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RESEARCH ARTICLE

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A consumer attributions-based approach for investigating the effect of corporate greenwashing on wishcycling

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Abstract

This paper addresses the issue of corporate greenwashing and its impact on consumer behavior, specifically in the context of circular food and beverage packaging. We conducted a survey with 537 participants and utilized Structural Equation Modeling to analyze the relationships between company motives, consumer attributions, perceptions of greenwashing, and wishcycling behavior. Additionally, we explored the moderating effect of core self-evaluation on the relationship between circular packaging and greenwashing techniques. Our findings highlight the mediating role of consumer perceptions of company motives in the relationship between corporate greenwashing and wishcycling. We also found that consumer personality traits, particularly core self-evaluation, moderate the relationship between circular packaging and perceptions of greenwashing. These results emphasize the importance of understanding consumer behavior and perceptions in circular environments and policy domains. The findings provide valuable insights for policymakers, businesses, and researchers seeking to promote sustainable consumption and mitigate environmental harm in the transition toward a more circular economy.

KEYWORDS
attribution theory, circular economy, circular food and beverage packaging, consumer perception, core self-evaluation, greenwashing, wishcycling

1 | INTRODUCTION AND MOTIVATION

The scale of waste production has grown to significant levels globally, posing substantial challenges for both environmental degradation and public health (Basu et al., 2024; Friedrich, 2021). In the UK alone, household waste averages 66 plastic items per week, resulting in approximately 2.5 million metric tons of plastic packaging waste being generated. (Alves, 2023). Ocean Conservancy (2017) on their International Cleanup 2017 report, identified that eight out of the ten most littered items were specifically linked to the packaging of food and beverages, including items such as drink bottles, carrier bags, and food wrappers. Recognizing the magnitude of the problem, many governments are implementing interventions to addressing the issue (White & Lockyer, 2020) with one of the most prominent being the adoption of circular economy (CE) initiatives (Maione et al., 2022). As a concept, CE has taken a central role for many policies around the world that aspire to promote environmentally sustainable economic progress (Hartley et al., 2020).

The Circular economy (CE), is a restorative and regenerative by-design paradigm (Baran, 2019), aiming to offer actionable business models for creating slow, narrow, intense, and closed resource loops (Geisendorf & Pietrulla, 2018). The food and beverage packaging

industry presents a unique context within the CE paradigm given its critical connections to food safety and health, its intricate nature, and its heavy dependence on single-use packaging practices (Nielsen & Hakala, 2023). Circular packaging needs to protect natural resources, maximize their usage, reduce the detrimental effects of packaging on the environment (The Ellen Macarthur Foundation, 2012) and "designing out waste" (Szaky, 2019).

In their effort to meet consumer expectations and governmental policies without drastically changing their business models (Lopes et al., 2023), some companies exaggerate the environmental benefits of their operations, a practice known as greenwashing (Ruiz-Blanco et al., 2022). Greenwashing leads to consumer confusion (Putri & Hayu, 2024) and green skepticism (Kavitha & Kumar, 2023) if they are unable to distinguish between genuinely eco-friendly products and those falsely marketed as such (European Commission, 2023). Such practices can obstruct genuine progress in achieving CE goals and promoting sustainability (Maher et al., 2023) and can also transfer the aforementioned pressure to consumers who may in turn resort to wishcycling. Wishcycling (otherwise known as wishful recycling or aspirational recycling) is the act of placing items in the recycling bin in the hope that it is recyclable (Lee et al., 2022; Lyon & Montgomery, 2015).

It follows that a greenwashed consumer is more likely to conduct wishcycling and that the lack of relevant regulations and punitive systems and actions is a strong motive for corporate greenwashing (Lyon & Montgomery, 2015).

Using circular packaging as a lens, we investigate the role of consumer attributions toward greenwashing and wishcycling. Attribution theory is a well-established concept in Human Resource practices when researching how employees in an organization adapt to changes inflicted upon them (Guest, 2017). At the heart of the concept of attribution, theory lies the assertion that people are constantly seeking to explain events that they encounter (Hewett et al., 2018). This approach has been recently introduced in sustainability studies (Katou et al., 2023; Vayona & Demetriou, 2020). At the same time, we introduce core self-evaluations (CSE) which is a well-established concept in Psychology (Farčić et al., 2020) and Organizational Development (Joo & Jo, 2017) related to sustainability research. CSE represents a fundamental and essential evaluation of an individual's self-worth, effectiveness, and capacity, influencing their level of motivation (Köppe & Schütz, 2019). Individuals with high CSE possess the skills and mindset needed to effectively approach problems with dynamism and critical thinking (Kong et al., 2014). Thus, considering that CSE reflects the emphasis of the individual's effort to understand both themselves and their environment (Chen et al., 2023), we introduce CSE as a moderating factor in the relationship between circular packaging and greenwashing.

The relationship between circular packaging, greenwashing, and wishcycling involves complex interactions among environmental practices, consumer behaviors, and corporate strategies. Individual personality traits can play a significant role in influencing these dynamics create by emphasizing both gaps and contributions in the relationship between circular packaging, greenwashing, and wishcycling. Educating and empowering consumers in making more sustainable choices and fostering a culture of responsibility can enhance the overall effectiveness of circular economy initiatives. In particular: by leveraging attribution theory (Hewett et al., 2018) and CSE (Johnson et al., 2008), we argue that to be able to define and implement policies toward CE adoption, governments and policymakers should be vigilant of greenwashing techniques and their effects on consumer behavior, specifically wishcycling. This study uniquely explores the mediating mechanism of consumer greenwashing attributions in the relationship between corporate greenwashing and wishcycling. We split consumer attribution into two distinct types following Zaremohzzabieh et al. (2019), business-oriented and society-oriented attributions. This classification offers a valuable opportunity to explore consumer perceptions of corporate motives more thoroughly. Second, we examine how consumers' self-evaluation acts as a moderating mechanism in the relationship between engaging in circular food and beverage packaging and corporate greenwashing.

Against the above, in this paper we build upon the concept of behavior transition by Lu et al. (2023), with a specific focus on understanding consumer engagement with circular food and beverage packaging. Through an exploration of consumer attributions toward greenwashing and wishcycling, this study aims to uncover the underlying dynamics shaping consumer behaviors and perceptions within the context of circular packaging practices. The paper is divided into six sections. Following the introduction, Section 2 offers the literature review and hypotheses development. Section 3 presents the detailed methodology followed in the empirical study, and the results are exposed in Section 4. In Section 5, the theoretical and managerial implications are discussed, and the limitations as well as the directions for future research are presented. Finally, in the last section the conclusions of the study are summarized.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Taking into consideration that the theory of core self-evaluation and attribution theory are important in explaining the phenomenon under study, we briefly refer to their meanings, before we explain in detail how these two theories are engaged in the serial relationships between circular packaging, greenwashing and wishcycling. In particular:

Core self-evaluation theory (CSE) proposes that individuals possess a fundamental appraisal of their own worth and capabilities, which influences their attitudes, behaviors, and performance across various domains of life. At its core, it suggests that people who have positive self-evaluations tend to exhibit higher levels of job satisfaction, motivation, and overall well-being, while those with negative self-evaluations may experience lower self-esteem, reduced job satisfaction, and poorer performance outcomes. This theory is crucial as it sheds light on the underlying mechanisms of individual differences in behavior and performance, providing insights for personal development, organizational management, and interventions aimed at

enhancing overall satisfaction and effectiveness in various contexts (Judge et al., 2002, 2003; Judge & Bono, 2001).

