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Explaining the willingness of consumers to bring their own reusable coffee cups under the condition of monetary incentives

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ABSTRACT

An increasing number of hospitality firms attempt to foster sustainable practices among their customers. Amongst these, incentives for customers to bring their own reusable products stand out. In this study, we first analyse whether consumers are willing to bring a reusable coffee cup (RCC) under the condition of a monetary incentive (qualitative decision) and the minimum discount required for individuals to be willing to use an RCC (quantitative decision). Second, we analyse the explanatory factors impacting these two decisions. Several factors are proposed to explain an individual's willingness to bring an RCC including their environmental knowledge and involvement, and personal restrictions for using an RCC. An empirical application, conducted on 1,371 individuals using a Heckit model, allows us to conduct a joint modelling and provide a novel methodological contribution to the study of the willingness, and barriers, of individuals towards the use of RCCs in the coffee shop industry.

1. Introduction

In 2018, the food service disposables international market was valued at USD 56.5 billion with expected growth due to an increase in online delivery services by restaurants, retail outlets and coffee shops as well as a trend towards ready-to-eat-food consumption (Grand View Research, 2019). Along with this, the use of plastic packaging in the fast-moving consumer goods (FMCG) industry is forecast to grow by 14% between 2018 and 2022 (Euromonitor International, 2019). This trend has been amplified by the COVID-19 global pandemic, which has caused an increased demand for plastic packaged products including via online delivery and takeaway services (Heiges and O'Neill, 2020; Vanapalli et al., 2021). The social and environmental cost of plastic pollution in general, which includes disposable coffee cups, was estimated at USD 139 billion per year by Trucost, a research arm of Standard & Poor Global (Lord, 2016).

Measuring the market sizes of materials that are commonly used in the U.S. food service disposable market (i.e., plastic, paper/paperboard and aluminium), plastic represents the largest segment with over 40% of revenue share in 2018. Due to its wide-ranging benefits, the hospitality industry finds it hard to replace this material (Grand View Research, 2019). However, when it comes to pollution, plastic (especially single-use plastic) is a key concern due to its ubiquity and detrimental ramifications on the environment (Keller et al., 2021). For example, since end-2017, over eight million tons of plastic pollute the oceans annually and the UN Environment Assembly noted that ocean plastic will exceed the amount of fish by weight if no action is taken (Euromonitor International, 2018). These issues are further aggravated by the fact that, although increasing, the recycling of plastic still lags behind the recycling of other materials (Euromonitor International, 2018). In response, many companies and consumers acknowledge the need for more sustainable and responsible behaviour. Taking into account the growing concerns about environmental issues and rising attempts to promote sustainability, it is highly relevant to conduct research on how organisations can encourage pro-environmental behaviour (Han et al., 2019; Keller et al., 2021).

Even though hospitality research has analysed some of the issues relevant to pro-environmental behaviour in hospitality and tourism

; RCC, Reusable coffee cup; PEB, Pro-environmental behaviour.

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contexts (e.g., Gao et al., 2016; Miao and Wei, 2016; Namkung and Jang, 2017; Kang and Namkung, 2018; Rhou and Singal, 2020), our understanding of sustainable behaviour within the coffee shop industry remains limited.

Considering that, worldwide, approximately 500 billion disposable cups are handed out annually (White et al., 2019), it becomes clear just how far reaching this issue potentially is, as "switching to reusable cups could achieve up to a threefold reduction in carbon emissions" (Foteinis, 2020, p. 7). A study from Woods and Bakshi (2014), which compares the life cycle impacts of reusable and disposable cups in the U.S., confirms that the environmental impact of reusable cups is lower than that of polystyrene cups for typical serving sizes, even when taking into account that a reusable cup is cleaned in a standard-sized dishwasher after every use. Although there has been an increase in the utilisation of reusable coffee cups (RCCs) in the last few years, the use of disposable cups is an ongoing issue as disposable cups are still commonly offered for takeaway drinks (Han et al., 2019; Novoradovskaya et al., 2020; Sandhu et al., 2021). In fact, the increase in on-the-go coffee consumption, which goes hand in hand with an increase in disposable cups, shows that to date we have failed to solve this acute environmental problem successfully, despite the fact that it is an issue that is ubiquitous both in public discussion and day-to-day life (Loschelder et al., 2019).

Coffee is often drunk on the go and around 63 billion disposable cups are thought to be used annually in North America alone (IMARC Services Pvt. Ltd., 2019). Roughly, 90% of these cups are dumped in landfill sites since they cannot be recycled due to a thin layer of polyethylene film on the inside that makes the cups impermeable and heat proof (Novoradovskaya et al., 2020). Nevertheless, there is an evident trend on the part of coffee shops that reflects the concern about cups, as these establishments are setting incentives, such as discounts, to those customers who bring their own cups or, alternatively, charging customers a fee when not bringing or utilising their own cups (Stafford and Jones, 2019). In 2019, some U.S. coffee retailers provided discounts for bringing reusable cups. For instance, Peet's, Starbucks and Caribou Coffee offered a 10-cent discount (Vice Media Group, 2019). An alternative approach was adopted by Portland Coffee in 2019; it charged an additional fee of 25 cents to customers who asked for a disposable cup (Forbes, 2019). However, there are contradictory results in terms of the effectiveness of such financial incentives (Finn, 2017; Morales, 2019), which indicate that further analysis is required (Ferreira and Ferreira, 2018; Gallego-Schmid et al., 2019).

