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RESEARCH ARTICLE

Understanding engagement with a deposit return scheme for reusable cups: A qualitative study on barriers and enablers of cup use and return through the COM-B Model

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Abstract

Single-use plastics are embedded in daily life and contribute heavily to environmental impacts. Circular initiatives such as deposit return schemes aim to curb this problem yet remain under-researched despite their growing popularity. This study explored the barriers and enablers of engagement within a piloted deposit return scheme at University College London (UCL), in which participants paid a £1 deposit on reusable cups, receiving this refund upon return. Nine semi-structured interviews were conducted with UCL students and staff and analysed inductively to identify influences on behaviour, with themes subsequently mapped onto the Capability Opportunity Motivation-Behaviour (COM-B) Model. Thirteen themes were developed and organised under five COM-B constructs: Psychological capability (understanding the scheme; forgetting to return cups), Physical opportunity (cup design; accessibility of drop boxes; posters and instructions), Social opportunity (social interactions regarding the cups), Automatic motivation (habits; positive feelings) and Reflective motivation (perceived ease; perceived usefulness; perceived reliability; perceived hygiene; alternative goals for using the scheme). For example, for the scheme's uptake, participants reported needing to understand the scheme, as well as perceiving it as hygienic and useful, and having constructive social interactions about it. Accessible drop locations were noted as particularly important for return behaviours, while forgetting cups or using them for other purposes (e.g., mementos) prevented reusable cups from functioning as shared, reusable assets. By applying a behaviour change framework, this study provides recommendations into how circular initiatives can be strengthened, for example, by providing clearer step-by-step instructions, enhancing communication by staff delivering the intervention and offering timely reminders to encourage cup returns. These insights can be used to inform similar schemes aiming to reduce single-use plastic consumption.

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Data availability statement: For this qualitative interview-based study, representative anonymised quotations supporting the findings are included within the manuscript. The interview guide and details of the study methods are provided as. The qualitative interview data generated and analysed during this study are not publicly available because participants did not provide consent for the public sharing of interview transcripts. In addition, the transcripts contain potentially identifiable information and contextual details which, even following anonymisation, could increase the risk of participant re-identification when considered as a whole dataset. Study data will be securely retained on University College London (UCL) systems for 10 years following completion of data collection, in accordance with UCL data retention policies. To ensure the long-term availability of the data and associated documentation, access will be maintained beyond the corresponding author's involvement in the project through secure sharing arrangements with the Centre for Behaviour Change Research Lead. Requests for access to the underlying data, subject to ethical, legal, and confidentiality restrictions and the conditions of the study's ethical approval, may be directed to the corresponding author or UCL Centre for Behaviour Change Research Lead via behaviourchange@ucl.ac.uk. Requests will be considered on a case-by-case basis.

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The work also contributes to the growing body of evidence highlighting the need for strategies to manage packaging items at the sources, such as reducing and reusing cups, beyond recycling initiatives.

Author summary

Single-use cups generate large amounts of waste and contribute to environmental pollution. Reusable cup schemes, where customers pay a small deposit and receive it back when they return the cup, are becoming increasingly popular as a way to reduce this waste. However, there is limited research exploring how people experience these schemes and what influences whether they use and return the cups as intended. In this study, we explored the experiences of staff and students who participated in a reusable cup scheme at a university in the United Kingdom. Through nine interviews, we identified factors that supported and prevented engagement with the scheme. Participants described using and returning cups more when they understood how the scheme worked, believed it was environmentally useful, found it convenient and received support from staff and peers. Barriers included concerns about cup hygiene, forgetting to return cups and keeping cups for personal use rather than returning them. Our findings highlight practical ways to improve reusable cup schemes, including providing clearer instructions, offering reminders, communicating hygiene procedures and making cup returns as easy as possible. These insights may help universities and other organisations design more effective reuse systems and reduce reliance on single-use packaging.

Introduction

The increasing use of single-use plastics has become a significant contributor to environmental degradation, creating challenges to sustainability and waste management [1]. Single-use waste contributes significantly to landfills, marine pollution and carbon emissions [2–4]. The UK discards over 2.5 billion disposable cups annually with estimates of only one in 400 being recycled [5]. These products have become deeply embedded in daily life, especially in workplaces, universities and event spaces [6]. As a result, these contexts have become valuable locations for addressing and exploring strategies for reducing single-use waste.

A wide range of interventions and policies have been developed to address single-use plastic consumption, from bans on certain single-use plastics to the development of reusable packaging systems [4]. A popular intervention has been deposit return systems, where people pay a small deposit at the point of purchase for an item, which is refunded when its container is returned for recycling or reuse. These initiatives are applied to many recyclable materials, such as PET bottles, aluminium cans and glass containers, and exist to varying extents across

different countries [2,7–10]. These schemes have been credited with incentivising recycling behaviour, underlining their potential to reduce waste and increase material recovery through recycling on single-use recyclable containers.

Circular reusable cup schemes (CRCSs; also referred to as 'return packaging schemes' beyond the context of reusable cups) are a specific type of deposit return scheme, where people pay a deposit on a container when purchasing an item and receive a refund when returning the container [11,12]. The container is then washed and reused to restart the process. Unlike many deposit return schemes, which recycle materials, a CRCS cleans and reuses them. Accordingly, such circular schemes are part of the growing movement towards higher-order resource strategies (such as reduction and reuse) for managing packaging items like cups, reducing waste at the source unlike recycling initiatives [13,14]. In enclosed, smaller-scale environments such as universities, hospitals, business and event venues, reusable circular cup schemes are often considered more feasible, as they support cup circulation and offer greater environmental benefits and cost-effectiveness than single-use and recyclable options like other deposit return systems. However, all deposit return schemes share the same behavioural principle: cup users pay a deposit and are incentivised through the promise of a refund. There is some evidence showing positive return rates of the cups and associated CO_2 emissions [15,16], especially when full deposit refund is provided for cup returns [17].

Universities offer a particularly valuable setting for testing sustainability interventions, especially closed-loop interventions, as they bring together diverse populations in a controlled environment where initiatives can be implemented and evaluated efficiently [12,18–21]. Students are at a formative stage where new habits and values can be shaped, making universities an effective 'living laboratory' for trialling sustainable practices [22,23]. At the university level in the Netherlands, the Billie Cup initiative achieved strong uptake without negatively affecting sales volumes, indicating that consumers were not deterred by the transition to a CRCS and environmental impact could be reduced at universities [24]. Similarly, University College London (UCL) piloted a circular reusable cup scheme at its UCL East campus between September 23rd and December 13th, 2025, referred to as 'UCL East Reusable Cup Scheme'.

Circular reusable cup scheme at UCL: UCL east reusable cup scheme

The UCL East Reusable Cup Scheme took place at its cafés and dining facilities, with people paying an additional £1 deposit for drinks served in reusable to-go cups and receiving a £1 refund upon returning the cups to designated drop-boxes. During the scheme, different alternatives were made available to people: they could initially choose between a returnable reusable cup, a personal reusable cup or a ceramic cup. Later, disposable cups were reintroduced with a 50p surcharge. While the scheme was generally successful, quantitative data showed an overall return rate of 65%, rising to 79% by the end of the trial. Although the trend was encouraging, the data do not explain why approximately 21% of cups were not returned. The final return rate was also lower than required to achieve meaningful environmental and financial impact [25], as the recovery of materials in CRCSs is key to achieving such impact.

