analysis green washing and green consumer

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Analysis Of Green-Washing And Green Consumer Using The Rasch Model

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Abstract:

Purpose: As extensive information comes so fast, increasing consumer awareness of greening the environment increases, the issue of environmental damage caused by human waste, natural disasters, and non-renewable natural resources and damage to natural ecosystems make consumers careful in purchasing decisions. This study aims to know which statements describe which indicators in the green-washing and green consumer variables are the least liked or preferred based on the gender of generation Z.

Research Methodology: method of analysis using the Rasch model, a sample of 340 respondents generation Z

Results: item Green consumer (consumers throw garbage in their place, water-saving consumer, consumers like cleanliness). consumers are willing to pay more to get the product labelled eco-product/ go green.

Limitations: This study is limited to explaining the response of generation Z regarding the items contained in the green-washing and green consumer variables

Keywords **green- washing, green consumer, generation Z, green marketing**

JEL Classification: **M31 Marketing**

Introduction

In generation Z, a marketer must be more creative in implementing marketing strategies. Generation Z is very good at using technology and the internet at their fingertips. They get fast and up to date information on anything they want to look for, including searching for information about using a product or exploring a place. Generation Z will look for product information about the product manufacturing process, packaging, benefits, attributes attached to a work. Generation Z will also choose tourist attractions/hospitals/hotels by looking for references via the internet, such as convenience, security, and ease of access. [1], [2]

As extensive information comes so fast, increasing consumer awareness of greening the environment is improving. Environmental damage caused by human waste, natural disasters, non-renewable natural resources, and damage to natural ecosystems makes consumers cautious in purchasing decisions. Increasing public concern for the environment encourages them to become environmentally responsible consumers and switch to

[1] Institutional postal address (Typeset in Arial Narrow, 10 pt, justify, Indentation 1 cm, line space Single).

using environmentally-based products [3]; greening the future climate can create a sustainable life future generations. [4]

Companies compete for the green consumer market segment. Green Consumer for the environment is a term for increasing consumer awareness of environmental problems, so that in choosing, using, recommending and purchasing a product, starting from packaging, manufacturing processes, perceived benefits or service products such as hotels, hospitals, tourist attractions and so on. Green companies usually have a go green logo and a positioning to place a good impression on the minds of consumers. A green marketing strategy is applied to answer challenges about environmental issues that occur today. Green Marketing (environmentally friendly marketing) can be concluded that marketers' efforts to design, promote, determine prices, and distribute products with attention to environmental sustainability and green in the long term [5][6] Products in the green marketing strategy are hereinafter referred to as eco-products, organic products, products that are easily recycled by marking the degree of ease with which the product decomposes (marked with a triangle or number symbol), non-toxic products (do not damage the ecosystem), water-saving products, energy saving, gasoline saving products, green-labelled products. [7]

In Indonesia, for skincare and cosmetic products that are successful in the environmentally friendly market segment is The Body Shop as the market leader for the go green cosmetic brand. This company claims that their products do not use animals as experimental materials. For babies and toddlers' needs, baby diaper products that carry Go green Merries, produced by Kao, claim that the remaining used baby diapers will be recycled into other household items so that they don't damage the environment. A supplier of environmentally friendly food and beverage packaging specifically for the Bali area, Affinity Supply Co., claims that the products produced are readily biodegradable by nature. This company collaborates with restaurants and hotels. Suzuki car company participates in Corporate Social Responsibility regarding fuel-efficient cars and developing Smart Hybrid Vehicle by Suzuki technology as a bridge to electric vehicles. Other competing companies then follow them. The green consumer segment is willing to pay a premium price to get products labelled as environmentally friendly or use ecologically friendly service products to create a sense of security and satisfaction.

However, not all products that use a green marketing strategy are environmentally friendly. The company commits unethical acts by committing fraud in marketing communications, from now on known as green-washing. Several previous research findings stated that if green-washing increases, the product's increased risk perception can reduce the level of consumer satisfaction with the product [8]. Marketing communications that are not accompanied by good company performance with attention to greening the environment make the company impression that it will be worse than no advertising about going green [9]

Products labelled as environmentally friendly must pass the AMDAL (Environmental Impact Analysis) process and be issued a go green (environmentally friendly), eco-label, eco-product certification. Products labelled as eco-friendly may also require several trials before they are declared eligible. However, not many consumers understand this certification process. Consumers believe more through advertising (green advertising) that is carried than to study in-depth. [10]

Several studies have shown that green marketing positively affects purchasing decision behaviour and purchase intention [1], [11], [12]. Research on green advertising as part of green marketing affects the right brand image about the product and company[9], [10], [13]. However, previous studies have not discussed in-depth the statement items that describe which indicators in the green-washing and green consumer variables are the least liked or preferred based on the gender of generation Z.

