Does an Upcycling Kimono Practice Support Recycle-Oriented Cultural Sustainability? Japanese College Students' Perspectives

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Abstract

Kimono (a traditional Japanese garment worn by women) has played an important role in Japanese indigenous cultural origins. Ecological and sustainable ideas have inherently existed in kimono culture within this lifestyle. Since the United Nations announced the Sustainable Development Goals (SDGs) in 2015, the Japanese government has focused on creating healthy spaces with a sustainable direction in mind. However, textile-related product recycling rates were relatively low in Japan at the time. This empirical study used SDGs as a conceptual framework to examine Japanese college students' perceptions of kimono upcycling practices and challenges. A mixed method was used to analyze the data. An open-ended questionnaire was distributed to college students in June 2019 in Liberal Arts at a national women's university (n=155). The findings showed that interest in kimono upcycling moderately correlated to those and an interest in western garments upcycling (.578; p<.01). The relationship between these variables was significant (Chi-square: 48.471; p <.001). In the qualitative analysis, a coding method was used to explore common themes of students' awareness and knowledge of upcycling kimono practices and found four strong themes to be present. The students perceived that upcycled kimono items connected to preserving family memories, whereas others noted upcycled items were used for sustainable resources. Also, three common challenges were found: practicality, technical issues, and people's awareness. Some students also associated items with Japanese cultural preservation. College students' attitudes and perceptions towards cultural sustainability engagement could therefore be a crucial mediator during sustainable development drives.

Keywords: college student, Japan, Kimono, recycling, sustainable development, upcycling

Introduction

Since the rapid adaptation of western clothing during the postwar period, the Japanese kimono has gradually been disappearing from daily usage in contemporary society (Assmann, 2008). Japanese people's lifestyles have been transformed into adapting western clothes; people wear kimonos to only formal events, such as weddings and graduations (Valk, 2018). Similarly, *yukata*, a kimono-style casualwear, has also seen declining usage. Shimizu (2008) explained that *yukata* was worn as a bathrobe or casual daily wear before the western garments became popular. Today, *yukata* is still worn by different age groups and genders but mainly as summer festival attire.

Along with the social transformation, a kimono recycling practice has become popular in Japan due to the scarcity of fiber production and supply during the early postwar period (Ogata, 2013). Since western clothes were introduced, people stored their unused kimonos. As a result, individual households still have large quantities of high-quality silk kimono materials in their closets. These kimonos have been sold at second-hand kimono shops, which became popular in the late twentieth century (Valk, 2018). Today, kimono and obi (sashes) are used to reinvent fashionable accessories, such as scarves, gloves, shoes, and handbags (Assmann, 2008; Valk, 2008). Creating new products from reusable clothes is called *upcycling*, defined as "uniqueness of bespoke production, scarcity and preciousness of material, emotional engagement with past experiences and memories and craft skills of making" (Fletcher, 2014, p.118). The sustainable upcycling concept can be applied to used and unneeded kimonos to remake distinguished stylish garments and accessories. Although an upcycling practice contains the idea of preserving the material along with users' precious memories, it has not become a leading practice. This empirical study investigates Japanese college students' recycling-orientated cultural sustainability awareness and interests and their perceptions of kimono upcycling implementation challenges.

Overviews of Textile Recycling and Sustainability in Japan

Since the United Nations announced its Sustainable Development Goals (SDGs) in 2015, the aim has become popular among different industries worldwide (UNESCO, 2017). Each country and society, business, educational institution, group, or individual focuses on creating healthy spaces aiming in a sustainability direction. In May 2016, the government of Japan established its SDGs Promotion Headquarters in order to set its own goals along with the SDGs (Ministry of Foreign Affairs, 2016). One emphasis area was creating a recycling-based society (Ministry of Foreign Affairs, 2016). Although the agenda discussed waste management in different ministries, textile waste and recycling were not noted in the white paper.

Prior to the SDGs promotion, the Japanese government has focused on the 3Rs, reducing, reusing, and recycling. In 2009, Japan hosted the *Regional 3R Forum in Asia* and established similar for promoting the 3Rs while waste issues have become a social and world problem (Minister of the Environment, 2010). The reducing concept is connected to waste management, whereas the reuse approach helps extend the products' life cycle (Fletcher, 2014). The concept of 3Rs has received much social attention. Dr. Wangari Muta Maathai of Kenya, a 2004 Nobel Peace Prize winner, has promoted the concept of *mottainai*, which incorporates the 3Rs (Wangari, 2011). The expression using the Japanese word, *mottainai* (what a waste), contains the meaning of avoiding having waste; it illustrates the motivation behind Japanese people's cultural behaviors, such as storing used or unused kimonos in their closets for generations and recycling them by donating them to second-hand stores.

