

Gender differences in Hong Kong adolescent consumers' green purchasing behavior

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Abstract

Purpose – This paper aims to examine how gender differs in environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, peer influence, self identity in environmental protection and green purchasing behavior in Hong Kong adolescent consumers.

Design/methodology/approach – A total of 6,010 (2,975 males and 3,035 females) adolescents in Hong Kong were recruited through multi-staged random sampling. Surveys were distributed through 48 high schools in Hong Kong.

Findings – Female adolescents scored significantly higher in environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, peer influence and green purchasing behavior than male adolescents in Hong Kong. In contrast, male adolescents' average score on self-identity in environmental protection was significantly higher than that of the female adolescents.

Research limitations/implications – A major limitation lies in the self-reported nature of survey used in the study. Future study should include some objective assessments (such as observations or other-reported survey) of the subjects' green purchasing and environmental behaviors.

Practical implications – This study should provide a useful source of information for international green marketers in Hong Kong. Hong Kong female adolescents constitute a potentially good market for green products. Marketing messages targeting this group should use emotional appeals, emphasize individual responsibility to protect the environment, and facilitate peer networking to spread good word-of-mouth.

Originality/value – This paper offers practical guidelines to international green marketers who are planning to target the Asian markets.

Keywords Hong Kong, Adolescents, Consumers, Green marketing, Gender

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this article.

Introduction

Western studies have evidenced that consumers in the USA and Western Europe are growing more environmentally-conscious in the past decade (e.g. Curlo, 1999). Recently, green consumerism has started to gradually emerge in the Asian regions (Gurău and Ranchhod, 2005). Asian consumers have recently become one of the primary targets for international green marketers for the following reasons:

- consumers in Asian societies are increasingly becoming conscious to the alarming environmental problems (Harris, 2006); and
- the fast-growing economies in Asia has led to a vigorous rise of financially-empowered consumers across Asia who are willing to spend more than previous generations (Li and Su, 2007).

Like many Asian cities, Hong Kong suffers from dangerously high levels of air pollution, poor water quality, high levels of exposure to severe traffic noise, high levels of garbage disposal and rapidly diminishing landfill space (Civic Exchange, 2007). Compared with what has been happening in the

West, consumers in Hong Kong are just at the stage of green awakening. Recently, the government and citizens of Hong Kong have started to realize the seriousness of the environmental threats, and the hazardous economic and health problems that result from them. The society as a whole is more ready and willing than before to respond to appeals based on “green” issues (Yeung, 2005). Emerging markets for environmental products, services, and technologies in Hong Kong mean promising opportunities for international green marketing.

Despite the unprecedented potential of the Hong Kong market, as well as other Asian markets, for green products, very little is known about consumers' green buying behaviors in this region. International green marketers have expressed that the unavailability of market information in foreign countries often becomes a major hindrance to the success of international expansion of their green products (Gurău and Ranchhod, 2005). Without sufficient market information in Asian countries, many international green marketers fail to practice effective market segmentation in their marketing strategies (Keegan and Green, 2000).

An even more rarely-explored topic is young consumers' green buying behaviors and factors that affect them. Indeed, adolescents constitute a large citizen group with the potential for constructing a powerful collective force in society for environmental protection. Past studies have found that young people are more ready than older generations to accept new and innovative ideas (Ottman *et al.*, 2006). Supporters of environmental protection tend to be younger in age (Martinsons *et al.*, 1997). Given the anticipated life span of this age group, the cultivation of its green purchasing behavior may reinforce behavioral commitment for a half-century or more.

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As such, this paper attempts to supplement existing Western-based studies by examining the gender differences in green buying behaviors among adolescent consumers in Hong Kong. Regarding the issues of gender difference in green purchase perception and behavior, many questions are still pending for answers. Not the least of which are:

- Can males and females be treated as identical segments in the process of green purchase action?
- Do they have similar motivations in engaging in green purchasing behavior?
- Do they have the same interests and preferences in environmental values and action?

Past studies in Western cultures have found gender differences in environmental perceptions, values and actions (e.g. Agarwal, 2000). However, this issue has rarely been examined in an Asian context. The aim of this research is to fill this void by examining gender differences in Hong Kong adolescents consumers': environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, self-identity in environmental protection, peer influence and green purchasing behavior.

Literature review

Environmental attitude

In existing literature, environmental attitude is commonly understood as a cognitive judgment towards the value of environmental protection. Contrasting results have been found between environmental attitude and behavior. Specifically, while some researchers have claimed a positive correlation between environmental attitude and environmental behavior (e.g. Kotchen and Reiling, 2000), others have concluded that the relationship is either moderate or tenuous (e.g. Davis, 1995). The contradictory results in studies of the relationship between environmental attitude and behavior suggest that:

- further studies are needed to confirm the relationship between environmental attitude and behavior;
- a previous assumption that individuals' cognition (attitude) will alter their behavior is challenged; and
- focus may need to be re-gearred to other possible variables that may better predict environmental behavior.

