4th PLATE 2021 Virtual Conference
Limerick, Ireland - 26-28 May 2021

Design for service-oriented approach: a case of collaborative consumption

Bai J. [(a)], **Shin H.D.** [(a,b)] , **Watkins M.** [(a)]
a) Nottingham Trent University, Nottingham, UK
b) Yonsei University, Seoul, South Korea

Keywords: Service-oriented Approach; Collaborative Consumption; Sustainability; Sharing Economy.

Abstract: Human activities are placing increasing pressure on our global resources and climate, with the circular economy considered as a promising approach to reducing the global pressure on diminishing resources. Service-oriented products have become firmly established as a crucial aspect of business today. With consumers recognising the benefits provided through apps and websites, combining convenience with the potential to improve individual's behaviour in respect to sustainability. Subsequently, the "sharing economy" is a term that describes a wide range of activities and organisations that foster the sharing of tangible assets for monetary or non-monetary benefits, typically through a peer-to-peer marketplace. Collaborative consumption is best conceived as a "resource circulation system" and a challenge for businesses and practitioners.
This paper discusses the findings of a questionnaire conducted in Britain and China, which sought to understand consumer's perceptions and behaviours around the use of collaborative consumption platforms, comparing the situation before and during the COVID-19 pandemic. The study found that individuals, who use collaborative consumption platforms, predominately use the service for its economic benefits rather than environmental concerns. Consumer's perception of sustainability may change post COVID-19, due to differing lifestyles with people being connected at a distance. Therefore, there is a need to explore new knowledge in order to find fresh revenue streams, new collaborative models, new partnerships, and new services. This paper aims to describe the gap between people's value and their action, hoping to identify and correlate differences in consumption behaviour between two countries to inform future consumption and communicate potential sustainability benefits.

Introduction

In recent decades, excessive consumption and increasing demand for limited natural resources have put greater pressure on the environment and generated increasing waste (Tukker *et al.*, 2008). Multiple agencies report that due to human activities, the pressure on our global resources and climate is increasing (Zengwei Yuan, Jun Bi and S, 2008). As a result, the fair and correct distribution of finite resources becomes a crucial issue. The idea of circular economy is not new, and many researchers are working in this area. The circular economy seeks to bring a new paradigm to the productivity of resources by creating an innovative model to transition from a linear economy. Circular systems employ reuse, sharing, repair, refurbishment, remanufacturing and recycling to create closed-loop systems, minimising the use of resource inputs and the creation of waste, pollution and carbon emissions (Geissdoerfer *et al.*, 2017). The circular economy is increasingly seen as a potential solution to sustainable development. People want to establish an economic system to minimise the input of resources, waste, emissions and energy leakage in the system to reduce negative impacts without jeopardising growth and prosperity (Geissdoerfer *et al.*, 2018).

However, the scale of the challenge continues to increase (driven by rapid market growth in developing countries and global population growth), it is clear that companies need to go beyond existing incremental approaches and make major changes in a fundamental way. Product Service System (PSS) have been regarded as one of the most effective tools for transitioning society towards a collaborative and resource-efficient future. The sharing economy is a crucial aspect of this and proposes concepts that use service-oriented platforms to practice collaborative consumption. However, since the outset of the COVID-19 pandemic, it may have been

challenging for companies to encourage and generate such innovations in practice. By creating value from shared resources, PSS encourages collaborative consumption, shifting the focus from individual private ownership of material goods to access and a more efficient usage of pooled assets. This creates opportunities for development of new (and conceivably profitable business) propositions with potentially lower environmental impact that provide more meaningful experiences to users. For example, ride sharing offers the opportunity to reduce car-running costs negative environmental consequences, but it also facilitates meeting new people through shared travelling. Finally, due to its reliance on social networks and interactions, collaborative consumption may promote social innovation and contribute to building stronger and more connected communities (Piscicelli, Cooper and Fisher, 2015).

In recent years, people's attitudes towards consumption have changed, and people are increasingly becoming concerned about the ecological, social and developmental impacts. A growing concern about sustainability has fostered 'collaborative consumption' and 'sharing economy' as an alternative marketplace (Albinsson and Perera, 2012). Botsman and Rogers (2010) believes that the 21st century will be characterised by collaborative consumption. It is a new business model, supported by network technology, and based on the ancient methods of trading by bartering and swapping.

