

Article

Which Consumer Associations Can Build a Sustainable Fashion Brand Image? Evidence from Fast Fashion Brands

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Abstract: Since fast fashion is often considered the opposite of sustainable fashion, this study was conducted to clarify the consumer brand associations with sustainable fashion by analyzing three fast fashion brands. Our research included two studies. First, we conducted in-depth interviews with 20 female consumers in Korea who had purchase experience with the sustainable fashion of three selected brands, H&M, Zara, and Uniqlo, to identify sustainable keyword associations. We then structured the keyword data using network analysis. The keyword associations for the three brands resulted in a network of 60 nodes and 629 links with the term “eco-friendly” as the most meaningful keyword. Second, we surveyed 200 women and quantitatively confirmed the association of “eco-friendly fabric” among the keywords suggestive of “eco-friendly” as the most important factor in building a sustainable fashion brand image. In addition, keywords, such as “marketing” and “campaign”, were ranked in the top ten in H&M and Zara, which may imply the opportunistic use of greenwash. This study contributes to the literature by applying in-depth analysis of consumer associations of fast fashion brands from a sustainability perspective through network analysis. We expect our findings to help fashion companies strategically build a sustainable fashion brand image.

Keywords: sustainable fashion; fast fashion; brand association; network analysis; sustainable fashion brand image; eco-friendly

1. Introduction

Forbes announced “responsible consumerism” as one of six global consumer trends in 2019 [1]. Responsible consumerism represents the trend of consumers who are interested in brands or companies that can help them make more responsible choices [1]. This reflects a shift in overall consumption consciousness and consumption patterns to sustainable consumption. Consequently, such consumption changes are increasing interest in sustainability in many areas including the fashion industry. For this study, sustainability, which is growing in importance in the fashion industry [2], is defined as a business goal that facilitates positive environmental, social, and economic impacts.

To address changing consumer consciousness and the growing interest in sustainable fashion, designers and fashion companies, such as Stella McCartney and Nike, have been introducing environmentally sustainable fashion items. In a broader vein, at the recently held UN Climate Change Conference (COP25), fashion stakeholders (companies and designers) established a Fashion Industry Charter for Climate Action (Ficca). This new Charter includes the goal of reaching a carbon neutral economy by 2050 and reducing emissions by 30% by 2030, thereby leading sustainable activities [3].

The fashion industry has received considerable attention in terms of energy and waste reduction. In particular fast fashion brands are confronting environmental problems from production to inventory

processing [4]. Multiple media reports have indicated that environmental pollution (e.g., disposal of apparel waste and the discharge of dyes and toxic chemicals) and ethical issues (e.g., over-consumption, unfair trade, and exploitation of child labor) are increasing due to fast fashion. As consumers become more aware of these issues in the fashion industry [5], consumer demand for sustainable fashion, free of resource depletion, environmental degradation, and ethical problems, has increased for fast fashion brands. As a result, fast fashion brands are striving for sustainability.

Fast fashion brands, such as H&M, Zara, and Uniqlo, have launched sustainable clothing collections in response to these changing consumption patterns, targeting the generation of consumers that value ethical consumption. For example, H&M, a Swedish, multinational fashion company, announced plans to convert all materials used in its products to renewable or sustainable materials by 2030 through its Conscious Collection [6]. Zara, a Spanish retailer specializing in fast fashion, also launched a sustainable product line, Join Life, in November 2015. The line includes clothing using organic cotton, recycled wool, and Tencel fibers. The company has also been campaigning to reduce packaging waste during online shipping [7]. Uniqlo, a Japanese retailer, announced a revised environmental policy in June 2018 that identified five areas for action: climate change, energy efficiency, water stewardship, waste management and resource efficiency, and chemical management [8]. Thus, although fast fashion brands have been pointed to as the main fashion industry culprit, causing various environmental problems, they are gradually striving to create sustainable fashion that highlights social responsibility and awareness. However, there are skeptics of the eco-friendly efforts of these fast fashion companies. For example, an article in the Huffington Post disputes that H&M, which produces 600 million garments annually, is effectively working on sustainable production [9]. Therefore, as fast fashion brands engage in various marketing activities, it will be helpful to clarify the consumers' true perceptions of the fast fashion brands' efforts towards sustainability. Such consumer awareness can be identified through brand associations. Brand association, which represents the consumer's knowledge about the brand, is often captured by the associative memory network model. This model describes the structure of brand association memory in the minds of the consumers [10].

In this study, we use network analysis to explore brand associations with sustainable fashion. Through the network analysis method, we can visualize the associations consumers have with the sustainable fashion brands and analyze their network structure. This process reveals individual associations by defining the relationship with the brand association and comparing it with other associations to find association dominance [11]. Recently, Wang and Horng [12] studied green brand associations using network analysis. Our study extends the use of this method to fashion research to examine consumer associations with a specific fast fashion brand's sustainable fashion.

The purpose of this study is to clarify the consumers' associations with the fast fashion brands' sustainable fashion efforts and provide information that fashion companies can use as the basis for future sustainable strategies. Our research questions are as follows. First, what are the keywords that reflect consumer associations with a sustainable fashion brand? Second, how can you explain the structural relevance of your keywords between brands? Third, what is the most important brand association for building a sustainable fashion brand image?