Tikka *et al.* (2000) have evidenced in their Western sample that females express more positive attitudes towards the environment than males do. Zelezny *et al.* (2000) provide additional evidence that women report stronger environmental attitudes than men across age and across 14 countries (Argentina, Canada, Columbia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, the United States and Venezuela). Referencing from existing literature, it is thus hypothesized that:

- H1. Female adolescent consumers would express more positive environmental attitude than male adolescent consumers in Hong Kong.

Environmental concern

Environmental concern refers to an affective attribute that can represent a person's worries, compassion, likes and dislikes about the environment (Yeung, 2005). Early studies in environmental concern mainly examined the predictability of demographic variables to environmental concern. Age,

educational attainment, political ideology, ethnicity, gender and value orientation have been found to have robust, consistent effects on environmental concern over time across different surveys and samples (Xiao and McCright, 2007). Later studies investigated the effects of environmental concern on behavioral intentions and behavior. For instance, Bang *et al.* (2000) found in their study that consumers who were more concerned about the environment expressed more willingness to pay more for renewable energy than those who were less concerned about the environment.

Existing studies have evidenced that women are more concerned about environmental issues than are men (Mostafa, 2007). Zelezny *et al.* (2000) have found that the display of gender difference in environmental concern could begin at as early as the primary-school age. Theoretical explanations for gender difference include the socialization of gender role (Zelezny and Bailey, 2006) and value orientation (Stern *et al.*, 2005). Specifically, socialization theory postulates that because women are socialized to be more interdependent, compassionate, nurturing, cooperative, and helpful in caregiving roles than men, women should have a stronger ethic of care for others, including the environment, when compared to men (Zelezny and Bailey, 2006). Other scholars try to explain the gender difference in environmental concern by using value orientation, claiming that women have stronger biospheric orientations (focusing on values that emphasize the environment and the ecosystem) than men (Stern *et al.*, 2005). Thus:

- H2. Female adolescent consumers would show higher environmental concern than their male counterparts in Hong Kong.

Perceived seriousness of environmental problems

Past studies on perceived seriousness of environmental problems mainly focused on finding out subjects' perception of the most serious problems, how serious they thought the problems were, and how subjects from different cultures perceived the issue differently (Dunlap, 1994). In general, sewage treatment, water quality, and air quality are most likely to be viewed as very serious local community problems. Residents in Asian countries rate these problems as more serious than do those who live in Western nations. Overall, Asian residents tend to perceive their local environments much more negatively than do their Western and European counterparts (Dunlap, 1994).

Recently, some scholars have examined the effects of mass media on audience's perceived seriousness of environmental hazards. Moser and Uzzell (2003), for instance, contend that the media's interpretation of pollution levels have an effect on audience's perception of the seriousness of the pollution problems. However, few studies have examined gender effects on perceived seriousness of environmental problems. A study on perception of environmental risks suggests that women reported higher perceived vulnerability to risks from global warming and hazardous wastes than men did (Bord and O'Connor, 1997). In addition, women were found to be more concerned about the negative outcomes of environmental damage than were men (Bord and O'Connor, 1997). Referencing from existing literature on gender difference in risk perception, it is hypothesized that:

- H3. Hong Kong female adolescent consumers would perceive the environmental problems as more serious than male adolescent consumers.

Perceived environmental responsibility

Recent reports have found that people in Hong Kong have acquired more environmental knowledge and awareness of environmental problems over the last decade (Lai, 2000). However, their sense of individual responsibility in environmental protection is still generally weak. On one hand, they expect more proactive public policy from the government to eradicate the environmental problems. On the other hand, they are hesitant to make individual sacrifices to cooperate with the government's policy (Lai, 2000).

Zelezny *et al.* (2000) have evidenced in their study that compared to males, females had higher levels of perceived personal responsibility towards environmental protection. The norm activation model (Schwartz, 1977), which is originated in the social psychology context, is often used to explain gender difference in perceived environmental responsibility. The model suggests that altruistic helping behavior is most likely to occur when individual are aware of harmful consequences (awareness of consequences – AC) and feel responsible for these consequences (ascribed responsibility – AR). In a sense, environmental behavior carries an altruistic meaning, whereby individuals may need to have a strong “other” orientation and willingness to sacrifice their time/ preferred activities to protect the environment for the long-term benefits of the earth and human race. Since it has been documented that females tend to have a stronger ability to take the role of a conceptualized others (i.e. other orientation) (Gough, 1994) and a stronger social “ethic of care” to take responsibility for alleviating problems in the world (Gilligan, 1982), it is posited that:

H4. Female adolescent consumers would personally hold more environmental responsibility than male adolescent consumers in Hong Kong.