The Japanese government swiftly reacted to the SDGs, establishing action platforms and sharing the objectives with different ministries. Generally speaking, Japan is known as one of the leading nations for recycling sources. People strictly separate reusable portions from waste in their daily practices. Their sustainable behavior particularly helped enhance the current plastic waste recycle rate, which was 84% in 2019 (Brasor, 2019). However, Oba (2019) explained that the rates could be misread that the 84% can be classified into three categorical processes: 56% by a thermal process, 23% by material recycled, and 4% by chemicals recycled. Although the recycling rate appears to be successful, some procedures could severely impact environmental and societal issues during the process. By the late 2010s, the government has enforced various recycling regulations and laws, such as those for food, containers, vehicles, and home appliances (Ministry of the Environment, 2018); however, textiles or garments-related regulations have not been issued nor discussed as environmental issues.

In the annual report from the Ministry of the Environment Government of Japan (2016), the overall recycled rate for all reusable resources (e.g., paper, home appliances, plastics, food, and textiles) has increased from 7.4 % (1990) to 16.3 % (2013). The statistics showed that people's awareness of and attitudes towards recycling have been improving. However, textile-recycling rates remained relatively low in Japan. 766,000 tons of textile and garment waste were generated in 2007 and 836,000 tons in 2014. Both years' recycled rates were only 0.2 % (Minister of the Environment, 2017). The rest of the waste could have been piled up in a landfill. Uchimaru, Kimura, and Sato (2013) speculated that the technical reason for textile recycling has to do with the fact that in order to reuse the fiber sources, a garment needs to be separated into each fiber type; however, many clothes consist of various types of fibers, which makes it challenging. Nowadays, advanced technology is widely known to produce recycled fibers using polyester and nylon fiber waste and products; polyester and nylon zippers, buttons, and other notions can be processed to become granulated, decolorized, and then be used as raw materials and then fibers (iTextiles, 2014). This technology seems to contribute to waste management. For example, in order to recycle cotton and polyester blended fabrics, these two fibers require to be separated into pure components; however, the separation process is quite challenging; therefore, various cotton/polyester-blended garments were widely produced and could after usage be disposed of in waste containers (Hou, Ling, Shi, Yan, Zhang, Zhang, & Dai, 2018; Kimura, Hanamitsu, Kurahashi, & Kimura, 2010; Zou, Reddy, & Yang, 2011).

Moreover, various leading companies have been involved in recycling. For example, an automobile interior manufacturer, Howa Textile company (n.d.) has implemented reusing off-cut waste fabric to create felt top mats. Another leading textile manufacturer, Teijin, in 2002 introduced chemical recycling technology using polyethylene terephthalate (PET) bottles to create recycled polyester (Teijin CRS, 2007; Bettin, 2014). Since then, the government has endorsed recycling bottle technology to transform them into flakes and then pellets and create various recycled polyester garments and other related products (Minister of the Environment, 2012). This technology may have contributed to the PET bottle recycled rate. It might therefore be speculated that people's recycling and sustainability mindsets may have improved because of the various textile manufacturers' efforts.

Textile Recycling in Apparel Sector in Overseas

In the apparel and textiles sectors overseas, various manufacturers and companies also aim for different sustainability improvements to reduce environmental impact: sustainable consumptions and productions (Jørgensen & Jensen, 2012; Fletcher, 2014), reducing environmental waste through pattern making approaches (McKinney, Cho, Zhang, Eike, &

Sanders, 2020; Rissanne, 2008), utilizing the innovative technology to recycle fibers (He, Wei, Liu, & Xue, 2015; Teijin CRS, 2007), and educating consumers about the lifecycle of cotton products (Blue Jeans Go Green ™, 2006). In 2016, the United States recycling rate was less than 20 % of overall clothing waste, approximately 12.8 million tons. For example, in 2017, from all the footwear waste generated, 13.6 % was recycled, 16.9 % was burnt with some energy recovery, and 69.5 % ended up in landfills (The U.S. Environmental Protection Agency, 2017). Although the textile recycling rates were different between Japan and the United States, the latter's textile waste has been increasing for years. The majority of the textile waste ended up in piles in the landfill, which is a universal tendency because of the popularity of fast fashion, which is known as a rapid production with inexpensive and trendy clothes (Fletcher, 2014) in quick succession.

In general, due to the large amount of recyclable material, a donation or reusing concept could become a widespread practice along with sustainable development. Regardless of people's environmental interests and mindfulness, most consumers donate their used textile products to charities; however, at the same time, those people also dispose of their goods through regular traditional disposal mechanisms (Weber, Lynes, & Young, 2016). Over the last 10 years or so, upcycling has increased in popularity among various eco-conscious designers, fashion students, and other professionals (Alegria, 2009; Stewart, 2014). The apparel industry in different countries and regions also makes an effort to become more sustainable; however, at the moment recycling rates continue to remain fairly small.