To answer these research questions, we attempt to visualize the consumer associations with sustainable fashion among three fast fashion brands mentioned (H&M, Zara, and Uniqlo). Our research was done in two studies. First, we collected the data on consumer associations through in-depth interviews with women who had purchased sustainable fashion products from the fast fashion brands. We then applied network analysis to visualize the data. Second, we conducted a quantitative survey to confirm which associations affected sustainable fashion brand images. The results of the study will enable the fast fashion brands to understand in greater depth consumers' perceptions of sustainable fashion and provide strategic direction for fashion brands looking to grow sustainable brands in the future.

2. Theoretical Background

2.1. Sustainable Fashion of Fast Fashion Brands

Sustainable fashion refers to fashion products that contribute to creating a sustainable future without sacrificing or at least harming the environment and society in the process of production and consumption [13]. This is a broad concept that includes many aspects of the production and consumption process. Sustainable fashion is used interchangeably with many other terms, such as sustainable clothing, green fashion, ethical fashion, and eco-fashion, which are usually described in sustainable terms [13–15]. Sustainable fashion categories include fashion made of recycled materials, vintage fashion, fashion with organic materials, fashion that considers animal care, handicraft fashion, custom-made fashion, locally produced fashion, and fashion that abides by fair trade [16].

Fast fashion is a brand category that satisfies consumers with low prices, trendiness, and frequent merchandise turnover. At the same time, these brands face many problems in the manufacturing and distribution process, including human rights violations, low wages, and environmental pollution [4]. For this reason, fast fashion brands are often seen as the antithesis of sustainable fashion [17]. Consumers sometimes perceive the sustainable fashion of fast fashion brands as greenwash. Greenwash refers to the act of misleading consumers in relation to the company's environmental practices or the environmental benefits of products or services [18]. Companies use greenwash to selectively disclose positive information about their environmental performance to build a positive corporate image [19]. As environmental and social responsibilities have grown in importance in recent years, fast fashion brands are using various eco-friendly and recycled materials, developing various sustainable fashions through new product development, and conducting related sustainable marketing activities [20]. However, considering that consumers can be skeptical about companies that opportunistically use environmental trends [21], it is necessary to examine the perceptions of actual consumers.

Recently, in conjunction with the increase in consumer interest in sustainability, a number of studies have been conducted on various sustainability issues. These include case studies and conceptual discussions [22–24], studies of consumer perceptions and attitudes [16,25–27], consumer type analyses [28], purchasing behavior [13,16] and company-level research [29]. However, although studies on sustainability are underway, there is a lack of academic research on sustainable fashion and the activities of the fast fashion brands.

Several previous studies on fast fashion have shown that sustainability is linked to a brand's corporate strategy. Chang and Jai [30] studied the strategies that fast fashion retailers use to position sustainability by applying the stimulus-organism-response model. Results of this study supported that sustainability positioning strategies (i.e., stimuli) can lead to positive corporate social responsibility (CSR) efforts (i.e., organism), thus supporting the effects of sustainability marketing (i.e., response) for fast fashion retailers. Li et al. [20] examined the impact of corporate social responsibility behavior on the sustainability performance of major companies and partners in the fast fashion supply chain. In addition, Hill and Lee [31] studied the sustainable brand expansion of fast fashion retailers. The results showed that the consumers' perceptions of the fit, both between brand and cause of sustainability (brand-cause fit) and between brand and extension line (brand-extension fit), increases the positive evaluation of the extension. They suggested that when presenting sustainability as an appropriate image for a brand, the level of consumer knowledge of the brand should be considered.

Consumer research related to fast fashion includes a number of studies. For example, Joy et al. [32] looked at how consumers perceive fast and luxury fashion, what sustainability really means to these consumers, and how the fashion industry should address sustainability. McNeill and Moore [26] explored the fashion consumer's behavior and attitude towards sustainable products and ethical fashion purchases. Their study found that fashion consumers could be classified into three groups: "Self" consumers who are interested in hedonistic needs, "Social" consumers who are concerned with social image, and "Sacrifice" consumers who strive to reduce their impact on the world. These three

groups regarded fast fashion differently and the impact of marketing sustainable fashion products to each group should be different, as well.

Most studies on sustainability in the fashion industry have been conducted in the general category of fashion rather than limited to fast fashion. Among the studies on the sustainability of fast fashion, research on the consumer side has been rare. As sustainability becomes an essential strategy for fast fashion companies, more research is needed on consumer brand associations to support effective marketing activities that remind consumers of the brand's sustainability efforts.

2.2. Brand Associations on the Sustainable Fashion of Fast Fashion Brands

A brand association is a concept related to a brand that includes factors that come to mind and "connect" to the brand [33]; namely, a node of new knowledge that connects to the brand node in the person's memory and represents the meaning of the brand [34]. Consumers have a variety of associations with a particular brand, and these associations influence their attitudes and purchase of the brand [33,35].