1. Literature Review

The notion of environmental marketing science, starting with Leigh et al. in 1988, ecological product positioning research should be an essential consideration in consumer marketing. This research also dealt with an extensive theory of consumer behaviour Ajzen in 1980. [14]

Green Marketing

Green marketing (green marketing) as a strategic effort to create a business based on environment and health has been known in the late 1980s and early 1990s. Green marketing appears as public awareness of a healthy and safe environment from sustainable environmental damage in the future. There are several definitions of green marketing based on previous research including: marketers carry out marketing strategy efforts by raising ecological issues in increasing the existence of enviro-labels (environmentally friendly labels) and ensuring the presence of eco-products [5]; Green marketing is defined as "the efforts of a company to design, promote, price, and distribute products in a way that promotes environmental protection."[6]; Green marketing is a concept that describes the implementation of a marketing program aimed at environmentally conscious market segments [15]; Do Paco et al said that as a corporate social responsibility, green marketing refers to "a holistic management process that is responsible for identifying, anticipating and satisfying the needs of customers and society, in a profitable and sustainable manner" [4]; Green Marketing is a marketing process that has all the capabilities to increase the economic sense of a business without noticeably increasing its brand image as green. Apart from being a visual recognition, a brand is also related to consumers' intuitive feelings about a service or product [16]; Welford defines green marketing as a management process that is responsible for identifying, anticipating and meeting customer and community requirements in a profitable and sustainable manner [17]; Green marketing is an approach that shows signs of shifting consumer attention to environmentally friendly products [18]. From some of these definitions regarding Green Marketing (environmentally friendly marketing), it can be concluded that the efforts of marketers to design, promote, determine prices, and distribute products by paying attention to sustainability and greening the environment in the long term.

The green marketing indicators consist of:

1) green product

Entrepreneurs wishing to use the green marketing concept came up with:

a. Identify the customer's environmental needs and develop products to address those needs.
b. Developing environmentally responsible products
c. has a lower impact on the environment from its competitors.

Various products on the market support green marketing, including:

a) Products are made from recycled materials.
b) Products that can be recycled or reused.
c) Efficient products that save water, energy or gasoline, save money, and reduce the environment's impact.
d) Products with environmentally friendly packaging.
e) Products with a green label.
f) Organic products.
g) A service that provides rental or loan services.
h) A product certificate that meets or ensures that the product meets or exceeds the criteria for being environmentally responsible.

2) green price

Price is an essential element of the marketing mix; most customers are prepared to pay more if there is a perceived value of the additional product. This value can enhance performance, function, design, visual appeal, or taste. Environmental benefits are usually a bonus but will often be the determining factor between the product's value and its quality with that of competitors. Most of the green products' prices require extra costs incurred by consumers as a form of quality and environmentally friendly products.

3) green place

Choose where and when to make the product, have a significant impact on customers to become interested. Only a few customers are interested in purchasing green products. The location must also match the image that the company wants. The company's area must differentiate the company from competing companies; this can be done by in-store promotions and visually appealing displays or using recycled materials to emphasize environmental and other benefits.

4) green promotion
Promote products and services to target markets, including advertising, public relations, sales promotion, direct marketing, and on-site promotion. Smart green marketers will strengthen environmental credibility by using sustainable marketing and communication tools and practices. The key to the success of green marketing is credibility.

Greenwashing

Contrary to green marketing. The term green-washing is used for companies or marketers who use the concept of environmentally friendly marketing but do not use the actual benefits ethically. Some definitions of green-washing are as follows: Green-washing is a marketing communication that raises environmental, social issues, but in fact, the products offered are not environmentally friendly [19]; Green-washing is a term for advertising and labeling that promises more environmental benefits than it produces but is still dubious [20]; Green-washing, also known as eco-whitening, white-wash, eco-wash, eco-bleaching, green sheen or green image washing, is a form of advertising where green marketing is not practised [21]; Green-washing is defined as intentionally misleading or deceiving consumers with false claims about the company's environmental impact and practices (Nyilasy, Gangadharbatla, and Paladino 2014); Green-washing is a company that knowingly misleads or defrauds customers with false claims about their actions and environmental impacts to improve public reputation or further build a favourable public image [22]

Furthermore, Zhang et al. developed five indicators to measure the perception of green-washing from a consumer perspective, namely: (1) product is misleading with words about its environmental features (2) misleading products with visuals or graphics regarding environmental features; (3) work is associated with vague or seemingly unprovable green claims; (4) the product exaggerates or exaggerates what green does; (5) products leave out or cover up important information, making green claims sound better than that.

Meanwhile, according to previous research (Nyilasy, Gangadharbatla, and Paladino 2014), green-washing is a consumer reaction to a situation where green advertising messages and real corporate social responsibility (CSR) interact. Thus the green-washing indicator can be divided into 2: green advertising (communication and environmental performance) and Corporate Social Responsibility (CSR).