Cultural Resources into Sustainability

The United Nations implemented 17 sustainable development goals (SDGs) targeted for completion by 2030. One goal focuses on "Culture [as] a driver and enabler of sustainable development and essential for achieving the 2030 Agenda." (UNESCO, 2017, p. 19) This agenda could perhaps be improved upon via the cultural characteristics of Japanese people with their recycle-oriented nature. As already mentioned above, reservation of used kimonos as a sustainable practice has inherently existed in Japanese culture for some time due to cultural values and *mottainai* behaviors.

Many second-hand recycled stores sell different textile products and clothes. Exclusive, expensive vintage clothes are most popular among sophisticated fashion-conscious people in different generations in Tokyo (Yagi &Yuasa, 2018). In other words, vintage clothes would capture people's attention and sell well, even at a higher price. However, some recycled clothes, including kimonos, may never have a chance to be sold, as they are not centrally displayed in these stores. Fletcher (2014) pointed out that recycling is a popular and easy practice for storeowners and consumers alike because it does not challenge radical innovation and adjustment. As a result, "[R]ecycling on its own … will never bring big change." (Fletcher, 2014, p. 126) When examining the 3Rs practice, it appears reasonable because an individual can start and achieve the goals. However, due to its long-range goals, the effectiveness of sustainability may not have a large impact.

Based on the vintage and recycled product relations, one way to achieve the SDGs is to upcycle products to make a new, highly valued product from discarded or unwanted items (Flowers & Gorski, 2017). Unlike recycled clothing, the upcycling practice may attract various people's attention because its concept is reborn into a new product using various unique used and vintage pieces of clothing. Recycled kimonos could be the ideal upcycled items because of their exclusiveness and antique heritage. Who would be the end-users of kimono upcycling

products? It was noted earlier that eco-conscious people could swiftly and positively react to this practice. For example, an American fashion designer incorporated pre-used fabrics to remake new garments to maintain her ecological mindset. She was also attracted to kimonos and other vintage textiles' aesthetic values (Billingsley, 2009). Some fashion professionals from the U.S. are fascinated to use old kimono materials for upcycling products. This indicates that there could be much demand for unique and distinctive products.

Practicability would be the main element for achieving these SDGs. To examine the kimono construction, the kimono consists of various rectangular panels, which are already intended to avoid waste. As a result, kimonos can be efficiently recycled; the seams can be easily removed because kimonos are traditionally hand-sewn. All panels can return to the kimono's original rectangular flat pieces, reusing the material to make any western clothing or accessories. When laying out kimono panels and western dresses side by side, interestingly enough, both the kimono and the basic western dress patterns come to the same length in yardage (Yanagisawa, Ishida, Ito, Ishige, & Watanabe, 1971). A kimono's versatility helps producers recreate different products and lead to a feasible cultural approach.

Although the kimono and other unneeded items in people's closets could become treasure resources for upcycling, "Fast Fashion has been a hallmark of the fashion industry for several years, and it has virtually characterized the market over time" (Štefko & Steffek, 2018, p. 7). The growth of fast fashion has led to textile waste and negatively affected our environment (Yoo et al., 2021). Many fast-fashion brands are very popular. However, recently at least some of them have begun to cherish different sustainable approaches. For example, UNIQLO launched a recycling and reusing program (UNIQLO n.d.), while H&M has invoked sustainability endorsements for organic items and recycled materials. Fast fashion and recycling/upcycling could live together when people's awareness of sustainability increases and fast fashion outlets create more sustainability goals for the goods.

Research Methodology

In this study, SDGs were used as a conceptual framework. Three research questions were posed to analyze students' perceptions of kimono culture and motivation for sustainability relations.

1. What is college students' awareness and level of knowledge regarding upcycling practices using kimono?
2. What are their interests regarding upcycling practices of old kimonos compared to used western garments?
3. What are the challenges of implementing upcycled kimono products in their daily practices?

Site and Participants

The empirical research piece at hand used a survey method to examine college students' awareness, interests, and challenges in kimono upcycling practices. 155 undergraduate and graduate students in Liberal Arts at the National Women's University in Japan participated. Their age range was from 18 to 25 years old. The university is known as one of the Japanese elite universities in Liberal Arts education that supports women's educational development with international relations and helps foster their global leadership. Selecting this university as a research site is beneficial because it can examine the next global leaders' attitudes and perspectives regarding sustainability issues.

The questionnaire consisted of dichotomous, multiple-choice, and some open-ended questions (Appendix A). Since the students were Japanese and a few Chinese exchange students, the Japanese version of the questionnaire was distributed (Appendix B). The data collection period was June 2019. The research involved human subjects. Before conducting the research, the Institutional Review Board (IRB) of the researcher's home university reviewed the application and approved it. Informed consent forms were also handed out to the participants before the survey.