This study analyses the determinant factors of the willingness of consumers to bring an RCC if a financial incentive (i.e., a discount) is given. It has two key aims: (1) to analyse the willingness of consumers to bring an RCC if a discount is offered (qualitative decision) as well as to examine the size of the discount needed to incentivise consumers to bring an RCC (quantitative decision); and (2) to examine the determinant factors of these qualitative and quantitative decisions. Note that the term "qualitative" is used here from a statistical viewpoint representing a situation where an individual makes a choice between two alternatives (Train, 1986; Nicolau et al., 2020). To achieve the first aim, this study suggests two research questions (RQ): (1) Are consumers willing to bring an RCC under the condition of a monetary incentive (i.e., a discount), and (2) what is the minimum discount required for individuals to be willing to use an RCC? To analyse the second aim, research hypotheses on the impact of the explanatory factors on both the qualitative and quantitative decision are developed in the theoretical background. Our main contribution, using a Heckit model (Heckman, 1979), is to identify the factors that influence responsible consumption if a monetary incentive is offered.

2. Theoretical background

The usage of single-use drink cups contributes to environmental issues like littering, resource depletion and carbon dioxide emissions, and, thus, is in conflict with the UN Sustainable Development Goals (Keller et al., 2021). There is an urgent need to gain a better understanding of the barriers to environmentally friendly behaviour in the context of coffee cup use by consumers in order to develop potential solutions to address this significant sustainability problem (Sandhu et al., 2021). In an attempt to address this issue, both consumers and companies have a role to play and can contribute to eliciting pro-environmental behaviour (PEB), which in this case refers to using a reusable hot drink cup when purchasing takeaway beverages (Novoradovskaya et al., 2020). Consumers are encouraged by governmental organisations (e.g., United Nations Sustainable Development, 2021; US Environmental Protection Agency, 2020), interest groups (e.g., Greepeace, 2021) and social media (WARC, 2020) to bring a reusable coffee cup and refuse single-use cups. Additionally, some companies offer monetary incentives to customers who bring reusable cups or only sell their drinks in reusable cups (Poortinga and Whitaker, 2018). The present study aims to analyse a joint framework regarding the willingness of consumers to bring their own reusable coffee cups if a monetary incentive is offered and the minimum discount necessary for which they were willing to bring a reusable coffee cup to the coffee shop.

In an effort to foster sustainable consumption in the hospitality industry, it has been recognised that eliciting PEB in consumers is one of the greatest challenges (Legrand et al., 2019). Many studies have focused on comprehending the underlying mechanisms of everyday PEB and on ways to inspire behavioural change in order to boost eco-friendly actions (Steg and Vlek, 2009; Schuitema and De Groot, 2015; Novoradovskaya et al., 2020). Research has also examined numerous variables including environmental knowledge and socio-demographics, as well as the role that culture-based attitudes play in individuals' capabilities to understand and appraise the influence that society has on the environment (Laroche et al., 2001; Diamantopoulos et al., 2003; Tilikidou, 2007). Research suggests that improving consumer knowledge about the ecosystem has the ability to induce eco-friendly behaviour and this remains true across distinct parts of the world (Fryxell and Lo, 2003; Lee and Moscardo, 2005). Hotel guests that display higher levels of environmental concern report greater willingness to pay higher prices for hotels that undertake green actions (Kang et al., 2012; González-Rodríguez et al., 2020). These findings suggest that an individual's knowledge about an issue has the potential to influence their behaviour.

As mentioned earlier, companies are providing monetary incentives to influence PEB with respect to RCCs (Sandhu et al., 2021). However, to date, there is a lack of research that analyses the interdependency of consumer willingness to use a reusable container if a monetary incentive is offered (qualitative decision) and the minimum discount required for these people to be willing to bring a reusable container (quantitative decision). Using a Heckit model, our main contribution to the literature in this area is to analyse the factors that influence a responsible consumption decision if a monetary incentive is offered. Fig. 1 shows a summary of the decisions, and explanatory factors, of consumers to bring an RCC under the condition of monetary incentives.

2.1. Consumers and pro-environmental behaviour

According to Kaplan (1991), the state of one's knowledge about an issue significantly influences one's decision-making process regarding that issue. In the context of this study, we refer to consumers' knowledge about disposable coffee cups. Environmental knowledge is often thought to be a precursor to environmental concern and environmental involvement, which in turn are predictors of PEB (González-Rodríguez et al., 2020). Environmental concern is commonly used to measure the importance that an individual ascribes to the environment and its protection (Alwitt and Pitts, 1996), and pertinent literature defines it as an attitude towards an environmental issue, both general or specific (e.g., Fransson and Gärling, 1999).

The notion of involvement refers to personal relevance, which is thought to be the product of inherent needs, interests and values