Collaborative consumption is still an emerging and niche market. However, after COVID-19, people have experienced need of change in traditional ways of shopping which do not meet their needs. Therefore, online collaborative consumption platforms have potential in addressing this gap and may suit individual needs. This study discusses the result of a questionnaire that challenged the understanding of collaborative consumption, focusing on how they consumers perceive its benefit and its relationship with sustainability. It also discusses how people's attitudes and behaviour around collaborative consumption has changed between pre and post COVID periods.

Methods

An online questionnaire was developed to collect insights and data on the purchasing behaviour and understanding of collaborative consumption amongst respondents in the Britain and China. A total of n = 630 responses were received 214 from Britain and 416 from China. Demographic questions collected sex, age, and annual income level (Table 1).

		China (%)	Britain (%)
Gender	Male	164(39.42%)	117(54.67%)
	Female	244(58.65%)	97(45.33%)
	Prefer not to say	8(1.92%)	0(0.00%)
Age	18-24	75(18.03%)	48(22.43%)
	25-34	209(50.24%)	66(30.84%)
	35-49	105(25.24%)	87(40.65%)
	50-64	24(5.77%)	11(5.14%)
	65-74	3(0.72%)	2(0.93%)

Table 1. Basic information of questionnaire

The definition of purchasing behaviour broadly covered the shopping, shopping frequency, current use of collaborative consumption platforms and respondents understanding of collaborative consumption and the prospective to the future.

Results

The following results are collected from the questionnaire both in China and Britain, some results were expected, and others were less predictable.

Figure 1. Purchasing habits of Chinese and British consumers prior to COVID-19

In question 4, respondents were asked about their Shopping habits. As shown in Figure 1, in the comparison of consumption habits before the COVID-19, Chinese consumers chose "I predominately shop online" most, accounting for 51.68%, compared to 26.64% in Britain, though it is worth noting that Chinese respondents were relatively younger.

	Nation	Total

		China	Britain	
Which of the following have you used before (click all that applies)?	Bike sharing	218	51	269
	Ride sharing	217	91	308
	Hospitality sharing	143	30	173
	Car Boot sale	86	40	126
	Co-working	85	43	128
	Swap meets	40	13	53
	Flea markets (second-hand market)	93	85	178
	None of above	12	57	69
	Total	416	212	628

Table 2. which of the following have you used before?

Table 2 shows the use of collaborative consumption opportunities, respondents were permitted to select multiple options, so the percentages equate to higher than 100% overall. Chinese consumers are most familiar with using "Bike sharing" and "Ride sharing". Whilst British consumers are most familiar with second hand 'flea' markets. Over 50% of Chinese respondents have used bike sharing. The ride sharing prevalence was almost as high in popularity followed by hospitality sharing, whilst the remaining categories were below 25%. It is worth noting that only 3% Chinese participants have never used the given collaborative consumption platforms, compared to over 25% in Britain. This could be partly explained by a higher proportion of Chinese respondents in the younger age group of 25-34 amongst Chinese respondents in (50.24%) compared to British (30.84%) and the high penetration of bike-sharing industry in China. In May 2018, the active users reached to nearly 60 million (Liu *et al.*, 2020). In China, bike sharing is a very common method of travel (Xie, 2019), with electric bike use, in China is gradually increasing. In Britain, ride sharing is the most popular form, followed by flea markets.

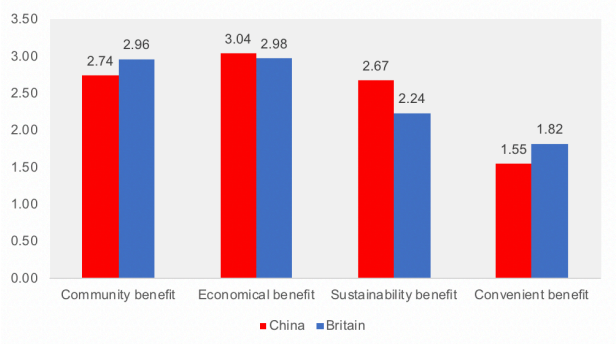

Figure 2. The benefits of collaborative consumption

As shown in Figure 2, the ranking options of the perception of the benefits of collaborative consumption typically follow in the perceived importance: Economical benefit, Community benefit, Sustainability benefit, and convenience benefit. It was interesting that these were so similar across both nationalities. Although it should be noted that the rankings of British consumers' Economical benefit and Community benefit were relatively close.