To value thousands of products in the United States and Canada, TerraChoice Environmental Marketing categorized marketing claims into the "seven sins of green-washing" [20]: The sin of hidden trade-offs: made by suggesting a product is "green" based on a narrow set of attributes that makes no sense without paying attention to other critical environmental concerns (e.g., paper produced from sustainably harvested forests may still generate energy and costs significant pollution). Sin without evidence: committed by ecological claims that cannot be substantiated by easily accessible supporting information or by reliable third-party certification (e.g., paper products claiming varying percentages of post-consumer recycled content without proof). The sin of obscurity: committed by any claim that is so poorly defined or broad that its real meaning is likely to be misunderstood by consumers (e.g., "Natural"). Irrelevant sin: committed by making environmental claims that may be true but insignificant or unhelpful to consumers looking for environmentally friendly products (e.g., "CFC free" is meaningless given that chlorofluorocarbons are banned by law). Sins less than two crimes: committed by claims that may be true in the product category, but the risk of distracting consumers from health or environmental impacts is greater than the type as a whole (e.g., organic cigarettes). The sin of fibbing: committed by filing a completely false environmental claim (e.g., a product falsely claiming to be Energy Star certified). The sin of fake labelling: committed by exploiting consumer demand for third party certification with counterfeit labels or third party support claims (e.g., images such as certification with green jargon such as "environmentally friendly")

Green Consumer

Green Consumer or consumer care for the environment is a term for increasing consumer awareness of environmental problems, so that in choosing, using, recommending and purchasing a product, starting from packaging, manufacturing processes, perceived benefits or service products such as hotels, hospitals, tourist attractions and later. Several definitions of the green consumer have been widely discussed in previous studies including Environmentally friendly consumers are consumers who prefer products that are less likely to endanger human health or damage the environment [23]; Green Consumer is Consumers increasingly aware of pressing environmental problems in a fast-growing global economy (Lai and Cheng 2016); Green Consumer is a consumer who is mindful of the responsibility for environmental protection and environmental regulations [24]

The three distinctive statements of green consumers are, first, "I identify myself as someone who cares about 'green/environmental issues,' second, "I purchase and consume green products," and third, "I consider my lifestyle to be' green. " [23]

Previous Research

Overall, green marketing and consumerism are still relatively young, and research on the topic of green marketing in China is even more emerging. The study focuses only on green issues in China. This research on green marketing has proposed "4Rs" (Transfer of customer needs, Reconsumption, Reorientation of the marketing mix, Reorganization); However, minimal research has been conducted focusing on China using the 4R perspective. (Zhu and Sarkis 2016) Green marketing research in Hong Kong uses a measurement tool for consumer perceptions, attitudes, problems, responsibilities, expectations, and habits. To further convince consumers to consume green products, packaging and advertising strategies should emphasize individuals' positive effects on specific environmental issues if green products are purchased to change consumers' attitudes and feelings of responsibility towards the environment. [25]

Previous research also studied several cooperative contracts in green product supply chains and investigated their environmental performance. This problem is analyzed and modelled in three agreements to increase cooperation: price only, green marketing cost-sharing, and two-part tariff contract. The analysis results show that collaboration among partners can help supply chains achieve environmental improvements. [26]

Another research finding, energy provider communication, appears to be in line with academic research on potential customer benefits (practical benefits, "warm light," natural experiences). However, detailed information about the impact of consumer decisions can improve communication. Besides, providers can increase their visual messages' effectiveness by using more images related to renewable energy. [27]. Christian Fuentes stated that green products marketed not only through practice, but they are also sold as enabling practitioners, that is, tools in the fulfilment of ways that are problematic to the environment [28].

Pires et al. stated that green-washing confuses and influences consumers' trust in green products in retail. After implementing the system, it is concluded that the results are feasible. Using fuzzy logic can help analyze and determine consumer satisfaction levels and help companies make future estimates of consumer behaviour from green products [21]. Other research shows that today, consumers purchase green products based on organizations' green claims, where many consumers remain confused and unsure about their authenticity. The aftereffect is when consumers become aware of the existence of green-washing points towards distrust, more prudent purchasing behaviour in the future, and spread their presence to other consumers through word of mouth [19]

Nyilasy et al.'s research show that the negative effect of low firm performance on brand attitude is more substantial in the presence of green advertising compared to general company advertising and

no advertising. Furthermore, when the company's environmental performance is high, both green advertising and public company produce a more unfavourable brand attitude than no advertising. (Nyilasy, Gangadharbatla, and Paladino 2014)

Ecolabel has emerged as one of the main tools of green marketing. Green marketing can learn from conventional marketing in finding ways other than labeling to promote eco-friendly products. Examples include addressing a wider range of consumers, working with positioning, pricing and promotion strategies and being actively involved in market creation. [29]. Komitmen sumber daya yang tepat sangat penting untuk keberhasilan setiap inisiatif hijau. Studi ini juga mendukung gagasan bahwa menjadi perusahaan pertama dalam industri yang memulai program hijau memberikan sedikit manfaat nyata.(Richey et al. 2014)

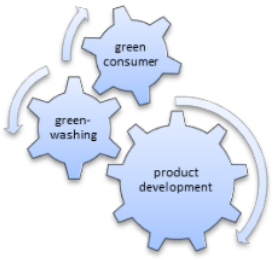
Substantive actions on environmental issues (green roads) do not harm or benefit the company financially, but symbolic actions (green talk) are negatively related to financial performance. Green-washing (the difference between green talk and green walk) harms financial performance, and green-highlighting (the concentrated effort of dialogue and hike) does not affect economic performance [13]