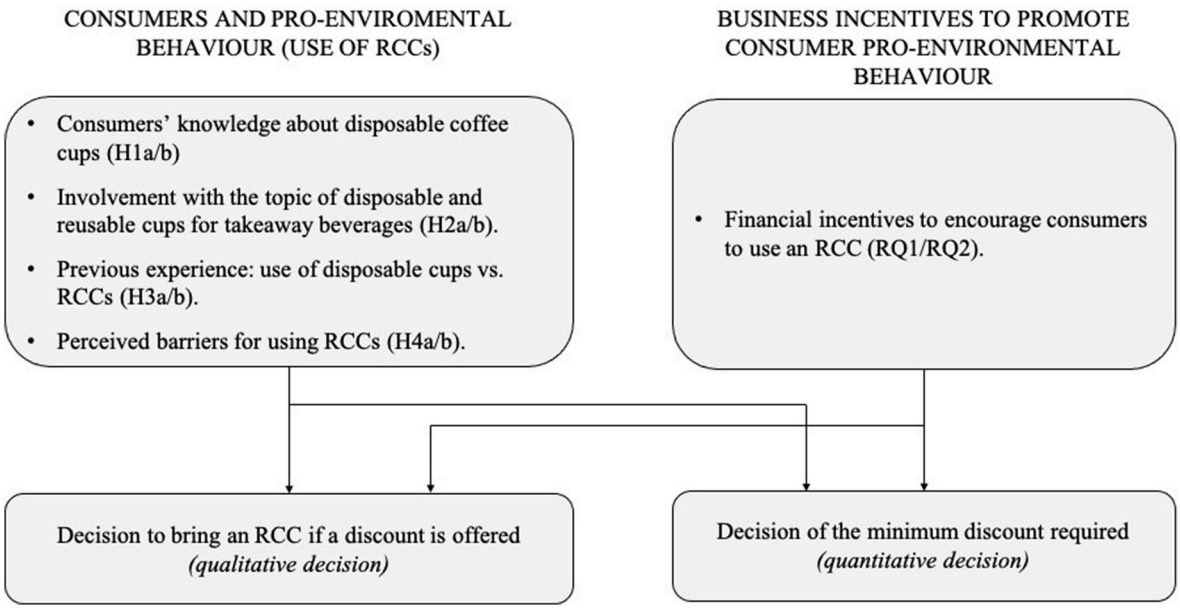

Fig. 1. Conceptual model under the condition of monetary incentives.
Note: Hypotheses with "a" refer to the qualitative decision. Hypotheses with "b" refer to the quantitative decision.

(Zaichkowsky, 1985), and alludes to the degree of interest or personal importance inspired by a stimulus in a given setting (Grau and Folse, 2007). Personal relevance and, thus, involvement are associated with the intrinsic importance of an issue, the expectation that an issue has substantial effects on a person's life and/or the situations in which the outcomes linked with the topic at hand make the instantaneous situational rewards seem insignificant (Cialdini et al., 1976; Hajjat, 2003). Cause involvement, more specifically, is defined "as the degree to which consumers find the cause to be personally relevant to them" (Grau and Folse, 2007, p. 20). Cause involvement makes consumers gravitate towards an issue and relate to it and, like involvement in general, can be induced through personal relevance, intrinsic interest or alleged social importance (Browning et al., 2018). In this study, cause involvement refers to the use of reusable cups for takeaway.

To date there is no consensus on whether environmental concern or cause involvement are predictors of PEB. It is common to find a gap between responses to surveys on environmental attitudes and actual behaviour (Juvan and Dolnicar, 2014; Font and McCabe, 2017), suggesting that we need to better understand context and consumer specific drivers and barriers to sustainable behaviour (Juvan and Dolnicar, 2017). Regarding hotels, Miao and Wei (2016) found that if consumers have to compromise on personal comfort, they are less likely to participate or engage in PEB. "[Personal] comfort is a salient consumption goal in a hotel setting and the hedonic motive can override the environmental motives to predominantly influence consumer [behaviour] in this setting" (Miao and Wei, 2016, p. 332). Thus, PEB in hotels can be impeded by non-environmental motives that are often triggered by the setting itself (Miao and Wei, 2016).

There are, however, numerous studies that have identified a positive relationship between individuals' environmental concerns and PEBs. A meta-analysis of 187 studies concluded that individuals are more likely to engage in recycling, petitioning and energy conservation if they display higher levels of environmental concern (Hines et al., 1987). Correspondingly, Ellen et al. (1991) found that a general attitude of environmental concern is one of the reasons why people purchase eco-friendly products and engage in recycling. Another meta-analysis of 46 studies confirmed that awareness of and knowledge about environmental problems are determinants of pro-environmental behaviour (Bamberg and Möser, 2007). Recent studies suggest that environmental concern represents a key driver to shape PEB (Ballantyne et al., 2011; Sellers-Rubio and Nicolau-Gonzalbez, 2016; Hao et al., 2019), as environmentally conscious consumers prefer to purchase products that have less of an impact on the environment (Taufique et al., 2019; Wu et al., 2021). In the context of consumers' willingness to bring an RCC, we suggest the following hypotheses:

H1a. Environmental knowledge positively influences consumers' willingness to bring an RCC.

H2a. Cause involvement positively influences consumers' willingness to bring an RCC.

A recent review of the business case for CSR in the hospitality industry identifies "growing demands not only of pro-environmental but also of pro-social practices in hospitality establishments" (Rhou and Singal, 2020, p.7). These authors evidence the importance of CSR as a core corporate strategy in hospitality companies. Despite widespread pro-environmental attitudes among consumers (40%), only a handful of consumers (4%) actually behave sustainably (Luchs et al., 2010). One potential reason is that many pro-environmental campaigns are geared towards people who are socially conscious and already committed to the sustainability agenda, while attempts to address the other half of the population, who is more concerned about taking care of the self, are lacking or ineffective (Nisbet and Kotcher, 2009; Corner and Randall, 2011). Another reason might be that a large proportion of consumers find that they do not have the means or are not willing to spend them on sustainable behaviour. This is in line with a consumer survey conducted by Booking (2018), according to which 78% of American travellers reported to be concerned about the environment; however, 46% found obstacles to acting in accordance with their concerns, such as not having enough money to pay for the additional expenditure.

Concerns regarding the environment are increasing rapidly. Yet, behavioural change among people in the realm of sustainability has proven to be very difficult (Dietz et al., 2009). Morales (2019) discusses a range of practical issues that create barriers to using RCCs: consumers tend to view carrying around an RCC as an inconvenience; troubles for baristas which are caused by unique travel-mug sizes; and, interestingly, the paper coffee cup has also become a status symbol, a signal of wealth and a busy schedule. In this light, disposable cups constitute an excrescence of our wasteful culture in which convenience trumps sustainability and consumers are used to the convenience of throwaway packaging (Poortinga and Whitaker, 2018). Based on the above, the

following hypotheses are posited:

H3a. Consumers' previous experiences regarding cup choice when ordering takeaway beverages influence their willingness to bring an RCC, in that (i) individuals who occasionally or more frequently use RCCs are more willing to bring an RCC, and (ii) individuals who rarely or never use RCCs are less willing to bring an RCC.

