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Reframing Recycling Behaviour through Consumers' Perceptions: An Exploratory Investigation

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Abstract: Despite the increasing awareness of the consequences of waste, there is no consensus on how and why consumers engage in recycling, making it challenging to design behavioural interventions that might promote recycling, especially in organisational settings. This study is designed to explain consumers' recycling behaviour and how it differs across contexts, particularly between home and work settings. Using personal accounts of 367 employees from different organisations in the UK, this study explores recycling behaviour at home and work including its motivations and barriers. The findings show that recycling behaviour is different across contexts due to many disparate factors underlying people's waste generation and recycling behaviours from one context to another. According to the findings, buying and consumption behaviour and waste generation patterns influence the way consumers engage in recycling. The study further demonstrates that contextual factors and individual circumstances are important contributors to consumption behaviour, waste production, and recycling behaviour. While recycling behaviour has been investigated extensively, the findings of this study indicate the need for consumption and waste production patterns to be taken into consideration when designing recycling interventions, enhancing the prospect of a circular economy. This study contributes to theory and practice by associating recycling behaviour with buying and consumption behaviour, including waste generation patterns.

Keywords: recycling behaviour; consumption patterns; facilities; waste management; circular economy; home and work; accountability; control; responsibility; personal circumstances

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1. Introduction

Waste production is critical in achieving a circular economy (CE) and sustainability [1,2]. This is evident in the number of studies on recycling behaviour across many disciplines [3,4]. According to meta-analyses of studies on recycling [3,5,6], the common trend is to attribute recycling behaviour to the effects of psychological factors, such as attitudes and identity. However, consumers are inconsistent across contexts when engaging in recycling [7,8], undermining the effects of psychological factors on recycling behaviour. Moreover, most of the available studies fail to guide employees on how to engage in pro-environmental behaviours [9], especially recycling behaviour in their workplaces [10]. Despite the plethora of studies on recycling [11], our knowledge of recycling, especially across contexts [3,12] and how to promote recycling, is in constant flux [12,13]. According to Kollmuss and Agyeman [14], the question of "*Why do people act environmentally and what are the barriers to pro-environmental behaviour*?" is extremely complex, and a single explanation is not feasible.

The complexity of recycling has been highlighted in previous studies [3,13]; however, this study is not an attempt to diagnose the issues associated with previous studies; instead, it seeks to explore why consumers engage in recycling by understanding their perceptions. Specifically, the study is designed to understand whether recycling is context-specific and, if so, why recycling behaviour varies across contexts. In the UK, there is a significant disparity in the way recycling at home and work is set-up, based on the UK legislative requirements [4]. There is therefore a need to establish whether recycling considered as an established behaviour in the home [15] translates to work settings [10,16]. The rationale is to offer a more logical and robust explanation of recycling behaviour by identifying motivations and barriers through the lens of consumers as they evaluate and interpret their actions. By using consumers' insights to explain recycling behaviour as anticipated in this study, there is an opportunity for waste planners and policymakers to design effective waste management strategies and recycling schemes [10], including how they are marketed to consumers.

Literature and Theoretical Underpinning

Recent efforts have resulted in many interventions and theoretical models [5,17] to understand recycling behaviour. Theories, such as Ajzen's [18] Theory of Planned Behaviour (TPB) and Schwartz and Howard's [19] Norm Activation Model (NAM), have been adopted in many studies to explain recycling behaviour. For instance, attitudes, perceived behavioural control, intentions, subjective norms, monetary incentives, and knowledge are linked to recycling behaviour [4,5]. Another factor often associated with recycling behaviour is commitment, although the focus of research has been on householders' commitment to recycling at home [5,6]. Nonetheless, studies [3–5] have shown that individual commitment, through goal setting and feedback, is more effective than group commitment in enhancing recycling behaviour. In organisational settings, organisations can demonstrate their commitment to recycling by installing correct facilities, making recycling easy for their employees to perform [8,10].

While previous individual studies have identified factors that might explain recycling behaviour, there is no consensus among them about the determinants of recycling behaviour [3,13]. The lack of consensus is partly due to different methods, contexts of investigation [8,10], and the interdisciplinary nature of research efforts [11]. This disparity in methodological approaches and research findings means that there is still great difficulty in explaining recycling behaviour with clarity [3,4].