Peer influence

Peer group constitutes an imperative part of an adolescent's social context (Brown, 1990). Researchers have suggested that peers influence each other by several ways:

- as reinforcing and punishing agents (Lamb *et al.*, 1980);
- as modeling agents (Sagotsky and Lepper, 1982);
- as objects for social comparisons (Shaffer, 1994); and
- as value-setters for a particular idea or behavior (Shaffer, 1994).

The social dynamic in which individuals affiliate with others by displaying similar attributes is called homophily (Ryan, 2001). Homophily of peer group values and behaviors has been found in reported frequency of smoking, drinking, drug use, and dating (Urberg *et al.*, 1997). Besides risk-taking behaviors, homophily in peer groups has also been found for positive traits such as GPA, college aspirations, time spent on homework, general engagement in schoolwork, academic motivation and achievement as well as prosocial behaviors (Ryan, 2001).

Chen-Yu and Seock (2002) have found that conformity is a significant motivation to purchase certain clothing among adolescents. In making a purchase decision, adolescent consumers' choice is often made in accordance with peer group opinions (Lascau and Zinkhan, 1999). Despite the established link between general purchasing behavior and peer influence, little has been done to investigate how gender affects individuals' susceptibility to peer influence on green

purchasing decision. Past gender studies have found that compared to males and their same-sex friends, female circles stress more on equality, harmony and connections (Zelezny *et al.*, 2000). As such, females are found to be more susceptible to conformity pressure (Chen-Yu and Seock, 2002). In fact, Agarwal (2000) contends that females' social networking should constitute an important basis for environmental collective force. Thus:

H5. Hong Kong female adolescent consumers would be more susceptible to peer influence on green-purchasing behavior than male adolescent consumers.

Self-identity in environmental protection

Hormuth (1999) contends that acts have symbolic functions and meanings for a person and the acquisition of certain acts may be done to obtain a certain status, create an impression upon others, or acquire an identity for the self. Because environmental behavior is a special kind of altruistic act, it carries symbolic functions and can be used for self-identity formation or self-presentation to others who one is (Hopper and Nielsen, 1991). Recently, some scholars have provided evidence suggesting that the self-identity dimension can be a useful in studying motivations to behave environmentally (e.g. Mannetti *et al.*, 2004; Stets and Biga, 2003). For instance, Mannetti *et al.* (2004) have found that an individual's personal identity of being an environmentally-responsible person contributes significantly to the explanation of intentions to recycle.

Identity exploration is most salient in adolescence (Sharp *et al.*, 2007). In recent studies on identity formation, it is found that individuals engage in self-defining activities (i.e. those activities that individuals identify as being important to who they are) to explore, develop and reflect their own identities (e.g. Waterman, 2004). According to Coatsworth *et al.* (2005), the activities that are most significant to identity development are those that provide a sense of special meaning, importance or self-actualization to the individuals. In this regard, environmental behaviors could be considered as potentially self-defining activities because they often carry the symbolic meanings of morality, unselfishness, other- or nature-orientation and eco-aspirations. To date, gender difference in self-identity in environmental protection has not been examined. Early gender studies have suggested that males tend to use activities to establish status and respect whereas females tend to use activities to express harmony and equality (Tannen, 1990).

R1. Is there any gender difference in self-identity in environmental protection among Hong Kong adolescent consumers?

Green purchasing behavior

Green purchasing behavior refers to the consumption of products that are:

- benevolent/ beneficial to the environment;
- recyclable/ conservable; or
- sensitive/responsive to ecological concerns (Mostafa, 2007).

Past studies have put focus on examining what factors affect environmental behavior in general (e.g. household, environmental group joining etc) (e.g. Johnson *et al.*, 2004). These studies suggest that environmental attitude, affect,

knowledge and memory could be important determinants of eco-friendly behavior (Chan, 2001).

Comparatively speaking, existing literature on environmental behavior has paid less specific attention to green purchasing behavior. Chan (2001) has evidenced the effects of Chinese adult consumers' man-nature orientation, degree of collectivism, ecological affect and ecological knowledge on their attitudes toward green purchases and purchase intent. However, actual green purchases were not examined. To date, little is known about the gender effect on green purchasing behavior among Hong Kong adolescent consumers. Referencing from existing Western literature, which evidenced that women reported significantly more participation in general environmental behavior and specific green consumption than men (Maineri *et al.*, 1997), it is posited that:

H6. Hong Kong female adolescent consumers would engage in green purchasing behavior more than their male counterparts.

Methodology

Subjects

A total of 6,010 (2,930 males and 3,035 females) adolescents in Hong Kong participated in the present study. The mean age was 14.35 years old with a standard deviation of 3.13 years. Among the participants, 54.6 per cent ($n = 3284$) of them were Grade 7 to 9 students, 35 per cent ($n = 2106$) of them were Grade 10 to 11 students, 9.9 per cent ($n = 597$) of them were Grade 12-13 students, and the remaining 0.4 per cent ($n = 23$) of them were unidentified.