H4a. Perceived barriers for using RCCs negatively influence consumers' willingness to bring an RCC, in particular: (i) a lack of incentive to use an RCC, (ii) no possession of an RCC, (iii) a limited salience of RCCs in an individuals' mind, (iv) a perceived loss in convenience by using an RCC, and (v) a lack of awareness about using an RCC.

2.2. Financial incentives to encourage behavioural change

Exploratory research on reusable coffee cups confirms that convenience often beats green conscience: even though awareness on the issues surrounding coffee cups and landfills has increased, many consumers are not using RCCs due to a perceived loss in convenience when compared to disposable cups (Morales, 2019). Appeals to environmental values are insufficient to change behaviour in hedonic contexts and further incentives are required (Corner and Randall, 2011; Dolnicar et al., 2017). One of the standard tools for policy makers to encourage or discourage certain behaviour is the introduction of financial incentives such as discounts or charges (Poortinga and Whitaker, 2018). Studies on the use of single-use carrier bags demonstrate that charges can be a highly effective instrument to prompt behavioural change (Poortinga et al., 2013); however, this instrument also comes with the risk of working as an extrinsic incentive thereby diluting someone's intrinsic motivation to act in an environmentally friendly way (Thomas et al., 2016).

In the context of price incentives to promote sustainability consumption, a number of studies have used Heckit models to analyse consumers' decisions of how much more they are willing to pay for sustainable products and services and to identify the drivers of these decisions. For instance, Sellers-Rubio and Nicolau- Gonzálbez (2016) conclude that multiple socio-economic characteristics (i.e., age, gender, income), knowledge about wine culture and environmental concern affect the willingness to pay a price premium for sustainable wine as well as the average amount of the price premium consumers are willing to pay. In the context of restaurants, Nicolau et al. (2020) found that two of the determinant factors that seem to exert an impact on the decision of how much more to pay for a green restaurant are green consumerism and the psychographic variable that measures the individual's willingness to make an effort in terms of time and travel distance to select a green restaurant instead of a non-green restaurant. Casado-Díaz et al. (2020) used a Heckit model to show that guests' personal concerns and efforts regarding water conservation play a more important role than attitudinal determinants in explaining guests' willingness to pay a premium to promote water conservation.

With regard to the quantitative decision, our study analyses the effect that the explanatory variables have on the decision of the minimum discount required. The rationale for the justification of these hypotheses follows a similar pattern regarding the qualitative decision. Consequently, the following hypotheses are posited:

H1b. Environmental knowledge positively influences the decision of the minimum discount required, in that (i) individuals with more environmental knowledge require a smaller discount in order to be willing to bring an RCC, and (ii) individuals with less environmental knowledge require a larger discount in order to be willing to bring an RCC.

H2b. Cause involvement positively influences the decision of the minimum discount required, in that (i) individuals with a higher level of cause involvement require a smaller discount in order to be willing to bring an RCC, and (ii) individuals with a lower level of cause involvement require a larger discount in order to be willing to bring an RCC.

H3b. Consumers' previous experiences regarding cup choice when ordering takeaway beverages influence individuals' decisions of the minimum discount required, in that (i) individuals who occasionally or more frequently use RCCs require a smaller discount in order to be willing to bring an RCC, and (ii) individuals who rarely or never use RCCs require a larger discount in order to be willing to bring an RCC.

H4b. Perceived barriers for using RCCs negatively influence individuals' decisions of the minimum discount required, in particular: (i) a lack of incentive to use an RCC, (ii) no possession of an RCC, (iii) a limited salience of RCCs in an individuals' mind, and (iv) a perceived loss in convenience by using an RCC.

In summary, many studies and meta-analyses have found that environmental concern and cause involvement positively influence PEB (e.g., Hines et al., 1987; Ellen et al., 1991; Laroche et al., 2001; Bamberg and Möser, 2007; Ballantyne et al., 2011; Sellers-Rubio and Nicolau-Gonzalbez, 2016; Hao et al., 2019; Taufique et al., 2019; Wu et al., 2021). Nevertheless, in many instances, attitude and behaviour seem to diverge: for all the environmental concern that consumers state to have, environmentally sustainable behaviour is often impeded by a range of practical issues, with convenience seemingly leading the way. Thus, environmental knowledge and involvement might have the potential to increase PEB but they stand in direct conflict with practical factors and other personal desires that hinder PEB. Therefore, combining intrinsic and extrinsic motivators might be the key to unlocking PEB. Hence, this study considers two factors. First, it investigates, by means of two research questions (RQ1 and RQ2), whether consumers are willing to bring an RCC under the condition of a monetary incentive and what the minimum incentive value needs to be in order to encourage the use of RCCs. Secondly, it looks at four personal factors (i.e., environmental knowledge, involvement, previous experience regarding the use of disposable and reusable cups as well as barriers for using RCCs) that influence the aforementioned willingness. Fig. 1 provides the conceptual model with research questions and hypotheses of the explanatory variables on the quantitative and qualitative decision.

3. Research methodology

3.1. Sample

Data for this study was collected in the U.S. in August 2019. The location was chosen because North America constitutes the largest regional market for food service disposables and this region has the highest number of restaurants and retail outlets providing food for takeaway (Grand View Research, 2019). We sampled participants from the U.S., recruited via Amazon Mechanical Turk (MTurk). MTurk is a web-based, research platform that is considered to offer a larger, and more demographically-diverse, population than traditional data collection methods (Buhrmester et al., 2016) and is frequently used in environmental business studies (Smith et al., 2016). A small monetary reward was offered to those respondents who completed the online survey (Oppenheimer et al., 2009).

