, normative beliefs in the form of 'perceived expectations of others' and control beliefs regarding 'the actions/effects that an individual believes can be influenced' (Lane and Potter 2007: 1086). Individual attitudinal change can result from coercive or rewarding actions of others (whether at the personal level or organisational level), but in some cases may result from a combination of factors. For example, it has been reported that environmental attitudes and ownership status have a strong influence on one's environmental behaviour such as adoption of water-efficient equipment (Millock and Nauges 2010); and resident owners with very positive environmental and water conservation attitudes consume less water than those with moderately positive attitudinal concern (Willis et al. 2011). Individual environmental behaviour (such as energy conservation or recycling or water conservation), however, can sometimes be effected without an explicit change in attitudes through new legislation or procedures such as changes in pricing, taxation or other economic incentives (Owens and Driffil 2008).

Several studies have focused on consumer attitude and uptake of green practices including European countries, USA, and China (Cheng et al., 2014; Caird, Roy and Herring, 2008; Faiers and Neame, 2006; Gao and Liu 2014; Hansla, Gamble, Juliusson and Gärling, 2008; Jager, 2006; Lane and Potter, 2007; Mills and Schleich, 2009; Niemeyer, 2010). Tanner and Kast (2003) found that individual consumers' positive attitudes towards protecting and improving the environment and their perceptions of fair trade along with local production and availability of action-related knowledge have a positive association with consumers' green purchase practices. Consumers' positive attitudes towards green electricity has also been found to be one of the factors to influence their green electricity adoption intention (Ozaki 2011). However, Chan's (2001) study suggests that consumers' cultural backgrounds and beliefs, and their ecological knowledge and ecological effect have a significant role in influencing general environmental attitudes. Moreover, Burton and Paragahawewa (2011) conclude that environmental schemes to influence one's environmental attitudes are not going to work unless they are embedded in their respective culture for which 'policy makers need to devise approaches that allow the creation of cultural and social capital' within communities rather than trying to compensate for the loss of economic capital (p.95).

Social/Community and Demographic Influence

The role of social and community influence is important in the uptake of green practices, as the intention to undertake an action is strongly affected by social norms (Bamberg, 2003). Embracing green practices regarded as norms within a group helps people feel a part of that group and gives them a sense of group membership. Thus, social environments and norms have a strong influence on the development of people's values, and the intention to adopt pro-environmental practices (Ozaki, 2011). Moreover, consumers who already exhibit commonly performed pro-environmental behaviours are proactive in their search for further ways to minimize their environmental footprint (Cornelissen, Pandelaere, Warlop and Dewitte, 2008).

Consumers are favourably influenced by the opinions and actions of their family, friends and associates (Jager, 2006; Pickett-Baker and Ozaki, 2008; Sidiras and Koukios, 2004), cultural values (Chan, 2001), and media attention to climate change (Ozaki, 2011). Emotional, societal and cultural influences affect consumers' behaviour towards the use of domestic energy (Faiers, Cook and Neame, 2007). For many people, presenting a positive image of oneself is very important and this encourages people to conform to the norms of the group to which they want to belong. Social and personal identity and values can be represented by a person's level of consumption; for example, consumers have acknowledged

that adopting green electricity is attuned with their pro-environmentalist identity (Ozaki, 2011). It is important to note that the uptake of any new practice by an individual must remain within the limits of acceptability of the social environment of the group whose opinions are valued the most by the individual (Bartiaux, 2008), as a pro-environmentalist identity can be perceived negatively (Hurth, 2010) and therefore has the potential to place the individual outside the group.