Increasing awareness about various environmental issues has led to a shift in the way consumers live people's lives. There has been a change in consumer attitudes towards a green lifestyle. People are actively trying to reduce their impact on the environment. However, it is not widespread and is still developing. This study introduces green marketing and looks into the various ways in which different consumer attributes are related to the idea of green marketing [18]. Eco-labelling in the food industry is focused solely on promoting organic farming, limiting the scope to the agricultural stage of the supply chain. Carbon labelling informs about the carbon footprint over the product life cycle. [30]

Ad design with self-referencing and strong arguments has the best advertising effect; positive moral emotions and social emotions have a better advertising effect, and under the action of emotion, subject preferences for ad design will also change. This research is useful for constructing and optimizing green advertising designs to understand the relationship between the factors that influence the advertising effect and green marketing benefits. [31]. Consumers develop positive green marketing awareness based on evolving environmental knowledge. They become aware of a retail store's eco-marketing program when they notice that the store allocates a particular space to sell eco-friendly products. [32]

From the literature review and previous research, the conceptual framework in this study is

Figure 1 Conceptual Framework



2. Methodology

The population of generation Z in South Sumatra, the sample uses the Lemeshow formula, with a selection of 340 respondents. This research is quantitative research. Rasch modelling was initially being used in education to determine individual academic abilities. Over time this modelling was applied in other fields of science. The data were collected through a questionnaire, and then the data was tabulated with Microsoft Excel software. The SPSS tool is used to describe the profile of respondents with frequency analysis. Then the data were analyzed using the Rasch model assisted by Winstep

software. The Rasch model converts the item scores measured on a Likert rating scale (which are ordinal data) into interval scales called "logarithmic probability units" (logits). Cronbach's α coefficient is used as an index of internal consistency of reliability: if the value is close to 1, it indicates that the internal measurement's surface is good. The validity level of the response on the item based on the amount of Outfit Mean Square (MNSQ) received was 0.5 <MNSQ <1.5, the Outfit Z-Standard (ZSTD) conformity of the received value of the z test -2.0 <ZSTD <+2.0, and Point Measure Correlation (Pt Mean Corr) 0.4 <Pt Mean Corr <0.85. If the instrument items' items meet at least one of the above criteria, the instrument item is suitable for use. The validity test concludes that all green-washing and green consumer items have statistical fit measures so that the instrument can be used for research. Rasch modelling overcomes data integrability by accommodating logit transformations by applying logarithms to the odds ratio of the respondents' raw data. This study's univariate analysis shows statement items that describe which indicators in the green-washing and green consumer variables are the least liked or preferred based on the gender of generation Z seen from the Wright map items' distribution people (characteristics) generated from the Rasch Modeling. (Nguyen and Ng 2014; Sari et al. 2016; Setiawan, Panduwangi, and Sumintono 2018)

3. Case studies

The questionnaire was distributed online so that the generation Z category respondents born from 1995 to 2010 exceeded the target, namely 340 respondents. Respondent profiles are described in the following table

Table: 1 Respondent Profil

Information	Frequent	Persentase
Sex		
Male	119	35
Female	221	65
Statue		
Single	340	100
Job		
College Student	338	94,2
Student	2	0,6
Age		
Under 25 years	340	100
Monthly expenses		
1-2 million rupiah	94	27,6
2-5 million rupiah	12	3,5
5-10 million rupiah	1	0,3
Under 1 million rupiah	233	68,5

primary data processed (2020)

Table 1 explains that most respondents are women under 25 years of age and 221 respondents or 65 percent of the total sample. These female respondents are students, with the most monthly expenses spending below 1 million rupiahs 156 respondents or 70 percent of the total female respondents. Furthermore, 26 percent (58 respondents) of female respondents spent around 1-2 million each month. 2 percent (6 respondents) spent approximately 2-5 million. Only one female respondent stated that she spent more than 5 million rupiahs.

As many as 117 male respondents (98 percent) were college students, 2 percent were students. Seventy-seven respondents or 65 percent of male respondents spent less than 1 million rupiahs per month, 36 respondents or 30 percent of male respondents spent around 1-2 million rupiahs per month, 6 (5 percent) male respondents men spend approximately 2-5 million rupiahs. It can be concluded that male respondents with the status of students spend the most money under 1 million rupiah per month.

The respondents' knowledge of eco-green product brands as a whole is quite diverse. On average, stainless steel or bamboo materials tend not to be branded or branded, but respondents cannot clearly remember the brand. Respondents know that this straw made of stainless steel or bamboo has replaced the plastic straw that has been used to anticipate future build-up of garbage. See Figure 2.

Figure 2. Environmental friendly straw products (source from the internet)

Source: shopee.co.id

Validity and Reliability Test

Data analysis using the Rasch model tends to deepen each item statement in a questionnaire. Here's about the validity test:

The level of validity of the response on items based on the value of Outfit Mean Square (MNSQ) received was 0.5 <MNSQ <1.5, the Outfit Z-Standard (ZSTD) conformity of the received value of the z test -2.0 <ZSTD <+2.0, and Point Measure Correlation (Pt Mean Corr) 0.4 <Pt Mean Corr <0.85. From table 2 Item Statistics MisFit Order regarding the validity test, it can be concluded that the questionnaire used is valid.