While behavioural models/theories are instrumental in recycling behaviour [4,6,11], many of the available models are limited in their practical implications and contributions. According to Osbaldiston [20], theoretical models can only explain a moderate variance in effect sizes of conservation behaviour. In addition, most pro-environmental behaviour models assume that people are rational and fail to account for individual, social, and institutional constraints, especially in organisational settings [10,21].

Consequently, there is no consensus in the literature about the motivations for recycling behaviour [3,9], and many interventions in changing recycling behaviour have outcomes that are mostly short-lived [5]. Additionally, it is not established whether recycling behaviour is context-specific, given that cross-context studies are extremely rare [7,8]. Using the above premises as a point of departure, this study seeks to answer the following research questions:

Research Question 1 (RQ1): How do people in the UK perceive waste?

Research Question 2 (RQ2): Why do consumers in the UK engage in recycling?

Research Question 3 (RQ3): What are the effects of context and its attributes on recycling behaviour in the UK?

Research Question 4 (RQ4): How can recycling behaviour be promoted, especially at work in the UK?

2. Methods

This study adopts an exploratory interpretive approach to answer the presented research questions and seeks to understand how recycling is framed using consumers' accounts [22]. This study explored two dominant but different behavioural contexts [7], home and organisational settings, to establish whether recycling, including its motivations, is context-specific. We randomly sampled organisations rather than households to ensure that key informants who could provide adequate information about recycling in both contexts were recruited. Organisations were randomly selected from commercially available repositories, Financial Analysis Made Easy (FAME) and Kompass databases, of registered organisations in the UK. Dedicated individuals (gatekeepers) within the randomly selected organisation were contacted to disseminate an online questionnaire survey within their organisation. This approach was necessary, considering that employees' contacts are not accessible to the public. Using this approach, 367 employees (230 females; 126 males; 11 prefer not to say; ages ranging from 16 to 65 years old) from different organisations across the UK completed the online survey [10].

The survey was part of ongoing research on the spillover of pro-environmental behaviour. For a detailed explanation of the instrument development, including its dissemination, validity, and reliability tests, see Oke et al. [10]. This present study is based on the open-ended questions included in the survey, providing respondents an opportunity to explain their recycling behaviour at home and work. For consistency, all respondents were asked the same questions. Firstly, they were asked to select a context where they recycle more with regard to "type/range and volume" of materials and "frequency of recycling". The follow-up questions using the open-ended format requested that respondents describe and compare their recycling behaviour in both contexts consistent with their response to the first question (i.e., context selection). This approach allowed respondents to offer their accounts of recycling through their lived experiences rather than the authors' prescriptive explanations of recycling. The rationale was to establish whether recycling, perceived as normative in UK homes [15], translates to recycling in other contexts, especially in organisational settings. The comparison is necessary considering different regulatory requirements underpinning recycling at home and work in the UK [4,10]. Contrary to households, all UK businesses must present metal, plastic, glass, and paper (includes card and cardboard) waste for collection separately as of 1 January 2015 according to the Waste (Scotland) Regulations 2012 and Waste (England and Wales) (Amendment) Regulations 2012 [4,7].

3. Analysis and Results

The socio-demographics (Table 1) are consistent with UK Office for National Statistics' (ONS) demographic information of people in UK workplaces.

To answer the research questions presented above, we asked respondents to indicate whether they recycled more at home or work [16] regarding the volume of materials, the range of materials, and the frequency of their recycling. The results are presented in Table 2. According to the descriptive analysis (Table 2), many people reported recycling more at home compared to work settings in terms of volume and range of materials. They also reported recycling more often at home. Although Table 2 shows that recycling is prevalent at home, it provides no understanding of "why" there is a disparity between the two contexts, which is the crux of this study. As a result, we further explored respondents' comments using thematic analysis to offer valuable insights into why they engage in recycling activities more at home than at work.

Each comment was read and reread to gain a full understanding of the respondents' worldviews and how they framed their recycling behaviour using a systematic method of constant comparison [23]. In this familiarisation stage, key recurrent ideas and emerging themes were identified which informed the process of abstraction and conceptualisation using a case-by-case approach [24]. The thematic analysis was facilitated by NVivo 11, a qualitative data analysis package by QSR, with a coding scheme and framework of themes designed by the research team. To present a coherent and robust narrative about

recycling behaviour and how it is practiced across contexts, the developed coding scheme and framework of themes were cross-checked by the authors, and any differences were discussed to reach a consensus. The procedure ensured rigour and trustworthiness in the data analysis [23,25]. It allowed us to identify, itemise, and organise different themes that best represent respondents' personal accounts of their behaviour as they experience recycling in both settings.