Attribution Theory explores how individuals interpret the causes of their own and others' behaviors, attributing them either to internal factors (such as personality or ability) or external factors (such as situational or environmental factors). It suggests that these attributions significantly shape individuals' perceptions, emotions, and actions, influencing interpersonal relationships, organizational dynamics, and societal interactions. By understanding attribution processes, researchers, psychologists, and practitioners gain insights into how people make sense of the world around them, predict behavior, and respond to events. This theory is vital in various fields such as psychology, sociology, education, and management, as it offers valuable perspectives for understanding human behavior, conflict resolution, motivation, and decision-making processes, ultimately contributing to improved communication, teamwork, and social harmony (Heider, 1958; Hewett et al., 2018; Kelly, 1973; Weiner, 1979).

2.1 | Core self-evaluations, circular packaging, and greenwashing

According to Judge et al. (2006) the dimensions of CSE are: *self-esteem* reflects the level to which individuals believe that they are people of worth; *self-efficacy* reflects the level to which individuals believe that they are skilled to effectively and efficiently complete tasks; *emotional stability* reflects the level to which individuals believe that they are functional; lastly, *locus of control* reflects the level to which individuals believe that they are capable of managing their future.

While it is important to describe the personality of individuals according to their CSE, a question of contextual relevance arises: what is the level of the individual's engagement with circular food and beverage packaging, and how does this relate to greenwashing? The term *circular packaging* is used to describe the packaging design of reusable, refillable, compostable, biodegradable, and/or recyclable materials, with a strong emphasis on the substitution of virgin materials and being economically viable (European Commission, 2022).

Greenwashing may be achieved via *seven sins*: false environmental claims, misleading labels, hidden trade-offs, irrelevant environmental claims, lesser of two evils, unproven claims, and vague claims (Strähle & Hauk, 2017). A greenwashed consumer would not be able to make informed decisions about recycling and whether their actions contaminate the recycling stream (Brouwer, 2016). Accordingly, greenwashing undermines consumer trust and leads to green skepticism, where consumers cannot distinguish between true and false green claims (de Freitas Netto et al., 2020).

However, study of the relationship between circular packaging and greenwashing comes with its own set of challenges, as the literature shows contrasting results. Lopes et al. (2023) investigate circular consumption – the broader domain circular packaging falls under – and its relationship with greenwashing. While they acknowledge that, the prevailing position in the literature is that circular consumption and greenwashing are negatively related (Zhang et al., 2018), they nevertheless observed a positive relationship between them. The authors interpreted this as a committed effort by environmentally conscious consumers to counter corporate greenwashing. Lopes et al. (2023) acknowledge the complexity of this association and suggest the need for further research into additional factors that may come into play. Antecedents to greenwashing in the literature focus mainly on the packaging as communication means of the sustainability and green qualities of the product. Boncinelli et al. (2023) study the effect of green color to susceptibility of greenwashing. Niceforo (2023) examines the effect of advertising on greenwashing. As our research is interested in understanding the influence of circular packaging behaviors, we leveraged Boncinelli's approach by focusing on the circular packaging properties. Notably, there have been limited studies investigating the influence of personality on topics related to sustainability and the circular economy (Zarei & Mirzaei, 2022). Research has shown that personal factors affect how individuals perceive their purchasing actions (Verma et al., 2019), with personality traits having moderating effects (Zarei & Mirzaei, 2022). Therefore, we consider the consumer's personality dimensions, particularly those described by the mature CSE construct.

Several studies consider the influence of consumers' self-esteem when making purchases (Bi & Zhang, 2023; Qiu et al., 2023). Self-esteem is particularly interesting as a moderating factor, with paradoxical findings when studying campaigns capitalizing on negative feelings. According to Hansen et al. (2010), consumers with high self-esteem smoke more when exposed to mortality salient warnings on cigarette packets. We argue that consumers with high CSE are more likely to recognize greenwashing techniques (i.e., an activity with a negative connotation).

Accordingly, we formulate the following hypothesis:

> **Hypothesis 1.** Core Self-Evaluations (CSE) moderates the negative relationship between Circular Packaging and Greenwashing, such that this relationship is stronger for high CSE.

2.2 | Consumer greenwashing attributions

Attribution theory is particularly suited to investigating consumer behavior (Cho et al., 2021). In the context of sustainability, attribution theory provides a framework for understanding how consumers perceive a company's ability to adopt a more responsible business approach, how they attribute such motives to the actions of the company, and how this cognitive process ultimately impacts consumers' subsequent responses (Leonidou & Skarmeas, 2017). The connection between perceived knowledge and long-term purchase intentions can be explained by the theoretical justification that exists in the form of feelings of self-competence to the attribution of responsibility (Frommeyer et al., 2022). The theory is particularly applicable to the investigation of green products, as attributions are commonly triggered in situations where there is divisiveness and suspicion, which is

a common occurrence in sustainable product marketing (Leonidou & Skarmeas, 2017).

When consumers encounter marketing communications perceived to exhibit greenwashing, they may engage in cognitive processes aimed at understanding the motivations behind such strategies. Consumers may conjecture that companies resort to greenwashing due to heightened competition within their industry or in response to the rapid and dynamic economic shifts affecting their sector (Jansen et al., 2006). This inclination to rationalize the phenomenon of greenwashing underscores consumers' efforts to make sense of corporate behavior within the broader context of market dynamics and economic exigencies (Lee, 2024). In other words, this rationale influences their attributions concerning greenwashing based on situational external factors (Heider, 1958). Following the distinction introduced by Lee et al. (2012), those factors could be either business-oriented (increase sales, lower cost, facilitate operational processes), or society-oriented (demonstrate environmental ethos, signify social responsibility). This dichotomy into two major classes of factors is justifiable as it reflects the dual nature of corporate motivations, wherein businesses strive to achieve both economic objectives and societal expectations. We could argue that greenwashing would be the manifestation of the antagonistic relationship between these two classes of factors. As such, this rationale influences consumers' attribution toward greenwashing, controlling future events (Weiner, 1979), such as their wishcycling activities.

Accordingly, we formulate the following hypotheses:

Hypothesis 2. There is a positive relationship between greenwashing and consumer business-oriented attributions.