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Table 2 Item Statistics Misfit Order

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PTMEASUR-AL CORR.	PTMEASUR-AL EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Item
23	1056	340	.48	.06	1.55	6.56	1.55	6.60	A .14	.41	32.8	41.8	gc14
21	1059	340	.47	.06	1.48	5.86	1.48	5.91	B .21	.41	36.1	41.4	gc12
22	1392	340	-.72	.07	1.28	3.64	1.31	3.76	C .28	.33	32.8	38.6	gc13
16	1559	340	-1.62	.09	1.23	2.24	1.22	1.91	D .27	.24	64.2	60.9	gc7
18	1048	340	.51	.06	1.23	2.97	1.22	2.94	E .38	.42	35.8	41.8	gc9
20	1083	340	.39	.06	1.20	2.59	1.21	2.78	F .36	.41	38.5	41.3	gc11
12	1548	340	-1.54	.08	1.14	1.49	1.08	.79	G .29	.25	61.8	56.9	gc3
3	1057	340	.48	.06	1.10	1.33	1.10	1.40	H .45	.41	34.0	41.8	gw3
8	1230	340	-.11	.06	1.09	1.23	1.08	1.15	I .38	.38	34.6	39.0	gw8
13	1187	340	.04	.06	1.07	1.02	1.09	1.21	J .35	.39	39.3	40.2	gc4
4	1067	340	.44	.06	1.00	.08	1.00	.02	K .49	.41	42.0	41.5	gw4
11	1218	340	-.06	.06	.98	-.26	1.00	-.04	L .36	.38	42.6	39.5	gc2
15	1143	340	.19	.06	.98	-.30	.99	-.16	k .38	.40	44.7	40.7	gc6
14	1592	340	-1.90	.10	.97	-.20	.84	-1.37	j .31	.21	72.2	70.6	gc5
5	1095	340	.35	.06	.87	-1.88	.87	-1.85	i .49	.41	42.6	41.1	gw5
9	1099	340	.34	.06	.86	-1.97	.87	-1.82	h .47	.41	44.4	41.1	gw9
2	983	340	.72	.06	.83	-2.58	.83	-2.56	g .47	.43	44.1	41.2	gw2
6	1184	340	.05	.06	.80	-3.02	.79	-3.10	f .49	.39	45.9	40.2	gw6
10	1228	340	-.10	.06	.79	-3.20	.80	-3.01	e .38	.38	45.3	39.0	gc1
1	1019	340	.60	.06	.79	-3.19	.79	-3.15	d .48	.42	47.9	41.6	gw1
17	1085	340	.39	.06	.75	-3.85	.75	-3.84	c .44	.41	48.2	41.3	gc8
19	1168	340	.11	.06	.69	-4.89	.70	-4.78	b .45	.39	49.7	40.5	gc10
7	1055	340	.48	.06	.62	-6.04	.63	-6.00	a .54	.41	52.7	41.8	gw7
MEAN	1180.7	340.0	.00	.06	1.01	-.1	1.01	-.1			44.9	43.7	
P.SD	173.1	.0	.72	.01	.24	3.2	.24	3.2			9.9	7.8	

Primary data processed (2020)

Reliability test to measure overall that the questionnaire is suitable for use, it is known that the alpha value is more than 0.6 <0.99 so that it can be concluded that the questionnaire is ideal for use, see table 3 :

Table 3 Reliability Test

Person	340 INPUT	340 MEASURED		INFIT		OUTFIT	
	TOTAL	COUNT	MEASURE	REALSE	IMNSQ	ZSTD	OMNSQ	ZSTD
MEAN	79.9	23.0	56.23	2.65	1.01	-.2	1.01	-.2
P.SD	9.4	.0	6.34	1.28	.60	2.0	.59	1.9
REAL RMSE	2.94	TRUE SD	5.62	SEPARATION	1.91	Person RELIABILITY		.79
Item	23 INPUT	23 MEASURED		INFIT		OUTFIT	
	TOTAL	COUNT	MEASURE	REALSE	IMNSQ	ZSTD	OMNSQ	ZSTD
MEAN	1180.7	340.0	50.00	.65	1.01	-.1	1.01	-.1
P.SD	173.1	.0	7.23	.12	.24	3.2	.24	3.2
REAL RMSE	.66	TRUE SD	7.20	SEPARATION	10.83	Item RELIABILITY		.99

Primary data processed (2020)

Wright Map Analysis

Table 4 classified the items according to the item logit scores (shown in Figure 3). The classification of items into six strata is done by dividing the items' logit score into six equal parts. Specifically, the stratification process uses percentile values of 16.67, 33.33, 50, 66.6, 7, and 83.33, respectively. Figure 3 is an item-person map. The left-hand side shows the respondents' distribution according to their logit scores, from the person who disagreed the most (logit score ¼ - 3.63) to the person who most agreed (logit score + 3.44). On the right side of the map is displayed the difficulty level of each item, ranging from the easiest to agree on (logit score¼ - 1.12 for Gc5 items) to the most difficult to agree on (logit score¼ + 0.72 from item gw2). These items function well and can separate each respondent, meaning that they have good discriminatory power.