Measures

Five-point Likert type scales were used in all measures. They either ranged from 1 = never to 5 = always; 1 = strongly disagree to 5 = strongly agree or 1 = not at all to 5 = very much.

Environmental attitude was measured using seven items. Subjects were asked to indicate their response to the following statements:

- 1 "It is essential to promote green living in HK";
- 2 "Environmental protection works are simply a waste of money and resources";
- 3 "I strongly agree that more environmental protection works are needed in HK";
- 4 "Environmental protection issues are none of my business";
- 5 "I think environmental protection is meaningless";
- 6 "It is unwise for HK to spend a vast amount of money on promoting environmental protection"; and
- 7 "It is very important to raise environmental awareness among HK people."

Items 2, 4, 5, and 6 were reverse-coded. Reliability of this subscale was 0.87.

Four items were developed to examine participants' degree of environmental concern. They were:

- 1 "Hong Kong's environment is a major concern";
- 2 "I would say I am emotionally involved in environmental protection issues in HK";
- 3 "I am worried about the worsening of the quality of HK's environment"; and
- 4 "I think about how the environmental quality in HK can be improved".

Reliability of this subscale was 0.84.

Five items were developed to examine each participant's degree of perceived seriousness of environmental problems. They were:

- 1 "How serious do you think the environmental problems in HK are?";
- 2 "How urgently, in your opinion, do HK's environmental problems need to be dealt with?";
- 3 "I think HK's environmental problems are worsening";
- 4 "HK's environmental problems are threatening our health"; and
- 5 "HK's environmental problems are threatening the reputation of HK".

Reliability of this subscale was 0.85.

Seven items were developed to examine participants' degree of perceived environmental responsibility. They were:

- 1 "I should be responsible for protecting our environment";
- 2 "Environmental protection is the responsibility of the HK Government, not me";
- 3 "Environmental protection is the responsibility of environmental organizations, not me";
- 4 "Environmental protection starts with me";
- 5 "I have taken responsibility for environmental protection since I was young";
- 6 "How much responsibility do you think you have in protecting the environment in HK?" and
- 7 "How willing are you to take up the responsibility to protect the environment in HK?"

Items 2 and 3 were reverse-coded. Reliability of this subscale was 0.86.

Self-identity in environmental protection was measured using a three-item scale. Participants were asked to indicate their response to the following questions:

- 1 "Supporting environmental protection makes me feel that I'm an environmentally-responsible person";
- 2 "I feel proud of being a green person"; and
- 3 "Supporting environmental protection makes me feel meaningful."

Reliability of this subscale was 0.75.

Six items were developed to examine participants' social context in environmental protection. They responded on:

- 1 how much they learned about environmental issues from their friends;
- 2 how often their friends discussed w environmental issues/products with them;
- 3 how often their friends recommended environmentally-friendly products to them;
- 4 how often they went shopping for green products with their friends; and
- 5 how often they shared with each other about green product experiences and information.

Reliability of this subscale was 0.87.

Green purchase behavior was measured using the following items:

- "I often buy organic products";
- "I often buy products that are labeled as environmentally-safe";
- "I often buy products that are against animal-testing";
- "I often buy products that contain no or fewer chemical ingredients";

- “When I consider buying a product, I will look for a certified environmentally-safe or organic stamp”;
- “I often buy products that support fair community trades”; and
- “I often buy products that use recycled/ recyclable packaging.”

Reliability of this subscale was 0.85.

Procedures

A list containing all secondary schools in Hong Kong was first obtained from the Education Department of Hong Kong. A total of 202 schools were randomly selected from the list. A letter was sent to the principal of each of the school with objectives and procedures of the present study stated. Follow-up calls were then made to invite their participation. A total of 48 schools agreed to participate in the present study. After the parental consent forms were collected from the principals, date and time were then scheduled for the survey. Students were group-administered the questionnaires in one of their classes. The questionnaire took approximate 15 minutes to complete. The questionnaire was originally in Chinese.

Findings

Gender differences in environmental variables

T-tests were conducted to examine whether there were gender differences in environmental variables. Results showed that compared to male adolescent consumers, female adolescent consumers scored significantly higher in environmental attitude, $t(5772) = -9.78, p < 0.001$; environmental concern, $t(5863) = -3.63, p < 0.001$; perceived seriousness of environmental problems, $t(5705) = -5.55, p < 0.001$; perceived environmental responsibility, $t(5963) = -4.84, p < 0.001$; peer influence, $t(5901) = -7.81; p < 0.001$; and green purchasing behavior, $t(5861) = -6.66, p < 0.001$. In contrast, male adolescent consumers reported significantly higher degree of self-identity in environmental protection, $t(5922) = 4.95, p < 0.001$. The descriptive data for male and female adolescent consumers are shown in Table I.