Data Analysis

A mixed method was used to analyze the data. The dichotomous questions were analyzed by using SPSS version 26, a standard statistics software, here to explore students' awareness and interests in upcycling kimonos and sustainability practice. A qualitative method was utilized to further analyze the data. The researcher translated the participants' answers into English and examined them to find common themes by counting the frequency of words and phrases manually.

Findings

In a quantitative analysis, the two items, *kimonos possession* and *understand sustainability,* did not have any relationship with *interest in kimono upcycling* and *interest in western garments upcycling.* The findings showed that *interest in kimono upcycling* moderately correlated to those and *interest in western garments upcycling* (.578; p<0.01). The relationship between these variables was significant (Chi-square: 48.471; *p* <.001). In addition, neither of the other variables, such as major distinctions, age, or class level explained their interests in upcycling kimonos nor did any previous experiences with upcycling.

Figure 1

Chi-Square Test Between Interest in Kimono Upcycling and Interest in Western Garments Upcycling

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	48.471[a]	1	.000		
Continuity Correction[b]	45.880	1	.000		
Likelihood Ratio	48.480	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	48.136	1	.000		
N of Valid Cases	145				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.54.

b. Computed only for a 2x2 table

The following figure showed the other overview. 37 % of students have never heard of the word sustainability, nor they know its meaning. 62 % of students possess one or more kimonos. 33.8 % of students noted that they are not interested in upcycling kimono, whereas 66.2 % said they are interested in upcycling kimono. Moreover, 31.7 % of students answered that they are not interested in upcycling western garments, while 68.3 % of them noted that they are interested. Although the results explained that students were more interested in upcycling western garments, the percentage ratio was quite similar.

Figure 2

Comparison of Students' Interests in Kimono Upcycling and Western Garments Upcycling

			Interest Western Upcycle		
			0	1	Total
Interest Kimono Upcycle	0	Count	34	15	49
		% within Interest Kimono Upcycle	69.4%	30.6%	100.0%
		% within Interest Western Upcycle	73.9%	15.2%	33.8%
	1	Count	12	84	96
		% within Interest Kimono Upcycle	12.5%	87.5%	100.0%
		% within Interest Western Upcycle	26.1%	84.8%	66.2%
Total		Count	46	99	145
		% within Interest Kimono Upcycle	31.7%	68.3%	100.0%
		% within Interest Western Upcycle	100.0%	100.0%	100.0%

Note: 0= No interest; 1= Interest

Internal reliability can be measured by Cronbach's Alpha or Kuder-Richardson (KR-20). In this study, the data were at a dichotomous level. Therefore, KR-20 was used for examining Cronbach's Alpha value. The value exceeded .70 between the above two variables. This indicates that the items fit together and are internally consistent.

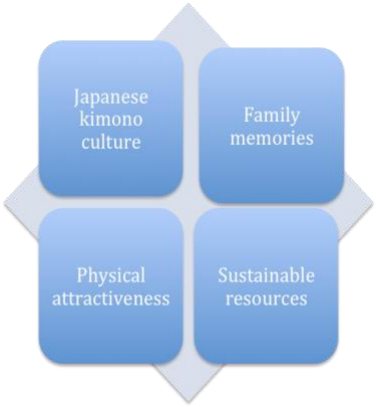
Figure 3

Internal Reliability Between Interest in Kimono Upcycling and Interest in Western Garments Upcycling

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.733	.733	2

Further open-ended questions helped find the details of their knowledge or awareness of upcycled kimono products and practice. The questions asked, were: *When and where did you see kimono upcycled products; How did you feel about them?* (Appendix A). In the survey, four themes regarding their awareness and knowledge of upcycling kimono practices were found (Figure 4): to perceive physical attractiveness, to keep family memories, to maintain Japanese kimono culture, and to endorse reusing existing sources.

Figure 4
Students' Knowledge or Awareness of Upcycled Kimono Products and Practice



Many students explained upcycled kimono products' appearances and physical features; such voices descriptions were "neat", "chic", "cute", "soft", "smooth", "gorgeous", "exclusive", "original", and "attractive", because of various colors and motifs. Others expressed: "Design-wise, upcycling kimono products are for middle-aged women" and "My grandma may like the items". Interestingly, several students already owned upcycled products that were made by their grandmothers. Their reactions were regarding their product appearances and their precious memories of previous kimonos, their grandmother, and their family. Furthermore, another student recalled, "I had memories that my grandma made into a pouch using her old yukata". At the same time, another student noted, "A kimono upcycled garment keeps one of my great family memories". Many noted that it is a good way to retain Japanese culture and customs through upcycling. On the other hand, a student pointed out, "A kimono does not need to be transformed into a new product," which means the kimono itself should be kept in its original form.