The final sample comprised of 1,371 (sampling error = 2.64%; $p = q = 0.5$; $z = 1.96$). In the study sample, the use of RCCs (provided by the companies or by the customers) was low (mean = 3.15 and 3.20, respectively, on a seven-point scale) in comparison to the use of disposable cups (mean = 4.76). Accordingly, approximately two thirds of participants stated that they used disposable coffee cups most of the time, or more frequently, and only 13.30% said they never, or very rarely, used disposable coffee cups. Slightly more than 60% stated that they occasionally, or less frequently, used RCCs (either brought by the person themself or provided by the coffee shop).

3.2. Research model

To examine the determinants of consumers' willingness to use an RCC, a Heckit model was employed. This model permitted the identification of the explanatory variables of consumers' willingness to use an RCC while, at the same time, controlling selection bias. The method allowed for analysis of two simultaneous decisions, one of which was qualitative (referring to whether individuals were willing to bring an RCC with them if the coffee shop offered a discount for doing so) and the other was quantitative (reflecting the minimum discount necessary for which they were willing to bring an RCC to the coffee shop).

Let z_{tk} be the series of variables where k represented the decision to bring an RCC (qualitative decision) for individual t, such that a latent variable d_t* represented the decision. The vector of parameters γ_k represented the effect of z_{tk} on the decision d_t*. Let x_{ts} be the variables s that explained the minimum discount (MD_t) necessary for individuals to bring an RCC (quantitative decision), and β_s was the coefficient that reflected the effect of these variables on the quantitative decision. Finally, CV_{ht} gave a series of control variables used in the two equations, where λ_h and δ_h were parameters that reflected the effects of these control variables. Consequently, the two equations in the Heckit model were:

$$d_t^* = \sum_{k=1}^{K} \gamma_k z_{tk} + \sum_{h=1}^{H} \lambda_h CV_{ht} + u_t, \quad (1)$$

$$MD_t = \sum_{s=1}^{S} \beta_s x_{ts} + \sum_{h=1}^{H} \delta_h CV_{ht} + \varepsilon_t \text{ observed only if } d_t^* > 0. \quad (2)$$

A bivariate normal distribution was assumed for the error terms u_t and ε_t, with mean equal to zero and variances σ_u andσ_ε, for each error term. The covariance between the two error terms was $\sigma_{\varepsilon u}$. In fact, our empirical application finds that there is a selection bias (between respondents who bring a reusable coffee cup if a discount is offered and those who do not) as shown by the significant ρ parameter (ρ = 0.971; p-value < 0.01), which proved that there was non-zero correlation between equations (1) and (2) (Amemiya, 1985). This supports the use of the Heckit model; accordingly, when estimating the quantitative equation, we used only those individuals that chose to use an RCC.

3.3. Variables

The dependent and independent variables used in the model are described next. Descriptive statistics for these variables are presented in Table 1.

Dependent variables refer to the qualitative and quantitative decisions. The qualitative decision reflected whether or not an individual would bring an RCC if a discount was offered. If the individual was willing to bring an RCC then the dependent variable was 1 and, otherwise, it was 0. The quantitative decision referred to the minimum discount that the individual needed to receive to bring an RCC. The individuals were asked about the minimum discount for which they would be willing to bring an RCC.

With regard to the independent variables, the following variables were analysed.

(a) *Knowledge about disposable coffee cups.* Using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree), respondents were asked to indicate the extent to which they agreed or disagreed with these statements: i) disposable coffee cups are a problem for the environment; ii) disposable coffee cups require a lot of resources in the production process; iii) the logistics of shipping disposable coffee cups to the individual coffee shops requires a lot of resources; and iv) disposable coffee cups produce a lot of waste. The items for this variable were adopted from general facts about coffee cups (Scottish Government, 2019; The Independent, 2018).

(b) *Involvement with the topic of disposable and reusable cups for takeaway beverages.* Consumers' involvement with the topic of disposable and reusable cups for takeaway beverages was measured using 5 items with a 7-point semantic differential scale ("unimportant – important", "means nothing – means a lot", "irrelevant – personally relevant", "doesn't matter – does matter a great deal", "is of no concern – is of great concern"). The items for cause involvement were adopted from Grau and Folse (2007).

(c) *Previous experience: use of disposable cups vs. RCCs.* Using a 7-point scale (1 = never, 7 = always), individuals were asked to indicate the type of cup they normally used when ordering beverages for takeaway, in the following statements: i) I use disposable (single use) cups provided by the coffee shop/restaurant/company where I buy the beverage; ii) I use an RCC that I bring with me; or iii) I use an RCC that the coffee shop/restaurant offers. The items for this variable were adopted from previous studies (Poortinga and Whitaker, 2018).

(d) *Perceived barriers for using RCCs.* Individuals were asked to indicate how much they agreed/disagreed with the following statements, using a 7-point Likert scale: i) There is no incentive for me to do so; ii) I don't own a portable RCC; iii) I often forget to bring an RCC; iv) I don't like having to carry the coffee cup around with

Table 1
Descriptive statistics.

	Mean/ proportion	SD
Dependent variables		
Qualitative decision: whether to bring an RCC	92.61%	
Quantitative decision: the minimum discount to bring an RCC	26.50	28.21
Independent variables—key dimensions		
Knowledge about disposable coffee cups		
Disposable coffee cups are a problem for the environment.	5.89	1.36
Disposable coffee cups require a lot of resources in the production process.	5.89	1.35
The logistics of shipping disposable coffee cups to the individual coffee shops requires a lot of resources.	5.58	1.40
Disposable coffee cups produce a lot of waste.	6.06	1.37
Previous experience: use of disposable cups vs. RCCs		
I use disposable (single use) cups provided by the coffee shop/ restaurant/company where I buy the beverage.	4.75	1.74
I use a reusable cup that I bring with me.	3.14	1.94
I use a reusable cup that the coffee shop/restaurant/company offers.	3.19	1.90
Perceived barriers for using RCCs		
There is no incentive for me to do so (e.g., there is no price discount for bringing my own cup)	3.80	1.88
I don't own a portable reusable coffee cup.	3.47	2.17
I often forget to bring a reusable coffee cup.	4.46	1.87
I don't like having to carry the coffee cup around with me.	4.16	1.94
I have never really thought about using reusable coffee cups.	3.83	2.06
Involvement with *the topic of using disposable cups for takeaway beverages*		
unimportant – important	4.90	1.75
means nothing – means a lot	4.74	1.71
irrelevant – personally relevant	4.82	1.75
doesn't matter – does matter a great deal	4.90	1.75
is of no concern – is of great concern	4.90	1.77
Control variables		
Age	37.28	12.17
Less than high school	0.48%	
High school graduate	10.74%	
Some college	26.81%	
Undergraduate degree	42.16%	
Postgraduate degree	10.42%	
Professional degree	7.83%	
Doctorate	1.53%	