Hypothesis 3. There is a positive relationship between greenwashing and consumer society-oriented attributions.

2.3 | Consumer attributions and wishcycling

Although mistakes in recycling can easily be made by misinformed consumers, we argue that consumers may perceive deliberate misinformation (greenwashing) differently depending on whether they attribute the reasons for it as business-oriented or society-oriented. Business-oriented attributions may be perceived as selfish actions of companies and thus produce negative feelings in consumers, which in turn passes on to wishcycling. On the contrary, society-oriented attributions may be perceived as altruistic actions of companies and thus produce positive feelings in consumers (Lee et al., 2012), which again passes on to wishcycling. This is in line with the practice of the so-called advocacy advertising (Lee et al., 2019) and the concept of socially responsible consumption (Lăzăroiu, Ionescu, Andronie, & Dijmărescu, 2020; Lăzăroiu, Ionescu, Uță, et al., 2020; Prendergast & Tsang, 2019), tapping into consumer's emotional engagement, see for example the research by Palacios-González and Chamorro-Mera (2022) who unveiled a relationship between emotional engagement and responsible consumption, part of which is waste generation reduction. Accordingly, we formulate the following hypotheses:

Hypothesis 4. There is a negative relationship between consumer business-oriented attributions and wishcycling.

Hypothesis 5. There is a positive relationship between consumer society-oriented attributions and wishcycling.

2.4 | The research framework

Summarizing the research hypotheses developed previously, Figure 1 presents the research framework of the study. This framework proposes that circular packaging, which negatively affects greenwashing corporate practices, is moderated by CSE. Greenwashing negatively or positively affects wishcycling, depending on the business-oriented or society-oriented consumer attributions as mediating mechanisms, respectively. Combining the previous individual hypotheses, a reduced general hypothesis is that the conceptualized model refers to a multi-path and serially mediating mechanism research framework. In this conceptualized model, the constructs are considered to be reflective, explaining the observed correlations among them.

3 | METHODOLOGY

3.1 | Research design

This quantitative research design aims to examine the relationship between corporate greenwashing and wishcycling behavior among consumers in the United Kingdom (UK). The study will employ a cross-sectional survey method to collect data from a pre-determined sample of consumers selected through random sampling techniques. Participants, presenting first their own core self-evaluations, will be asked to complete a questionnaire consisting of items measuring their perceptions of circular packaging, corporate greenwashing practices, attributions of corporate motives behind environmental claims, and their wishcycling behaviors. Additionally, demographic information, such as age, gender, education level, employment status, income and circular economy knowledge will be collected to control for potential confounding variables. Statistical analysis, including structural equation modeling estimation and mediation/moderation tests, will be conducted to explore the direct and indirect effects of corporate greenwashing on wishcycling behavior, mediated by consumer attributions. The findings will provide valuable insights into the psychological mechanisms underlying consumers' responses to corporate environmental claims and their subsequent wishcycling behaviors in the UK context.

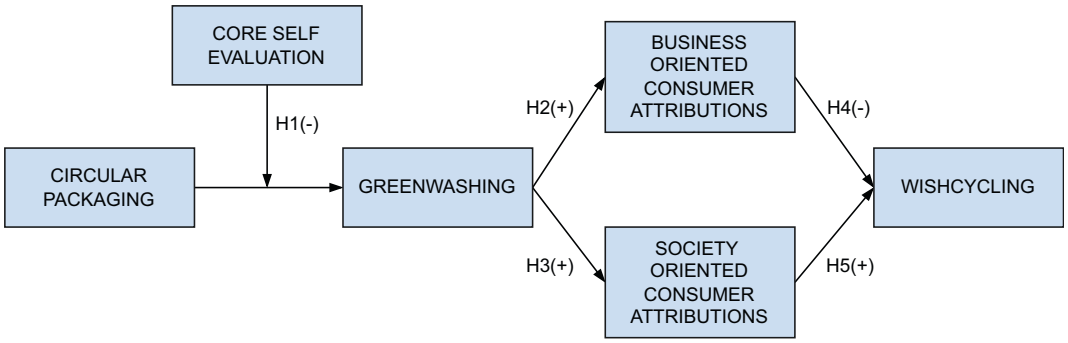

FIGURE 1 The research framework that represents the relationships between consumer engagement in circular packaging, consumer perception of corporate greenwashing techniques and consumer wishcycling and the way they are affected by consumer self-evaluations and business and society-oriented consumer attributions. H: Hypotheses. (+) positive relationship. (−) negative relationship.

3.2 | Data collection and the sample

The primary data for this study were collected via a questionnaire survey targeting individual consumers in the UK. The UK, was selected as it is placed among the countries with the highest generation of plastic waste (Alves, 2023) but has also developed the Circular Economy Package (CEP) policy in 2020 (Zhu et al., 2022) and joined the New Plastics Economy Global Commitment in April 2018 (UNEP, 2022). It is also worth mentioning that although the UK has been proactive in the development of such policies and initiatives, is not considered to be among the top performers in CE transition according to Claudio-Quiroga and Poza (2024). Such country profile made UK a good candidate for our enquiry.

The survey included 92 scale items in total and 7 demographic questions. To determine required sample size, we initially used the rule of thumb for relatively complex Structural Equation Modeling (SEM) studies, of 50 + 5X where X = number of observed variables (Gaskin, 2023). Since our X = 92, the derived sample size is 510. In verifying this sample size, we further employed the GPower (Faul et al., 2007) and the Soper (2024) software programs, with significant level $\alpha = 0.05$ statistical power 0.95, and medium anticipated effect size. The derived sample sizes were 545 and 532, respectively.

The sampling protocol followed had two steps; a pilot survey and a full-scale survey. During the first week of October 2022, the pilot study was performed through Qualtrics (2022) online platform. In this pilot study, 42 fully answered questionnaires were returned. As the pilot study participants did not mention any problems understanding the questions, we proceeded to the full-scale survey without changes.

The full-scale survey was released on the 17th of October 2022 through the online platform Prolific.co, an online platform specifically designed for researchers (Palan & Schitter, 2018). According to this platform, random sampling was applied referring to UK consumers, to ensure equal opportunities for individuals to take part in the study (Noor et al., 2022). We received 495 fully answered questionnaires covering most areas in the UK, thus, ensuring that the sample represents the entire population. Accordingly, and taking into consideration that the time difference between the pilot study and full-scale study was short and cannot support changes in individual behavior, the full-scale and the pilot-study responses were amalgamated to a database of 537 responses. Since this sample, size is in the same range with the sample sizes indicated by the three sampling methods employed, we support that the statistical power of the study is equal to 0.95, that is, the statistical power used in the sample size determination. Demographics of the sample respondents are presented in Table 1.