Table 1. Respondents socio-demographics.

		Frequency	Percent
Gender	Male	126	34.3
	Female	230	62.7
	Prefer Not to Say	11	3.0
Age	Prefer Not Say	11	3.0
	16–25	25	6.8
	26–35	78	21.3
	36–45	98	26.7
	46–55	110	30.0
	56–65	40	10.9
	over 65	5	1.4
Qualification	None	1	0.3
	School (i.e., General Certificate of Secondary Education (GCSE))	48	13.1
	College (i.e., Higher National Certificates/Higher National Diplomas/National Vocation Qualifications (HNC/HND/NVQ))	53	14.4
	University Higher Education	265	72.2
Employment status	Employed, full-time	315	85.8
	Employed, part-time	47	12.8
	Self-employed	4	1.1
	Working as a volunteer	1	0.3
Organisation category	Public	203	55.3
	Private	164	44.7
Industry	Administrative and Support Services	20	5.0
	Agriculture, Forestry, and Fishing	7	2.0
	Community, Social and Personal services	15	4.0
	Digital, Creative, and Information Services	19	5.0
	Education	56	15.0
	Energy (including Oil and Gas)	54	15.0
	Financial and Business Services	21	6.0
	Food, Beverages, and Tobacco	18	5.0
	Health and Social Care	12	3.0
	ICT and Precision Instruments	13	4.0
	Public Admin and Defence	24	6.0
	Research and Development	69	19.0
	Engineering and Utilities	39	11.0

Oke, McDonald, and Korobilis-Magas (2021).

Table 2. Comparison of home–work recycling.

Recycling	Contexts	Frequency	Percent
Volume of materials	Home	303	82.6
	Work	64	17.4
Range of materials	Home	315	85.8
	Work	52	14.2
Frequency of recycling	Home	301	82.0
	Work	66	18.0

In what follows, we present how consumers framed their recycling behaviour at home and work, including its motivations and barriers to constructing the dynamics of recycling while providing a robust narrative of recycling behaviour across contexts.

3.1. Framing Recycling Behaviour

The findings of this study highlight the inherent challenges in understanding and promoting recycling, especially in organisational settings. While consumers may perceive recycling the same way across contexts regardless of materials, our study shows that more people engage in recycling at home compared to organisational settings (Table 1).

According to this study, the uniqueness of individuals' motivations for recycling is due to a mix of events (Table 3), contrasting the established view in the literature that recycling behaviour is primarily due to psychological factors [6,17].

Table 3. Respondents' perceptions of recycling behaviour.

Main Themes	Category	Sub-Category
Recycling Behaviour	Waste production	Range Volume
	Contexts (home and work)	Range of materials Volume of materials Frequency of recycling Recycling opportunity
	Motivations and barriers	Personal Context-specific
Consumption Pattern	Waste production	Contexts (home and work) Materials (range and volume)
	Buying behaviour	Family size Income (social status)
	Personal circumstances	Family size and composition Housing type Personal activities (cooking, cleaning, and other domestic chores)
Time availability	Time costs	Work schedule and deadlines Time constraint
	Personal activities	Buying behaviour Consumption behaviour Waste generation (range of materials; volume of materials)
Recycling Facilities	In/convenience	Materials (type) Bin proximity Storage space Setup Location Recycling scheme Accessibility/Availability
Control over recycling	Recycling contexts	Home; work
	Recycling opportunity	Facilities Recycling strategy and scheme
	Recycling knowledge	Recycling experience Procedural—how and what
	Convenience	Setup Scheme design
	Commitment and responsibility	Personal attributes Interaction of contextual attributes Interaction of contextual and personal factors

Table 3. *Cont.*

Main Themes	Category	Sub-Category
Control over recycling	Scheme design	Ease of recycling Correspondence (uniformity) within and across contexts
Accountability	Attribution of recycling to other	Cost (time, effort, financial) implications Local councils Organisations (employers) Colleagues, families, friends Consequences of recycling
	Attribution of recycling to self	Altruism Consequences of waste production Ethical/Moral issue

Although recycling is a complex activity that is challenging to unravel, using multiple worldviews, especially consumers' personal accounts of their recycling behaviour, can enhance the narrative of recycling. For instance, we observed that what many respondents consider as barriers, such as lack of space, to recycling in one context (for instance, home) often serve as motivations for the same individuals in organisational settings.