Table 4 Classification of Items following the Respondent Item Logit Score

Category	Criteria	Item
More difficult to be considered		
Difficult strata 1	Logit Value ⩾0.7249	Gw 2 (visually misleading) LV 0.72
Difficult strata II	0.7249 >LV ⩾0.4234	Gw 1 (misleading words) LV 0,60 Gc 9 (prefer to take transportation) LV 0,51 Gw7 (there is no CSR) LV=0,48 Gc 14 (consumers like to purchase bottled water) LV=0,48 Gw3 (the green claim is not clear) LV=0,48 Gc12 (consumers are willing to purchase plastic bags) LV=0,47 Gw4 (exaggerate product functionality) LV=0,44
Difficult strata III	0.4234 > LV⩾0.0100	Gc11 (consumers bring their own grocery bags) LV = 0,39 Gc 8 (consumers know the green product certificate) LV = 0,39 Gw 5 (cover important information) LV =0,35 Gw 9 (green claims do not match performance) LV = 0,34 Gc 6 (consumers like to recycle unused objects) LV =0,19 Gc10 (loyal consumers with green products) LV=0,11 Gw 6 (product green certificate is uncertain) LV=0,05 Gc4 (consumers pay attention to the green label) LV=0,04
More comfortable to be agreed or considered		
Difficulty Strata IV	0.0100 > LV ⩾ −0.2934	Gc2(consumers are willing to pay more) LV = -0.06 Gc1 (consumers purchase green products) LV = -0.10

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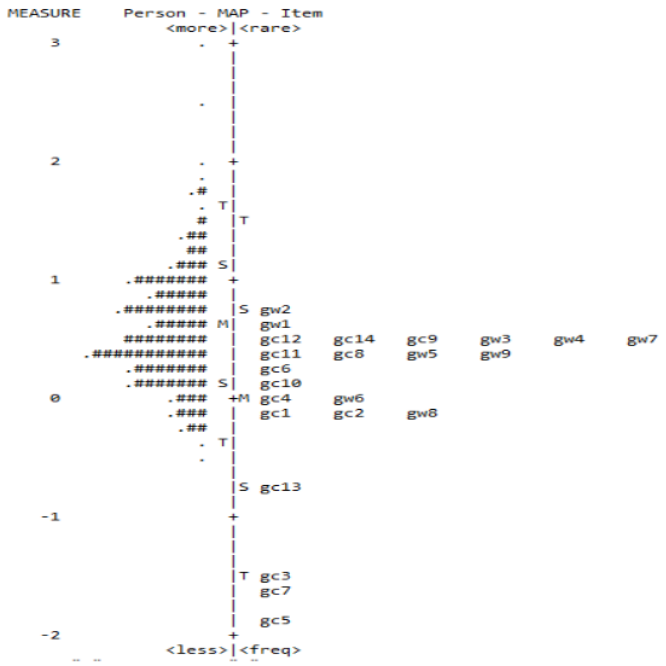
Category	Criteria	Item
		GW8 (consumers are less aware of green products) LV = -0.72
Difficulty Strata V	−0.2934 > LVI ⩾ −0.7966	Gc 13 (using own bottle of water) LV = -0,72
Difficulty Strata VI	LVI < −0.7966	Gc 3 (consumers throw garbage in their place) LV = 0.72 Gc7 (water saving consumer) LV = -1.62 Gc5 (consumers like cleanliness) LV = -1.90

Primary data processed (2020)