3.3 | Measures

Most measures are based on the research cited. In all structural items, a five-point Likert scale is used (Nikmard et al., 2023), ranging from 1 = strongly disagree to 5 = strongly agree. Additionally, all constructs/dimensions are operationalized as reflective, since they are assumed to reflect variations in the construct/dimension, and any measurement error is considered as random error. The measures developed are:

Core self-evaluations: This construct is based on Judge et al. (2006). It consists of 12 items distributed evenly among four sub-scales: *self-efficacy*, *self-esteem*, *emotional stability*, and *locus of control*.

Circular packaging: This construct is based on Testa et al. (2020). It consists of 11 items distributed among three sub-scales: *packaging general* (3 items), *food packaging* (4 items), and *beverages packaging* (4 items).

Greenwashing: This construct is based on Testa et al. (2020) and Leonidou and Skarmeas (2017). It consists of 21 items distributed evenly among seven sub-scales (i.e., the sins); *false environmental claims*, *misleading labels*, *hidden trade-offs*, *irrelevant environmental claims*, *lesser of two evils*, *unproven claims*, and *vague claims*.

Consumer attributions: As far as we know, there is no consumer attributions scale available in the literature in relation to greenwashing. Thus, we followed the structure of the scale referring to Human Resource Management that was developed by Nishii et al. (2008). We modified this by developing seven sub-scales (i.e., corresponding to the seven types of sins). Each consumer responded to all seven types of sins. For example, for one sub-scale, the five response items of the consumers were: *Companies use false environmental claims on their packaging (sin 1) for: increasing their sales*, *keeping costs down*, *minimum disruption of their processes*, *demonstrating environmental ethos*, and

TABLE 1 Respondent demographics of the full study.

	N	%
Gender		
Male	192	38.8
Female	333	62.0
Non-binary	8	1.5
Prefer not to say	4	0.7
Age (in years)		
−30	162	30.2
31–40	156	29.1
41–50	96	17.9
51–60	74	13.8
61 +	49	9.1
Education		
High School	83	15.5
College	133	24.8
University	188	35.0
Post Graduate Studies	133	24.8
Employment status		
Employed	397	73.9
Unemployed	120	22.3
Other	20	3.7
Income (in £)		
– 20,000	100	18.6
20,001 – 30,000	119	22.2
30,001 – 50,000	159	29.6
50,001 +	159	29.6
Circular Economy knowledge		
None	334	62.2
General	156	29.1
Expert	47	8.8

signifying social responsibility. This response structure was repeated for the other six types of greenwashing sins, producing 35 items altogether for all types.

Wishcycling: This construct is based on Sløgedal and Starling (2020). It consists of 11 items distributed among three sub-scales: *quality* (4 items), *contamination* (4 items), and *machinery damages* (3 items).

3.4 | Validity and reliability of the survey instrument

Validity is described as the "ability of the instrument to measure what it is supposed to measure" (Wood et al., 2006). The questionnaire developed for this research has been operationalized by well-accepted items developed in the literature, supporting its content validity (Straub, 1989). The properties of the items and 1st and 2nd order dimensions were examined through Confirmatory Factor Analysis (CFA). Since the loadings belonging to the 1st and 2nd order dimensions are higher than the critical value of 0.40, the survey instrument supports construct validity (Hair et al., 2013).

The properties of the constructs used for testing the model are presented in Table 2. Since 82% of Cronbach's alphas are higher than .70, the survey instrument supports internal consistency (Nunnally, 1978). The Total Variance Explained (TVE) per dimension obtained by applying CFA with Varimax rotation and the eigenvalue greater than one criterion (Hajjar, 2018) are higher than 50.0%, so the instrument construct validity is supported (Hair et al., 2013). The calculated Composite Reliability (CR) scores are higher than .80 so the construct composite reliability is acceptable (Hair et al., 2013). As the values of Kaiser-Meyer-Olkin (KMO) measure are >0.50 and the Bartlett's test is significant ($p < .05$) (Chakraborty et al., 2020), the data is significantly meaningful for further analysis and suitable for structure detection (Kaiser, 1974). Finally, as the Intra-Correlation Coefficients (ICC) have values much larger than .10, structural equation analyses are supported, and as the Inter-Rater Agreement Measures (RWG) are >0.70, aggregation between units is justified (Kozlowski & Klein, 2000).

3.5 | Normality tests

To prevent any potential distortion of the overall findings, normality tests and coefficient calculations were performed to identify any extreme scores on individual or multiple variables (Samsudin & Hasanan, 2017). The Kolmogorov-Smirnov (K-S) test suggests that, while the data on circular packaging, greenwashing, and wishcycling were normally distributed, the data for core self-evaluations, business-oriented consumer attributions, and society-oriented consumer attributions may not have been (Table 3). As a result, we calculated the skewness and kurtosis values. Although there is no clear consensus regarding the cut-off values for skewness and kurtosis before non-normality becomes a concern (Kline, 2011), it is generally accepted that data are considered normally distributed if skewness falls between −2 and +2 and kurtosis between −3 and +3 (Byrne, 2016). With skewness ranging from −0.884 to 0.550 and kurtosis ranging from −0.328 to 2.650 (see Table 3), we consider all variables to be normally distributed.

Additionally, we calculated correlation coefficients between pairs of all constructs used in estimation and the square root of the average variance explained (AVE) of each construct, to examine the construct discriminant validity (Table 4). The correlation coefficients are significantly different from unity and are smaller than the square root of each construct's AVE, thus providing evidence for separate constructs.

3.6 | Common method bias

To investigate the possibility of common method bias (CMB), we conducted the single-factor test proposed by Harman (1967). When all

TABLE 2 Properties of the constructs of the study. TVE stands for Total Variance Explained, CR for Composite Reliability, KMO for Kaiser-Meyer-Olkin, ICC for Intra-correlation Coefficient and RWG for Inter-rater Agreement Measures.