me; and v) I have never really thought about using RCCs. The statements for this variable were adopted from general facts, reports and studies about coffee cups (BBC News, 2018; Sandhu et al., 2021).

We used two control variables: first, *Age*, measured by a quantitative variable, and second, *Education*, measured by a categorical variable (1 = Less than high school, 2 = High school graduate, 3 = Some college, 4 = Undergraduate degree, 5 = Postgraduate degree, 6 = Professional degree, and 7 = Doctorate). Note that the variable *Education* was inserted in Equation (1) only, to comply with the "exclusion restriction". Heckit models require an "exclusion restriction", which meant that we had to find a variable with a significant effect in Equation (1) and a non-significant effect in Equation (2). When running the estimation, the *Education* variable was included in the former, but not in the latter.

4. Results

With regard to RQ1, the research findings showed that 92.61% of consumers were willing to bring an RCC if a discount was offered (qualitative decision). Regarding RQ2, we found that the average of the minimum discount to bring an RCC was 26.50 cents (SD = 28.21) (see Table 1).

Regarding the analysis of the determinant factors of the decision to bring an RCC and the level of discount that motivated consumers to do so, a Heckit model was conducted using both qualitative and quantitative decisions as dependent variables. As mentioned earlier, we used four independent variables: (a) knowledge about disposable coffee cups (H1a/b), (b) involvement about the topic of using disposable cups for takeaway beverages (H2a/b), (c) previous experience regarding the use of disposable cups vs. RCCs (H3a/b), and (d) barriers for using RCCs (H4a/b).

Table 2 presents the parameters obtained in both equations. Before describing the individual parameters, it is important to test the joint modelling conducted via the Heckit approach. First, the "exclusion restriction" was assured because the variable *Education* was significant in one of its categories (Postgraduate degree) in Equation (1) ($\gamma_k = -0.592$; t-statistic = −2.076; p-value < 0.05) and was not significant in Equation (2) ($\delta_h = 0.626$; t-statistic = 0.105; p-value = 0.916). More relevant to our case was the fact that a significant Rho parameter (ρ) was found (ρ = 0.971; p-value < 0.01), which proved that there a was non-zero correlation between equations (1) and (2), which, in turn, supported the appropriateness of the Heckit model because it confirmed the existence of sample selection bias; thus, only those individuals that chose to use an RCC were included in the quantitative equation.

As for the individual parameters, we obtained different patterns for the effects of the explanatory variables on each decision. Specifically, regarding the variables related to "knowledge about disposable coffee cups", while none of them were significant in the decision of the minimum discount (H1b), we found that the variable "disposable coffee cups require a lot of resources in the production process" was significant and positively related to the decision to bring an RCC (H1a). Thus, individuals who were aware of the resources involved in producing disposable coffee cups were more willing to opt for reusable cups if a discount was offered; interestingly, the amount of the discount did not seem to be influenced by this awareness.

As for involvement, we found that the more involved the individuals were with the cause, the more willing they were to bring their RCC and the lower a discount they required, thus, confirming H2a and H2b. Hence, there seemed to be a personal component in people's preparedness to bring their RCC: if cause involvement was implied, they were willing to bring their RCC in exchange for a smaller discount. These results were in accordance with the postulates of Cialdini et al. (1976) that "instantaneous situational rewards are dwarfed by outcomes connected with the topic" (Hajjat, 2003, p. 97) that people feel involved with.

Table 2
Explanatory factors of the decisions to bring an RCC and the minimum discount.

	Decision whether to bring an RCC		Decision of the minimum discount	
	Parameter	**SD**	**Parameter**	**SD**
Key dimensions				
Knowledge about disposable coffee cups (H1a/H1b)				
(i). Disposable coffee cups are a problem for the environment.	0.088	0.065	0.510	1.346
(ii). Disposable coffee cups require a lot of resources in the production process.	0.158[b]	0.070	−0.549	1.429
(iii). The logistics of shipping disposable coffee cups to the individual coffee shops requires a lot of resources.	−0.015	0.060	−1.614	1.139
(iv). Disposable coffee cups produce a lot of waste.	0.054	0.066	0.508	1.287
Previous experience: use of disposable cups vs. RCCs (H3a/H3b)				
(i). I use disposable (single use) cups provided by the coffee shop/restaurant/company where I buy the beverage.	0.051	0.040	−0.979	0.768
(ii). I use a reusable cup that I bring with me.	0.009	0.048	−0.460	0.809
(iii). I use a reusable cup that the coffee shop/restaurant/company offers.	−0.009	0.044	−0.313	0.765
Perceived barriers for using RCCs (H4a/H4b)				
(i). There is no incentive for me to do so (e.g., there is no price discount for bringing my own cup)	−0.059	0.042	1.876[a]	0.724
(ii). I don't own a portable reusable coffee cup.	−0.151[a]	0.037	0.284	0.735
(iii). I often forget to bring a reusable coffee cup.	0.055	0.038	0.145	0.700
(iv). I don't like having to carry the coffee cup around with me.	−0.095[b]	0.042	1.017	0.754
(v). I have never really thought about using reusable coffee cups.	0.006	0.040	−0.912	0.710
Involvement with the topic of using disposable cups for takeaway beverages (H2a/H2b)				
Involvement	0.085[c]	0.046	−1.750[b]	0.835
Control variables				
Age	0.003	0.006	−0.264[a]	0.101
Some college	−0.219	0.256		
Undergraduate degree	−0.329	0.246		
Postgraduate degree	−0.592	0.285		
Professional degree	0.001	0.351		
Doctorate	−0.095	0.571		
Constant	0.463	0.493	47.551[a]	11.260
Rho (ρ)	0.971[a]	2E-04		

[a] p < 0.01.
[b] p < 0.05.
[c] p < 0.10.