The brand associations associated capture the most representative experiences, knowledge, feelings, and evaluations of the brand, which may be newly formed or forgotten over time [34,36]. The most prominent feature of the brand association is its network form [33,34]. In other words, some associations are directly linked to the brand, while others are indirectly connected through other associations. We can assume that associations connected to multiple associations will have more influence on brand attitudes and purchase intentions than associations that are not connected to other associations or that are only connected to a few associations. Consumers tend to reduce purchasing mistakes by considering as many factors as possible when determining their brand attitudes and purchase intentions. This is because a particular association connected with multiple associations can give psychological satisfaction by reminding consumers of multiple associations [37]. Considering this, companies can find important clues to help assess the effectiveness of existing marketing strategies and establish new strategies by analyzing which associations consumers have with the brand and what network structure these associations form.

Since fast fashion brands are working on various sustainable fashions and marketing activities, they need to be sure that they understand what the consumer brand association network structure looks like in terms of sustainable fashion. Despite this, few studies have identified brand associations for fast fashion brands focusing on sustainable fashion. Camiciottoli et al. [38] confirmed the degree of match between brand associations of fashion bloggers and brand associations found in company-generated texts of three luxury brands. The analysis revealed that the three types of brand associations associated with product attributes, non-product related attributes, and designer identities were consistent across all three brands. In addition, some unique brand themes have been identified. Their study was limited to researching online data of luxury brands. Therefore, this study attempts to discover associations for sustainable fashion among fast fashion brands through in-depth interviews and utilize network analysis to identify their structure.

2.3. Network Analysis Method

Network analysis can be used to identify the structure of the brand associations. Noting that the brand association of consumers has a network structure, Henderson and Iacobucci [39] applied the various concepts and methods used in network analysis to derive and analyze a consumer brand association network. Network analysis is a mean of investigating social structure, also called "social network analysis" or "structural analysis" [40]. This is one of the content analysis method and the technique of analyzing potential meanings based on the relationships in the interpretations of specific meanings or concepts [41].

According to the associative network theory, the unit composing the network is defined as a "node" and the relationship between the units is defined as a "link" [42]. The concept of nodes is explained based on an associative structure and the connections between nodes are associations that appear

within the consumer's mind. For example, one node is described as the connection between the brand (e.g., Uniqlo) and the product (e.g., Heattech) or attitude (e.g., positive). Teichert and Schöntag [43] explored consumer knowledge structures using associative network analysis. They provide a new perspective on consumer knowledge analysis by combining cognitive psychology models with a network analysis approach to gain in-depth insight into brand image. Thus, network analysis becomes a way to reveal what consumers associate with a brand by defining the relationship between brand associations, and comparing them with other associations to identify the important links.

The biggest advantage of network analysis is that it reflects consumers' comparisons of several brands and, at the same time, draws associations among the brands based on similarities and differences [41]. To establish a marketing strategy for a brand, a company should analyze not only the associations the consumers have with its brand but also the associations with competing brands. Given this, network analysis provides useful information about how consumers perceive the brand compared with competing brands, and what associations to focus on to improve or strengthen brand ties. This analysis can provide brand managers with useful information. Although not investigating the fashion industry specifically, Wang and Horng [12] recently used network analysis to validate green brand associations. The researchers analyzed the associations of McDonald's, MOS Burger, and Starbucks to see how the associations between green brands were constructed. Since the research on brand associations with fashion brands has been limited, our study aims to confirm the associations that will support a sustainable fashion brand using network analysis.

3. Study 1

In Study 1, we collected data through in-depth interviews with 20 women to extract keyword associations with fast fashion sustainable fashion. We then used network analysis to visualize the structure between associations and compare brand associations.

3.1. Materials and Methodology

3.1.1. Participants

To identify the brand associations in terms of keywords, we conducted in-depth interviews with 20 female consumers in Korea with experience purchasing sustainable fashion products from fast fashion brands using Zaltman's metaphor elicitation technique (ZMET). ZMET is designed to surface the consumer's mental model through an in-depth interview using pictures prepared in advance [44]. Namely, it is a technique to elicit both conscious and unconscious thoughts by exploring non-literal or metaphoric expressions. For studies using the ZMET approach, a small number of participants (typically 20-25) are recruited for the keyword extraction phase [45]. Purposive sampling was used to recruit the female consumers. As female consumers are generally considered to be more interested in fashion and more environmentally conscious than men [46,47], they can be selected as representatives of the larger population in the context of sustainable fashion research [48].

We interviewed the 20 female consumers between June 2019 and October 2019, as shown in Table 1. The average age was 31.95 years old (i.e., nine in their 20s; seven in their 30s; and four in their 40s). Of the women interviewed, 60% were single ($n = 12$), either undergraduate students, graduate students, office workers, or self-employed.

Table 1. Participants' profile of Study 1.