As the pilot scheme only ran for four months, it is possible that if it continued, environmental and financial impacts may have improved in line with the suggested trend. However, more systematic approaches to improving this scheme and similar CRCSs should be based on understanding why participants engaged with these schemes, including adopting, using and returning cups, as well as why some cups were not returned. This is particularly important given that the quantitative data identified that a meaningful portion of cups were not returned but could not explain the reasons for this. For people to engage with these systems (e.g., opting for these cups, using them and returning them), they need to be able to incorporate the relevant behaviours into their everyday lives. By allowing participants to describe their experiences in their own terms, qualitative methods can be a useful way to explore why these behaviours occur or do not, including reasons that were not anticipated by researchers. Therefore, the current study will focus on qualitatively exploring the influences on UCL staff and students in engaging with the pilot scheme.

Engagement with circular reusable cup schemes and wider deposit return schemes

Because many of these schemes are driven by practical concerns, they often lack peer-reviewed academic evaluation. Existing research also tends to focus on quantitative outcomes [17,21], offering limited insight into how people actually engage with the schemes or what barriers and enablers shape that engagement [26]. However, findings from studies on CRCSs, circular reusable food packaging and other deposit return systems highlight several factors that might influence participation or willingness to participate in these systems. These factors include hygiene perceptions [27–29], environmental convenience (e.g., number of return spots or design of reusable products) [27,30,31], communication (e.g., clear instructions about scheme) [32], perceived costs [29] and incentives [33], beliefs and values (e.g., perceived environmental threat) [34] and habits [33]. For example, a survey-based study found that participants rated physical attributes of reusable cups (e.g., their design, weight and material) and their perceived cleanliness as very important to their willingness to use these cups, ranking these attributes above sustainability attitudes [31]. In another study, involving a CRCS at an Australian university, increases in participants' habit strength and personal norms were significantly associated with the use of the scheme [33]. These studies provide a useful starting point to see which factors should be targeted (e.g., personal norms) for a CRCS to have better uptake. More qualitative work could support exploring these factors more and allow participant-led insights into how these schemes work.

Many of these studies also lack a theoretical basis. Behavioural theories, models and/or frameworks provide a more systematic lens through which to examine and organise influences on sustainability behaviours [35–38], such as psychological, social and environmental influences. By helping to identify which influences to target, these frameworks can provide guidance on how to improve the interventions [39], sometimes even indicating which behaviour change techniques (the smallest components of an intervention's content that have the potential to bring about behaviour change) could be added to improve the intervention [40,41].

Capability-Opportunity-Motivation Behaviour (COM-B) model

The current study applies the COM-B Model (Capability, Opportunity, Motivation – Behaviour) to guide data collection and analysis [40], as this well-established framework examines Physical and Psychological capability, Physical and Social opportunity, and Reflective and Automatic motivation (see Fig 1). This model also links to the wider Behaviour Change Wheel [40], which suggests potential behaviour change techniques that can be used to influence behavioural influences

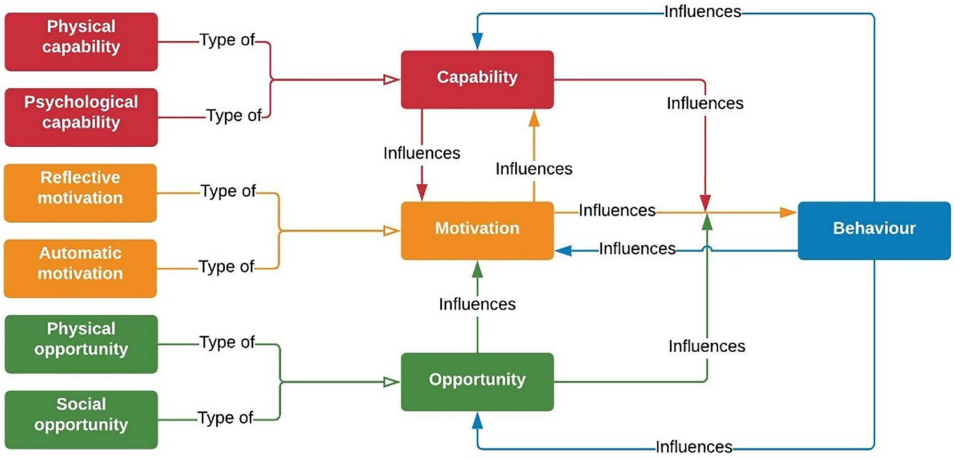


Fig 1. The Capability-Opportunity-Motivation Behaviour (COM-B) Model [42].

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structured with the COM-B Model. Previously, a study used the COM-B Model and the Theoretical Domains Framework (TDF) to explore behavioural influences on single-use and reusable cup use at UCL [43]. The present study extends the findings from the use of personal reusable cups to a CRCS.

Research aims

To improve the CRCS at UCL, supporting its wider rollout, and provide insights for other universities but also more widely, the current study aims to explore the behavioural barriers and enablers that influence UCL students' and staff's engagement with the UCL East Reusable Cup Scheme.

Materials and methods

A qualitative study using semi-structured interviews drawing on the COM-B Model was conducted to explore the engagement behaviours of students and staff as part of the UCL East Reusable Cup Scheme. The study was reported following the consolidated criteria for reporting qualitative research (COREQ) [44] where relevant. The study was informed by a critical realist position, assuming that participants' accounts provide meaningful insights into influences on behaviour while recognising that these experiences are interpreted through social and contextual lenses [45–48]. We therefore acknowledge the interpretive role of both participants and researchers in constructing meaning in relation to the research question.

One researcher (IW) led the planning, data collection and analysis as part of their MSc project in behavioural sciences with interest in environmental sustainability, and a second researcher supported the data analysis (JH – MSc student in behavioural sciences). These processes were supervised by two early career researchers with PhDs related to behavioural sciences (ALA & PS), both with experience in qualitative research and ALA with expertise in sustainability research. This study drew on a research method established by ALA for investigating barriers and enablers to reusable cup adoption within the UCL campus context [43]. The study took place at UCL East, the only campus where the scheme was piloted. UCL East is smaller and more enclosed than UCL's main Bloomsbury campus, creating a distinctive environment in which barriers and enablers for engagement could be explored.

Ethics statement

Ethical approval was granted by University College London's ethics committee (0199 PaLS- Clinical, Educational and Health Psychology LREC) and registered with UCL's data protection office (no. 6364106/2025/04/138 social research) in 2025.

Recruitment

Eligible participants included students and staff who had interacted with the reusable cup scheme at UCL East in some capacity. To ensure that participants could meaningfully reflect on their experiences, the eligibility criteria required that they had used the scheme at least once. Participants also needed to be over 18 and have access to a device with internet connection.