Concerning the variables that measured "consumers' previous experience regarding the usage of disposable vs. RCCs", none of them were significant in any equation, which meant that people's behaviour at the time, regarding RCCs, did not determine whether those individuals were willing to bring an RCC nor did it determine the minimum discount for which they were willing to do so. Therefore, both H3a and H3b are rejected.

With respect to the "barriers for using RCCs", we found that the variables "I don't own a portable RCC" (H4a_ii) and "I don't like having to carry the RCC around with me" (H4a_iv) were significant to, and negatively correlated with, the decision of whether to bring a coffee cup, confirming H4a_ii and H4a_iv. Thus, consumers with no portable RCC,

and those who did not like having to carry it, were more reluctant to bring an RCC even when offered a monetary incentive to do so. The variable "There is no incentive for me to do so (i.e., there is no price discount for bringing my own cup)" was significant and positive in the decision of the minimum discount (H4b_i); thus, as expected, the consumers that required an incentive to bring their reusable coffee cup demanded higher discounts. The variables "I often forget to bring a reusable coffee cup" and "I have never really thought about using RCCs" relating to H4a_iii, H4b_iii, H4a_v and H4b_v proofed insignificant. Therefore, H4a and H4b are partially rejected.

Regarding the control variables, age was significant and negatively related to the amount of discount required; thus, the older the individuals, the lower the discount they required to bring RCCs. Education (postgraduate degree) had a negative and significant effect on the qualitative decision to bring an RCC (remember that this variable was utilised as the exclusion restriction, so it was not introduced in Equation (2)).

5. Conclusions and implications

This article examines the explanatory factors of consumers' willingness to bring an RCC from a twofold perspective: from a qualitative viewpoint that examines whether an individual brings a reusable product and from a quantitative standpoint that analyses the minimum discount required for consumers to be willing to bring an RCC. Both decisions are analysed through the dimensions "knowledge about disposable coffee cups", "involvement with the topic of reusable and disposable cups for takeaway beverages", "consumers' previous experience regarding the usage of disposable vs. RCCs", and "perceived barriers for using RCCs".

5.1. Theoretical contribution

Using a sample of 1,371 individuals, our study contributes methodologically to understanding the incentives required to change consumer behaviour through the application of a Heckit model that allows the joint modelling of decisions. By employing a Heckit Model, we answer Juvan and Dolnicar's (2017) call to investigate context and consumer drivers as well as barriers to adopting sustainable behaviour. Previous studies have applied Heckit models to analyse consumer choices processed into two stages (e.g., Sellers-Rubio and Nicolau-Gonzalbez, 2016; Casado-Díaz et al., 2020; Nicolau et al., 2020): (i) the decision to perform an action/behaviour, and (ii) the analysis of how much study participants are willing to pay for this decision. Taking into account these studies using Heckit models, our contribution with this paper is to show how the analysis of people's willingness to bring an RCC can be broken down into two steps: first, deciding whether or not to bring an RCC if a discount is offered, and second, how large the discount would need to be. The two steps are appropriate because there is a behavioural interdependency between these two variables.

First, we consider the decision of whether to bring an RCC if a discount is offered. Looking at the significant dimensions obtained, we can conclude that: i) awareness of the resources required to produce disposable coffee cups increases consumers' willingness to use an RCC; ii) consumers' previous experiences regarding cup choice does not determine whether individuals are willing to bring an RCC, nor does it determine the minimum discount for which they would be willing to do so; iii) consumers with no portable RCC, and those who do not like having to carry one, are more reluctant to bring an RCC even if offered a monetary incentive.

Second, we reflect on the decision regarding the size of the discount needed, seeking to better understand incentives to promote PEB in hedonistic contexts (Corner and Randall, 2011; Miao and Wei, 2016; Dolnicar et al., 2017). The determinant dimensions observed allow us to conclude that: i) consumers requiring an incentive to bring their reusable coffee cup demand high discounts; ii) if cause involvement is implied (the topic matters a great deal to the individual), consumers are willing to bring their RCC in exchange for a smaller discount than the discount required by customers who claim that the topic is important but that no personal involvement exists. Hence, we can conclude that instantaneous situational rewards (e.g., financial incentives) seem insignificant if involvement is high, as individuals with a higher level of involvement require less of an incentive than do those with a lower level of involvement (Hajjat, 2003).

The findings that awareness of the production process of disposable cups fosters consumers' willingness to use an RCC as well as that consumers with a higher level of cause involvement require lower levels of incentives is in line with previous studies that found that environmental knowledge and concern are antecedents in PEB (e.g., Hines et al., 1987; Ellen et al., 1991; Bamberg and Möser, 2007; Ballantyne et al., 2011; Kang et al., 2012; Sellers-Rubio and Nicolau-Gonzalbez, 2016; Hao et al., 2019; Taufique et al., 2019; Casado-Díaz et al., 2020; Nicolau et al., 2020; Wu et al., 2021). Specifically, we test and transfer these findings to the context of beverage cups in the hospitality industry.