Participants	Age	Occupation	Marital Status
1	45	Graduate student	Married
2	40	Employee	Married
3	36	Employee	Married
4	25	Undergraduate student	Single
5	43	Employee	Single
6	22	Undergraduate student	Single
7	24	Undergraduate student	Single
8	29	Graduate student	Single
9	27	Graduate student	Single
10	33	Graduate student	Married
11	38	Housewife	Married
12	24	Undergraduate student	Single
13	25	Undergraduate student	Single
14	23	Undergraduate student	Single
15	22	Undergraduate student	Single
16	32	Graduate student	Married
17	36	Employee	Single
18	38	Employee	Married
19	38	Housewife	Married
20	41	Self-ownership	Single

Prior to our in-depth interviews, an online survey of 120 consumers was conducted by a survey company. We presented a list of 12 global fast fashion brands with stores in Korea and participants responded to which fast fashion brand came to mind in terms of sustainable fashion. From the result, three brands emerged: H&M 34.2% (n = 41), Uniqlo 26.7% (n = 32), and Zara 18.3% (n = 22).

3.1.2. Brand Association Analysis Process

In this study, brand association is identified through the ZMET technique. The main goal of using in-depth interviews is to elicit deeper brand associations. Participants were asked to bring their own selection of at least five images per brand about one week before the interview to convey their thoughts and feelings about the topic. One week later, they participated in interviews of about 40 minutes to an hour and a half. Non-verbal cognitive stimulus can result in more relevant and abundant interview data regarding the brand or product under investigation than relying solely on verbal interviews [49]. All interviews were voice recorded and used for analysis with the consent of the participants.

From the interview data, we extracted keywords. To explore consumer associations with sustainable fashion of the fast fashion brands (H&M, Zara, Uniqlo), the interview data were typed and analyzed by applying grounded theory. Strauss and Corbin [50] proposed grounded theory as a qualitative research method useful for eliciting new perspectives, through the three stages of open coding, axial coding, and selective coding. In open coding, the categorization process involves classifying data and finding similarities and differences in concepts. In this process, multiple keywords were extracted because each participant expressed her thoughts in a variety of words. Through the process, words, such as synonyms, are refined to avoid confusion in the analysis as the words from the participants differ and are numerous [51]. Axis coding is the process of recombining data that have been decomposed through open coding. In this process, the categories are linked to subcategories and

the paradigm is revealed through various conditions, contexts, actions/interactions, and consequences associated with the phenomenon. Finally, the phenomena are analyzed through selective coding, incorporating the analyzed data and discovering the central categories [50,52]. The keywords extracted through the coding process include only content mentioned by at least two participants. An example of the process of extracting a concept and deriving its relationship is shown in Table 2.

In a qualitative study, reliability is measured by the consistent response of various coding personnel [53]. In our study, researchers verified inter-coder reliability. Inter-coder reliability was 80.9%, higher than the 80% suggested by Miles et al. [54], ensuring internal consistency. This enabled an objective interpretation of the meanings, as stated by the participants.

Table 2. Process of extracting concepts and concept relationships.

Comments	Concept	Concept Relationship
<i>I found out that H&M is doing green activities through activities like recycling box. (H&M 11)</i>	recycling box	recycling box → eco-friendly
<i>I know that Uniqlo is changing the way it is dyeing jeans and making it more environmentally friendly. (Uniqlo 17)</i>	jeans	jeans → eco-friendly manufacturing process

3.2. Results

The extracted concepts and the relationships between the concepts were visualized and analyzed using the NodeXL program. Analyzing the sustainable fashion brand association network for H&M, Uniqlo, and Zara resulted in a network with 60 nodes and 629 links (Figure 1). To identify the network of keywords associated with the three brands, cluster analysis was performed using the Clauset-Newman-Moore algorithm. Some keywords were associated with only one brand; however, for keywords that were associated with two or three brands simultaneously, we needed to identify which brands were more closely related to the words. By identifying the network structure through cluster analysis, we were able to classify the structure into four groups having a density of 0.109 to 0.219, as shown in Table 3. Density is defined as the number of connected links of all possible links, which is an indicator of the extent of network connectivity. The average geodesic distance of the network was 2.191, and the average graph density was 0.058.