3.1.1. Roles of Consumption Pattern in Recycling

The most important finding of this study is the contribution of consumption behaviour in recycling behaviour at home and work. Despite the plethora of studies on recycling [11,17,26], studies have not explicitly explained recycling behaviour in terms of consumption and buying behaviour [7,21]. According to the findings of this study, recycling behaviour is a direct reflection of the type of waste people generate based on their consumption behaviour. The observed pattern is influenced by behavioural contexts, whether they occur in the private or public sphere. Contexts are a strong contributor to respondents' buying, consumption, and waste production behaviour. Due to personal activities, the findings of this study show that people consume more materials and produce more waste at home compared to work settings. For example:

> "*I generate more waste at home by cooking, post mail received and everyday life, therefore there is more material to recycle*". [Resp_89]

> "*I have a job that requires me to do my entire work on the computer. Further, I do not print anything unless absolutely necessary, for, e.g., to submit a report required in print. I keep my desk as paperless as possible. I don't use any stationary from day to day. Hence, my 'material' requirements at work are negligible. On the other hand, at home I use a wider range of items like food, groceries, toiletries, clothes, etc., hence I recycle more. Also, I don't buy items unless absolutely necessary*". [Resp_183]

The findings show that consumption behaviour is mostly affected by individual circumstances which are different from context to context. Considering that this study addressed key recyclables, the respondents' comments suggest that family size affects waste production and hence recycling behaviour at home based on the range and volume of materials they consume. For instance:

> "*I generate more waste at home—there's much more to recycle at home in the family of 5*". [Resp_100]

> "*With a growing family, we generate waste from everything we do so there is just more opportunity to recycle at home*". [Resp_275]

While family size and composition influence recycling behaviour at home, these personal attributes have no effect in organisational settings when the individual is considered as a unit of analysis. It is evident from the comments that more personal activities, such as cooking and other domestic chores, are responsible for the range/volume of materials as well as the frequency of recycling at home compared to organisational settings. Personal

circumstances, such as family size, influence buying and consumption behaviour, and this has been observed to be more evident for food items than other materials, such as textiles.

The observed association between recycling behaviour and consumption pattern is facilitated by buying behaviour, including personal circumstances. For instance, consumers may not engage in glass and paper recycling if they are not producing glass and paper waste as part of their consumption pattern. It is unlikely that researchers can explain why and how consumers engage in recycling, especially across contexts, without understanding their consumption patterns. Sustainable consumption will reduce poverty as advocated by the United Nations as part of its Development Goals [27] but will also ease the current pressure on resources and minimise waste production, influencing recycling behaviour. Consistent with our findings, Knickmeyer [28] argued that consumer buying behaviour, including the decision-making process, may affect the way consumers engage in recycling. Although consumers' decision-making processes regarding their consumption are not part of this research, we observed that consumers made decisions based on personal circumstances, such as family size and household dynamics. This finding provides alternative and pertinent explanations not only for improving recycling but also for preventing waste production. For example, collaborative consumption through participation in the peer-to-peer sharing economy [29,30] may reduce the current rate of waste production. With collaborative consumption [10,29], consumers may take cautious and deliberate decisions to reduce their buying behaviour and consumption patterns whether for personal reasons, such as available disposal income, or for a good cause, such as to minimise environmental deterioration. An example of a "waste reduction mindset", was offered by one respondent:

> "*I used a range of items at home, like groceries items, envelopes, cans, etc. I try to minimise this as well, by choosing paperless correspondence and buying groceries without packaging, whenever available, I avoid plastic bags completely*". [Resp_183]

> "*I use more material that can be recycled at home. I don't use the water cups or drink coffee at work therefore I only really recycle food packaging and paper whereas at home I recycle food, newspaper, cardboard, cans and bottles every day*". [Resp_271]