We aimed to recruit 9–12 participants, informed by recommendations for qualitative interview studies [49,50]. This sample size was intended to capture a range of perspectives across the university community to explore the study's overarching research question rather than achieve saturation within specific participant groups. Recruitment included posters in high-traffic campus locations (e.g., near waste bins and the café/refectory) and in-person approaches café/refectory areas. An example poster can be found in S1 Fig (with images removed from the poster due to copyright restrictions). These efforts were supplemented with snowball sampling, with interviewed participants being asked to share the study information sheet with others who participated in the scheme. Interested participants contacted the researcher directly in-person or via email after seeing the recruitment poster or being referred through snowball sampling.

Once participants expressed interest, the study information sheet was shared outlining the research goals to better understand the scheme and inform potential improvements in the future. The information sheet introduced the primary investigator (IW), an MSc Behaviour Change student at UCL, and stated that the study formed part of an MSc research project conducted under academic supervision. Interview times were arranged individually based on participants' availabilities. All interested participants gave informed consent prior to taking part, and each participant received a £10 Love2Shop voucher as compensation for their time.

Materials

To structure the semi-structured interviews, an interview guide was developed, with questions prompting the influences on engagement behaviours across the different COM-B constructs [40]. This ensured that a range of potential factors were considered during the interviews. These questions were piloted with two MSc students at UCL and refined accordingly. Questions were structured around Psychological capability, Physical and Social opportunity and Reflective and Automatic motivation (see example questions in Table 1, and the full guide can be found in S1 Text). To limit the length of the interviews, we included general prompts that could help identify potential barriers and enablers arising from the interaction between users' physical capabilities and the physical environment, instead of prompting specific questions on the COM-B construct of Physical capability (e.g., relating to musculoskeletal conditions, dexterity and physical skills). As return behaviours are a specific type of engagement behaviour that had lower adherence than hoped for in the UCL East Reusable Cup Scheme, specific questions were prompted around the influences on this more granular behaviour.

Data collection

Once informed consent was obtained, a researcher (IW) conducted all the interviews via Microsoft Teams. The duration of these interviews ranged from 31 to 43 minutes (average: 37 minutes). Interviews were recorded and automatically transcribed via Microsoft Teams. The researcher then checked all transcripts for accuracy and anonymised them before analysis. Due to the limited timescale of the project, the transcripts were not returned to participants for comment or correction.

Data analysis

An abductive thematic analysis was conducted [51], combining inductive theme development with deductive interpretation informed by the COM-B Model. This approach to the analysis involved two key steps: (1) an inductive thematic analysis step, where barriers and enablers were inductively coded and themes were developed by the research team (IW, JH,

Table 1. Example interview guide questions structured based on the COM-B Model.

COM-B	Construct	Engagement Behaviour	Return behaviour
Capability	Physical	N/A	N/A
	Psychological	How clear was the scheme to you at first and then while using it?	What is your understanding about where and how to return the reusable cup?
Opportunity	Physical	Do you feel like the cups are convenient to use?	Have there been times when you couldn't return the cup when you wanted to?
	Social	What have you noticed about how others like your peers interact with the scheme?	Have any social interactions or conversations influenced your decision of when and where you return the cup?
Motivation	Automatic	To what extent has using a reusable cup from the scheme become part of your routine? Had it become a habit?	Have you ever forgotten to return a cup? If so, what do you do if you forget?
	Reflective	Does this scheme align with your environmental beliefs?	Are there any reasons why you might not return a cup?

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ALA & PS) and (2) a deductive step, where these themes were refined and organised using COM-B constructs to support the theoretical interpretation of influences. In the inductive step, the researcher (IW) read and then re-read the transcripts, noting down initial ideas to capture barriers and enablers to engagement as described by the participants, similar to recommendations by Braun and Clarke [52]. Then, utterances relating to barriers and enablers were extracted from transcripts onto an Excel workbook and grouped together according to patterns of meaning to generate preliminary codes. These codes were structured into preliminary themes and subthemes and labelled and described by the researcher (IW). To ensure trustworthiness, a second researcher (JH) reviewed 22% (2/9) of the transcripts and independently coded relevant excerpts to the preliminary themes and sub-themes [53]. The two researchers discussed and resolved any discrepancies by amending the themes and subthemes where needed. The refined versions of the themes and subthemes were reviewed by post-graduate researchers (ALA & PS), and discussions with the lead researcher (IW) led to further refinements.

After the refinement of the inductively developed themes and subthemes, the lead researcher (IW) deductively mapped these to COM-B Model constructs using an Excel workbook. This process was iterative, with the research team regularly discussing the mapping and reaching agreement on the most appropriate mapping for each theme [54]. Participants were unable to provide feedback on the findings due to the project's timescale for an MSc project.

In line with the qualitative orientation of this study, interview data were not quantified. The analysis focused on the meaning and context of participants' accounts rather than the frequency with which themes were mentioned.

Results

Participants

Altogether, 14 people expressed interest, with 10 potential participants agreeing to be interviewed. As one person reported not having interacted with the scheme when confirming eligibility, nine participants were interviewed. This included six students (one undergraduate and five post-graduate students) and three staff members at UCL, with their ages ranging from 23 to 30 years (average: 25.78; range: 23–30). Details about the participants' roles and departments can be found in the Table 2.

Themes

The researchers developed 13 themes, with altogether six sub-themes, relevant to the barriers and enablers of behaviours to engage with the UCL East Reusable Cup Scheme. These themes were mapped onto five of the six COM-B constructs, providing a structured way to interpret the behaviours observed. Two themes were mapped onto Psychological capability, one onto Social opportunity, three onto Physical opportunity, two on Automatic motivation and five onto

Table 2. Participants' roles and department at UCL.

Participant	Role	Department
1	Post-graduate student	Robotics and AI
2	Post-graduate student	Chemical Sustainability
3	Staff	Technologist
4	Undergraduate student	Art History
5	Post-graduate student	Robotics and AI
6	Post-graduate student	Computer Science
7	Post-graduate student	Math
8	Staff	IT Desk
9	Staff	Student Support and Wellbeing

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Reflective motivation. Fig 2 illustrates the breakdown of themes onto the COM-B Model. A full overview of the themes and sub-themes can be found in Table 3 at the end of the Results section.

Psychological capability

1. Understanding the mechanics of the scheme

Participants varied in their understanding of the scheme's mechanics, with some describing the scheme as straightforward and easy to grasp, while others reported only a partial knowledge or uncertainty. Participant 2 reflected, "*It was made extremely clear to me and I really, really loved it*." Participants who understood the scheme also expressed finding the return process easy to follow. Participant 1 noted that returning cups took "*less than a minute*" with "*no issue with the tapping or payment*".

A few participants were unsure of key details about the scheme, such as how deposits worked or what was expected of them, including whether to wash the cups and whether to keep the cups or return them. For example, Participant 3 expressed: "*The only thing that I was sure of was that I could reuse it… But other than that I wasn't really clear on what other ways I can use it*". The participant also noted being unsure of whether the cup was "*a keep for life kind of thing"* or where they could return it (e.g., at cafés or a machine). Such uncertainties seemed to influence how participants chose to engage with the scheme, deterring participation and return behaviours when there were unclear expectations. Social interactions both with peers and the staff delivering the scheme was often noted as important to whether participants understood the scheme and how it works (see details in Theme 3 "Interpersonal interactions and support regarding scheme use").