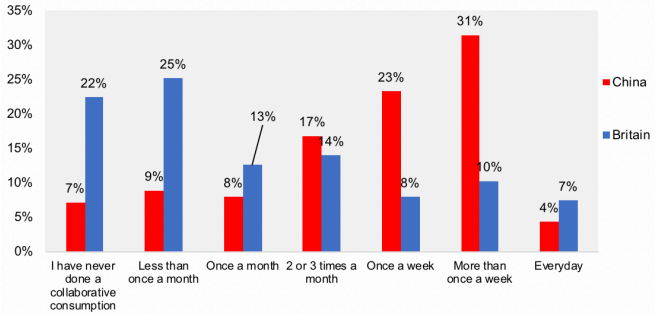

Figure 3. Frequency of use of collaborative consumption platforms before COVID-19

Interestingly, people were confident about their use frequency of collaborative consumption platforms (Figure 3). More than 50% Chinese consumers use collaborative consumption platforms once a week and the majority of British consumers said less than once a week. These figure shows an analogous tendency with the online shopping frequency which may due to most collaborative consumption using online applications and platforms therefore more accessible in China and collaborative consumption usage being higher than UK.

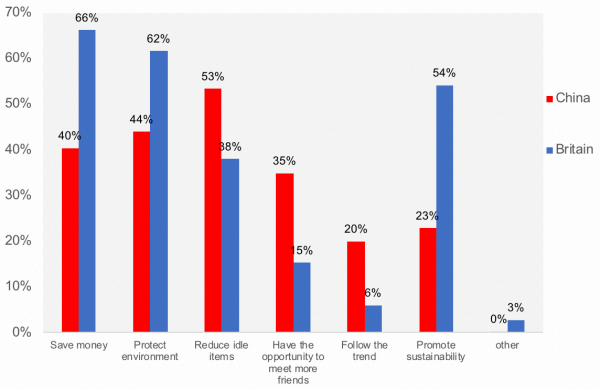

Figure 4. Reasons for using collaborative consumption platforms

When responding to their personal drivers for using collaborative consumption platforms (Figure 4), “save money” and “protect environment” came first and second for British, and second and third for Chinese. Significantly, “reduce idle items” came the first in China, this may be due to the city lifestyle, possibly living in limited space., This may also have a link to explains the desire for meeting other friends, 35% Chinese respondents want to meet more friends whilst only 15% in Britain. Over a half of British respondents expected to promote sustainability compared to 23% in China, accounting for the majority answers.

Figure 5, shows that in relation to the disruptive perception of collaborative consumption platforms in the future; both Chinese and British consumers are most likely to choose "Slightly disruptive"

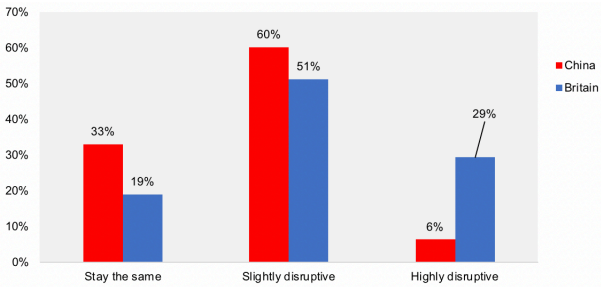

Figure 5. The disruption of collaborative consumption platforms

Over a half of participants in both countries think collaborative consumption platforms are disruptive, these platforms offering innovative options for their way of purchasing, sharing and living.

Discussion

In recent years, there has been an increasing interest in collaborative consumption platforms. Chinese consumers are more likely to engage in online collaborative consumption whilst British consumers are more likely to engage in physical collaborative consumption activities. A difference between these two countries is the population which could highly influence the result obtained. Also, the majority Chinese people live in apartment blocks and cities with higher density of population; therefore, city occupants have easier access to participate in collaborative consumption and receive products or services easily. But in Britain, wider access to such platform can be limited due to wider spread of population across the region. Collaborative consumption is more economically viable in China; with a higher likelihood of profitability and success due to above mentioned reasons. British consumers perceived “collaborative consumption” vocabulary as “disruptive”, whilst the practice of collaborative consumption was already evident in traditional practices such as flea-markets. Consumers in both countries have interest towards sustainability, but the consumption infrastructure is built in different ways due to the population base. Online shopping is rapidly increasing in China, this is probably affected by the smartphone use (Ma, Grafton and Renwick, 2020), However, sustainability has always been the central concern for Britain people. The sample of respondents in the survey may explain some differences for example female respondents made up 58.65% of the Chinese respondents but 45.33% of the British respondents. Whilst Chinese respondents were also typically younger by comparison 18 to 34 was 68.27% compared to 53.27% from Britain, for example, younger Chinese females are more likely shop online, but elderly people prefer shop in stores traditionally.