Table I Means and standard deviations of environmental variables for male and female adolescent consumers

Variable	Male		Female	
	M	SD	M	SD
1. Environmental attitude *	3.57	1.07	3.83	0.94
2. Environmental concern *	3.89	0.96	4.10	0.86
3. Perceived seriousness of environmental problems *	3.58	1.07	3.73	0.90
4. Perceived environmental responsibility *	4.12	0.70	4.20	0.65
5. Peer influence *	3.80	0.97	3.99	0.91
6. Self identity in environmental protection *	3.22	1.15	3.08	1.09
7. Green purchasing behavior *	2.10	0.70	2.89	0.64

Note. * indicates significant sex difference, $p < 0.001$

Significant predictors of green purchasing behavior among male adolescent consumers

In order to identify significant predictors of green purchasing behavior among male adolescent consumers, simultaneous multiple regression was conducted. The model containing all six factors was significant, $R^2 = 0.45, F(6, 2905) = 400.45, p < 0.001$. Among the six factors, perceived seriousness of environmental problems was found to be a non-significant predictor of green purchasing behavior among male adolescent consumers ($\beta = -0.02, n.s.$). The predictability of the five variables was in the following descending order: Peer influence ($\beta = 0.28, p < 0.001$), environmental concern ($\beta = 0.27, p < 0.001$), self identity in environmental protection ($\beta = 0.19, p < 0.001$), perceived environmental responsibility ($\beta = 0.12, p < 0.001$), and environmental attitude ($\beta = 0.07, p < 0.001$). Table II presents the result of the simultaneous multiple regression tested among male adolescent consumers.

Significant predictors of green purchasing behavior among female adolescent consumers

Another simultaneous multiple regression was conducted to identify significant predictors of green purchasing behavior among female adolescent consumers. The model containing all six factors was significant, $R^2 = 0.44, F(6, 3016) = 394.87, p < 0.001$. All predictors were significant. The predictability of the six variables was in the following descending order: Peer influence ($\beta = 0.30, p < 0.001$), environmental concern ($\beta = 0.27, p < 0.001$), perceived environmental responsibility ($\beta = 0.17, p < 0.001$), environmental attitude ($\beta = 0.15, p < 0.001$), self identity in environmental protection ($\beta = 0.10, p < 0.001$), and perceived seriousness of environmental problems ($\beta = -0.09, p < 0.001$). Table III presents the result of the simultaneous multiple regression tested among female adolescent consumers.

Discussion

The force of “going-green” is now extending to the Asian regions (Ottman *et al.*, 2006). The present study aimed at providing international green marketers information concerning Hong Kong adolescent consumers' green purchasing behavior. It was found that Hong Kong female adolescent consumers reported significantly higher degree of environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived

Table II Result of the simultaneous multiple regression tested among male adolescent consumers

Variable	β	T
1. Peer influence	0.28	18.20 *
2. Environmental concern	0.27	14.04 *
3. Self identity in environmental protection	0.19	11.12 *
4. Perceived environmental responsibility	0.12	7.81 *
5. Environmental attitude	0.07	4.12 *
6. Perceived seriousness of environmental problems	-0.02	-1.38

Notes: * $p < 0.001$; $F = 400.45$ *; $dfs = 6, 2,905$; $R^2 = 0.45$; adjusted $R^2 = 0.45$; $n = 2,987$

Table III Result of the simultaneous multiple regression tested among female adolescent consumers

Variable	β	T
1. Peer influence	0.30	19.80 *
2. Environmental concern	0.27	14.31 *
3. Perceived environmental responsibility	0.17	9.82 *
4. Environmental attitude	0.15	8.60 *
5. Self identity in environmental protection	0.10	6.80 *
6. Perceived seriousness of environmental problems	-0.09	-5.39 *

Notes: * $p < 0.001$; $F = 394.87$ *; $dfs = 6, 31,016$; $R^2 = 0.44$; adjusted $R^2 = 0.44$; $n = 3,022$

environmental responsibility, peer influence and green purchasing behavior than their male counterparts.

Gender socialization theory posits that behavior is predicted by the process of socialization whereby individuals are shaped by gender expectations within the context of cultural norms (Zelezny *et al.*, 2000). Female children are often socialized to be more expressive, compassionate, nurturing, cooperative, independent and helpful in care-giving roles (Davidson and Freudenburg, 1996). When entering into adolescence, females often start to assume responsibility for housework, child care and family matters (Hochschild, 1989). This is especially true in Chinese family in which daughters are often encouraged to stay indoors and help their mothers with household chores whereas sons are typically encouraged to go out and play with peers (Bond, 1996). This orientation to the private sphere and motherly-role may shape females to become more concerned about environmental threats to health and safety. Moreover, since most environmentally relevant behavior takes place at home (e.g. saving of electricity, recycling etc.), and most of the household purchase is much more often done by females than by males, green purchasing may be a concept more relevant to females than males.