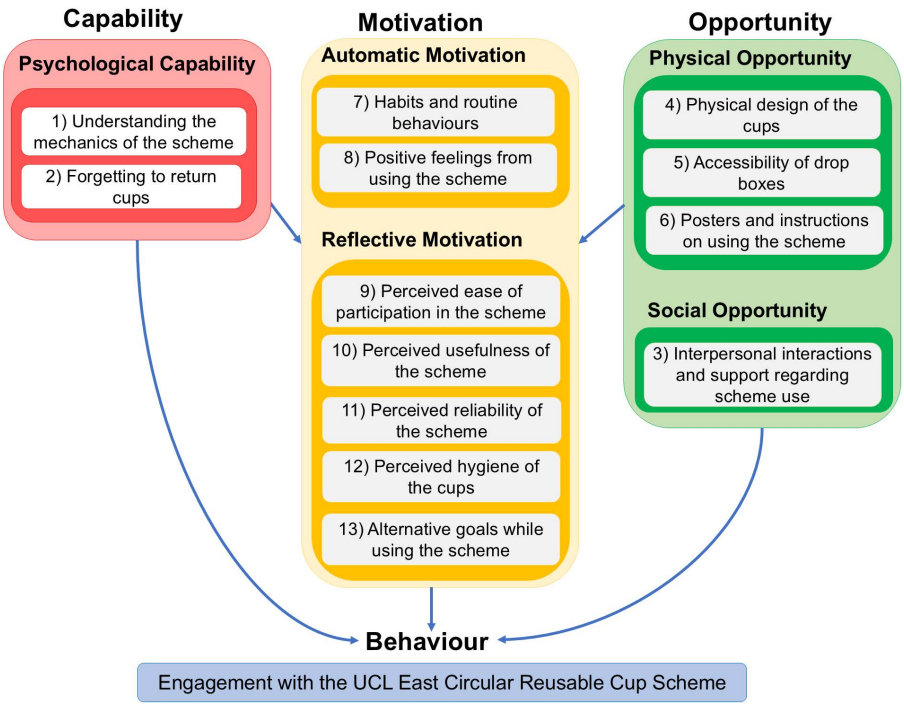


Fig 2. Themes regarding the barriers and enablers for engaging with the circular reusable cup scheme mapped onto the COM-B constructs.

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Table 3. The themes about the barriers and enablers on engagement behaviours with the UCL Circular Reusable cup scheme, with theme descriptions, example quotes and mapping onto COM-B constructs.

COM-B constructs	Theme	Subtheme	Description	Example Quote
Psychological Capability	1) Understanding the mechanics of the scheme		Participants generally expressed understanding the scheme and how it worked, although some were unsure about how to interact with it.	I'm a good example of someone who didn't … have to waste a single thought on whether I'm doing something wrong or was confused. It was made extremely clear to me and I really, really loved it. (P2)
	2) Forgetting to return cups		Participants expressed that lapses in attention or preparation interfered with their ability to return cups.	I go to the café at least once a day and to the refectory at least once a day. And I would just either forget to get it out of my bag or just feel lazy. (P3)
Social Opportunity	3) Interpersonal interactions and support regarding scheme use		Participants expressed that their interactions with peers or staff shaped their understanding and awareness of the scheme positively or negatively, thereby influencing their engagement the scheme.	
		3.1) Peer influence on scheme use	Participants expressed that interactions with their friends, colleagues or classmates improved their understanding and awareness of the scheme, and engagement with it.	In my case my friend told me about the drop boxes … if it was just me, I would never have seen the machine at that point. (P5)
		3.2) Influence of staff delivering the scheme	Participants expressed that clear, friendly communication about the scheme from staff made it easier to understand and engage with, whereas unclear or incomplete explanations interfered with engagement.	The instructions were clear on how to return it, so I did know I could use a drop box, but the barista was nice, so I just wanted to speak to him. (P9) I think it really depends on what's the barista hands me … I don't know if I should like clearly mention that I want this cup rather than that cup or like, just let it go. (P4)
Physical Opportunity	4) Physical design of the cups		Participants expressed positive perceptions of the cups' durability, comfort and appearance, often linking these qualities to their usability and to participants' overall experience of engaging with the scheme.	These [cups] felt… like a good quality, like thick enough. And… they were like clean and easy to use. (P9)
	5) Accessibility of droboxes		Participants expressed that the locations for returning cups were convenient and generally accessible.	Until I saw the bins, I didn't know that there were such kind of technology to do that. But when I saw the bins, especially those at the entrance of the Marsh Gate, so that place was very good actually, because technically when we are leaving the building, we can just throw it away (P5).
	6) Posters and instructions on using the scheme		Participant expressed that posters (both printed and shown on TV screens) and other written instructions on the scheme's infrastructure (e.g., on cups) helped them understand and engage with the scheme, although these materials sometimes lacked clear calls to action.	[On the poster] I don't get any information other than what the scheme is called. (P3). I saw someone just leave a cup behind… on it said return this and get £1. (P1)

(Continued)

Table 3. (Continued)

COM-B constructs	Theme	Subtheme	Description	Example Quote
Automatic Motivation	7) Habits and routine behaviours		Participants expressed that established habits and routines could interfere with scheme engagement, whereas forming new routines around using the cup facilitated it.	After the first time of me using it, it … become part of the routine. (P 7) I think people are just so used to the idea of having a 50P additional charge for a cup for a throwaway cup that they don't really think anything of it anymore (P3).
	8) Positive feelings from using the scheme		Participants expressed experiencing positive emotions such as satisfaction and a sense of doing good when engaging with the scheme.	It does make me feel really good about myself. For being part of it, I was like, oh, you know, we're being sustainable today. And it's like it's a nice thing to do. (P1)
Reflective Motivation	9) Perceived ease of participation in the scheme		Participants generally expressed finding the scheme easy to participate in.	It's motivating 'cause you are not doing something very difficult. (P2)
	10) Perceived usefulness of the scheme		Participants expressed their perceptions about the usefulness of the scheme in terms of its environmental and financial benefits.	
		10.1) Perceived environmental contribution of the scheme	Participants expressed perceiving the scheme as contributing to sustainability and making a positive difference, although a few felt that its environmental impact was relatively limited.	I'm not that strongly opinionated on environmental… causes, but I do believe we should be taking care of our planet a bit more. And these little… not little… these… initiatives or ideas help bit by bit just to restore our planets like greenery and all sorts. (P8)
		10.2) Perceived financial benefits of the scheme	Participants expressed that the scheme is seen as financially beneficial and motivating.	It's good for your bank account because you get the money back, so like economically it's a no brainer, 'cause otherwise you'd have to pay for the 50P disposable cups. (P6)
	11) Perceived reliability of the scheme		Participants expressed trusting the scheme's security and functionality, with its association with the university reinforcing this trust and reducing concerns about the financial aspects of the scheme.	We didn't think about that much because we thought that like it's a UCL programme … but if it's outside somewhere, yeah, we would question actually question twice where we were tapping our card. (P5)
	12) Perceived hygiene of the cups		Participants sometimes questioned the cleanliness of the cups and this uncertainty discouraged some from engaging with the scheme, while others did not report such concerns.	I am a little bit worried about the hygiene issue. If they're properly washed and if they've stayed in that bin for too long. (P4) The were… clean and easy to use. (P9)
	13) Alternative goals while using the scheme		Participants expressed sometimes adjusting or improvising how their interacted with the scheme, extending, bending or subverting the intended scheme design.	