Chinese people want to use collaborative consumption platforms for number of reasons, but the option of “reduce idle items” was most important to them, it was suspected that this was due to a lack of space but the average living space per capita is very similar in urban regions in China at 36.9m² (statista, 2020) compared to Britain at 36.5 m² (Anthony Breach, 2019). Why Chinese respondents prioritise space and may want to get rid of unused products to save space is unknown.

The difference in response between "protect environment" and "promote sustainability" is interesting and might indicate a difference between reducing the use of finite resources and promoting an increased awareness and channels for developing sustainability. Chinese respondents' top choices relate to values that are not sustainable focused, whilst in Britain, respondents had strong values towards sustainability, but the lack of accessibility and convenience may limit them having a stronger impact.

It is important to understand people's true perception of collaborative consumption and their current use of or reasons for increasing their use in future. With a significant difference between those China and Britain, and their perceptions of collaborative consumption, with Chinese consumers being more familiar with online platforms. Collaborative consumption platforms can help foster behaviour change by providing methods and tools to adopt pro-environmental and pro-social action through the application (Piscicelli *et al.*, 2016). There is a clear need for reorienting consumption patterns and, more fundamentally, the dominant economic system based on unlimited growth in our materially finite world (Marchand and Walker, 2008). In this way, consumers can become more involved in the sharing economy, reducing waste and negative environmental impacts. There is a need to find a more culturally compatible form of collaborative consumption considering the factors discussed in this paper. Whilst China has successful platforms, the respondents lack an awareness and values aligned with sustainability and many of these platforms further reinforce unsustainable patterns of behaviour i.e. the bike sharing waste piles in China (Haas, 2017). However, whilst sharing economic activity has brought great convenience to people, it has also led to undesirable and unsustainable behaviours (that violate regulations and debase social norms). For example, abandoning shared bicycles in undefined or restricted areas, rivers or lakes, vandalism or fitting personal locks to prevent bicycles from being used by others (Yin, Qian and Singhapakdi, 2018). i.e. excessive use of collaborative consumption causes additional social problem. This suggests that online collaborative consumption platforms are not a universal answer and can result in unsustainable behaviours if not managed correctly. Suggesting that there is a need for society and companies involved to cultivate and elicit sustainable social behaviours as they pursue economic benefits (Chi *et al.*, 2020). Such challenges and the findings of this study suggest that we need to better understand the participants, especially their motivations for participation; but more over how service provider and policy makers can work together to achieve healthier circular economy. Although the economy can develop further, sharing should not be compromised (Liu *et al.*, 2020).

Conclusions

The most interesting observation to emerge from the data comparison was how the responses differed between the cultures of the two countries. China has a well-established online collaborative consumption infrastructure with a huge potential market and several well-known sharing brands. However, for the Chinese respondents it seems that economic benefits are prioritised over sustainability reasons. Chinese respondents paid more attention to reducing idle items and saving money, it appears that they want to participant in collaborative consumption but lack sustainable awareness. As a consequence, there is an undeniable gap between people's values and action. Second-hand markets are popular in Britain and online shopping is not as popular in comparison with China. British consumers care about sustainability and are confident in living a sustainable lifestyle. However, the evidence from this study suggests that British consumers have a lower engagement with collaborative consumption due to a lower frequency of online platforms, preferring traditional shopping in physical stores and second-hand markets. An implication of this is the possibility that the cultural background of consumers largely affects the promotion and use of collaborative consumption platforms. Therefore, there is an urgent need to explore new trends, technologies and innovations to keep both customers and collaborative consumption businesses growing, especially during the COVID stay at home restrictions to enable consumer behaviour to be managed in a sustainable and convenient manner by exploring new ways of shopping online and trends, technologies for delivering goods and services.

Limitations of the Study

This study was based upon 630 questionnaires and future work could expand this sample to permit statistically valid comparisons. In relation to this sample there were two key disparities to be addressed in future. First the Chinese sample is younger than the British sample, which could explain some of the findings regarding online shopping. Second, the representative age groups were not equally distributed. Third, the male and female demographics differ, with a greater number of females in China and males in the Britain, which has not permitted for analysis of responses by sex.

Investigating the reason why Chinese people want to save space and get rid of idle items, what rooted for the response between "protect environment" and "promote sustainability", they all need to be explored in our further work.

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