Since females are socialized to value the needs of others more than males, they often possess stronger ethic of care and display more helpful and altruistic behavior (Stern *et al.*, 2005). This other-orientation explains why girls display different patterns in moral development than that of boys in general (Gilligan, 1982): While the male approach to morality is characterized by fairness, individual rights, individual autonomy, conflict of rights, hierarchy, logical and abstract thinking, and perceived danger in connection (a "justice orientation"), the female approach to morality is characterized by care, responsibility, self-in-relationship, hurt-avoidance, lateral networks, and fear of lack of connection (a "responsibility orientation").

With the responsibility orientation in mind, females are likely to engage in the "post-conventional paradigm" – that is, the understanding that a connection, or relations involves two entities (here, human and environment) and that the relationship is harmed if either one is snubbed (Gilligan, 1982). Such paradigm might help facilitate the internalization of environmental values in females (Gilligan, 1982). This internalization of environmental values might, in turn, explain why female adolescents scored significantly higher in environmental attitude, concern, perceived seriousness of environmental problems, perceived environmental responsibility, peer influence and green purchase behavior than male adolescents in Hong Kong.

Male adolescents of Hong Kong scored significantly higher in self-identity in environmental protection. Recently, scholars have found gender difference in identity development through self-defining activities (Sharp *et al.*, 2007). They assume that adolescents' identity discovery and development, as well as intrinsic motivation, are often facilitated in voluntary activities. In a sense, green purchasing behavior is a kind of voluntary consumption activities. Results of the present study showed that green purchasing behavior provides stronger identity experiences and sense of self-worthiness for Hong Kong male adolescent consumers than for their female counterparts. This may imply that while female adolescent consumers' green purchasing behavior is motivated by the intrinsic values in environmental protection, male adolescent consumers might need to be awarded by a sense of "feeling great" about themselves during and after the green purchasing acts.

Multiple regressions showed that the top three predictors of green purchasing behavior among Hong Kong female adolescent consumers were: peer influence, environmental concern and perceived environmental responsibility. The top three predictors of green purchasing behavior among Hong Kong male adolescent consumers were: peer influence, environmental concern and self identity in environmental protection.

First, peer influence was found to be the top predictor of green purchase behavior in both Hong Kong male and female adolescent consumers. This finding further consolidates the important roles of peers in adolescents' development (Brown, 1990). It also suggests that green purchasing recommendations may be most effectively delivered through interpersonal communication/interaction among Hong Kong adolescent consumers.

The strong power of peer influence suggests a possible "group effect" in environmental behavior. That is, adolescents' significant peer network could suggest, cultivate, circulate and reinforce a set of pro-environmental values and behavioral norms. Adolescents observe and follow the norms of environmental behavior in their social circles in order to acquire acceptance by other members. The pressure to follow the behavior of the social circle is particularly strong in adolescents, whereby members have strong desire for social approval and acceptance. This may be particularly the case in the collectivistic Chinese culture, whereby individuals are expected to conform to larger social norms (Hofstede, 1980). If this is true, then green purchasing behavior should carry some social meanings and functions in Hong Kong adolescent consumers.

Environmental concern was found to be the second top predictor of both Hong Kong male and female adolescent consumers. This finding suggests that Hong Kong adolescent consumers' green purchasing behavior is more easily triggered by an emotional appeal than by a rational statement. That is to say, green purchasing behavior necessitates emotional involvement because environmental protection, by its very nature, embeds the ideas of social responsibility, human-nature harmony and love of motherland.

In addition, the characteristics of the adolescent stage should also help explain why emotional concern is one of the most important predictors of green purchasing behavior in this study. Shaffer (1994) suggests that adolescence is a stage particularly susceptible to emotional appeals. In their study, Messerlian *et al.* (2005) found that, in social marketing campaigns for gambling prevention, an emotional appeal that

portrayed the negative consequences associated with a gambling problem was highly endorsed by their adolescent participants. Owens and Nowell (2001) have also found that books with an emotional appeal are particularly effective in facilitating the learning of content among adolescent students. Since the effectiveness of emotional appeals on adolescents is now evidenced, future green marketing messages should be made more emotionally-involving and passion-triggering to young consumers.

Perceived environmental responsibility was the third top predictor of green purchasing behavior among Hong Kong female adolescent consumers. Once again, the present study confirms the postulation that females are more likely than males to take responsibility for ameliorating environmental problems. Zelezny *et al.* (2000) attributed the gender difference in perceived environmental responsibility to the strong ecocentric and relational orientations that have been socialized in females since their childhood. Future green marketing messages to female adolescent consumers should emphasize individual responsibility to protect the environment.