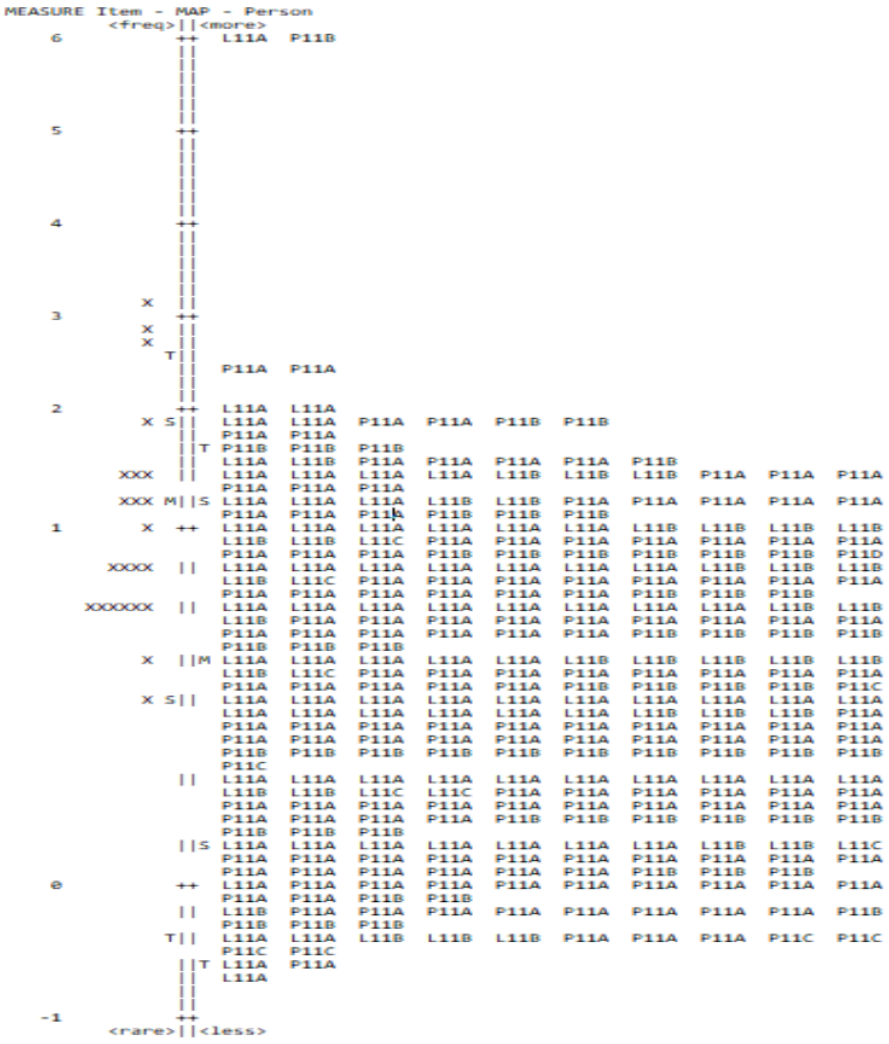
Figure 3 Variable Maps



The three separate groups of respondents are as follows (see figure 4): there are 163 people (47 percent) who are very easy to consider; 158 people (47 percent) thought it was enough; and 19 people (6 percent) who are very difficult to consider nine green-washing items and fourteen green consumer items. From the right side of the item-person map, it can be seen that Gc 3 (consumers throw garbage in their place) LV = 0.72, Gc7 (consumers save water) LV = -1.62, Gc5 (consumers like cleanliness) LV = -1.90 are items that are highly liked or considered by the majority of respondents in describing themselves as green consumers. Green-washing item Gw 2 (misleading product with visual or graphic about its environmental features) LV = 0.72, considered as the most

difficult item to like in the green-washing variable, the second item that is difficult to like is Gw misleading) LV 0.60, Gw7 (no CSR) LV = 0.48, Gw3 (unclear green claim) LV = 0.48, Gw4 (exaggerate product functionality) LV = 0.44.

Figure 4 item map person



Items from the green consumer variable that are least preferred start in the second-order, namely Gc 9 (prefer to take transportation) LV 0.51, Gc 14 (consumers like to purchase bottled water) LV = 0.48, Gc12 (consumers are willing to purchase plastic bags) LV = 0.47. These items are considered not reflecting the identification of a consumer liking a green-labelled product.

Items from green-washing that are considered preferred and easy to answer by consumers are in the fourth difficulty order; namely, G.W. 8 (consumers do not know green products) LV = -0.72 GW 8 (Consumers do not know products labelled green / go green) LV = -0.72. Thus, it is necessary to increase green marketing communication to know about products labelled green / go green.

In Figure 5 and figure 6, we can see that male respondents, who are students, are not married and spend an average of less than 1 million per month. They most agree in considering the nine items of green-washing and

fourteen items of green consumer. In contrast, female respondents, with the status of a student, unmarried and spending an average of 1-2 million rupiahs per month were respondents who most agreed in considering the nine items of green-washing and fourteen items of green consumer. Thus it is easier for women to spend their money purchasing go green products/products labelled green with considerations of more expenditure.

DIF (Differential Item Functioning)

The detection of bias on items in the Rasch model analysis is shown on the DIF . DIF is necessary to determine whether the items provided tend in confident respondents' categories. Figure 5 shows the types of respondents based on gender. Male respondents from 22 question items 9 question items did not contain bias. In comparison, the value of 13 items below 0.05 meant that they had a bias, female respondents from 22 question items only 6 items that did not contain bias, while 16 question items contained bias. It can be concluded that the response of men is different from that of women. Male respondents found it more difficult to answer questions than female respondents.