Studies on environmentalism with a focus on socio-demographic factors such as gender, age, race, place of residence, education, and political ideology have found some associations between demographic factors and environmentalism. For example, age or birth cohort has been found to be significantly associated with environmentalism, followed by education and place of residence, whereas gender and race have been reported to have a weaker and less consistent association with environmentalism (Dietz et al. 1998). In terms of race, Blacks have been found to be more concerned about environmentalism than Whites but they may have lower concern for the environment relative to other public issues due to time and money constraints (Mohai 1990; Mohai 1992; Mohai and Twight 1987; Dietz et al. 1998). In relation to gender, women have generally higher concerns for environment in their beliefs, attitudes and behaviours than men (Mainieri et al., 1997; Hamilton 1985). However, this cannot be generalised for all countries in the world because of differences in cultural beliefs and their influence on individual environmental behaviour (Chan, 2001).

Government Policy

When it comes to the most desirable government policies concerning environmental issues, consumers frequently nominate economic incentives through discounts, grants, subsidies and other schemes as motivators for investing in energy efficient products and services (Caird et al., 2008; Jager, 2006; Niemeyer, 2010; Sidiras and Koukios, 2004). Yet not all consumers are aware of the economic incentives that are offered by their state governments or of the opportunity of help with grant submission which has been available in some places (Jager, 2006). The findings of a recent survey in Australia suggest that the government needs to do more to protect the environment (Pietsch and McAllister, 2010). Environmental protection authorities (EPAs) generally act as regulating bodies for the various environmental policies and legislation relating to air pollution, climate change, water pollution, hazardous waste and toxic substances, solid waste, and so forth. Green movements and grass-roots activists also have an influence in the way government environmental policies are administered (Barry and Doherty 2001; Bullard and Johnson 2000).

In today's environment, consumers are aware of the importance of protecting and improving the environment via increasing media coverage, government statements, policies and agreements (Ozaki 2011). However, the initial cost is usually cited as being one of the most prominent barriers for consumers in the adoption of green technologies and practices. In some countries financial incentives have been offered to alleviate the initial cost of upgrading to energy efficient initiatives such as the use of solar power and home insulation; and these inducements have provided some motivation for consumers to adopt the technology. It has also been noted that some consumers would prefer to see governments taking a proactive role by introducing regulation (Zaccai, 2008) including compulsory standards for product performance, reliability and durability; and closer regulation to prevent opportunistic organisations from completing sub-standard installation work (Caird et al., 2008). Past research has also shown that some consumers support the idea of introducing taxes particularly for the polluters who are causing environmental problems (Zaccai, 2008); and enforcement of financial penalties for the use of inefficient technologies (Caird et al., 2008). However, implementation of such measures can be very challenging because of possible resistance from businesses and consumers. Thus the influence of government policy on consumers' green practices still remains unclear.

Environmental Behaviours/Green Practices

Environmental behaviours and green practices include recycling, waste reduction, energy saving, energy conservation, travel mode choice, travel behaviour, car-use, bus-use, public transportation, cycling, walking, pro-environmental mobility behaviour, water conservation, organic food, green consumerism, green purchases, ethical behaviour, environment-friendly buying behaviour, environmental consumer behaviour, ecological consumer behaviour, green consumption, green consumer behaviour, ecological behaviour, pro-environmental behaviour, conservationism, environment-friendly behaviour, environment protection behaviour, ecological behaviour and personal norms, ecological behaviour and morality, and pro-environmental attitudes (Bamberg and Moser 2007). However, these environmental behaviours or practices can be more conveniently classified within four broader domains: 1) domestic energy/water use such as installation of insulation products, better energy management and usage; 2) waste behaviour such as wasting less and increasing recycling; 3) buying or using energy efficient (low-carbon) transport vehicles; and 4) eco-friendly shopping such as buying energy-efficient products and adopting a diet which has lower environmental impacts (Whitmarsh and O'Neill 2010). There is a general understanding among consumers that many environmental problems are the consequences of their purchasing behaviour and there is now a trend towards consumers choosing to purchase greener products (Mostafa, 2007; Vermillion and Peart 2010). Goldsmith and Samson (2006) show that green practices are influenced by a firm's sustainability orientation and business strategy. However, various past studies have also reported that having an environmental friendly attitude does not necessarily lead to green behaviours and practices (Ozaki 2011; Mostafa, 2007; Leire and Thidell, 2005).