Constructs	Sub-constructs	Number of items	Cronbach alpha	TVE (%)	CR	KMO (Bartlett test)*	ICC	RWG	VIF
Core Self-Evaluation (CSE)	• Self-efficacy	**4**	**0.839**	**68.133**	0.895	**0.801**	**0.565**	**0.950**	1.856
	• Self-esteem	3	0.611	59.596		0.644	0.344	0.928	2.299
	• Emotional stability	3	0.755	68.049		0.695	0.506	0.902	1.685
	• Locus of control	3	0.688	60.101		0.638	0.401	0.902	1.899
		3	0.762	67.825		0.667	0.517	0.892	
Circular Packaging (CP)	• General packaging	**3**	**0.754**	**67.199**	0.855	**0.566**	**0.705**	**0.908**	1.122
	• Food packaging	3	0.585	45.491		0.679	0.260	0.967	3.111
	• Beverages packaging	3	0.894	76.225		0.830	0.679	0.825	3.149
		4	0.878	73.716		0.819	0.643	0.824	
Green Washing (GW)	• False environmental claims	**7**	**0.882**	**73.217**	0.950	**0.899**	**0.517**	**0.971**	1.516
		3	0.850	76.995		0.727	0.654	0.845	2.293
	• Misleading labels	3	0.918	85.964		0.747	0.789	0.848	2.146
	• Hidden trade-offs	3	0.835	75.206		0.709	0.627	0.895	2.247
	• Irrelevant environmental claims	3	0.809	72.432		0.713	0.585	0.901	1.829
		3	0.822	73.745		0.718	0.606	0.887	1.925
	• Lesser of two evils	3	0.844	76.379		0.729	0.644	0.876	2.195
	• Unproven claims	3	0.815	73.313		0.686	0.595	0.889	
	• Vague claims								
Business Oriented Consumer Attributions (BoA)	• Increasing sales	**3**	**0.904**	**72.008**	0.884	**0.629**	**0.578**	**0.927**	1.316
	• Decreasing costs	7	0.905	64.311		0.907	0.577	0.960	2.755
	• Disruption of processes	7	0.893	55.697		0.879	0.543	0.944	2.905
		7	0.907	64.558		0.913	0.583	0.948	
Society Oriented Consumer Attributions (SoA)	• Environmental ethos	**2**	**0.963**	**96.469**	0.982	**0.500**	**0.969**	**0.862**	7.339
	• Social responsibility	7	0.913	66.251		0.907	0.600	0.954	7.339
		7	0.921	68.036		0.916	0.623	0.954	
Wish Cycling (WC)	• Decrease quality	**3**	**0.775**	**69.185**	0.871	**0.689**	**0.534**	**0.897**	1.444
	• Contamination	4	0.845	69.516		0.798	0.576	0.872	1.737
	• Machinery damages	4	0.721	54.501		0.753	0.393	0.848	1.751
		3	0.613	57.881		0.619	0.345	0.862	

*Bartlett's test $p < .001$.

TABLE 3 Parameters of constructs and normality tests.

Constructs	CSE	CP	GW	BoA	SoA	WC
Mean	3.369	3.512	3.802	3.669	3.944	2.124
Standard Deviation	0.588	0.681	0.588	0.616	0.696	0.715
Skewness	−0.263	−0.168	−0.822	−0.281	−0.884	0.550
Kurtosis	0.339	−0.328	2.650	2.650	2.070	0.004
K-S test	$p = .033$	$p = .062$	$p = .141$	$p = .038$	$p < .001$	$p = .054$

Abbreviations: BoA, Business-oriented attributions; CSE, Core self-evaluations; CP, Circular Packaging; GW, Greenwashing; SoA, Society-oriented attributions; WC, Wishcycling.

items were simultaneously loaded onto a factor analysis without any rotation, five factors were identified instead of just one. Moreover, the first factor only explained 30.515% of the total variance, indicating that any common method bias present in the data was minimal. Additionally, we ran a full-collinearity test and examined the variance inflation factors (VIF), to ensure that the constructs used in estimation are free of CMB. The results of this test are presented in Table 2 (last column) and in Table 5. Although there is no strict threshold for what constitutes a problematic VIF, it is generally accepted that VIF less than 5 indicates low level of multicollinearity, VIF between 5 and 10 suggests moderate level of multicollinearity, and VIF greater than 10 is considered to indicate a serious issue with multicollinearity (James et al., 2013). In our case, all VIF indices reported in Tables 2 and 5 are less than 5, except two VIFs (Environmental ethos and Social responsibility) that are equal to 7.339. Thus, we accept that there is no serious multicollinearity in our case.

3.7 | Estimation methodology

The above results allow us to proceed with a Structural Equation Model (SEM) approach for testing the developed research

TABLE 4 Correlation coefficients between constructs and AVE of constructs.

Constructs	Correlation coefficients					
	CSE	CP	GW	BoA	SoA	WC
CSE	[0.825][a]					
CP	−0.093*	[0.820]				
GW	−0.182**	0.113**	[0.856]			
BoA	−0.139**	0.083	0.668**	[0.848]		
SoA	−0.095*	0.016	0.635**	0.539**	[0.982]	
WC	−0.021	−0.237	−0.040	0.038	−0.027	[0.832]

Abbreviations: BoA, Business-oriented attributions; CSE, Core self-evaluations; CP, Circular Packaging; GW, Greenwashing; SoA, Society-oriented attributions; WC, Wishcycling.
*Correlation is significantly different from unity at the .05 level (2-tailed).
**Correlation is significantly different from unity at the 0.01 level (2-tailed).
[a]The values in square brackets represent the square root of AVE.

TABLE 5 Variance Inflation Factor (VIF) of constructs/controls in matrix form.

Constructs/controls	GW	BoA	SoA	WC
CSE	1.011			
CP	1.011			
GW		1.006	1.024	
BoA				1.591
SoA				1.589
CE KNOWLEDGE		1.006		
EDUCATION			1.024	
AGE				1.007

hypotheses of the proposed framework (Chen & Huang, 2024). SEM consists of two interwoven parts (Civelek, 2018), the measurement and the structural models. The structural model cannot be established if the measurement model is unreliable or invalid (Hair et al., 2021). For the purpose of our study, the software Mplus was chosen which is designed for latent variable modeling and is frequently used in social science and psychology to examine latent variable frameworks (Chang et al., 2020). Although the skewness and kurtosis rules indicated that the constructs follow normality, to be on the safe side, we used weighted least square (WLS) parameter estimates, via Mplus, since the Kolmogorov–Smirnov (K-S) tests indicated that some constructs do not follow the normal distribution (Muthén & Muthén, 2017). Additionally, considering that research goal of this study is theory testing, where the focus is on assessing the fit of a hypothesized model to the data, we followed the covariance-based SEM approach.

To evaluate the overall model fit, we followed Bollen (1989) suggestion to consider multiple indices. This is because a model may be acceptable based on one fit index but not on others. To increase the likelihood of rejecting a mis specified model, it is advisable to use more fit indices (Fan et al., 2016), and at least two fit indices should be considered to accept a SEM (Hu & Bentler, 1999). We therefore used the following fit indices, following Bentler (1990): chi-square (with critical significance level $p < .05$), normed-chi-square ratio (with critical level no more than 3), Tucker Lewis Index (TLI) (with critical level not lower than 0.80), Comparative Fit Index (CFI) (with critical level not lower than .90), Root Mean Squared Error of Approximation (RMSEA) (with critical level not more than .08).

However, the TLI and CFI indices are sensitive to the complexity of the model and the size of the sample. Thus, if these indices are lower but close to the indicated values, they may still be accepted (Judge & Hulin, 1993). Additionally, there must be at least 15 observations for each parameter estimated in SEM (Hair et al., 2013). We estimated 32 parameters, meaning that the sample must contain at least 480 observations. Our 537 observations fulfill this rule.