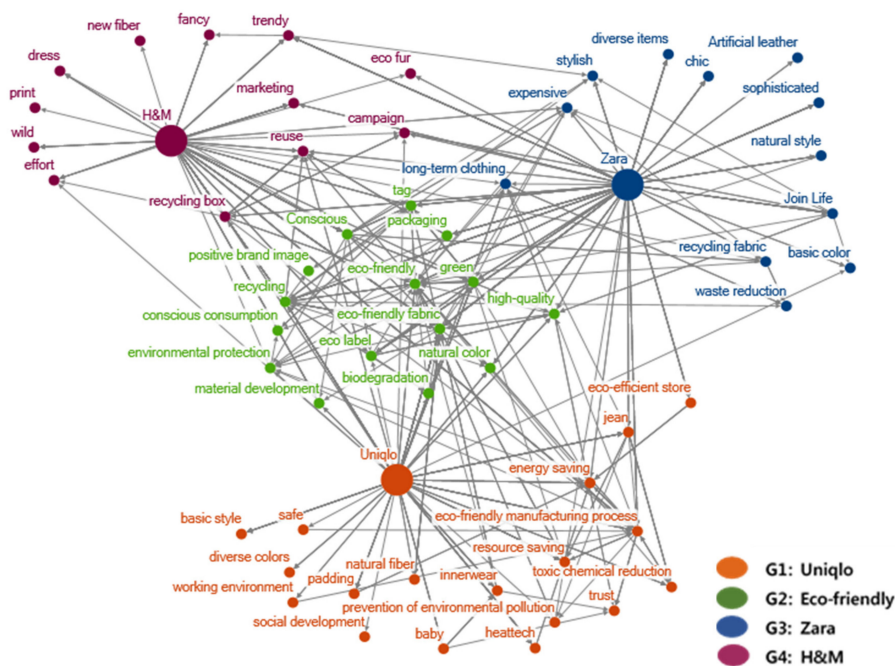


Figure 1. Network analysis of shared terms in brand association.

Table 3. Group analysis for the brand association network.

Group	No. of Nodes	No. of Links	Average Geodesic Distance	Graph Density	Group Specific Terms
G1 Uniqlo	19	112	1.812	0.199	Uniqlo, eco-friendly manufacturing process, energy saving, trust, resource saving, prevention of environmental pollution, toxic chemical reduction, jeans, baby, innerwear, basic style, down jacket, Heattech, safe, positive working environment, natural fiber, eco-efficient store, diverse colors, social development
G2 Eco-friendly	15	81	1.538	0.219	eco-friendly, environmental protection, high-quality, green, tag, eco-friendly fabric, eco label, biodegradation, natural color, material development, conscious consumption, positive brand image, Conscious, packaging, recycling,
G3 Zara	13	64	1.740	0.109	Zara, expensive, stylish, long-term clothing, recycling fabric, waste reduction, basic color, natural style, Join Life, artificial leather, diverse items, chic, sophisticated
G4 H&M	13	62	1.645	0.109	H&M, fancy, campaign, recycling box, effort, reuse, print, dress, trendy, marketing, eco fur, wild, new fiber

The first group (G1) represents brand associations related to Uniqlo. Uniqlo is associated with “eco-friendly manufacturing process”, “resource saving”, “prevention of environmental pollution”, “toxic chemical reduction”, and “positive working environment.” In particular, many environmental aspects were mentioned in the manufacturing process of jeans. In addition, product-related associations appeared: “down jacket” and “Heattech” were mainly associated with “energy saving”, followed by “safe” and “trust” relating to “baby” and “innerwear.” In addition, keywords, such as “natural fiber”, “diverse colors”, and “basic style”, were associated with Uniqlo.

The second group (G2), named eco-friendly, had a high graph density, predominantly, because it captured keywords that appeared simultaneously in two or more brands. Many keywords, such as “environmental protection”, “high-quality”, “green”, “tag”, “eco-friendly fabric”, “eco label”, “biodegradation”, “natural color”, “conscious consumption”, “Conscious”, “packaging”, and “recycling”, were, ultimately, associated with “eco-friendly.” Notably, the keyword “Conscious”, which represents H&M’s sustainable collection, is included in the second group because the keywords associated with it are frequently similar to the keywords in the “eco-friendly” group.

The third group (G3) represents the brand associations with Zara. Zara has the sustainability collection called “Join Life”, but it is not as strongly associated with “green” as H&M’s “Conscious” collection. Zara’s brand associations included “recycling fabric”, “artificial leather”, “basic color”, “natural style”, “diverse items”, “stylish”, and “sophisticated.” In addition, the keywords “expensive” and “long-term clothing” were associated with expensive, long-wearing brands, which, in turn, lead to “waste reduction.”

The fourth group (G4) refers to the brand associations with H&M, which are related to keywords that exclude “Conscious” associations from the second group. The associations with H&M are suggestive of the “recycling box”, which links to “campaign” and “reuse”, confirming that collecting old clothes and donating them relate to sustainability. Other associations include “fancy”, “print”, “eco fur”, “wild”, “dress”, and “trendy”, leading to product associations that reflect a rather colorful and trendy image. In addition, related to the development of orange fiber and pineapple fiber, “new fiber” associations appeared, leading to “marketing” and “effort”, suggesting that consumers recall the efforts through various sustainability activities of H&M.

Next, the degree, betweenness, and closeness centrality were reviewed to identify the relationship between important nodes and nodes in the whole network related to brand associations. Degree centrality quantifies the degree of centralization through the relationship between nodes; namely, how much is one keyword associated with another keyword. The larger the number of nodes connected, the higher the connection centrality, and the more important the nodes [55]. In this study, the brand associations identified the directional in-degree and out-degree. Closeness centrality represents the distance of connection paths between nodes. It is an index that measures how close

one keyword is to another keyword [11]. High closeness centrality indicates that one node has a strong direct connection with another node. Betweenness centrality refers to the degree to which a keyword plays the role of connecting one point within the shortest distance; the point plays the role of an intermediary in building a network with other points. This method is based on the role of the intermediary [41].