Consumers have access to product related environmental information through electronic media, so that they can identify suitable environmental friendly products of their choice. However, in reality consumers do not use the information as much as they claim (Leire and Thidell, 2005); and in the uptake of green products and technologies, even environmentally friendly consumers look for more than the green attribute of a product before actually committing to it. They also expect other benefits from the products or technologies, such as lower prices and convenience (Vermillion and Peart 2010) which suggests that consumers are not willing to compromise their lifestyles. In terms of environmental practices in Australia, ABC News reported that people are using less electricity, with consumption down by 1.2 per cent in the past year which can be attributed to the increases in power tariff (based on the report produced by Infrastructure Australia). Since 2006, there has also been a marked improvement in the recycling of waste, although there is a large variation between cities. For example, Canberra and Adelaide recycle 70 per cent of their waste, while Perth only recycles 40 per cent (ABC News, Oct 20, 2011). Nevertheless, in relation to attitudes toward global warming and public support for climate change, a recent study reported that despite its wide coverage in the media, many in the Australian community no longer consider it as a high priority (Morrison et al. 2014).

Research Questions

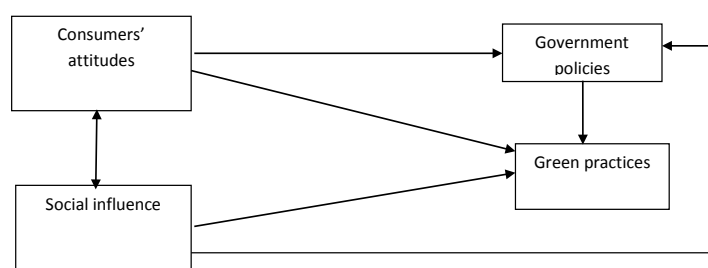
The literature review above suggests that individual's attitude towards the environment can influence one's environmental behaviour (Millock and Nauges 2010); and the extent of influence on behaviour depends on the level of concern for environment (Willis et al. 2011; Ozaki 2011) and the individual's cultural background and beliefs (Chan 2001). Moreover, the uptake of green practices is strongly influenced by social/community norms such as the views and actions of family and friends (Jager 2006; Pickett-baker and Ozaki 2008) and demographic factors (Dietz et al. 1998; Mainieri et al. 1997). In terms of government policy, economic incentives can motivate consumers to use energy efficient products and services (Caird et al. 2008, Niemeyer 2010) and green activists can play an important role in influencing the government's environmental policies (Barry and Doherty 2001). Community

responses suggest that the government needs to take a more proactive role in protecting and improving the environment through policies and legislation and offering of discounts, incentives and appropriate incentive schemes (Zaccai 2008; Caird et al. 2006). As discussed earlier, environmental behaviours/practices can be broadly classified into categories concerning domestic energy/water use, waste management/recycling, buying/using energy efficient vehicles, and engaging in eco-friendly buying practices (Whitmarsh and O'Neill 2010). Although there are several studies that have examined the link between consumers' environmental attitudes and environmental practices, some of them lack empirical support and very few have focused on green consumers. Therefore, this study aims to investigate the following research questions using data from consumers of Australian green companies based on the Sunshine Coast:

1. Are consumer attitudes towards green purchases favourable?
2. What are the perceptions of green consumers regarding social influences?
3. What are the perceptions of green consumers regarding government policies?
4. What are the perceptions of green consumers regarding green practices?
5. Do social influences affect consumers' green practices?
6. Is there a relationship between social influences and attitudes towards green purchases?
7. Is there a relationship between attitudes toward green purchases and green practices?
8. Do government environmental policies affect consumers' green practices?

The conceptual framework to address the above research questions is presented in Figure 1.