Moreover, some students connected upcycled kimonos to sustainable resource practice. A student pointed out that kimono upcycling is an "innovative idea for reusing kimonos". Also, the other participants voiced that it is a "good practice for using a used fabric as a new resource" and "good for our environment". Although their responses were varied, and most perceptions were positive, some students left the answer blank. Some of those students who did not answer these questions belonged to the group who had also answered that they were not interested in upcycled kimonos.

Kimono Upcycling Implementation Challenges

Compared to the previous responses, many students answered the various challenges of implementing upcycling kimono practice. Three common challenges were found (Figure 5): practical issues, technical challenges, and awareness of upcycling and sustainability.

Figure 5
Implementation Challenges of Upcycling Kimono Practices

First, practical issues were most visible and dominated. Students noted that the challenges were the products' cost and time to remake. Upcycling products tend to be costly because it would take time to create them. Several students questioned whether in times of the popularity of fast fashion expensive upcycling products would actually sell. Another student pointed out, "Is old kimono material strong enough to remake it into a new one?" Moreover, some raised questions regarding hygiene and sanitation matters because of the age and use of the kimonos. Many students also linked this major challenge to the practical implementation issues.

The next challenge was related to technical matters. Students noted that the lack of upcycling skills and knowledge could be the main challenge for implementing the practice. Many pointed out that they do not know how to use a sewing machine. Some students asked, "Who would be able to create upcycled products?" Other students suggested that providing how-to videos through YouTube or using social media to reinforce knowledge based on this concern would be helpful.

Finally, people's lack of awareness could also be a serious issue. This challenge had the most diverse opinions: Lack of awareness of sustaining the current clothes, awareness of exclusiveness, awareness of strengths and weaknesses of upcycled fashion, and awareness of sustainability. People's lack of awareness could impede kimono upcycling practices. For example, participants anticipated that "used" and "second-hands" sound less attractive. Some questioned why people would pay more money for those old clothes. Others explained, "The challenge would be people's attitudes towards our gorgeous kimono culture". Moreover, a student pointed out that only a few people making a great effort would not change the entire lack of awareness culture; thus, it would not be efficient.

One answer noted regarding water conservation; "After gathering all the used kimonos, we would need to dry clean them all. This process tends to use a large volume of water." Sustainable practices may not always lead to a positive impact. The student looked at the larger picture and rightly predicted the negative consequences of this practice.

Finally, many participants explained challenges but also described practical suggestions. Some proposed that exposure to practice and products would garner more attention. Others explained that we would need to show the advantages of recycling, because "People would not know about the upcycled kimonos because those people are only interested in new clothes and do not have a chance to know that upcycled products." Another practical suggestion is to implement

a recycling box so that people can donate their old clothes easily. This idea can be implemented anytime on a micro-level and could expand to other communities and institutions.

Discussion

The findings showed that students who were interested in kimono upcycling and western garment upcycling had similar profiles; however, slightly fewer students were interested in kimono upcycling than those who were interested in western garment upcycling. Since more than half of college students possess kimonos, familiarity may not be the major reason that they were less interested in upcycled kimonos than western garments. The Japanese people's lifestyles have changed greatly over the last century. Beginning in 1928, industrialization allowed society to adapt and produce sewing machines (Gordon, 2011). The dressmaking boom that began in 1945 led to the rapid spread of home sewing machines. Later, the advanced development of industrial sewing machines helped to increase the use of ready-to-wear apparel. Kimono production used only hand-sewn techniques but the increasing use of sewing machines may have lead people to create western-style clothing instead (Cliffe & Eicher, 2017).

Another prominent transformation was when women's education started; western-style uniforms were gradually socially accepted and implemented in schools. In the 1920s, an increasing number of girls' schools gradually allowed western-style school uniforms (Namba, 2012). Functionality could have been the major reason for schools and society to implement western-style school uniforms. For example, a kimono wraps around the entire body, which comes together at the front and is held together by multiple cords. When the wearer moves around, the cords can become loose and easily expose the body's front and impede movement. On the other hand, a western dress has a zipper or button closure, can easily be taken on and off and is unlikely to hinder the wearers' movement. Functionality was a therefore a good reason that both boys and girls wear western school uniforms in current Japan.

Although many participants noted that they own kimonos, their daily wear is western-style clothing. Therefore, they would also be more interested in upcycling western clothes and which would be a natural response. Slightly less than half of the students noted that they had seen upcycled kimono products. This finding may explain why students' interest levels in upcycling kimono products were less prominent than for western garments because their reactions had been formed based on their experiences seeing the actual products. They may not have been easily able to visualize the connection between kimonos and upcycled kimono products.