(Continued)

Table 3. (Continued)

COM-B constructs	Theme	Subtheme	Description	Example Quote
		13.1) Alternative uses of the cup beyond the scheme	Participants sometimes expressed that alternative uses of the scheme's cups, such as using them as personal cups, mementoes or household product.	I just use it all as like an on the Go Cup, but I know one of my friends uses it as a toothbrush holder. Like to put like toothbrush and toothpaste in her bathroom. (P6)
		13.2) Incentives for returning others' cups	Participants sometimes described finding cups that were not their own and returning them to the scheme for the financial incentives.	I thought that well, it's lying around. Clearly someone doesn't want to return it, so I'm just doing that labour for them, getting their money back. (P6)

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2. Forgetting to return cups

Many participants described leaving the reusable cups at home, in their bags or forgetting to return them while on campus, which delayed or prevented them from returning cups and sometimes led to them to stop participating in the scheme altogether. For example, Participant 7 explained "*I just forget that I have it and I just take it home*", and similarly, Participant 6 noted that they often returned cups late "*I think the most I've had is like 3… I'm like, oh, I should probably take them back*". When thinking about the process of returning the cups, Participant 3 expressed "*the urge just kept getting lower and lower*" to return the cups. While most participants eventually returned their cups, forgetting consistently led to delayed return behaviours, interfering with the scheme's smooth functioning.

Social opportunity

3. Interpersonal interactions and support regarding scheme use

Peer influence played a role in shaping awareness and visibility of the scheme and was sometimes highlighted as supporting engagement with the scheme, particularly for return behaviours (Subtheme: 3.1 Peer influence on scheme use). For some, seeing classmates consistently engage with the scheme made it more noticeable and part of everyday behaviour: *"I've seen a lot of my other classmates there regularly buy coffee from the shop and use [it] in class before each lecture, and if I was in a position to do the same, I would"* (Participant 1). Peers also acted as sources of information, with Participant 6 noting their support in understanding the return process: "*One of my friends showed me the box and was like…have you seen this? … And then they showed me how to do it*". Therefore, in some cases, peers seemed to support participants in feeling more comfortable with doing the unfamiliar new behaviour and ensuring proper use of the scheme. For students, their friends' environmental values also seemed to shape their engagement with the scheme. For example, when describing how their social group and background shaped use of reusable cups, Participant 4 explained "*almost all of my friends are … environmentally conscious*". A few participants described returning cups as a social activity, encouraging their use of the scheme. For example, Participant 5 expressed: "*We like to go all together* [to return cups]. *That was more fun*".

Café staff interactions shaped participants' willingness and ability to engage in the scheme in both positive and negative ways, as most participants learned about the scheme through the staff delivering it (Subtheme 3.2 Influence of staff delivering the scheme). For some, clear and friendly communication from baristas encouraged engagement: "*I didn't go in knowing [it] was available… just speaking to him about it… convinced me to give it a try*" (Participant 9). However, others

described receiving incomplete information, leading to uncertainty, with Participant 3 saying "*I wasn't really told the specifics. They just said it was a reusable cup. They didn't say reusable in what way… I wasn't explicitly told that I could return it and then make the money back*". Similarly, Participant 7 explained that they had to go back to the café to seek clarification about the return process: "*I… remember… going back to the café and then asking the staff where I can return it… they didn't really tell me when I first got the coffee*".

Needing to interact with staff for the scheme could sometimes act as a barrier for students, with some highlighting social discomfort in asking follow-up questions or asking for their deposits from café staff. For example, in reference to learning more about the scheme through the staff, Participant 4 expressed "*Baristas can get a little bit scary.*" Similarly, Participant 2 stated finding it "*quite awkward…saying 'can I please have my £1 back?'*" This suggests that while staff could help explain the process, inconsistent information and the social effort required to ask for guidance occasionally acted as barriers to engaging with the scheme, especially returning the cups.

Physical opportunity

4. Physical design of the cups

The physical design of the cups was often mentioned as influencing participants' perception of the scheme. Durability and comfort were highlighted as positive features of the cups, with several participants noting that the cups felt sturdier and more practical than disposables. For example, Participant 2 expressed appreciating that the cup felt sturdy, saying "*it's nice to have a rigid thing [cup] in your hand.*" Participant 6 also appreciated that they "*can hold it [the cup] and it wouldn't burn me or anything, but it would still keep warm*". Other participants had more neutral perspectives on the cup's design, with Participant 4 calling the cups "*pretty standard*". There was also no negative feedback expressed on the cup design. Accordingly, the generally positive perception of cups' usability seemed to enable participation in the scheme.

5. Accessibility of drop boxes

Participants often mentioned that the accessibility and availability of drop-boxes shaped their return behaviours. Many participants praised the drop-boxes' convenient and visible placement, describing them as being in "*quite the natural location*" (Participant 4) and noting that "*you can't miss it on your way out*" (Participant 5). Some participants appreciated that the boxes allowed more flexibly engagement with the scheme, such as returning cups after hours: "*We can just throw it [the cup] away and leave the building because sometimes the refractory [café] is closed*" (Participant 5). However, some participants noted that the bins are not always available, as they are sometimes "*overflow*"ing (Participant 1). Others did not note such issues and described the infrastructure as consistently available, as cafés did not have long lines and drop-boxes had space.

6. Posters and instructions on using the scheme

Participants referred to posters (in paper format or projected onto TV screens around campus) and instructions as helping them learn about the scheme and understand how to use it. Generally, participants noted that posters about the scheme around the campus were noticed, but some found that these posters too vague to drive engagement with the scheme. Participant 3 explained: "*It just says that there exists a scheme like this. The messaging's not really clear, I wouldn't know whom to give it to, where to drop it off, how to get the money back*". In some cases, instructions visible on the scheme infrastructure itself (e.g., the cup or the bins) were noted as very helpful in learning about the scheme. For example, Participant 1 stated "*I saw someone just leave a cup behind… on it said return this and get £1*". Overall, posters and instructions contributed to awareness and comprehension of the scheme, but clearer calls for action, especially on the posters, seemed to be needed for these to be stronger enablers.

Automatic motivation

7. Habits and routine behaviours

Several participants referred to their habits and routines as influencing their participation in the scheme. This included routines they developed while engaging with the scheme, as well as existing habits that supported or interfered with using it (e.g., already using their own reusable cup or being used to paying the extra charge for a disposal cup). For some participants, using the scheme became part of their daily routine: "A*fter the first time of me using it, it … become part of the routine*" (Participant 7). Others highlighted that they already had established habits using their personal reusable cups, reducing their reliance on the scheme: "*I just… always bring my own. I think that's been a long-term custom of mine like a habit*" (Participant 4). One participant also suggested that existing charges for using disposable cups might be normalised in people's routines, making behaviour more difficult to shift. Participants 3 expressed this as: "*I think people are just so used to the idea of having a 50p additional charge for a cup for a throwaway cup that they don't really think anything of it anymore"*. Therefore, when people's existing routines and habits did not align with the scheme, this seemed to interfere with engagement. However, integrating the use of the scheme into one's routines could sustain engagement with it.