Our results show that “eco-friendly” (24) was highest in in-degree centrality, and “recycling” (10) was highest in out-degree centrality (Table 4). The highest associations in closeness centrality were “eco-friendly” (0.011), “eco-friendly fabric” (0.010), and “recycling” (0.010). Among the derived keywords, “eco-friendly” showed the highest in-degree centrality and closeness centrality, which means that “eco-friendly” is, ultimately, associated with sustainable fashion and has a high connection with other keywords. Thus, it occupies an important position in the brand associations.

Table 4. Degree, Betweenness, and Closeness centrality measures (Top 20 keywords).

Rank	Degree Centrality				Betweenness Centrality	Closeness Centrality		
	In-Degree		Out-Degree					
1	eco-friendly	24	Uniqlo	32	Uniqlo	939.757	eco-friendly	0.011
2	eco-friendly manufacturing process	10	Zara	31	Zara	912.564	Zara	0.011
3	recycling	9	H&M	24	H&M	666.518	Uniqlo	0.010
4	environmental protection	9	Conscious	12	eco-friendly	383.578	eco-friendly fabric	0.010
5	eco-friendly fabric	8	recycling	10	eco-friendly manufacturing process	237.517	recycling	0.010
6	green	7	eco-friendly fabric	10	recycling	208.266	eco-friendly manufacturing process	0.010
7	high-quality	7	eco-friendly manufacturing process	8	eco-friendly fabric	171.430	H&M	0.009
8	energy saving	7	green	6	energy saving	99.760	green	0.009
9	expensive	6	tag	6	Conscious	76.906	eco label	0.009
10	reuse	6	recycling box	6	tag	68.707	recycling box	0.009
11	tag	5	jean	5	long-term clothing	61.567	long-term clothing	0.009
12	eco label	5	Join Life	5	environmental protection	60.259	reuse	0.009
13	resource saving	5	high-quality	4	high-quality	59.645	high-quality	0.009
14	long-term clothing	5	eco label	4	green	54.643	environmental protection	0.009
15	stylish	5	packaging	4	eco label	35.155	energy saving	0.009
16	campaign	5	eco-friendly	3	recycling box	34.312	campaign	0.009
17	recycling box	4	energy saving	3	trendy	29.875	tag	0.008
18	biodegradation	4	resource saving	3	recycling fabric	29.248	resource saving	0.008
19	natural color	4	recycling fabric	3	campaign	25.421	jean	0.008
20	prevention of environmental pollution	4	innerwear	3	reuse	24.608	natural color	0.008

4. Study 2

In Study 2, we conducted quantitative analysis based on the brand association keywords extracted from the in-depth interview process. The keywords extracted for each fast fashion brand captured the associations related to each brand’s sustainable fashion. However, to compensate for the limited number of participants in Study 1, we needed to extend our analysis.

Here, we examine how the degree of brand association with “eco-friendly” affects the brand’s image. The keyword association results indicate that “eco-friendly” is one of the most meaningful keywords for sustainable brand association. Thus, keywords suggestive of “eco-friendly” can play an important role in building a sustainable fashion brand image. Moreover, sustainable messages delivered by fashion brands are linked to positive brand awareness [5]. A fast fashion brand also needs

to understand which keywords are associated with sustainable fashion to build an eco-friendly image, using the words in various activities and products related to sustainability. For this reason, our survey questionnaire examined the impact of the extent of the brand association with important keywords related to “eco-friendly” on the brand’s sustainable fashion image.

4.1. Materials and Methodology

4.1.1. Participants

In our quantitative analysis, data were collected from 200 female consumers, aged 20 to 40, who lived in metropolitan cities in Korea with experience purchasing from the three brands in the past year. Prospective participants received an email invitation from the online survey company with a survey URL and asked to voluntarily participate in this study. The questionnaire was designed to clarify the extent of the brand association for the extracted keywords, the perceptions of the sustainable fashion brand image, and demographic characteristics. The average age of these respondents was 31.95 years (87 in their 20s, 87 in their 30s, and 26 in their 40s), 59% (118) were married, and 80.5% (161) were undergraduate students.

4.1.2. Procedure and Materials

First, we asked participants about the extent of their brand association with the degree centrality top 20 keywords by brand (total 60 keywords, using a 5-point scale). Next, the sustainable fashion brand image was measured to see how the brand associations affected brand image. To measure this, we used a green brand image scale. Chen [56] indicated that a green brand image represents the recognition of a series of brands in the minds of consumers related to environmental promises and environmental issues. Here, the green image equates to the perception of the brand’s sustainable fashion in the minds of consumers related to environmental promises and environmental issues from the fashion perspective. In this regard, we measured it through four items, referring to the measurement items in previous studies [56,57]: (1) the brand is regarded as the best benchmark of environmental commitment in fashion, (2) the brand is competent regarding its environmental reputation in fashion, (3) the brand is well established regarding environmental concerns in fashion, and (4) the brand is trustworthy regarding environmental promises in fashion. Last, the respondents were asked to answer questions regarding demographic characteristics.