In contrast, self identity constituted the third top predictor of green purchasing behavior among the male adolescent consumers. Keller (1985) describes the male socialization process as a path whereby males learn to acquire a hierarchical and independent social order in order to separate themselves from the world around them. As such, it might be important for male adolescents to establish a clear self identity to symbolize independence and social status. A self identity of being a moral, ideologically-driven, and environmentally-responsible person might appear particularly appealing to male adolescents, who are socialized to desire for social respect and status. Thus, self identity in environmental protection constitutes the third top predictor of green purchase behavior in Hong Kong male adolescent consumers. It should be safe to argue that the male participants in the present study are partially drawn to the extrinsic rewards of green purchasing act.

Conclusions

In view of the dearth of non-Western research on green marketing, this paper examines gender differences in green purchasing behavior among Hong Kong adolescent consumers. Findings imply that the common approach of rational appeals is not sufficient to motivate adolescents to make an environmental purchase.

The present study shows that the key to successful green marketing among adolescents in Hong Kong lies in the effective use of emotional appeals in the marketing messages, peer networking to create word-of-mouth or buzz, and gender-based market segmentation.

Managerial implications

The study shows that adolescents in Hong Kong (especially female adolescents) display quite a promising market opportunity for green products. International green marketers are advised to consider adolescents as one of their potential targeted markets for the following reasons:

- they have purchasing power;
- they have influencing power on their parents' and peers' purchase decision;
- they welcome new and innovative ideas; and
- their anticipated life-span is longer.

All these imply a potentially great marketing value-return in the long-run.

Applying the results of the present study to the practical marketing planning, international green marketers are advised to consider the following points in future green marketing work: First, environmental marketing messages to Hong Kong adolescents should contain more emotional appeal than rational appeal. Messages that entail positive notions that “we could heal the earth”, “we could make a difference to our environment”, “together, we could help save the world”, “the earth needs you”, “there is something we can do”, or “our every effort counts” should also be included. Secondly, green marketers should identify and target at opinion leaders among adolescent peer circles. Buzz marketing campaigns should be directed at encouraging adolescent consumers to spread positive personal testimonies or word-of-mouth of good environmental products to their friends in person or via the Internet. Activities that entail peer-group collaboration and activities to “save the world together” should help facilitate the power of peer networking in circulating positive environmental messages.

The present study also suggests that green marketers need to market their products through gender-based market segmentation. It would be unwise for green marketers to presume that what works best for the female adolescent market also works best for the male adolescent one. As shown in this study, while emphasizing environmental responsibility in the marketing messages might work effectively in female adolescent consumers, it might not equally well in male adolescent consumers. Thus, the importance of a gender-based market segmentation needs to be acknowledged in green marketing.

Since the female participants in this study showed a more readily-favorable cognition, emotion and behavior in environmental protection, international green marketers are advised to first target at Hong Kong female adolescents. These female adolescent consumers, due to their relational and responsibility orientation, are potentially good communal forces for boosting the environmental culture in their social networks in the society. They may also play the role of opinion leaders to influence their male counterparts in environmental protection through interpersonal interaction. Marketing campaigns targeting at Hong Kong female adolescents should trigger their sympathetic emotions and passions, emphasize on individual responsibility to protect the environment, and facilitate their peer networking.

Limitations

As with any study, the methods in the present study imposed limits on the generalizability of the results, each of which suggest areas of future inquiry. First, adolescent consumers are different in many ways from children or adults in other age groups. For instance, adolescents are highly susceptible to emotional appeals. One should be cautious in generalizing the findings of the current study to other age groups or other cultural groups until these findings are replicated. Secondly, all variables were measured self-reportedly. The reliance on self-reported measures may run the risk of social desirability effect. Future study should examine the potential impact of subjects' social desirability bias on their response or include some objective assessments of these variables. Third, the possible cultural influence suggested in this paper was speculation only. To confirm cultural effects on environmental variables, one must include collectivistic and individualistic measures and test their relationships in future studies.

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Further reading

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Executive summary and implications for managers and executives

This summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefits of the material present.

Growing environmental-consciousness among Western societies is slowly beginning to be replicated in Asia. This awareness, together with the fact that economies are booming, has made Asian consumers increasingly attractive to international green marketers.

Hong Kong is plagued with similar problems to other Asian cities and concerns about such as air pollution and poor water quality has made the population more responsive to green marketing appeals. However, international marketers face a struggle to develop effective segmentation strategies in this region because information relating to consumer purchase behavior of green products and services is limited. Where young consumers are concerned, the void is even greater. Kaman points out the significance of this, given the evidence that young people are likelier than older generations to support environmental issues and embrace novel ideas.