8. Positive feelings from using the scheme

Participant generally expressed that engaging with the scheme elicited positive emotions, serving as a reinforcer for continued use of the scheme. Several participants described a sense of satisfaction from participating in the scheme, with Participant 9 noting, "*I was … pleased that … I hadn't wasted paper, [and] saved some money in the process*" and Participant 1 more broadly saying "*You use the reusable scheme … then you also feel good*". For some, these positive feelings translated into enthusiasm for the scheme's continuation: "*I want it to come back even if … I'm graduating in three months*" (Participant 1). Curiosity also acted as a motivator, with participants describing enjoyment in experimenting with the return infrastructure itself. For example, Participant 5 said "*It was fun for me to use the machine to see the system working and also thinking about how it can be implemented… especially for us, some engineering students*". Therefore, the positive feelings towards the scheme, both associated with enjoying the scheme and positive financial and environmental impacts (also see Theme 10 "Perceived usefulness of the scheme"), appeared to act as a reinforcing mechanism for continuing to use the scheme.

Reflective motivation

9. Perceived ease of participation in the scheme

Participants generally found the scheme straightforward to use, often describing the steps as simple and efficient. For example, Participant 2 noted "*It's motivating 'cause you're not doing something very difficult"*, while Participant 1 reflected "*the process was really smooth. I just had to scan the barcode.*" The convenience of the scheme was repeatedly highlighted, with participants commenting on the flexibility of return timing, even when cafés were closed: "*I could just not take it home and just return it on the spot*" (Participant 7). Participants valued being able to take cups with them and return them later, as Participant 2 explained: "*I love that you could be mobile with it, but then just bring it back the next time that you're at uni*." For some, the process required more effort than expected, leading to reduced motivation to reengage with the scheme: "*I appreciate this scheme in theory, [but] the application of it is a little bit more effort… after a while I was just lazy, it just seemed like a lot of effort*" (Participant 3). Overall, ease of participation was described as an enabler of engaging with the scheme, but a few participants perceived engagement as effortful which led to reduced motivation to participate.

10. Perceived usefulness of the scheme

Participants expressed mixed views about whether the scheme meaningfully contributed to environmental sustainability (Subtheme 10.1: Perceived environmental contribution of the scheme). Some were sceptical, noting that small individual

actions felt insignificant compared to larger systemic issues: "*In the grand scheme of things... everything is really bad and small contributions like that are nothing in the face of like corporate environmental crimes*" (Participant 9). Others, however, saw value in the initiative, describing it as a practical way to support the environment: "*I feel it's doing something. I don't know. I saved a cup*" (Participant 4). Participants, who expressed strong environmental values and that collective action was needed, seemed to particularly highlight the scheme's environmental contribution. For example, Participant 8 explained "*I do believe we should be taking care of our planet… these initiatives or ideas help bit by bit.*" Some participants framed their engagement with the scheme as contributing to a more efficient and less wasteful university system, with Participant 2 noting, "*You're helping the university be part of a more circular system*."

Many participants emphasised the appeal of avoiding extra charges or reclaiming deposit and that this served as motivating for engaging with the scheme (Subtheme 10.2: Perceived financial benefits of the scheme). For example, Participant 6 noted "*It's good for your bank account because you get the money back … economically it's a no-brainer.*" Others highlighted the perceived value of the cup itself: "*I'm getting an actual cup that I can use again for £1, which is a steal*" (Participant 3). Avoiding the additional cost of disposables was also frequently noted as a valuable aspect of participation. For example, Participant 6 explained their reason for engaging in the scheme by saying: "*Mine would just be the extra money. I don't wanna pay the extra £0.50 per coffee … I've been looking into buying … [a] reusable one from now on … since it's [the scheme] not available*". Especially for students trying to save money, this perception of the scheme was also highlighted as important. Participant 4 reflected "*I'm a student right now, so just trying to be clever [with money]*", also noting that they might opt for making their own coffee to further save money.

For participants who already had their own reusable cups and a habit of carrying these (see Theme 8: "Habits and routine behaviours"), the financial incentive was not perceived as strongly, as they received the same discount from their own cup. Moreover, discounts for UCL-branded reusable bottles and cups were also highlighted as a competing perception of the scheme's financial benefits: *"there are discounts if you bring in that UCL reusable cup*" (Participant 4). Therefore, the scheme seemed particularly valuable for participants who did not have their own reusable cup or students who are trying to limit their costs, especially when they did not bring their own coffee.

12. Perceived reliability of the scheme

Participants generally expressed trust in the scheme, noting that its association with UCL provided reassurance. Participant 5 noted that particularly being able to trust the financial side of the scheme was important, "*We are cautious when we tap our card somewhere. But we didn't think about that much because we thought that like it's a UCL programme*".

13. Perceived hygiene of the cups

Some participants mentioned that they were uncertain of the cups' hygiene, sometimes discouraging engagement altogether. For example, Participant 4 explained "*I prefer to stick to my own because I am a little bit worried about the hygiene issue. If they're properly washed and if they've stayed in that bin for too long*". Similarly, Participant 5 expressed doubt about the cups' hygiene, saying "*The only question is how do they really clean those cups.*" However, other participants seemed to perceive the cups to be clean, with Participant 9 for example saying: "*The were… clean and easy to use.*"

14. Alternative goals while using the scheme

Some participants adapted the scheme to fit their own preferences rather than following the intended scheme process (Subtheme 13.1: Alternative uses of the cup beyond the scheme). For example, a few participants purchased the cup with the intention of keeping and reusing it. For example, Participant 3 said *"I didn't buy it for the express purpose of getting the money back. I bought it because it's reusable and I would like to use it again, so returning it is not really my top priority*." Similarly, Participant 6 explained: "*I only kept one after they stopped giving them out because I found it so convenient*." The student also explained that the cup was a "*memento from my time at UCL*", suggesting that the cup's symbolic value related to the student's desire to keep it. In addition, participants described adapting the cups for purposes beyond their

intended use, often finding practical or personal value in them. For example, Participant 6 underlined "*I just use it all as like an on-the-go cup, but I know one of my friends uses it as a toothbrush holder*". These different usage patterns show how participants may have interpreted the scheme's intention in different ways, using the cups as closed-use products and thereby weakening the scheme.

Several participants reported returning cups that were not their own to collect the £1 deposit (Subtheme 13.2: Incentives for returning others' cups). Some described the practice as playful or collective, with friends "*collecting some cups, putting them back and buying their coffee for free*" (Participant 5). For some, this was opportunistic: "*Well, it's lying around. Clearly someone doesn't want to return it, so I'm just doing that labour for them, getting their money back*" (Participant 6). A few stressed they only picked up unattended cups, usually left behind at night, but admitted the financial incentive made it appealing: "*If I see it's unattended… then because I have the opportunity to get a pound, I'll definitely take that cup to the kiosk downstairs and get paid for it*" (Participant 1). This practice being referred to by several participants highlighted how the scheme may have had unintended consequences, whether these are positive or negative.