On the other hand, a few students did possess upcycled kimono products, connected to their family memories. Those who currently possessed the products noted their particular sweet and nostalgic memories especially regarding their grandmothers who had made these items. Family and cultural attachments come into upcycled products. This concept could be similar to a Japanese family possessing family crests and passing them on form generation to generation. Family crests are a Japanese tradition and "appear on some formal clothing, and businesses and organizations have adapted the concert for commercial purposes" (Hornun, 1986, p.1) and symbolize family ties and close relationships (*Family Crests of Japan*, 2001). The family crest culture then explains why some people treasure the cultural artifacts because they relate to families and pass the tradition onto next generations.

Many students also connected items to Japanese cultural preservation. They responded that upcycled kimono products helped to retain Japanese culture. Many students aligned the transformation of the kimono as a new product with their positive views. In contrast, a few

other students noted that they could not find a reason for transforming old kimonos into new garments. A few respondents noted that upcycling kimonos discourages Japanese cultural heritage; they would rather maintain the kimono's original form. They may have perceived the kimono as more of a cultural artifact than mere clothing. This answer could be a natural reaction to the fact that people cherish their cultural heritage and kimono costumes' legacy (Francks, 2015) passed down through generations. Janigo, Juanjuan, and DeLong (2017) pointed out, "Emotional connection may have played a role in individuals' decisions to keep upcycled items" (p. 277). These positive and negative responses explain that they attach to the traditional form of kimono that sustains their cultural heritages.

The last common theme was that participants related upcycled kimono products to sustainable resource preservation. Compared to the first three themes, not many students responded that this practice connects to sustainability. However, several participants pointed out that reusable resources could help save our environment. As noted earlier, since 2016 the government of Japan has actively promoted its sustainability platforms (Ministry of Foreign Affairs, 2016). The rules and regulations could have influenced the participants' sustainability behaviors.

Based on the common themes, students' reactions to the upcycled kimono products were dominated by the latter's physical attractiveness, such as colors, patterns, motifs, and textures. There were also comments that the products were more for older people. These perceptual differences were unique. Although the students' responses to questions of sustainability connected to upcycling were low compared to the other three themes, some examined sustainability connections were described as implementation challenges. Students noted that the challenges for upcycling kimonos appear to lie in practical issues and technical matters, all part of concerns of remaking new garments and accessories. In this case, collaborating with apparel companies or individuals would enable upcycling practices to become feasible; however, another issue could be the costs. Unlike massive production, an upcycling product becomes a one-of-a-kind or exclusive one, which means that the process tends to take time and is costly. However, the participants pointed out that consumers might not want to spend higher than usual prices for the upcycled products. Some students suggested that promoting the concept as saving our earth would prompt more people to buy these products.

The results of the upcycling kimono practice survey can also be explained by SDGs sequences. When people have quality education (SDG #4) to understand that an individual's action leads to retaining our environment, the communities and countries help reduce inequality (SDG #10) by less having a mass production by preventing child labor or eschewing sweatshop conditions (UNESCO, 2017). This improvement helps produce sustainable cities and communities (SDG # 11) by reasonable consumption using a recycling approach and creating upcycled products (SDG #12). Although the SDG's 12th goal particularly focuses on water, energy, and food as responsible consumption and production (United Nation, 2020), including textiles that they wear and purchase, may lead to changing their views and behaviors. Also, the 12th goal contains the infinity symbol, which entails focusing on recycling and upcycling. Ultimately, this sequence becomes a positive climate action (SDG #13) because it conserves water and naturalistic energy when people recycle or upcycle their garments.

The Ministry of Environment (2018) explained the university and other academic institution's role as "to support the development of a proper international framework for the circulation of resources and the overseas expansion of waste management and recycling industries" (p. 58). Innovative interdisciplinary student engagement would help maintain the recycling-based

society. However, this study's data showed that students' awareness and interest in recycling and upcycling practice might need to be sharpened.

Limitations

The major limitation of this study is that the findings cannot be generalized to college students' perceptions in Japan. The samples and the site were selected purposely; however, choosing different colleges for the study could lead to different results due to the make-up of the student bodies. Since the research location for this study was an elite university whose objective is to foster globalized initiatives, the students may have been more conscious of sustainability relations than at other institutions. However, even in this study, over one-third of the students did not know the meaning of sustainability.

Moreover, exploring male or other gender students' perceptions, different age groups, and majors might very well provide different results. Another limitation would be the translation of participants' answers. Although the researcher is the translator/transcriber and a native speaker of Japanese, the translations could slightly differ when replicating a similar study. Cross-checking data with other native speakers in a similar field would ensure that the results are valid across the board.

Implications and Conclusion

Although recycling practices have improved in Japan, there still exists limited literature and research on upcycling practice, products, and consumers' perceptions. There were no longitudinal Japanese studies in this area of research. This challenge has not only been seen in Japan. Likewise, there were only limited studies regarding upcycling products in other countries, such as Korea, China, and New Zealand (Kim, Jung, & Lee, 2021; Yoo, Jung, & Oh, 2021; Koch, 2019). Lack of research in this area was also the main reason for this study to have been undertaken.