Figure 5 Person DIF Plot (Gender)

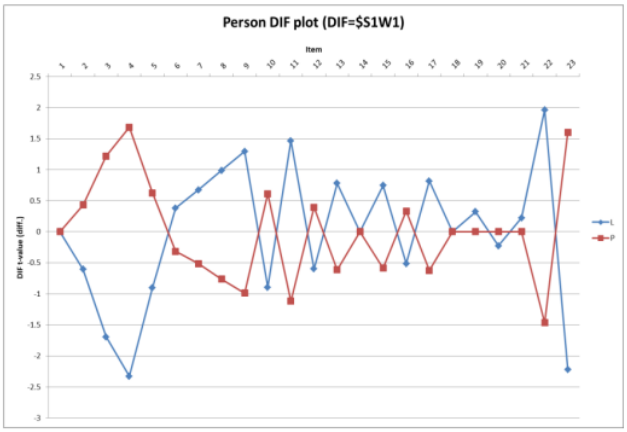
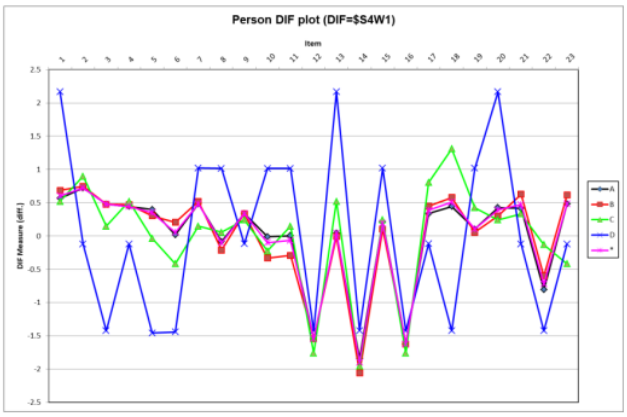


Figure 6 shows the categories of respondents based on expenses. Respondents with expenditures below 1 million from 22 question items 9 question items did not contain bias, while the value of 13 items below 0.05 meant that they contained bias, respondents with expenditures of 1-2 million from 22 question items only 8 items that did not contain bias, while 13 question items biased. Respondents with spending 2-5 million from 22 question items, only six items that have no preference, while 16 question items contain bias. Respondents with spending 5-10 million from 22 items of question 9 items that contain no bias, while 13 items have a bias. It can be concluded that respondents with expenditures under 1 million and respondents with 5-10 million expenses were more comfortable to answer questions than other expenditure classifications.

Figure 6 Person DIF Plot (Expense)



Are consumers willing to pay more for products labelled Go Green?

Based on the frequency analysis, the average value of respondents answering questions is on a scale of 4, which means that the respondent agrees to pay more for products labelled Go Green. They believe by purchasing environmentally friendly products, and they can contribute to saving the environment. Based on gender, we know that 65 percent of female respondents in generation Z are more willing to pay more than male respondents.

Based on the analysis of the Rasch model on the statement item, consumers are willing to pay more for products labelled go green. We know that this item's total score is 1218, with 340 respondents who answered that the measured value is -0.06 with the S.E model 0.6. Infit MNSQ 0.98 and ZSTD -0.26. MNSQ Outfit 0.98 and ZSTD -0.20. PT Measure Correlation 0.36 and EXP 0.38. Statistically, this statement item is valid. This item is classified as Easier to be agreed upon or considered.

Discussion

Generation Z considers statement items classified as green-washing challenging to answer because they do not believe that companies carry an environmentally friendly label but do not carry out environmentally friendly activities. The statement is consistent with the research of Pires et al. Stated that green-washing is confusing and influences consumers' trust in green products in retail. The result of the variable mapping, all items of green-washing statements, are in the stratum of problematic statements. According to the Walker research, green-washing harms financial performance [13]. For green consumers, even though some companies have a go green logo or promote environmentally friendly good corporate advertising, the company does a little environmental damage but continues to improve the company's performance in anticipating environmental damage, greenhouse effect, waste disposal by trying to innovate on performance and products that are guaranteed to be environmentally friendly, because the company realizes that green-washing can cause losses in the future. Consumers appreciate this transitional change process.

Visual items and misleading wording in company advertising use green advertising, but the company has not entirely looked after the environment are the most difficult items consumers dislike and are challenging to answer. Consumers do not think the company is lying. They believe there is a process towards better protecting the environment and the earth. Consumers perceive companies that do green advertising better than none at all. The statement is following Nyilasi's research. [9]. However, the results of this study were different from Dahl's [20]. Green consumers do not doubt companies that carry environmentally friendly or products labelled go green. They trust the company.

Green consumers protect the environment by not littering, and consumers save on water and energy, consumers who bring their drinking bottles that can be used more than once, so they don't use disposable drinking water bottles, and consumers who like to clean the environment. Consumer awareness of the

environment encourages companies both in industry and tourism to carry out green practices in a sustainable manner. Environmentally friendly labelling activities can be focused primarily on the organic food industry, organic cosmetic products, or agricultural ingredients. It is not surprising that currently, there are technological developments related to this environmentally friendly concept, exceptionally clean and recycled water. Consumers are also willing to pay more for products labelled go green [28], [33]

Conclusion

From the section above, we can conclude that the most preferred statement items are the statement items that describe the green consumer variable. Thus, it is necessary to increase green marketing communication to know about products labelled green / go green. Consumers are also willing to pay more for products labelled go green. The statement is an advantage for the company in increasing profits and maintaining customer loyalty. Companies need to raise awareness of environmental sustainability and the use of technology aimed at environmental preservation.

Limitation And Study Forward

This study is limited to explaining generation Z's response regarding the items contained in the green-washing and green consumer variables. Future research is expected to use respondents with different categories to find out more about consumer behaviour towards green products and responses to companies that use green labels.

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