Discussion

This study explored the barriers and enablers to students' and staff's engagement behaviours with the UCL Reusable Cup Scheme, including the purchasing, use and return of cups. Thirteen influences on engagement were identified across five COM-B constructs [40], including Psychology capability, Physical and Social opportunity, and Automatic and Reflective motivation, with Reflective motivation encompassing the greatest number of themes. Engagement was supported by participants' understanding of the scheme, accessible infrastructure, positive social interactions and favourable perceptions of the scheme's usefulness, while barriers arose from forgetting to return cups, unclear guidance, established routines and concerns about hygiene.

Participants emphasised the importance of understanding the scheme to use it correctly and return the cups as intended (Theme 1: "Understanding the mechanics of the scheme"). For example, not understanding how to get deposits back could discourage participants from using the scheme, while misunderstanding the scheme and assuming you could keep the cups could lead to people to not return them as required. Similar patterns have been observed in other packaging initiatives, where participants reported needing clear step-by-step instructions to familiarise themselves with schemes [30], and negative views were most common among those who found schemes complex [55]. For the UCL Reusable Cup Scheme's posters, the findings suggested that the steps and behaviours required to use the scheme needed to be outlined more clearly (Theme 6: "Posters and instructions on using the scheme"). Having instructions on the cups and the bins themselves seemed to provide valuable and clear prompts to facilitate engagement with the scheme. Based on previous research, one aspect of repackaging schemes that needs explicit communication is hygiene practices (e.g., that cups are washed), as concerns around hygiene are common in such schemes [56]. This was also reflected in the current findings: Participants who believed the cups were clean described this as an enabler, while others were unsure about the reused cups' hygiene and less comfortable using these cups as a result (Theme 12: "Perceived hygiene of cups").

To improve knowledge and enable engagement with the scheme, participants highlighted social interactions as a useful source, including staff delivering the scheme (café staff) and observations of or interactions with peers (Theme 3: "Interpersonal interactions and support regarding scheme use"). When the staff provided clear instructions on how to use the scheme, this was described as an enabler. Interestingly, in particular for students, seeking clarifications or having to ask for deposits seemed to feel particular difficult, once more underlining the need for clear instructions [30]. Peers communicated information about the scheme directly and modelled the behaviours required for engagement with the scheme (e.g., being able to observe someone using the deposit boxes). In some cases, peer groups could also form norms and activities around using the scheme, such as returning cups together. This collective, more enjoyable practice represents a unique finding, suggesting that reusable cup schemes could be made more engaging in university settings and integrated into wider implementation efforts to enhance uptake.

The scheme was generally considered to be easy to use (Theme 9: "Perceived ease of participation in the scheme"). The accessibility of the drop boxes, for example, allowed for participants to better understand the scheme and use it flexibly (Theme 6: "Accessibility of drop boxes"). Similar responses have been observed in other sustainability initiatives, where convenience and smooth integration into daily routines enhance acceptance and engagement [30,57]. Poorly located or overly complex return points have been shown to deter participation in similar schemes, whereas strategically placed infrastructure significantly increases return rates [30,32].

Participants underlined that the environmental and financial benefits of the scheme (Theme 10: "Perceived usefulness of the scheme") encouraged engagement with the scheme. The importance of the financial element of the scheme is generally in line with other reusable packaging schemes, especially in avoiding losses through surcharges on disposables [33,57]. A consideration raised, however, was to what extent motivations based on avoiding such surcharges remain once people have become used to these charges (Theme 7: "Habits and routine behaviours"). Participants also noted that the scheme's UCL branding allowed them to trust it, especially considering the financial element of the scheme (Theme 11: "Perceived reliability of the scheme"). One unexpected barrier was that the £1 deposit seemed to be low enough for some participants to keep the cup for themselves or use it for different purposes (Theme 13: "Alternative goals while using the scheme"). Similar patterns have been observed in other sustainability initiatives, where low deposits or poor incentives encouraged consumers to repurpose or "game the system" rather than follow intended behaviours [58].

The perceived environmental benefits related to people feeling positively about the scheme: several expressed feeling that they were doing something "good" (Theme 8: "Positive feelings from using the scheme"). This finding reflects broader evidence that anticipated positive emotions are key drivers of pro-environmental behaviours, including using reusable cups [33,59], especially when initiatives align with individuals' sustainability values [60].

Forgetting to return cups emerged as a recurring issue among participants (Theme 2: "Forgetting to return cups"). The design of the scheme meant that forgetting did not completely prevent engagement, as participants could always purchase another cup or utilise the delayed return option. For some, this flexibility enabled by the drop boxes was seen as a helpful feature that reduced pressure and made the scheme easier to use (also see Theme 5: "Accessibility of drop boxes"). However, others perceived the accumulation of unused cups at home as wasteful and found themselves less likely to return cups they had taken home. These findings provide a potential explanation for the 21% shortfall in return rates by the end of the scheme's pilot period, namely participants forgetting to return cups. This explanation is in line with previous research showing that habits and forgetfulness can be barriers to sustainable behaviours, including reusable cup use [33].

Unexpected potential reasons for the shortfall in cup returns included participants keeping cups as mementos (Theme 13: "Alternative goals while using the scheme"). A case study at music festivals similarly suggested that branded reusable cups were often taken out of a scheme as souvenirs [17], although the study did not test this explanation directly. In line with this, municipality- and industry-based guidelines and reports include recommendations to only brand a percentage of reusable cups, supporting marketing reach and engagement while limiting the number taken as mementoes [61,62].

For participants who had established routines with their own reusable cups, the scheme was seen as less useful, as their existing habits were reliable, convenient and already aligned with their sustainability goals (Theme 7: "Habits and routine behaviours"). While this can mean lower engagement with the scheme, it is still in line with the aim of reducing disposable cups [57,63]. Therefore, UCL Reusable Cup Scheme and initiatives for people to use their own reusable cups can be seen as compatible, parallel running sustainability initiatives, providing university students and staff with flexible options to reduce their single-use plastics waste. Therefore, CRCSs may benefit from framing themselves as a complementary option and a reliable alternative when personal cups are unavailable.

Implications

Drawing on the findings and identifying relevant intervention functions from the Behaviour Change Wheel (see S1 Table for the wheel's mapping between COM-B constructs and intervention functions) [40], the study findings provided concrete

insights into how the UCL Reusable Cup Scheme could be improved. To improve knowledge of the scheme and provide contextual cues that support engagement, a key improvement would be having clearer posters that introduce the steps on how to engage with the scheme (Intervention functions: "Education" increasing understanding of steps and "Environmental Restructuring" prompting the behaviour at the point of use). Clearer physical instructions and prompts would be particularly helpful for students who feel more anxious about interacting with staff. In addition, staff working in cafés could be given a short script prompting them to check whether people are aware of the reusable cup scheme, when they are not using their own cup. If café users indicate that they are unfamiliar with the scheme, staff could provide a clear, simple explanation (Intervention functions: "Environmental restructuring" and "Enablement"). In addition, to reduce any social friction for students when trying to return the cups, drop boxes could be added right outside of cafés for situations where students might feel uncomfortable to talk to café staff (Intervention function: "Environmental restructuring").

Persuasive posters (Intervention function: "Persuasion") could also be used to increase confidence in the scheme's hygiene practices. Such posters could include facts about the cups' cleanliness (e.g., information about the reusable cups being equally clean to single use ones, and cleaner than most cups used at home). If more reassurance for this barrier is needed, institutions could conduct regular hygiene testing of reusable cups and communicate the results through posters or digital screens across campus, providing regular assurance to help build trust.