Inspiring younger consumers to adopt a positive attitude towards the purchase of eco-friendly products could see marketers rewarded with long-term behavioral commitment of this sizeable population group. Previous research involving younger consumers in the West has revealed gender differences in attitude and action towards environmental issues. As similar research within an Asian context is rare, the aim here is to examine whether these differences exist among Hong Kong adolescents.

Influential factors

Previous research has explored a number of key issues.

Environmental attitude

The extant literature suggests conflicting evidence about the influence of environmental attitude on behavior. Different studies have also found women of all ages in a number of countries to be more positive than men about the environment.

Environmental concern

Research in this area has examined the impact on intention and behavior. One study found a greater willingness to pay the higher costs associated with renewable energy among consumers more concerned about the environment than others. There is also evidence of women being more concerned than men about the environment and that gender difference could begin during primary school. Some theorists

believe that these higher levels of concern among women are the product of a socialization process that nurtures females to be more compassionate and helpful than men. Another notion put forward is that women are more oriented towards environmentally-related values.

Perceived seriousness of environmental problems

Studies to date have largely focused on identifying how different cultures perceive environmental issues and problems. The suggestion is that perceptions of the local environment are more negative among Asians than their Western counterparts. Media representation has been found to influence these perceptions. Limited investigation into the influence of gender has concluded that females express greater concern than males about global warming and other threats to environmental welfare.

Perceived environmental responsibility

Awareness of environmental issues has increased significantly among the population of Hong Kong in recent years. But their sense of personal responsibility remains “generally weak” and they are reluctant to make individual sacrifices. Researchers argue that any sense of individual responsibility is likely to be stronger among women than men and this is supported by limited study. A theory with origins in social psychology posits that altruism and caring for others is more evident in females and perceived environmental responsibility is inspired by these qualities.

Peer influence

Many studies have shown peer influence to be particularly significant among adolescents, in relation to both positive and negative behaviors. Pressures to conform to peer-group expectations impacts on the general purchase behavior of younger consumers. Previous studies have established that females are “more susceptible to conformity pressure” since they place higher value on equality, harmony and connection with others.

Self-identity in environmental protection

The argument here is that individuals regard certain activities as symbolic in that they can shape status or identity, or generate an impression on others. It is suggested that pro-environment behavior meets this criteria as it symbolizes morality and thoughtfulness. Studies have found that self-identity can inspire environmentally-responsible behavior and explains such as intention to recycle. Gender differences in this area have not been explored but earlier research implies that males are more driven to boost status and respect than females.

Green purchasing behavior

Previous investigations have suggested environmental attitude, affect, knowledge and memory to most influence pro-environmental behavior. Research in the West reveals that eco-friendly behavior and green consumption is substantially more evident among women than men but marketers lack corresponding information about adolescents in Hong Kong.

Study and outcome

The current study involved 6,010 Hong Kong adolescents with an average age of 14.35 years old. Just over half were female. A questionnaire was issued to secondary schools and

participants were asked to respond to a series of statements relating to the key factors discussed above.

The findings indicated that:

- 1 females rated significantly higher than males in environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, peer influence and green purchasing behavior;
- 2 males indicated substantially greater levels of self-identity in environmental protection than females;
- 3 the top three predictors of green purchasing behavior among male respondents were peer influence, environmental concern and self-identity; and
- 4 the top three predictors of green purchasing behavior among female respondents were peer influence, environmental concern and perceived environmental responsibility.

Ideas for marketing and further study

According to Kaman, this suggests that:

- recommendations to buy green will prove most effective when they are generated among Hong Kong adolescents themselves;
- environmental attitudes and behavior may be the product of group consensus, which is especially influential within collectivist societies like China;
- given the influence of environmental concern on both genders, emotional rather than rational appeals may inspire green purchasing. The message should assert that the actions of young people can make a difference. Studies in other contexts have shown the effect of using emotional appeals to adolescents;
- messages aimed at female adolescents should focus on accentuating individual responsibility to safeguard the environment; and
- persuading male adolescents to buy green may be successful if they are portrayed as ethical individuals with a propensity towards environmentally-responsible actions.

Study findings reveal Hong Kong adolescents as a viable segment for international green marketers. Such consumers have buying power and possess the ability to influence purchase behavior of parents and peers. Marketing managers should target adolescent opinion leaders and use buzz marketing to encourage positive word-of-mouth (WOM) in relation to environmental products. Kaman urges gender-based segmentation based on awareness that different strategies may be needed for male and female adolescent consumers. Because of their “relational and responsibility orientation”, marketers are advised to target female adolescents first. The rationale is that their influence may help a stronger pro-environment culture to evolve.

The author points out adolescent susceptibility to emotional appeals and the self-reported nature of measures as study limitations. Generalizations should not be drawn without further research that also examines other age groups and cultural types.

(A précis of the article “Gender differences in Hong Kong adolescent consumers’ green purchasing behavior”. Supplied by Marketing Consultants for Emerald.)