4 | RESULTS

4.1 | The measurement model

Before estimating the theoretical model of the study (Figure 1), two models were investigated using weighted least squares CFA via Mplus. The first, the hypothesized model, considers all six constructs used in the study. The derived fit indices (Chi-square = 360.739, df = 155, $p = .000$, normed-chi-square = 2.327, RMSEA = 0.050, CFI = 0.847, TLI = 0.812) are acceptable, being compared to the critical values presented previously. The second is the single factor model (i.e., Harman's type model), where all items was loaded into a single factor. The derived fit indices (Chi-square = 945.652, df = 170, $p = .000$, normed-chi-square = 5.563, RMSEA = 0.092, CFI = 0.421, TLI = 0.353) are very poor, being compared to the critical values presented previously, indicating the data could not be represented by a single construct.

Comparing the chi-square results of these two models, Δchi-square/Δdf = (945.652–360.739)/(170–155) = 38.99, we see that as this ratio is much greater than the critical value of 3.84 per degree of freedom, single respondent bias is limited, and the latent factors correspond to separate constructs (Brown, 2015).

4.2 | The structural model

Two versions of the theoretical model were estimated, a fully mediated model, reflecting the model presented in Figure 1, and a partially mediated model with directly linked related constructs. However, in the partially mediated model, the estimated coefficients of the direct paths were not significant, so the fully mediated model represents the data better than the partially mediated model. The fit indices of the fully mediated structural model (Chi-square = 597.278, df = 219, $p = .000$, normed-chi-square = 2.727, RMSEA = 0.057, CFI = 0.840, TLI = 0.803) are acceptable and better than the hypothesized model, which is the desired outcome.

Figure 2 represents the estimated theoretical model. All estimated coefficients are significant and presented in standardized values. However, the dimensions of "general packaging" in the circular packaging construct and "decreasing costs" in the business-oriented consumer attributions construct were not used in estimation because their obtained standardized coefficients were below the cut-off value of 0.40 and they were not significant.

4.3 | Testing the hypotheses

It appears that both core self-evaluations ($\beta = .455$) and consumer engagement with circular packaging ($\beta = .816$) have a positive relation with consumer's perception of the level of corporate greenwashing practices (Figure 2). However, the interaction variable (CSE × CP) has a negative relationship ($\beta = -.754$). To illustrate the combined effect, we employed ModGraph software (Jose, 2013) which allows us to study the moderation effect of CSE.

Using the actual estimations and not the standardized ones, Figure 3 presents the graphical plot of the moderation effects of core self-evaluations on the relationship between CP and corporate GW. The three lines have a negative slope, suggesting a negative correlation between CP and GW.

There are two key parameters when inspecting the lines/relationships presented in Figure 3:

The position of the line. This is a relative measure indicating a shift in the relationship. By comparing the relative positions of the three lines, it is clear that participants with greater self-evaluation

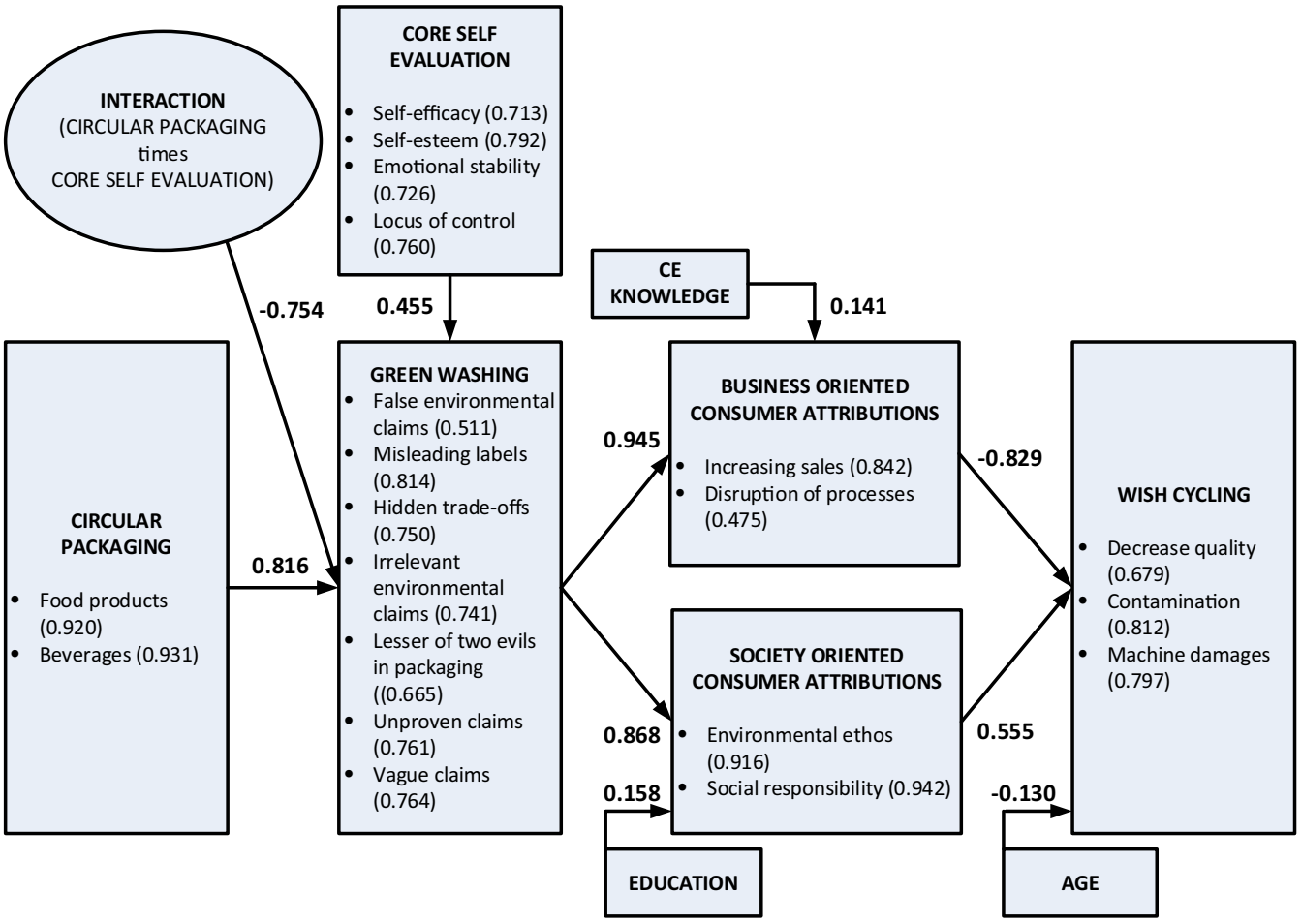

FIGURE 2 The estimated fully mediated model, showing the constructs (latent variables), the factor loadings of the constructs (β), coefficients of the paths and controls with statistical significance (CE self-reported knowledge, education and age). All figures represent standardized estimates.