Figure 1:
Conceptual framework



Method

To investigate the research questions, an online survey of consumers of three Sunshine Coast based companies was conducted in the last quarter of 2010. Participants in the study were drawn from the contact lists of the case companies who utilise green products and processes in their production systems, or produce products that are beneficial

to the environment as they provide renewable energy solutions. The survey was disseminated to each company contact list by the individual companies concerned and therefore it was not possible to develop a sampling frame.

Survey questions were drawn from the literature on attitudes and behaviour towards a variety of green practices. The survey also captured information on social influences, government policy and attitudes towards green practices. The relevant questions were generated from several studies including Caird et al. (2008), Chan (2001), Niemeyer (2010) and Ozaki (2011). A pilot study of the survey was conducted using staff members of the University of the Sunshine Coast and staff members of the three case study companies. Based on the feedback from the pilot study, the questionnaire was revised and then forwarded to each case study company. Each of the case study companies was given the opportunity to submit specific questions to be included in the survey and where applicable these questions were allocated to the relevant section within the survey. The majority of items in the survey were designed to encapsulate consumer opinion on a 5 point (1 = strongly disagree to 5 = strongly agree) scale.

The questions on green practices cover a wide variety of behavioural items undertaken on a day-to-day or habitual basis such as recycling, composting, conserving water and energy and so forth. The survey questions were collated from two studies, Barr et al. (2005), whose research looked at about 40 environmental actions that may be carried out in-and-around the home, and Pickett-Baker and Ozaki (2008), who considered how consumers are swayed towards opting for greener products. The survey also included demographic questions such as income, occupation, education and length of residence in current area. Respondents were also asked to describe what they believed to be critical issues facing climate change and green practices now and over the next three years.

The online survey provided a means of easy and direct access to the entire contact list of each company thereby giving a potentially large sample size, however a disadvantage of using this method emerged when a number of respondents did not respond to every question. A decision was made to retain surveys where a majority of questions had been completed resulting in 218 usable responses. Early respondents were compared with late respondents to address the possibility of non-response bias; and no significant differences were found. The survey data were recorded in the Statistical Software Package called SPSS version 19. Various statistical techniques including descriptive analysis, correlation analyses, and factor analysis were used in analysing the data relevant to each research question. The details of the results are presented in the next section.

Results

Of the 218 responses, 63% were female respondents and the remaining 37% were male respondents; and the majority of respondents were 55 years and older. In relation to annual household income, nearly 31% of them were in the \$40,000 - \$70,000 income bracket; and more than 36% of them had an annual household income of over \$70,000. Nearly 28% of them were professional followed by technician and trades workers (9%), clerical and administrative workers (6.8%) and home duties (6.8%), sales workers (4%). In relation to highest education level, 50% of the respondents had a university qualification, 22.6% had a secondary school qualification, and 18.3% had a TAFE qualification. As the survey was targeted to the consumers of green companies, a bias in responses towards green consumers can be expected which would limit the generalisability of the study findings; but as there were many other motivations for purchase e.g. lower cost or higher quality this may not be such a limiting factor.

Each research question was analysed separately and the results are presented in the following paragraphs:

Research Question 1: Are consumer attitudes towards green purchases favourable?

Four items were included to measure consumer attitudes towards green purchases, where the respondents were asked to rate their level of agreement using a five-point scale (1=strongly disagree to 5=strongly agree); comprising: "I have a favourable attitude towards purchasing a green version of a product", "I like the idea of purchasing green", "I would purchase a green product though it is more expensive" and "Purchasing green is a bad idea (reverse coded)". As shown in table 1, for these 4 items, 91.7% of consumers agreed or strongly agreed that purchasing green is a good idea (reverse coded); followed by 87.6% for the statement "I have a favourable attitude towards purchasing a green version of a product"; 81.2% for "I like the idea of purchasing green"; and 55.4% for "I would purchase a green product even though it is more expensive". These scores suggest that consumers' attitudes for purchasing green were favourable with most of them agreeing or strongly agreeing with the corresponding statements; though the response to the last question would suggest that cost was also a factor.