We also shed some light on the paradox of widespread pro-environmental attitudes and behavioural intentions being at odds with actual behaviour that was found in previous studies (e.g., Dietz et al., 2009; Luchs et al., 2010; Booking, 2018). More specifically, our research shows that two practical factors—namely, not owning an RCC and/or not wanting to carry it around—act as impediments to engage in PEB (i.e., using an RCC) despite consumers' willingness to do so. This is in line with Morales' (2019) findings that a range of practical issues including the loss of convenience hinders the adoption of RCCs. It also confirms the conclusion from Miao and Wei (2016) that individuals are not willing to trade personal comfort for PEB in the context of hotels, and the findings from Nicolau et al. (2020) that individual's willingness to make an effort in terms of time and travel distance play a role in the choice of a green restaurant over a non-green restaurant.

5.2. Managerial implications

In addition to the theoretical contributions, the findings of this study offer insights for coffee shops and food outlets into various practical actions that can be taken to help increase the percentage of customers that use RCCs. The recommendations can be broken down into three separate measures, which, in practice, can be applied individually but are most likely to be effective when implemented together.

The first measure is to educate customers on the sustainability issues that surround the use of disposable coffee cups. In turn, this creates awareness of the wider problems associated with plastic pollution (Poortinga and Whitaker, 2018). Our study shows that consumers who understand how many resources go into producing disposable coffee cups are more willing to bring an RCC. Therefore, coffee shops can use their digital presence, as well as in-store space and materials, to educate customers on the disposable coffee cup production process. This should help heighten their customers' awareness of the problems of disposable cups and, thereby, increase their willingness to use RCCs. Obviously, if consumers are aware of the cost and daily operations of the coffee shops, and considering the different perceptions found in the study of Narwal and Nayak (2020) in the framework of fixed prices, more emphasis can be put on the use of resources to increase their willingness to bring an RCC.

The second measure is to increase the availability of RCCs and to make their use more convenient. As expounded earlier, individuals that do not own a portable RCC, and those that do not like carrying one around, are more likely to resist using RCCs even if monetary incentives are offered. The inactivity of the former can potentially be overcome simply by selling RCCs at the venue. The reluctance of the latter might be overcome, for example, by selling foldable RCCs, which makes them easier to carry around. Larger food and beverage chain companies with numerous outlets in an area could implement a programme that would allow customers to borrow an RCC when buying a drink and return it to

any outlet; thus, only requiring customers to carry the RCC around for a limited amount of time. Starbucks, for instance, started a trial of such a programme in 2021 in response to a need to restrict the use of personal RCCs in the height of the COVID-19 pandemic (USA Today Money, 2021). Under this programme, called "Borrow a Cup", customers received their drink in an RCC from Starbucks for which they paid a $1 deposit. They got this deposit back, plus loyalty programme points, when they returned the RCC at any participating store (Starbucks, 2021; USA Today Money, 2021).

The third measure is to offer rewards and incentives (e.g., discounts, gift cards, coupons) for using RCCs. A financial incentive can convince both environmentally conscious customers to use RCCs as well as those that are not involved with the topic. Whilst environmentally conscious people can be enticed by a monetary discount, the amount required does not seem to be as relevant to them as the gesture of offering a discount. However, while a small discount may attract environmentally aware people (as the gesture weighs more than the amount), a higher level of monetary incentive may still be necessary to encourage those customers who have no, or a low level of, involvement with the topic. Therefore, depending on the prevailing characteristics of a restaurant's customer base (e.g., customers with personal involvement on the topic of disposable and reusable coffee cups vs. those without), a balance should be sought regarding the optimal level of discount offered by the establishment.

Implemented alone, or in combination, these measures can help restaurants to effectively decrease the number of disposable coffee cups they use.

5.3. Limitations and future research

The study is not free from limitations. First, both social desirability bias and self-representation bias may have affected the responses of the participants, which is common in studies on PEB (Juvan and Dolnicar, 2016). It is important to apply quasi-experimental and experimental methodologies (Viglia and Dolnicar, 2020) in future studies so that the findings of the research can be used to inform the design of more environmentally friendly forms of tourism (Dolnicar, 2020).

Second, it is worth recognising that message framing can have a substantial impact on the ability to trigger pro-environmental knowledge, concern and intentions to entice PEB; hence, it is important to experiment with different messages in further studies (Font and McCabe, 2017; Shahzalal and Font, 2018).

Third, this study does not attempt to calculate the optimal level of discount. In this research, we have investigated the different effects that the proposed dimensions had on each decision. However, if the study was extended to include information about the different market segments that a specific establishment serves, it would be possible to determine the optimal discount to apply, to maximise the number of people willing to bring their RCC.

Fourth, the study is relevant only to the population of U.S. citizens that are likely to engage in an online survey via MTurk and that are financially incentivised. We might find that consumers that do not respond to such incentives are less sensitive to the financial incentives gained from reusing coffee cups. Future research should therefore be conducted with other study populations. Researchers should consider, in their investigations, that different patterns of environmental behaviour might be explained by structural and cultural differences across countries. According to Tam and Chan (2017), environmental practitioners exhibit cultural sensitivity, for instance, the environmental concern-behaviour association is stronger in societies with strong individualism (versus collectivism) and in societies with strong looseness (versus tightness). Specifically, Tam and Chan (2017) found that, for a U.S. sample, there was a relationship between environmental concern and pro-environmental behaviour. However, further research should replicate this study in other societies.

Lastly, it would also be of interest to replicate this study in the current context of a global pandemic, as this might lead to a change in the willingness of consumers to bring their own containers. It is conceivable that, in a pandemic, more consumers would want to bring their own containers from home in order to minimise interaction with external objects. Alternatively, consumers might be more reluctant to bring their own containers, as they would want to minimise the risk of spreading bacteria and/or viruses via their containers. In either case, it is probable that the current pandemic has led to changes in consumer willingness to bring an RCC and observing these changes would provide relevant insights into the levels of discounts to offer.

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