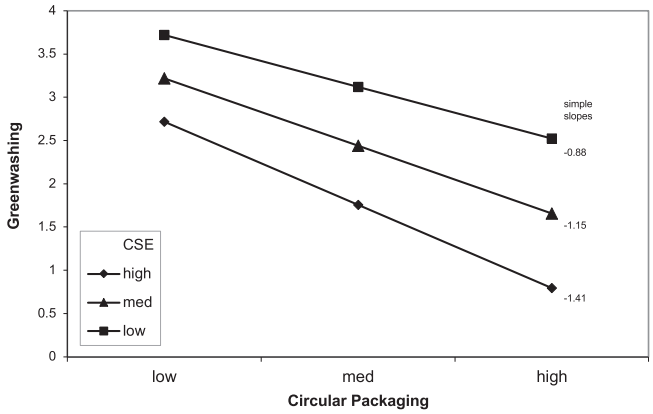

FIGURE 3 Moderation effects of CSE on the circular packaging – greenwashing relationship. *Source*: all three constructs (Greenwashing, Circular Packaging, CSE) are on the continuous scale 1–5, as shown in graph extracted from ModGraph software.

were less likely to recognize greenwashing across all levels of engagement with circular packaging.

The slope of the line. The higher the self-evaluation, the more strongly negative the relationship is. The steepest slope, indicating the strongest negative association, was found among consumers who scored high on CSEs. This means that core self-evaluations negatively moderates the relationship between consumer engagement in circular food and beverage packaging and consumer perception of corporate greenwashing practices. It is apparent from the graph that the relationship becomes stronger for consumers high in self-evaluation, thus supporting hypothesis 1.

Furthermore, our model estimation (shown in Figure 2) indicates that greenwashing produces positive business-oriented consumer attributions ($\beta = .945$) and positive society-oriented consumer attributions ($\beta = .868$), supporting hypotheses 2 and 3. Additionally, the results indicate that business-oriented consumer attributions have a negative effect on wishcycling ($\beta = -.829$), supporting hypothesis 4, and society-oriented consumer attributions have a positive effect on wishcycling ($\beta = .555$), supporting hypothesis 5.

Moreover, the results indicate that the mediation of business-oriented consumer attributions in the relationship between greenwashing and wishcycling is negative and significant, since the standardized estimate of full mediation is −0.782 ($p < .001$), supporting the combined hypotheses 2 and 4. The mediation of society-oriented attributions in the relationship between greenwashing and wishcycling is positive and significant since the standardized estimate of full mediation is 0.482 ($p = .011$), supporting the combined hypotheses 3 and 5. Combining these two effects, we find that the total aggregated impact of greenwashing on wishcycling, through consumer attribution is −0.300 ($p < .001$), with confidence interval limits −0.363 [lower 5%] and −0.237 [upper 5%]. This means that overall, consumers who recognize greenwashing more are less likely to engage in wishcycling.

Of the controls used in the study, only three produced significant results. In particular, the results suggest that individuals who self-report higher knowledge of CE issues have a higher score for ($\beta = .141$) business-oriented attributions. Individuals with higher education have a higher score for ($\beta = .158$) society-oriented attributions. Finally, older individuals are less likely to ($\beta = -.130$) wishcycle.

5 | DISCUSSION

This paper builds on previous academic work on consumer behaviors on circular packaging and recycling, by investigating whether corporate greenwashing practices and attributions may serially mediate such relationship.

Through moderation analysis, we established that consumers' self-evaluation significantly influences their engagement with circular food and beverage packaging, as well as their perception of corporate greenwashing. Specifically, consumers with high self-esteem and high engagement with circular packaging practices believe that companies conduct less greenwashing, in contrast to those with a lower self-esteem. This finding is in line with prior studies indicating that personal attributes, including attitudes and beliefs in green consumption, have a negative effect on the consumption of environmentally friendly and sustainable products (Braga Junior et al., 2019). This study complemented and strengthened the view of personality features playing a significant role when considering green practices (Zarei & Mirzaei, 2022) and corporate greenwashing.

We have introduced the concept of two distinct categories in corporate motives for greenwashing, business-oriented and society-oriented. For both categories the relationship with greenwashing is positive (i.e., consumers recognize greenwashing whether it is attributed to business or societal reasons), however when considering wishcycling we observed a negative correlation with business-oriented consumer attributions and a positive relationship when examining society-oriented attributions. This finding contributes directly to, and extends the work by Guerreiro and Pacheco (2021), who have identified a number of mediators between greenwashing and purchase intention, including word of mouth and consumer brand engagement. The authors conject that there should be more mediating effects that warrant future research.

Furthermore, self-reported knowledge of CE is specifically associated with business-oriented attributions, indicating that consumers who have, or believe to have, a higher knowledge of CE, are more inclined support a view that corporate greenwashing is due to a business-oriented agenda. The level of education is uniquely linked to society-oriented attributions, with consumers of a higher educational level subscribing to a more society-oriented corporate agenda. Both controls show a positive relationship. Lastly, age was found to be negatively linked solely to wishcycling, indicating that younger consumers are more prone to wishcycling.

5.1 | Theoretical and research implications

The primary theoretical outcome of this study is the development of a framework that enhances our understanding of the factors influencing the relationship between consumer engagement in circular food and

beverage packaging and wishcycling, particularly within the context of U.K. consumers. To this end, the research framework underscores two critical consumer factors influencing the relationship. The first is that consumers' personalities moderate the relationship between consumer engagement in circular packaging and consumer perception of corporate greenwashing techniques. More specifically, consumers with higher core self-evaluations (self-esteem, self-efficacy, and locus of control) who engage in circular packaging, perceive that corporate greenwashing is lower than consumers with lower self-evaluations. The second factor involves consumer attributions, which are differentiated as business-oriented and society-oriented. We established that both of these factors mediate the relationship between greenwashing and wishcycling, albeit in opposing directions. Although there have been numerous studies exploring the connection between different facets of consumer behavior and environmental consciousness, additional research is needed to examine consumer behavior regarding the littering of other types of products in the environment (Rasool et al., 2021). We argue that this contribution is significant as it utilizes individual factors to enhance consumer understanding of circular economy relationships.

We extend CE research by incorporating multidisciplinary factors, such as attribution theory from Human Resource Management (Guest, 2021), and CSE from Psychology (Farčić et al., 2020), and Organizational Development (Joo & Jo, 2017).

Moreover, we provide a theoretical contribution to the well-established field of attribution theory by adopting it to sustainability studies and extending the concepts of "employees" to "consumers". By categorizing consumer attributions into society-oriented and business-oriented, we have not only investigated how consumers perceive corporate greenwashing but also explored what they believe to be its underlying drivers. Simultaneously, there is supporting evidence indicating that consumers are more vigilant and engage in less wishcycling when they perceive corporate greenwashing techniques to be driven by business-oriented motives. However, consumers who are less vigilant toward society-oriented greenwashing corporate techniques, are more likely to carry out wishcycling.