Table 1:

Level of respondents' agreement on attitudes, social influences and government policy related items

	Mean ¹ (SD)	% who agree & strongly agree ²	% who disagree & strongly disagree ³
Consumers' attitudes towards green purchases			
AT_4 Purchasing green is a bad idea (Reverse coded)	4.39 (0.72)	91.7	2.1
AT_1 I have a favourable attitude towards purchasing a green version of a product	4.04 (0.61)	87.6	2.1
AT_2 I like the idea of purchasing green	4.01 (0.74)	81.2	3.1
AT_3 I would purchase a green product even though it is more expensive	3.42 (0.92)	55.4	17.1
Social influences			
SI_1 Important people in my life would approve of my using green products	3.55 (0.89)	59.3	11.1
SI_2 Important people in my life believe that I should use green products	3.31 (0.84)	42.4	14.7
Government policies			
GP_1 The government policies on climate change and green practice influence my decisions to use green products	3.24 (1.14)	44.3	31.8
GP_2 The government should offer financial incentives for individuals to adopt green products	2.03 (0.97)	9.9	81.2

Research Questions 2 and 3: What are the perceptions of green consumers regarding social influences? What are the perceptions of green consumers regarding government policies?

The following two items were used for measuring social influences: "Important people in my life would approve of my using green products" and "Important people in my life believe that I should use green products". The mean score for the level of agreement (agree and strongly agree) in the first item was 3.55 and in the second item was 3.31. In other words, 59.3% of the respondents rated agree and strongly agree in relation to the first statement and 42.4% in relation to the second statement (see table 1). This is just a modest level of agreement.

The two items used to measure the perceptions of consumers for government policies and subsidies were "The government policies on climate change and green practice influence my decisions to use green products" and "The government should offer financial incentives for individuals to adopt green products". The mean score for the level of agreement (agree and strongly agree) in relation to the first item was 3.24 or 44.3% rated

¹ Mean of five point scale: 1=strongly disagree, 2 = disagree, 3=neutral, 4=agree, 5=strongly disagree. SD stands for Standard Deviation.

² Combination of 4 and 5 on five-point scale

³ Combination of 1 and 2 on five-point scale

agree and strongly agree whereas in relation to the second item the mean score was 2.03 or only 9.9% of the respondents indicated their support for this statement (see table 1). In other words, the majority of respondents were of the view that there is no need for the government to provide financial incentives for individuals to adopt green products.