To strengthen the perceived financial consequences of the scheme, the scheme could further emphasise not losing the 50 pence surcharge for disposables through prompts (e.g., posters on café counter tills), as some participants noted that these might have become normalised (Intervention functions: "Persuasion" and "Incentivisation"). As the permanent removal of cups from the scheme has important implications for their life-cycle assessment [64], making sure that the incentives for returning cups rather than keeping them are high enough is key to improving the scheme. Reusable cups are more durable than single-use cups and so typically require more material to manufacture [65]. Therefore, if large numbers of cups are removed from circulation and repurposed by users as mementoes rather than as reusable cups, CRCSs may have unintended negative environmental consequences.

A consideration would be whether to increase the price of the cups' deposits to improve return behaviours and reduce the cup being kept as keepsake or for other purposes outside of the scheme (Intervention function: "Incentivisation"). However, this strategy and the optimal deposit point (e.g., higher than £1) would need to be tested or further explored to ensure it does not lead to disengagement at the point of sale due to the deposit being too high, particularly given that some students may be trying to save money on a daily basis. To reduce the incentive to keep the cups rather than return them, the branding could also be changed to make them less desirable as mementoes, for example by using a much smaller UCL logo (Intervention function: "Incentivisation").

As observing others' behaviour was helpful in learning about the scheme, volunteers could run public demonstrations, at the beginning of the academic year, to show how to use the scheme and return the cups (Intervention functions: "Modelling"). In parallel, the organic social activities developed during the scheme could be considered for integration into the scheme itself to further encourage engagement (Intervention function: "Environmental restructuring"). For example, the cup scavenger hunts or discounted-coffee return days, could be piloted and evaluated. The scheme developers could co-develop such activities with UCL's sustainability student societies. Separately, to help participants remember to return their cups, the scheme's app could also have prompts that student and staff set up in the mornings to remind them to return their cups (Intervention function: "Environmental restructuring"). Similarly, if participants have more than three cups, they could be reminded on a weekly basis to return these.

The success of schemes like this also carries broader policy and practice implications. Disposable cups are rarely recycled in practice due to technical difficulties with sorting and collection and in separating out constituent materials, so reducing reliance on them is critical to reduce this waste stream [66,67]. Demonstrating effective models for reuse not only helps cut waste at the source but also contributes to the development of innovative circular approaches [13,14]. Figuring out how to make reuse economies viable is therefore an important part of circular design, and scheme evaluations of

university-based schemes can provide valuable evidence and momentum for designing schemes that work for product users (a critical step is circular design) and scaling such strategies more broadly [14].

Strengths and limitations

A key strength of this study is its behavioural approach, which goes beyond quantitative outcomes to explore the influences on engagement behaviours with a circular reusable cup scheme. Thereby, the study presents more participant informed insights, such as the unintended uses of the scheme and how the scheme can be complimentary to other sustainability efforts (e.g., people using their own keep cups). Another strength was that participants included students as well as staff, reflecting perspectives from a range of groups within the university community. However, as the study was conducted as part of a Master's thesis, recruitment took place towards the end of the academic year, resulting in participants consisting primarily of staff and postgraduate students. Despite including a range of perspectives, the sample size was relatively small and not sufficiently diverse to capture the full range of experiences across the university population. Consequently, the findings provide only limited insight into how barriers and enablers may differ between groups within the university community. Future research involving more participants, recruited earlier in the academic year, would help to explore these potential differences in greater depth.

Another limitation of this study, similar to other recruitment efforts requiring self-selection, is that the participants included might have been more interested in sustainability and the scheme than others on campus. As the pilot scheme had ended at the time of the interviews, participants were also recalling behaviours from several weeks earlier, which may have limited detail, and participants' accounts were potentially more retrospective and interpretive in nature [23,68]. For example, participants may not have been able to accurately recall their motivations at the point of purchase of reusable cups, instead providing post-hoc rationalisations of their behaviour. Conducting brief interviews during the pilot period may have supported more accurate recall. Social desirability is also a potential concern, as participants may have framed their behaviour in line with pro-environmental or cost-conscious norms, an issue that is common in sustainability research, especially when interviews are conducted face-to-face [69].

Future research

Only including participants who had interacted with the scheme (using it at least once) meant that participants could share more information about the scheme and its influences on behaviour. However, to gain insights into how to increase uptake, we could interview people who did not interact with the scheme at all or use surveys to a reach more people across the UCL campus for a better overview on people's motivation, opportunities and abilities to engage with the scheme. For behaviours that interfered with the scheme (e.g., keeping multiple cups or throwing cups away), we could also use novel survey-based approaches to investigate the frequency of these "socially undesirable" behaviours that people feel uncomfortable reporting directly (e.g., previously used for falsifying Covid test results) [70].

If the scheme is continued, future studies could also explore how this scheme performs over time and in more competitive, real-world settings where multiple cafés and infrastructures are present. In the current study, both UCL staff and students were interviewed, but future research could more systematically examine how influences shape participation differently for a range of students compared to staff, as well as staff with different roles (e.g., early career researchers, lecturers, professor and administrative staff). For example, studies could explore how differences in working and study arrangements, access to storage space, and time spent on campus influence engagement with reusable cup schemes. In addition, research could be conducted with café staff to understand how their behaviours influence uptake and challenges they have experienced regarding the scheme's implementation. Finally, this study only explored the accessibility of the reusable cup scheme at a high level. Future studies should explore whether this or similar initiatives are inclusive and do not have unintended consequences, such as excluding some individuals from campus activities. For example, more nuanced survey prompts and targeted interviews with people who have musculoskeletal conditions or limited dexterity,

could help identify specific barriers and enablers for populations whose needs are often overlooked in sustainability initiatives.

Conclusion

Circular reusable cup schemes present a promising opportunity for reducing single-use plastics, particularly in settings such as universities where closed loop systems are more feasible. Drawing on the piloted UCL Reusable Cup Scheme as a case study, this study explored the barriers and enablers for staff and students to engage with the scheme. The findings highlighted the importance of a clear understanding of the scheme (communicated through posters, prompt, interactions with scheme staff or peers) for initial uptake and appropriate cup return. Perceived financial and environmental usefulness, positive feelings and supportive social interactions also seemed to encourage engagement with the scheme. In contrast, perceived hygiene, forgetting the cups or repurposing them for personal use interfered with the intended functioning of the scheme, while financial incentives sometimes led participants to "gamify" the scheme. By mapping these influences to Intervention Functions from the Behaviour Change Wheel, recommendations to improve the UCL Reusable Cup Scheme and similar schemes were outlined. These recommendations can be used by practitioners to refine aspects of these schemes but also inform further research to explore how these schemes best work in different contexts. Future research could also examine how the scheme delivery can be improved and why some individuals do not participate or return the cups as intended.

Supporting information

S1 Fig. Recruitment poster.
(DOCX)

S1 Text. Interview guide.
(DOCX)

S1 Table. Intervention functions mapped onto COM-B constructs from Michie et al. (2011) [40].
(DOCX)

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