3.1.2. Effects of Time Availability on Recycling Behaviour

Time availability is another determinant of recycling behaviour, although its impact and how consumers perceive it are relatively different, especially from one context to another. While the theme is associated with the range and volume of waste, time availability is also perceived as a time effort to engage in recycling, particularly at work. The observed effect of time availability is context-specific; however, consumers recycle more in a context, either at home or work, where they spend more time. The contribution of time availability is consistent with how the respondents explained the effects of buying and consumption behaviour, including consumers' waste generation potential, on their recycling behaviour. For example:

> "*I spend more time at home, generate a wider range of recyclable materials and more recyclable materials*". [Resp_53]

> "*I recycle more at home because I spend more time there (I work part time). I have a compost bin and glass and plastics bin and cook most things from scratch so have lots of peelings, etc. to recycle at home*". [Resp_59]

Although employees working full-time spend most of their active time at work, they undertake more personal activities, such as cooking, that involve different materials at home, resulting in the production of a broader range of materials and more volume of materials. Additionally, some people prepare the food they consume at work when they are at home, whereas others consume fast food when at work compared to home settings due to time constraints. Packaging materials, including takeaway containers that contribute to the sheer volume of waste at work, are not recyclable, and there is no provision for them in many workplaces, which may affect people's perception of recycling at work. For instance:

"*At work sometimes, I buy food in takeaway containers that are not recyclables. At home very rarely, I buy take-away, and when I do, I reuse the containers*". [Resp_73]

While there are differences between recycling at home and work regarding the range and volume of materials, people also tend to have more time to perform recycling at home when compared to work settings due to deadlines and busy work schedules. For example:

"*I have more time at home to sort and clean the relevant items*" [Resp_9]

"*It's easier as I have recycling bins for everything within easy access. In the office, waste collects until I have time/enough waste to make a trip to the bins, and so sometimes it's just easier and quicker to not separate this out (and the bins are often full to take more)*". [Resp_81]

3.1.3. Effects of Facilities on Recycling Behaviour

Despite the legislative requirements for UK businesses to provide separate collections for recyclables [4], the lack of opportunities for recycling in many workplaces further explains why people recycle more at home due to recycling facilities. For example:

"*It's more convenient at home. I can't store all sort of bins in my office. So, I try to deal with the most important one in the lab but won't spend time crossing the whole building just to recycle paper clips in the correct bin*". [Resp_92]

While recycling facilities, including storage space, contribute to recycling, the lack of space can instigate recycling, whether at home or work, but other facilities, such as kerbside and Household Recycling Centres, offer additional support for householders to engage in recycling at home compared to work settings. For instance:

"*As the recycling boxes are available in the office, the materials are distributed daily. At HOME, I will stockpile an amount over a period of weeks then transport to a recycling centre*". [Resp_1]

"*I have a small house, so I need to keep on top of recycling. The office is bigger, and it doesn't bother me as much if it is really untidy*". [Resp_162]

However, some items, such as food waste, are not ideal for storing, particularly in the workplace, due to hygiene issues including health and safety reasons. This may influence the provision of recycling facilities for food waste at work, with many workplaces making no provisions for the collection of food waste. The findings of this study are consistent with studies such as [12,14,21] that showed the effects of external and contextual factors on pro-environmental behaviours, including recycling.

With a personal commitment to recycling, consumers who experience a lack of facilities and space can drive a distance to recycling centres, such as supermarkets. Although a sense of personal commitment may contribute to recycling behaviour, consumers may engage in recycling for other reasons other than commitment. For instance, consumers may engage in recycling frequently to reduce the content of refuse bins due to the material collection rounds or lack of storage space. We observed that personal commitment is associated with a sense of responsibility, accountability, and concern about the consequences of waste. Using Schwartz and Howard's [19] NAM, those who construe the lack of facilities as barriers may ascribe recycling responsibility to others, such as local authorities and their employers, rather than oneself. For recycling to be normative at work, recycling should be convenient for people to undertake through the right facilities. For instance:

"*There are no recycling facilities at work. I don't like the thought of filling up the landfill with things that can be used again, and it's easy to separate paper/glass/tins at home and take them to the recycling centre, also means I have to empty my main bin less and so use less bin bags and space in the communal bins. Also, recycling containers are provided free by the council*". [Resp_133]

"*At home, I made many different containers for a variety of materials. At my workplace, there is no opportunity. Often if I want to recycle something, I have to go home to do it because of no appropriate opportunities*". [Resp_179]