Table 2:
Green (environmental) practices: Level of agreement

	N	Mean	Std. Deviation	% who agree & strongly agree ⁴	% who disagree & strongly disagree ⁵
SP30_I turn lights off in unused rooms.	191	4.47	0.587	97.4	1.0
SP34_I recycle cans.	191	4.43	0.653	95.3	2.1
SP33_I recycle newspaper.	191	4.42	0.660	95.3	1.6
SP32_I recycle glass.	190	4.41	0.682	94.7	2.1
SP35_I recycle plastic bottles.	190	4.40	0.689	94.2	2.1
SP24_I turn the heat/air conditioning system off in unused rooms.	191	4.38	0.684	90.6	1.0
SP27_I use a shower rather than a bath.	191	4.37	0.634	94.8	1.6
SP37_I donate clothes to charity.	189	4.34	0.604	95.2	1.1
SP29_I put on more clothes instead of more heating.	191	4.28	0.627	92.7	1.0
SP28_I wait until there's a full load for washing.	191	4.25	0.688	89.0	1.6
SP 1_I buy energy efficient appliances.	193	4.23	0.568	93.8	0.5
SP26_I keep heating/air conditioning low to save energy.	189	4.23	0.726	87.3	1.6
SP22_I turn the tap off when cleaning my teeth.	190	4.22	0.728	91.6	4.7
SP31_I use a sprinkler less in the garden.	191	4.18	0.953	82.7	6.3
SP36_I donate furniture to charity.	191	4.16	0.716	84.3	1.6
SP6_I use biodegradable soaps or detergents.	193	4.12	0.725	88.1	3.6
SP7_I reuse paper.	191	4.12	0.697	88.5	3.7
SP 23_I turn the tap off when washing dishes.	191	4.10	0.747	86.4	4.7
SP5_I avoid toxic detergents.	193	4.06	0.808	79.8	5.2
SP11_I buy locally produced goods.	192	4.03	0.682	81.2	1.6
SP15_I look for less packaging.	193	4.03	0.793	78.2	4.1
SP3_I compost garden waste.	193	4.01	1.013	78.2	13.0
SP12_I buy from a local store.	192	3.99	0.709	80.7	3.1
SP13_I use my own bag when shopping.	192	3.98	0.915	76.6	7.3
SP4_I compost kitchen waste.	193	3.95	1.088	73.6	16.1
SP14_I read labels to see if the contents are environmentally safe.	192	3.94	0.770	76.0	3.6
SP21_I reduce toilet flushes.	193	3.92	0.946	78.2	10.4
SP8_I reuse glass.	192	3.87	0.937	74.0	10.9
SP9_I buy recycled paper.	192	3.81	0.860	71.4	8.9
SP25_I reduce the temperature in my hot water system.	189	3.79	0.892	66.1	8.5
SP38_I buy products from companies who are environmentally responsible.	191	3.79	0.802	67.0	5.2
SP17_I buy products in packages that can be refilled.	192	3.78	0.782	70.3	6.3

⁴ Combination of 4 and 5 on five-point scale,

⁵ Combination of 1 and 2 on five-point scale

SP16_I buy products made of or packaged in recycled materials.	191	3.69	0.818	61.3	6.8
SP43_I refuse plastic bags when shopping.	191	3.66	1.001	57.6	12.6
SP39_I cut down on car use.	191	3.63	0.947	62.3	13.6
SP2_I avoid buying aerosol products.	193	3.63	0.992	58.5	15.5
SP18_I buy plants that do not need watering.	193	3.53	0.941	51.3	10.9
SP19_I turn the tap off when soaping up.	193	3.45	1.089	54.9	24.4
SP10_I buy recycled toilet paper.	192	3.40	1.088	46.9	22.9
SP20_I reduce the number of baths/showers I take.	192	3.31	1.137	48.4	27.1
SP40_I contribute money to environmental causes.	188	3.27	1.088	40.4	20.7
SP42_I approach my local councillor/member about environmental issues.	190	3.03	1.069	31.6	30.0
SP41_I volunteer for an environmental group.	191	2.91	1.030	24.1	33.5

Research Question 4: What are the perceptions of green consumers regarding green practices?

Respondents were asked to rate their level of agreement for 43 items used in the survey under 'green and environmental' practices. The questions focused on recycling, packaging, buying products, reducing water consumption, efforts towards saving energy consumption, reusing, doing something for environmental causes such as volunteering and contributing, composting of kitchen and garden waste, buying local and so forth. Of the 43 items, the highest level of agreement was for the statement "I turn lights off in unused rooms" followed by "I recycle cans". Table 2 shows sample size, mean scores and standard deviations for each statement and the proportion of respondents who rated the level of agreement and disagreement. The results showed very positive responses for the recycling aspect of green practices.

Research Questions 5, 6, 7 and 8: Do social influences affect consumers' green practices? Is there a relationship between social influences and consumers' attitudes towards green purchases? Is there a relationship between consumers' attitudes towards green purchases and green practices? Do government environmental policies affect consumers' green practices?

To address these four research questions, a comprehensive factor analysis using the principal component extraction method and varimax rotation was conducted simultaneously on all four dimensions (social influences, green practices, consumers' attitudes towards green purchases, and government environmental policies). The results for each dimension are reported below.

Social influences - The factor solution for the corresponding 2 social influence items resulted in one factor (eigen value of over 1 and cumulative percentage of variance of 87.31%) "Social influences" with an alpha 'reliability 'Cronbach' value of 0.855 .