Although the kimono has played a central role in the study of the origin Japanese's indigenous cultures, after World War II people have moved toward western attire instead. Nevertheless, they do possess knowledge of the legacy of traditional kimono culture (Francks, 2015). Japanese also have a characteristically recycle-oriented culture. This trait is advantageous for contributing to upcycling practices. However, further investigation is needed to study this cultural trait and its existence among the younger generations. In this research, various practical challenges were noted by college students. Likewise, Janigo et al. (2017) explained: "[A] primary disadvantage is the labor intensiveness of the work, including careful deconstruction of used clothing. Making a profit could be challenging, considering there seemed to be a limit to how much people might be willing to pay" (p. 272-273). When the major challenges are reexamined and a way is found to resolve them, upcycling kimonos could become the next recycling-oriented sustainable practice among Japanese people and others. Unlike mass-produced fast-fashion garments, upcycling kimono products could become exclusive and unique properties. Upcycling is tightly connected with slow fashion, which is to "reduce amounts of new clothing purchased from retail stores, slow the cycling of clothing through one's wardrobe, and keep clothing out of waste streams by extending its usable life" (Janigo et al., 2017, p. 276). The upcycle concepts and processes could work in different countries and their cultural artifacts to sustain their legacies.

In this study, not many students in a Japan university did connect upcycling kimonos to sustainability in order to reuse their cultural resources. This result would be one of the interesting findings which seem to suggest that more work needs to be done to safeguard cultural heritage. Textiles might not have been the center of their foci for this. It would be stimulating to explore why they tended not to regard their unneeded used clothes for recycling practices.

Although the SDGs are today's popular universal concepts the world over, some students still were not aware of sustainability goals. Some of them had never even heard of sustainability. Expanding the awareness of upcycling and spreading sustainable concepts would contribute to reusing any and all available cultural resources. Recycle-oriented cultural sustainable development is neither a burden nor does it negatively affect the environment. Shen, Richards, and Lui (2013) explained that when consumers do not have sufficient knowledge regarding sustainable products, they might not realize they are sustainable. Likewise, college students may lack knowledge of recycling kimonos to be used to make new garments. When people and students possess upcycling background knowledge, they can decide whether to recycle used clothes and update them as upcycling products.

Moreover, the issue could be that usage of sustainability has not been standardized in Japanese society or even worldwide despite their inclusion in the SDGs. Park and Kim (2016) pointed out that there is "no clear consensus on what it means to be "sustainable" for fashion companies or brands and how sustainability, as it is perceived by consumers, can be measured" (p.1). Likewise, sustainability is defined literally as "sustain" and "ability" in Japanese. As a result, some Japanese may not think in further detail about these issues, which is evident from many blank or "Do-not-know" answers.

Lastly, people may face technical challenges to remake clothes; however, this issue can be successfully approached and alleviated by different industry sectors. Kusakabe (2013) suggested that sustainability can progress when social capital, such as political and government support becomes higher, and that citizens will greatly participate in sustainable development. The Japanese government has already regulated other recycled products; many people actively seem to preserve useful resources already. Textile and garment recycling regulations could and perhaps should be the next laws and regulations to be implemented in order for people to recognize textile recycling as a major supporting practice for the SDGs to have been achieved by the year 2030.

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Appendix A

University of Hawai'i
Questionnaire in a Research Project

Minako McCarthy, Principal Investigator
Tentative title: Slow Fashion Concept Upcycled Kimonos as Recycle-oriented Cultural Sustainability

Background questions: Please circle MOST applicable for you and fill in the blank

a) Sex: Male, Female, Others
b) Ethnicity: How do you identify yourself? _____
c) Age: please specify your age if you don't mind. _____
d) Class level: Freshman, Sophomore, Junior, Senior, or others
e) Major: _____
f) First Language you speak: _____

Please answer the questions shown below. Choose the best applicable answer

1. How often do you purchase new clothes?

   A) More than once a year
   B) Once a year
   C) Every two-three months
   D) Once a month
   E) Twice a week
   F) Once a week
   G) Others; please specify _____

2. Where do you purchase your clothes?
3. How do you get rid of your clothes?

   A) Give to siblings or friends
   B) Sell or donate to thrift shops
   C) Leave in your closets
   D) Threw in the trash bin
   E) Others; please specify _____

4. Do you own a Kimono? Yes or No

   （ア）If so, how many kimonos do you own? _____

5. Do any of your family members own a kimono? Yes or No

   A) If so, how many and what kind do they own? _____

6. How often do you wear kimono?

   A) More than once a year

   B) Once a year

   C) Once in several years

   D) On some special occasions/ events

   E) Never wore

7. How do your life and kimonos are related together? Any experiences, perceptions, or preferences?
   A) Several times year
   B) Once a year
   C) Once in several years
   D) Special occasions or events, such as weddings etc…