3.1.4. Personal Control over Recycling

Perceptions of personal control over recycling emerged as a strong contributor to recycling behaviour and explain other factors that may influence recycling behaviour. As presented above, consumers engage in recycling more in a specific context due to their buying behaviour, the rate of material consumption, waste generation patterns, and the available recycling facilities. However, we observed that the interaction of facilities with other contextual and personal factors contributes to consumers' perceptions of control which consequently influence their recycling behaviour, either at home or work. For instance:

> "*At home, I feel like I have more facilities in place and am more in control of what is recycled. I did set up food waste recycling in the office; however, it's difficult to encourage staff to do this*". [Resp_214]

This finding can be explained further by Bandura's [31] idea of environmental forces shaping human behaviour in a certain context. According to the idea, people perceive home settings as a selected and constructed environment compared to work settings which are more of an imposed environment.

The extent of control determines consumers' feelings of responsibility for the waste they produce and consequently influences their recycling commitment and self-efficacy. Although the perception of control contributes to other factors, such as commitment and responsibility, consumers feel more control at home compared to work settings. This perception resonates with Bandura's [31] concept of a selected environment where consumers choose/select an environment, such as neighbourhood and accommodation type, affecting how they engage with recycling with some level of control over the recycling setup. On the other hand, consumers/users can create their recycling environment to suit their personal circumstances so they can exercise control over recycling at home. For example, our study shows that consumers at the household level often set up recycling facilities in alignment with their personal needs/requirements, but consistent with schemes in their areas. This selected and created environment due to a feeling of control makes recycling more convenient for consumers to perform at home compared to other settings. For instance:

> "*More convenient (at home). I can't store all sort of bins in my office. try to deal with the most important one in lab but won't spend time crossing the whole building just to recycles paper clips in the correct bin*". [Resp_93]

> "*Because I mainly have control at home, so I can determine what needs to be done*". [Resp_277]

On the contrary, recycling facilities outside home settings are generally designed and installed by organisations based on waste collectors' requirements and how organisations perceive recycling. For instance, organisations in the UK are required by law to have a separate collection system for recyclables. Consistent with Bandura's [31] argument of "imposed environment", employers or facility managers design and impose a recycling initiative, including its facilities, limiting employees' control over how they engage with recycling in their workplace. We observed that organisations mainly have provisions for materials with high economic value, such as paper, in meeting the needs of their waste contractors. It is difficult for consumers to control recycling at work, which may explain the disparities in recycling behaviour across the two contexts. For instance:

> "*It's easier to control your own environment than it is to control another*". [Resp_32]

> "*I am in control of what gets recycled (at home) and know how to find out what is available, but I have no control when I am at work*". [Resp_90]

It should be noted from these findings that consumers engage in recycling, irrespective of behavioural contexts, when they perceive control over recycling behaviour. The contribution of control extends beyond the provision of recycling facilities to how the available facilities are perceived to be convenient, including the knowledge of what is recyclable.

According to a respondent, "*I am in control (at home), there is a convenient provision for it*" [Resp_188]. Consumers have control of what they utilise and produce, including how they recycle at home as opposed to other settings, especially at work, where there are constraints placed on them by the organisational recycling strategy. The lack of control, responsibility, and commitment to recycling in organisational contexts indicate that recycling outside home settings may not become normative for many consumers. For example:

> "*I have facilities at home and places to leave recycling, this is then collected by the council, blue bins, etc. or I can take to the recycling centre. At work, we have no recycling facilities so I take what I can home to recycle, i.e., not confidential information but bring home cans, tins glass, etc. that I use in my own work as it's bad for the environment to just throw it away in the waste and I feel Guilty!*". [Resp_20]

The fact that recycling is managed better at home suggests that recycling is easy to set up at home according to users' needs and requirements, rather than those of waste contractors or focal organisations. Considering that recycling at work is imposed, users' expectations should be considered when designing and introducing workplace recycling schemes that are attractive to users, taking their preferences into account and promoting a similarity of design of schemes across contexts for ease of participation. Given that many people are still confused about what, where, and how to recycle [32], recycling schemes including their facilities should be uniform across contexts to reduce the confusion concerning what can be collected for recycling. To complete the recycling jigsaw puzzle, this study suggests the need for consumers to have some level of ownership and responsibility for the waste/materials they produce with a certain degree of personal control over their behaviour. While situational factors can enhance the feelings of control [3] and consequently recycling behaviour in a context, schemes should be uniform within and across settings [10] to ensure that recycling is easy to perform with consistency across settings.