Green practices - As discussed earlier, 43 green practice items were considered in this study which were factor analysed with a view to identifying the main underlying constructs (see Exhibit I). This analysis produced 10 factors with eigen values of over 1 and a cumulative percentage variance of over 67%. The resulting factors were: 'Recycling' (7 items with a Cronbach alpha (CA) value of 0.909); 'Environmental habits' (7 items, CA = 0.841); 'Water conservation practice' (6 items, CA = 0.755); 'Energy conservation practice' (4 items, CA = 0.770); 'Reuse practice' (4 items, CA = 0.791); 'Environmental advocacy' (3 items, CA = 0.756); 'Waste composting' (3 items, CA = 0.849); 'Other household practices' (4 items, CA = 0.656); 'Buying local' (3 items, CA = 0.550). As the tenth factor consisted of only one

item 'I buy energy efficient appliances', this factor was excluded from the analysis. The factor 'Buying local' was also excluded as the CA of 0.550 is lower than the acceptable minimal level (Robinson et al. 1991). The other CA values range between moderate to exemplary (Robinson et al. 1991).

Consumers' attitudes towards green purchases - The factor solution for the corresponding 4 consumer attitude items resulted in one factor (with eigen value of over 1 and 56.8% as cumulative percentage of variance), 'Attitude towards green purchases' with a CA of 0.716. This alpha value is acceptable as values between 0.70 and 0.79 are considered as extensive (Robinson et al. 1991).

Government policies - The factor solution for the 2 government policy items resulted in one factor with an eigen value of over 1 and cumulative percentage of variance of over 63%. However, the CA was 0.409 indicating an unacceptable level to consider this as one factor. Therefore, both items were considered separately in further analysis.

Outcome of the analysis - A correlation analysis was carried out to investigate the association between attitudes towards green purchases, social influences, government policies and green practices. The results are presented in table 3. The results show that 'attitudes towards green purchases' has a significant positive association with social influences, and different aspects of green practices such as recycling of newspapers, plastic bottles, glass and cans; environmental habits such as buying products made of recycled materials, using their own bag for shopping, looking for less packaging, refusing plastic bags when shopping, buying products from environmentally responsible companies; reusing paper, glass, recycled paper; environmental advocacy in the form of contributing money to environmental causes, approaching the local member and volunteering for environmental issues; composting of garden and kitchen waste; and other household practices which include using sprinkler less in the garden, using a shower than a bath, waiting until there is a full load for washing and so forth. These results suggest that in promoting green or environmental practices, it is important that green campaigners are able to change the individuals' attitudes towards green purchase. However, it is important to note that there was a negative association between attitudes towards green purchases and government decisions to offer financial incentives, which may indicate that consumers are skeptical of the efficacy of government financial incentives for adoption of green products.

Social influences would also appear to have an important role in making people form relevant environmental habits such as buying products made of recycled materials, using their own bag for shopping, looking for less packaging, refusing plastic bags when shopping, and buying products from environmentally responsible companies. Social influences were also associated with environmental advocacy and other household practices. Government policies on climate change and green practices were associated with government decisions to offer financial incentives for individuals to adopt green products such as buying energy efficient appliances.

Table 3:
Consumers' attitudes, social influences, government policies and green practices: A correlation matrix