4.2. Results

4.2.1. Brand Association Extent of Fast Fashion Brands

Participants were asked about the extent of their associations with sustainable fashion based on 20 keywords by brand. Table 5 presents the keywords and the associations from the survey. The results of the associations with the fast fashion brands related to sustainable fashion are ranked and also shown in Table 5.

Table 5. Brand association extent by brands.

Rank	H&M		Zara		Uniqlo	
	Keywords	Mean	Keywords	Mean	Keywords	Mean
1	trendy	3.48	diverse items	3.61	Heattech	3.63
2	recycling	3.43	trendy	3.61	basic style	3.58
3	recycling box	3.39	sophisticated	3.43	innerwear	3.55
4	campaign	3.33	stylish	3.42	warm	3.25
5	environmental protection	3.32	basic color	3.30	jean	3.21
6	tag	3.31	marketing	3.30	natural color	3.25
7	reuse	3.30	eco-friendly fabric	3.29	padding	3.18
8	eco-label	3.29	expensive	3.26	diverse colors	3.17
9	conscious consumption	3.26	natural color	3.26	material development	3.13
10	marketing	3.26	campaign	3.23	eco-friendly fabric	3.10
11	effort	3.21	Join life	3.20	long-term clothing	3.05
12	stylish	3.21	natural style	3.18	recycling	3.04
13	trust	3.18	tag	3.13	recycling box	3.03
14	eco-friendly fabric	3.17	package	3.12	environmental protection	3.00
15	recycling fabric	3.14	recycling	3.08	resource saving	2.97
16	biodegradation	3.10	eco label	3.05	eco label	2.97
17	dress	3.08	recycling fabric	3.03	reuse	2.95
18	eco-friendly manufacturing process	3.08	eco-friendly manufacturing process	3.02	eco-friendly manufacturing process	2.94
19	green	3.06	reuse	3.01	energy saving	2.94
20	material development	3.00	recycling box	3.00	prevention of environmental pollution	2.93

1 = not at all, 5 = very strongly

As the table shows, H&M had the highest degree of association with “trendy” ($M = 3.48$), “recycling” ($M = 3.43$), “recycling box” ($M = 3.39$), “campaign” ($M = 3.33$), and “environmental protection” ($M = 3.32$). Zara was highly associated with product aspects of sustainable fashion, including “diverse items” ($M = 3.61$). Additionally, “trendy” ($M = 3.61$), “sophisticated” ($M = 3.43$), $M = 3.63$), “basic style” ($M = 3.58$), and “innerwear” ($M = 3.55$) ranked high in Zara brand association. For Uniqlo, “Heattech” was mentioned as a core keyword associated with sustainable fashion in the surveys. Interestingly, keywords, such as “marketing” and “campaign”, were ranked in the top ten in H&M and Zara, which may imply the opportunistic use of greenwash by companies.

The survey results quantitatively verified the keywords in the qualitative research stage. The keywords in the top rankings reflect consumers’ current thinking regarding each brand’s sustainable fashion efforts.

4.2.2. Effects of Eco-friendly Associations on Brand Image

The regression analysis verified how the keywords relating to “eco-friendly” affect brand image. Among the keywords that affect ‘eco-friendly’ associations, five association keywords are extracted that meet all three brands and have high out-degree centrality: eco-friendly fabric, recycling, recycling box, green, and eco label. We examined the influence of these associated keywords on brand image.

Before the regression analysis, Cronbach’s α for each sustainable fashion brand image was found to be reliable (H&M = 0.895, Zara = 0.914, Uniqlo = 0.941). The results of the regression analysis are shown in Table 6. Among the eco-friendly associations, H&M’s association with eco-friendly fabric ($\beta = 0.286$), recycling box ($\beta = 0.168$), and eco label ($\beta = 0.258$), and Zara’s association with eco-friendly fabric ($\beta = 0.343$), recycling ($\beta = 0.151$), and green ($\beta = 0.137$) had a significant impact on their sustainable fashion brand images. For Uniqlo, eco-friendly fabric ($\beta = 0.197$), recycling box ($\beta = 0.167$), green ($\beta = 0.261$), and eco label ($\beta = 0.193$) had a significant impact on its green brand image. The associations with “eco-friendly fabric” for both H&M and Zara, and “green” for Uniqlo had the biggest influence on their sustainable fashion brand images. In the qualitative research, Uniqlo’s use of the term “green” to inform its sustainability efforts came out in the in-depth interview. As shown

in the results of Wang and Horng [9], who explored green brand associations in the food and restaurant service industry, keywords, such as “recycling” and “green”, were identified as meaningful in this study. The results of this study are more characteristic of keywords related to the fashion industry, such as “eco-friendly fabric” and “eco label”.

Based on the results, the term eco-friendly fabrics has a significant impact on sustainable fashion brand images for all three brands. Thus, fashion companies should focus on the eco-friendly fabric factor to generate consumer awareness of sustainable fashion rather than other factors.

Table 6. Eco-friendly associations influence on brand image (n = 200).