3.1.5. Accountability

The issue of accountability is another factor that explains recycling behaviour. The findings show that consumers engage positively in recycling when they feel a sense of accountability for the waste they produce. Although accountability or responsibility can be associated with ethics and altruism, consumers' sense of accountability contributes to their perception of control and consequently affects recycling behaviour, particularly at work. Recycling involves many steps, including separating recyclables into different components and from non-recyclables [33], requiring consumers to feel a sense of accountability or responsibility in effectively undertaking these tasks. While accountability is an important contributor to consumers' recycling behaviour, we observed that sense of accountability is different from one context to another, possibly due to the perception of whether one context is more personal or private compared to another context. Contrary to recycling at home, consumers generally perceive that recycling outside their home settings, particularly at work, is not their responsibility. For example:

> "*At work, I am not responsible for the disposal routes for example for redundant electrical equipment, but I assume this is recycled as required*". [Resp_106]

> "*At home, I am responsible for the functioning of the entire home, whereas in the office other people (e.g., facilities management) look after certain functions*". [Resp_314]

Additionally, we observed that the feeling of responsibility influences the extent to which consumers are committed to recycling. When consumers feel responsible for the materials they generate, whether at home or work, they feel committed to recycling. The reason for this commitment might be due to the awareness of the consequences of the materials they generate, which consequently affect how they ascribe responsibility for their treatment based on their moral obligations towards recycling [19]. While facilities enhance recycling behaviour, this study argues that recycling facilities do not complete the story of why people engage more in recycling within a context without understanding their sense of commitment and accountability. As consumers are less likely to have responsibility for

the patterns of waste creation within a work context, as purchasing is often done centrally in organisations, it could be that this lack of responsibility translates to a lack of feeling accountable for disposing of that waste.

3.1.6. Recycling Contexts

As can be seen from the above findings, behavioural context, including its attributes, contributes to consumption, waste production, and recycling behaviour. Compared to home settings, materials such as paper are generated and recycled more at work. For instance:

> "*I recycle paper every day at work but do not always use materials that can be recycled at home every day*". [Resp_218]

> "*The waste I generate is more likely to be recyclables at work (paper, card, plastic bottles). At home, there is more likely to be an unrecyclable waste, packaging, broken items, etc.*". [Resp_265]

The implication is that the recycling opportunity at work is limited regarding the items that can be prepared and collected for recycling, whereas local councils collect all materials, irrespective of their composition, from households. For instance:

> "*At work, I think what I recycle is paper and food whereas there are far more numerous and varied items at home*". [Resp_286]

Some workplaces try to force the recycling behaviour of their employees by making no provision for general bins such that only materials with high economic benefits are collected. Although the approach might prevent waste production, it may force employees to use the wrong receptacles for non-recyclables. There is a tendency for consumers, particularly those who cannot distinguish recyclables from non-recyclables, to report more recycling at home than at work due to the lack of adequate facilities, such as general bins at work.

Additionally, the nature of housing or accommodation, either small or large, contributes to recycling at home compared to the work settings where some level of uniformity is expected. While many consumers living in small houses may perceive the lack of space as an opportunity to recycle by using kerbside and recycling centres, others may see it as a barrier to their recycling behaviour. Context or work environment contributes to the way people recycle when at work in comparison to their recycling at home. For example:

> "*The office I work in recycle as little as possible*". [Resp_162]

> "*There is good recycling set up in work whereas, at home, there is limited space*". [Resp_216]

Although individual, psychological, and contextual factors have been reported to predict recycling behaviour [3,17], the findings of this study show that a behavioural context, including its attributes, is a strong determinant of recycling behaviour no matter the personality and psychological traits of consumers.

4. Discussion and Conclusions

The findings of this study suggest that the feelings and personal accounts of consumers are fundamental in designing and promoting recycling schemes. This underlines the need for researchers and waste management professionals to expand the range of motives for recycling beyond the measures of consumers' personal and psychological traits. According to this study, recycling behaviour cannot be addressed in silos without understanding the consumption patterns and waste production behaviour, including the available recycling opportunities. Although previous studies have attempted to segment consumers' green behaviour using consumption patterns [34], the intersection between green and consumption behaviours is blurred. However, many factors, such as commitment, responsibility, time, and accountability, emerged strongly as contributors to recycling behaviour. Additionally,

opportunities (with regard to options and facilities) to perform recycling are fundamental and often shape a consumer's decision-making process in whether to engage in recycling.