Factors	AT Attitudes	SI Social influences	Govt policy GP_1	Govt policy GP_2
AT Attitude towards green purchases ($\alpha=0.716$)	1	0.46***	-0.03	-0.29***
SI Social/community influences ($\alpha=0.855$)	0.46***	1	-0.15*	-0.15*
GP_1 The government policies on climate change and green practice influence my decisions to use green products	-0.03	-0.15*	1	0.26***
GP_2 The government should offer financial incentives for individuals to adopt green products	-0.29***	-0.15*	0.26***	1
Green practices				
Fac_1 Recycling (alpha ' α ' 0.909)	0.21**	0.04	-0.06	-0.02
Fac_2 Environmental habits ($\alpha=0.841$)	0.36***	0.18*	0.04	-0.13
Fac_3 Water conservation practice ($\alpha=0.755$)	0.13	-0.06	0.08	0.11
Fac_4 Energy conservation practice ($\alpha=0.770$)	0.11	0.07	-0.05	-0.04
Fac_5 Reuse practice ($\alpha=0.791$)	0.17*	0.04	0.12	-0.04
Fac_6 Environmental advocacy ($\alpha=0.756$)	0.24**	0.20*	-0.02	-0.05
Fac_7 Waste composting ($\alpha=0.849$)	0.26**	0.14	0.02	0.03
Fac_8 Other household practices ($\alpha=0.656$)	0.25**	0.16*	-0.13	-0.11

Note: * stands for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$

Discussion

The main aims of this study were to identify consumers' attitudes towards green purchases, their perceptions of social influences, their green behaviours, government policies in promoting green practices, and the relationships (if any) between these dimensions. Consumers' attitudes towards green purchases in the sample were favourable with a score in excess of 4 (agree) in 3 of the 4 items. There is general agreement that purchasing green is a good idea. This is consistent with the findings of Vermillion and Peart (2010), who found that consumers are conscious of the need to purchase greener products to protect the environment.

The study also investigated the relationships between social influences, attitudes towards green purchases, government policies and green practices, and found that most respondents (over 80%) believe in green purchasing. The results suggest that there is a positive significant association between consumers' attitudes towards green purchases and various types of green practices including recycling, reusing, waste composting and other environment related activities. In the light of earlier studies (e.g. Pickett-Baker and Ozaki 2008; Barr et al. 2005) this would indicate that the gap between attitudes and practices may have narrowed in recent times i.e. consumer attitudes now do translate into environmental actions or practices. Perhaps this is attributable to consumers' heightened state of awareness of the importance of environment issues in terms of a more green future. Social influences also have positive significant associations with consumers' environmental habits, and their environmental advocacy in terms of efforts to contribute money and volunteer for the protection and improvement of the environment. In this situation, perhaps this is due to a sharing of awareness of environmental issues amongst consumers, particularly in relationships of trust where one party has significant and sometimes reciprocal influence with another party i.e. the good environmental 'word' is spreading. However, the finding of a negative association between attitudes towards green purchases and government decisions to offer financial incentives may indicate that consumers are skeptical of the efficacy of government financial incentives for adoption of green products. This may be attributable to factors such as the recent withdrawal of State subsidies for solar power and other environmental products and services. Nevertheless, it should be noted that the study findings are based on consumers' self-reported measures of green attitudes and green

practices/behaviours. Further research may investigate whether the self-reported behaviours of green consumers 'match' their actual practices. Nevertheless, there is sufficient evidence to suggest that the relationship between green attitudes and green behaviours may be changing.

Conclusion

The results of the study show that consumers' attitudes towards green products are favourable and that there is a strong association between environmental attitudes and practices and a lesser but still significant association between social influences and environmental practices. This may indicate that the so called environmental attitude-action gap is narrowing. However, it must be acknowledged that the respondents were consumers of environmentally friendly products (albeit only one of the motivations for purchase) and this could account for the closer association between attitudes and practices. In addition, the small sample size together with the usual limitations of the survey method: lack of in-depth information, social desirability bias, and non-response bias may reduce the generalisability of the findings; though efforts were made to reduce the possibility of non-response bias by comparing early with late respondents. Nevertheless, the findings show some promise in that consumers had very positive attitudes toward environmental issues which may translate into positive environmental practices.

Acknowledgements

The authors wish to acknowledge the contributions of Professor Tim Smith and Associate Professor Don Kerr, University of the Sunshine Coast during the data collection phase of this project. We also would like to thank the delegates of the ANZAM 2013 Conference for their constructive feedback on an earlier version of this paper.

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