Based on the above, wishcycling is founded on the idea that consumers are making efforts to promote sustainability. Consequently, when companies employ greenwashing techniques promoting their environmental ethos and social responsibility, consumers tend to trust them more, leading to increased wishcycling behaviors.

This relationship is stronger in parallel with consumer education levels. Consequently, consumers with higher levels of education tend to place greater trust in corporate claims of promoting sustainability and ethical practices, believing they are acting in the best interest of the environment. Unfortunately, this frequently results in an increase in wishcycling. Although Debrah et al. (2021), reported that people with higher levels of education are both more concerned about the environment, and are also more likely to participate in actions that promote and support environmental policy decisions, our results suggest that they are also more likely to wish cycle packaging from companies they perceive to have a strong environmental ethos.

5.2 | Managerial and policy-making implications

In this study, we demonstrated that core self-evaluation moderates the relationship between consumers' engagement in circular food and beverage packaging and their perception of corporate greenwashing practices. Consumers generally engage in circular packaging when they can trust green claims and believe they have not been greenwashed. A confident consumer will actively engage in circular packaging when they believe that they are not being greenwashed. However, a consumer with low self-esteem will try to engage in circular packaging in the hope that they are not being greenwashed. From the above, we can conclude that while policymakers should promote strong, confident consumers, this finding raises a concern and emphasizes a critical consideration when applying and implementing policies to tackle greenwashing. Circular packaging could potentially be manipulated by unscrupulous companies targeting less confident circular-aware consumers, resulting in "circular washing" (Marrucci et al., 2022), so consumer knowledge of what can be recycled is important.

Furthermore, we discovered that consumers attribute their own wishcycling behavior differently when assessing greenwashing as a business-oriented motive versus a society-oriented one. Until now, greenwashing has been viewed as a singular concept, but this study underscores distinct variations and their impact on consumer behavior regarding wishcycling. Our findings indicate that consumers display a higher level of awareness concerning business-oriented greenwashing practices, resulting in reduced wishcycling tendencies. Conversely, consumers tend to engage in more wishcycling when companies employ society-oriented greenwashing practices. This highlights a previously unaddressed cognitive bias in human perception, potentially posing a threat to the adoption of sustainable practices (Engler et al., 2019). More precisely, consumers navigating decision-making scenarios, like determining whether certain packaging is recyclable or not, within uncertain circumstances, are particularly susceptible to cognitive biases (De Vries, 2020). For businesses, this represents a significant factor in leveraging environmental ethos and social responsibility while greenwashing consumers (Camilleri, 2022). Policymakers should consider this when working to mitigate corporate greenwashing. At the time of writing, there is a flurry of activity as seen in the recent legislative actions (see e.g., Speare-Cole (2023) and European Parliament (2023)) to contain and control extensive greenwashing. This finding could be a valuable insight to support and direct such legislative efforts toward efficient and actionable control of greenwashing, particularly toward greenwashing techniques where companies present themselves as environmentally responsible.

In the context of consumers, we found that those with higher self-admitted knowledge of the circular economy paradigm tend to be more skeptical regarding business-oriented corporate greenwashing. However, consumers with a higher level of education are more susceptible to societal-oriented greenwashing techniques, potentially increasing their wishcycling. Our results contribute to the existing body of research on consumer knowledge, which shows a

positive correlation between the level of education and environmental sensitivity (Wang et al., 2020). While these observations can aid policymakers in fostering circular economy awareness to protect consumers from greenwashing and potentially mitigate wishcycling, there is a concern that businesses might exploit this knowledge by projecting an image of socially responsible consumption. Therefore, we propose the integration of circular economy principles into a wide array of educational curricula and programmes, alongside initiatives, such as the SOS Teach In (2023). This approach aligns with contemporary environmental initiatives like the United Nations' Sustainability Development Goals (SDGs), which are increasingly pervasive (Raimo et al., 2024).

Finally, this study has confirmed that younger consumers tend to engage more in wishcycling, indicating a lesser understanding of recycling contamination. This agrees with Lee et al. (2020), who noted that despite being well-informed and supportive of environmental initiatives, Millennials often exhibit behavior that contradicts their values. Therefore, managers and policymakers should target campaigns aimed at enhancing recyclability awareness toward younger groups.

5.3 | Limitations and recommendations for future research

Our study has introduced an innovative approach by positioning consumers as central and active participants in the circular economy paradigm. However, the following limitations need to be addressed:

First, the data were generated using a cross-sectional questionnaire, which limits the ability to draw dynamic causal inferences. Future research employing longitudinal responses may enhance understanding of the relationship between engagement in circular packaging and consumer wishcycling, mediated by greenwashing and consumer attributions.

Second, there is a likelihood of single-respondent bias since both dependent and independent variables were self-reported. Although ex-post tests suggested low common method bias, future studies utilizing responses from multiple sources or directly measuring levels of household wishcycling could mitigate potential bias.

Third, due to the numerical nature of our data, the findings primarily establish relationships rather than elucidating underlying influences or their impacts. Therefore, further development of the research presented in this study could involve incorporating qualitative research methods alongside the quantitative approach.

Last but not least, the study's findings may lack generalizability beyond the specific sample and context. Factors such as sampling bias, social desirability bias, and contextual specificity could limit the broader applicability of the results to different populations or settings. As already mentioned, the study was conducted within the UK. Given the size and complexity of the framework, further validation in future research considering different cultural contexts is needed in order to enhance the robustness and applicability of the findings.

6 | CONCLUSIONS

This study has highlighted the important role of consumers in the adoption of circularity. Through the lens of circular food and beverage packaging, we explored the interconnected issues of corporate greenwashing and consumer wishcycling. We demonstrated that attribution theory extends beyond Human Resource Management, offering a valuable perspective to comprehend the role of consumers in circular environments and policy domains.

We have identified several strategic points that could accelerate a successful and sustainable transition toward an anthropocentric circular economy. More specifically, our research highlighted the significant role of consumer personality traits, particularly core self-evaluations, in moderating the relationship between consumer engagement in circular packaging and perceptions of corporate greenwashing. We also introduced the distinction between business-oriented and society-oriented attributions of corporate greenwashing, revealing nuanced effects on wishcycling behaviors. While consumers exhibited greater awareness of business-oriented greenwashing practices, they were more susceptible to wishcycling when faced with society-oriented greenwashing. This finding underscores the need for policymakers and businesses to address cognitive biases in consumer perceptions and tailor interventions accordingly.

In conclusion, our study sheds light on the interplay between consumer engagement in circular packaging, corporate greenwashing, and wishcycling behaviors. By identifying key factors influencing these relationships, we provide insights for policymakers, businesses, and researchers seeking to promote sustainable consumption and mitigate environmental harm.

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