Eco-Friendly Associations	H&M		Zara		Uniqlo	
	β	t-Value	β	t-Value	β	t-Value
eco-friendly fabric	0.286	3.413 **	0.343	3.741 ***	0.197	2.306 **
recycling	0.037	0.701	0.151	2.206*	0.028	0.341
recycling box	0.168	2.109 *	0.105	1.270	0.167	2.029 *
green	0.027	0.684	0.137	1.998 *	0.261	3.786 ***
eco label	0.258	3.200 **	0.059	0.600	0.193	2.066 *
R ²	0.374 ***		0.463 ***		0.527 ***	

*, $p < 0.05$, **, $p < 0.01$, ***, $p < 0.001$.

5. Discussion and Conclusion

Fast fashion brands are increasingly introducing sustainable fashion products and engaging in a variety of activities to improve their brand image in terms of sustainability. Therefore, we identified consumers' brand associations with fast fashion brands' sustainable fashion to lay the groundwork for companies to explore sustainable fashion strategies. To this end, three fast fashion brands, H&M, Zara, and Uniqlo, were selected, and we applied network analysis to identify brand associations with their sustainable fashion efforts. We extracted keywords for network analysis through in-depth interviews using the ZMET technique.

In Study 1, we derived keywords associated with sustainable fashion for the fast fashion brands and identified the association structures between keywords. The keywords were extracted using ZMET and the correlation between the keywords was confirmed through network analysis. Our association network of sustainable fashion for H&M, Zara, and Uniqlo consists of 60 nodes and 629 links. After confirming the network structure of the three brands through cluster analysis, we divided it into four groups: Uniqlo (G1), Eco-friendly (G2), Zara (G3), and H&M (G4). To understand the structural characteristics of the entire network, we examined degree centrality, betweenness centrality, and closeness centrality.

The results of this study can be summarized as follows. We show that eco-friendly has the highest in in-degree centrality and recycling the highest in out-degree. In addition, Uniqlo has a high betweenness centrality, confirming that its connection with various keywords is high. In closeness centrality, “eco-friendly”, “eco-friendly fabric”, and “recycling” are the top keywords, confirming that the associations are concentrated around these words.

In Study 2, conducted to quantitatively confirm the extent of the association of the extracted keywords with the sustainable fashion brands, H&M is identified with “trendy”, “recycling”, “recycling box;” Zara with “diverse items”, “trendy”, and “sophisticated;” and Uniqlo, followed by “Heattech”, with “basic style” and “innerwear.” In the next step, determining whether the eco-friendly associated keywords significantly impact the fast fashion brands' sustainable fashion images, the associations of “eco-friendly fabric” with both H&M and Zara, and “green” with Uniqlo have the greatest impact on their sustainable fashion brand images. In the case of “eco-friendly fabric”, it has a significant influence on the brand image of all three brands, confirming that it is an important factor in building a sustainable fashion brand image.

This study's significant academic and practical implications are as follows. From an academic perspective, we use a novel approach by examining the consumer associations with the fast fashion brands in terms of sustainability by applying network analysis. This study structurally confirmed that brand associations indicate the most representative experiences, knowledge, feelings, and evaluations related to the brand [31,33], and have a direct or indirect connection in the form of a network [30,31]. This study plays an important role in theoretical and methodological development by applying network analysis, not just to identifying consumers' associations through qualitative research, like previous studies on brand association have done. In addition to qualitative research based on the subjective judgment of consumer associations with brands, the network analysis method can identify additional structural relationships. To compensate for the shortcomings of subjective interpretation in this process, a detailed structure of the brand associations was objectively identified by analyzing the degree of connection between keywords and the strength of the connection, such as degree centrality. In addition, this study extended the theme of sustainability to the fashion category and examined brand associations. Fast fashion is often seen as the opposite of sustainable fashion [17]. However, since the fast fashion brand's efforts towards sustainable fashion are increasing, this study is meaningful as an academic approach. From a practical perspective, the study offers suggestions for strategic directions for fashion companies. Specifically, as the demand for sustainability in the fashion industry grows, fashion companies can utilize the results here to understand the factors for building a stronger sustainable fashion brand image and apply them in future marketing strategies. For example, the term "eco-friendly fabrics" is shown to have a significant impact on the sustainable fashion brand images of all three brands and can be used when considering future product and marketing strategies for sustainability.

This study also has some limitations. First, the initial number of study participants was limited. Due to the nature of the data collection method through the ZMET interview process, it was not possible to collect data from a large sample. Quantitative analysis was added to compensate for this drawback, but those survey respondents were more likely to be generalized. Second, the study was limited to women. Although many studies related to fashion focus solely on women, it would be useful to conduct research that includes diverse genders and ages in future studies. Third, our study focused on just three fast fashion brands, H&M, Zara, and Uniqlo, in terms of sustainable fashion. In the future, if other fast fashion brands are analyzed together, further integrated brand associations could be investigated. In addition, as various sustainable activities are increasing not only among fast fashion brands but also among luxury or sports brands, research considering various categories of brands should be conducted. Fourth, as this study examines the brand associations at a specific moment in time, the specific sustainable activities of the companies were not considered. Therefore, future research linking marketing-related activities and consumer perceptions could also be meaningful as a comprehensive study on sustainable fashion in the future.

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