Considering the number of recycling initiatives globally and the accumulation of knowledge on recycling [11,17], there are opportunities to develop a resource-based economy through research findings. However, studies on recycling are interdisciplinary with mixed findings [3,4] such that any attempt to associate recycling behaviour to a single explanation without understanding consumers' accounts can be misleading. While this study supports the existing literature, such as [21,35,36], it further shows that a context where people spend more time affects their consumption and consequently recycling behaviour.

The lack of time to engage in recycling, particularly in organisational settings, is an important factor to consider when explain recycling behaviour. Although personal commitment is required to participate in recycling, factors (such as recycling facilities and their proximity) that increase the time cost of recycling may serve as barriers to recycling [5,37]. The time cost of recycling is not an issue at home compared to work settings, given that people have the liberty to set up and arrange recycling facilities at home according to their personal needs and requirements. The ability to set up and arrange recycling facilities at home might be due to the perception of control over recycling and a sense of responsibility towards waste they produce in their private settings at home. Consistent with Schwartz and Howard [19], this study shows that consumers' awareness of the consequences of materials influences how they ascribe responsibility for their treatment based on consumers' personal norms towards recycling. While moral obligations influence whether consumers accept recycling responsibility, the waste generation context, whether private or public, affects consumers' recycling behaviour.

Consumption patterns are another important factor that should be considered when explaining recycling behaviour. According to the findings of this study, consumption behaviour is restrictive at work, due to job functions and organisational policy, and affects waste generation, including recycling behaviour. Recycling at work is mostly driven by organisational policy [4,38] and commitment through the provision of facilities including their availability, convenience, and accessibility. The level of organisational support may facilitate the degree to which people at work feel a sense of personal commitment, accountability, responsibility, and control [10,37]. According to this study, organisations including governments should commit to recycling in moving from waste-focused thinking to a resource-based sector and CE.

5. Implications and Future Research

This study demonstrates that the whole spectrum of material consumption [35], including product design, production, and distribution, should be analysed to understand how recycling can contribute to CE. The starting point in promoting recycling is understanding consumers' perceptions of waste and contextual attributes using their accounts. This approach is necessary, as a quantitative study, mostly influenced by authors' perspectives, may not provide a detailed account and sufficient evidence of consumers' recycling behaviour. To encourage recycling, especially in organisational settings, institutional factors, such as facilities, should be considered [10,36–39]. The understanding of these factors, including their interactions, may inform the design of effective recycling schemes. Considering that consumption affects the way people think and feel about themselves, this exploratory study underlines the importance of firstly looking at recycling behaviours from the point of view of consumers and secondly looking at these behaviours as part of the natural systems of purchase, use, and disposal, of which they are just one part. Failure to understand that any given consumer may undertake a wide range of different recycling behaviours and that these may well vary across contexts may be one of the reasons that equating behaviours with individual characteristics has led to such contradictory results in the past. More large-scale, qualitative research is needed to explore recycling behaviours in a wider range of contexts such as schools, hospitals, leisure venues, and town centres, as

well as a wide range of workplace contexts, to provide complete pictures of consumers' recycling behaviours.

The current linear economic model is transforming the way products are consumed [39]. For example, consumers are being encouraged to consume more materials even when it is avoidable, through marketing strategies, such as buy-one-get-one-free, resulting in more waste. Although waste production is not necessarily a problem in its own right, its handling constitutes major economic, social, and environmental problems. Waste production should provide opportunities for businesses to be innovative by perceiving waste as a resource rather than discarded materials. The interrelatedness of consumption, waste generation, and recycling behaviours shows the need to design products for reuse and recycling. The primary concern for waste practitioners, including policymakers, is not only about the consumption of materials because the global economy depends on it but also whether materials can be reprocessed, particularly through recycling, to derive value. This understanding is important for effective policies on waste management given that the social and cultural process of material consumption is intertwined with the economic system, leading to mass production and consumption of goods and services. As a result, this study concludes that sustainable consumption should shift from the current focus on poverty alleviation to its function in resource conservation and waste prevention.

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