8. How do kimonos and your daily lives connect? Please describe your experiences, family customs, or any onions.

9. Have you recycled (up-cycled) kimono to other garments (articles)?

   Yes or No

10. If so, can you tell me the details? What items have you made into? How were your experiences?

11. Have you seen any recycled (up-cycled) garments using kimonos?

    Yes or No

12. If so, can you tell me the details? When and where did you see it? design, color, etc…

13. How did you feel about those upcycled kimono garments or articles?

14. Sustainability contains various meanings. What does sustainability mean to you?

15. Would you be interested in recycling (up-cycling) your own clothes into a new garment?

    Yes or No

16. If so, can you describe any particular garments that you would like to make it? (someone to make it for you?)

17. Would you be interested in recycling (up-cycling) your own or second-handed kimono into a new garment?

    Yes or No

18. If so, can you describe any particular garments that you would like to make it? (someone to make it for you?)

19. What do you think are the challenges to implementing recycling (up-cycling) kimono to current young generations?

Thank you for participating in the questionnaire. 

Appendix B

University of Hawai'i
Questionnaire in a Research Project
Minako McCarthy, Principal Investigator
Tentative title: Slow Fashion Concept Upcycled Kimonos as Recycle-oriented Cultural Sustainability

アンケート参加者情報：それぞれ当てはまる情報にチェック、もしくは貴方の情報を書き込んでください。

A) 性別： 女性、男性、その他

B) 出身： _____ （日本の場合、都道府県；海外の場合、出身国をお願いします）

C) 年齢： _____もしよろしければ 貴方の年齢を書き込んでください。

D) 学年： １年生、２年生、３年生、４年生、その他_____

E) 専攻: _____

F) 第一言語：_____

下記の質問にお答えください。当てはまる項目を一つ選ぶ、または答えられる限りお願いします。

1. どのくらいの頻度で新しい洋服を購入しますか？

   A) 数年に一回

   B) 一年に一回

   C) ２、３ヶ月に一回

   D) １ヶ月に一回

   E) ２週間に一回

   F) １週間に一回

   G) その他 具体的に教えてください _____

2. 主にどのようなお店で洋服を購入しますか？

3. 古い洋服はどのように処分しますか？

   A) 身内に譲る

   B) リサイクルショップなどに寄付もしくは売る

   C) 処分せず、保有する

   D) 粗大ゴミにする

E) その他 具体的に教えてください _____

4. 和服（着物など）を所有していますか？ はい、 もしくは いいえ

5. もし、お持ちの場合、何着の着物を所有していますか？_____着。

6. 貴方の家族や親戚の方は和服（着物など）を所有していますか？

はい、 もしくは いいえ

7. もし、お持ちの場合、大体のべ何着の着物を所有していますか？_____

8. どのくらいの頻度で着物を着ますか？ 当てはまるものにチェックをつけてください。

A) 一年に数回、

B) 一年に一度、

C) 数年に一度、

D) 特別なイベント（結婚式やその他）などの時、

E) 一度も着たことがない

9. 貴方の生活と着物はどのようにつながっていると思いますか？経験、家族などの関わりや、意見、好みなど、 どんなことでも構いません。

10. 着物をリサイクルして新しい服や小物などを製作したことはありますか？

はい、 もしくは いいえ

11. もし製作したことがある場合、どのようなものを作られましたか？そして、その経験はどのようなものでしたか？

12. 今まで和服（着物など）をリサイクルし新しく生まれ変わった服や小物を見たことがありますか？

はい、 もしくは いいえ

13. 見たことがある場合、いつ、どこでそのような新しく生まれ変わったものを見ましたか？その和服（着物など）や小物の色やデザインなどはどの様なものでしたか？

14. その新しく生まれ変わった和服（着物など）や小物に対しての感想をお聞かせくださ

い。

15. サスティンアビリティという言葉を耳にしたことがあると思いますが、いろいろな意味を持っている概念、言葉です。**貴方が思う**サスティナビリティの定義、意味をお教えください。

16. 古い洋服をリサイクルし、新しい洋服や小物を作ることに興味がありますか？

はい、　　もしくは　　いいえ

17. 興味がある場合、どのような洋服や、小物を作ってみたいですか？もしくは誰かに作ってもらいたいですか？

18. 古い着物をリサイクルし、新しい洋服や小物を作ることに興味がありますか？

はい、　　もしくは　　いいえ

19. 興味がある場合、どのような新しい洋服や、小物を作ってみたいですか？もしくは誰かに作ってもらいたいですか？

20. 新しい洋服が手軽に手に入るこの世の中、古い洋服、和服をリサイクルし、新しい服や小物を作るということを現在そしてこれからの方々がこのようなことを試みるとしたら、どのような課題があると考えますか？

アンケートのご協力をありがとうございました。