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Integrating consumer behaviour into the circular economy: a proposed multidimensional scale

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Abstract: This study proposes a multidimensional scale to incorporate consumer behaviour into the circular economy (CE). A complete framework that follows consumer interactions from need recognition to post-purchase stage is developed by combining insights from consumer behaviour, sustainability, and CE concepts. The data was collected from young consumers in the Middle East. First- and second-order models provide good overall fitness, and the model fit indices validate the validity and dependability of the suggested scale. Strong correlations between decision-making components are found through correlational analysis, particularly between the evaluation of alternatives, information gathering, and need recognition, as well as between recycling and appropriate disposal procedures. The findings shed light on the factors that influence sustainable decision-making within the CE framework as well as its challenges and complexities. This study advances theoretical knowledge and provides useful insights for encouraging environmentally friendly consumer behaviour.

Keywords: consumer behaviour; circular economy; purchasing stages; sustainability; Middle East.

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1 Introduction

Sustainability has gained popularity as one of the most influential concepts in contemporary society during the past few decades (Alves et al., 2022). As a result, sustainable consumption emerged as a major theme in marketing research, with an emphasis on how different marketing techniques and instruments might be used to

influence customer behaviour to become more ecologically conscious (Piligrimienė et al., 2020).

The circular economy (CE) has become a viable solution for governments and companies alike in achieving sustainability (Alves et al., 2022). The overconsumptive lifestyles that are currently prevalent in wealthy cultures are being replaced by consumption patterns that are more sustainable, such as circular consumption. It results in less of a requirement for virgin resources and lower emissions by applying the reduction, reuse, recycling, and recovery (Luukkonen et al., 2024). This perspective addresses the United Nations Sustainable Development Goal (SDG) 12, that ensures sustainable consumption and production patterns.

Luukkonen et al. (2024) presenting a multi-level, collective viewpoint on the part that consumers play in the CE. However, the conceptual meaning of consumer engagement in sustainable consumption and its empirical relationships with other dimensions are not well understood in the literature (Piligrimienė et al., 2020).

Researchers and practitioners have been interested in CE, but not many studies have investigated how CE might be integrated with other strategies that can also be sustainable Accordingly, the key to closing the loop in the conventional linear economy model is the involvement of businesses, governments, and consumers in initiatives toward CE (Alves et al., 2022).

The three stages in the purchasing decision process consist of the pre-purchase stage, which include need recognition (NR), information search, alternative evaluation; the purchasing stage, which settles and confirms the agreement and establishes the payment procedure; and the post-purchase stage. In the CE context, the third stage expands to incorporate other stages, such as ‘shared use’, ‘repair’, ‘recycle’, ‘upcycle’, and so forth. Considering this, it is necessary to review and include these new stages into the consumer behaviour models to maintain circularity and keep everything updated (Vidal-Ayuso et al., 2023). Marketers must concentrate on the full purchasing process, which starts long before and continues long after the product is purchased (Kotler et al., 2024).

Although consumers play a crucial role in the CE, consumer behaviour and decision-making are still largely ignored in this field of study (Vidal-Ayuso et al., 2023). The involvement of consumers in sustainable consumption behaviours has been ignored in the literature, despite studies on the efficacy in the business sector (Santos-Corrada et al., 2023). According to Testa et al. (2022), there has been a rise in the number of green consumer behaviours in recent years. Consumer behaviour can be connected to green consumption in this context. However, the growing awareness of environmental issues compels businesses and scholars to do additional studies to investigate how customers manage their consumption from a CE standpoint (Alves et al., 2022). There are still few studies that address how customers affect the CE loop (Vidal-Ayuso et al., 2023).

Vidal-Ayuso et al. (2023) call for future studies to look at what components or factors consumers think are essential for extending the life of items before purchasing new ones, as well as what kinds of products they would most like to have their product lifetimes extended. The post-purchase stage is about ‘use’, ‘recycle’, and ‘upcycle’ was found to be still unclear, despite being a crucial component of consumer behaviour. There is no literature that links the decision-making process for CE items with the post-purchase phase (Vidal-Ayuso et al., 2023).

Different scales were used to measure consumer purchase behaviour. For example, information search scale (Schmidt and Spreng, 1996) and perceived risk scale (Stone and Grønhaug, 1993) at the pre-purchase stage. Purchase intent scale (Dodds et al., 1991) and decision involvement scale (Mittal and Lee, 1989) at the purchase decision stage, customer satisfaction scale (Oliver, 1993) and post-purchase dissonance scale (Sweeney et al., 2000) at the post-purchase Stage. This study contributes to the body of literature by exploring the complex dynamics of customer involvement in the CE loop across the whole decision-making process.

First, the study offers a complete framework for integrating customer behaviour into the CE. Through the integration of knowledge from consumer behaviour, sustainability, and CE concepts, the framework seeks to offer a comprehensive picture of how people interact with goods and services from the point of recognition of needs to the last post-purchase actions. A fragmented view of sustainability and the CE is the result of numerous research that concentrates on specific aspects or phases. Through the integration of these disparate observations into a unified paradigm, our research enables a more comprehensive analysis of consumer behaviour inside the CE loop. This can aid in the improvement of current theories regarding the behaviour and choices made by consumers, especially when it comes to sustainable consumption.

Second, the research expands the framework of conventional purchase decision models by incorporating stages that are particularly pertinent to the concepts of the CE. The shared use, repair, recycle, and upcycle phases are all included in this addition, which reflects the changing consumer landscape that emphasises sustainable and circular practices.

Third, the study offers insightful behavioural information about how consumers manage the challenges of making sustainable decisions. It reveals the complex nature of consumer decisions within the framework of the CE by examining the driving forces, obstacles, and influencing elements at each stage.

According to the observed gaps in the literature, the following objectives have been developed for this study:

RO1 Investigate the consumer's roles in the CE?

RO2 Expand the framework of conventional purchase decision models by incorporating dimensions that are particularly pertinent to the concepts of the CE.

RO3 Develop a measurement scale for integrating customer behaviour into the CE.

The current study consists of five additional sections. A detailed review of the literature is included in Section 2. Section 3 then goes on to detail the methodological techniques that were employed to conduct the study. Section 4 presents the findings that follow. Section 5 discusses the theoretical and practical implications. Conclusions, limitations, and directions for further research are discussed in the final section.

2 Literature review

2.1 Consumer involvement in the CE

The CE is an economic framework that replaces the concept of 'end-of-life' with the practices of reducing, reusing, recycling, and recovering resources during the

manufacturing, distribution, and consumption phases (Luukkonen et al., 2024). From production and consumption to disposal and recycling, resources must be managed effectively throughout their life cycle to maximise value from already-existing resources and minimise waste output (Zhidebekkyzy et al., 2022).

In the CE, consumer behaviour is vital because it shapes the shift to sustainable behaviours. Promoting circular goods and services requires an understanding of how consumers are involved at every level of the decision-making process when making purchases. Green consumer behaviour can be defined as how customers look for, buy, use, evaluate, and dispose of things with consideration for the environment. Given that customers' participation with green products extends beyond their purchase, it is worthwhile investigating the impact of environmental concern on their usage, evaluation, and disposal practices (Nittala and Moturu, 2023).

Understanding how people engage in sustainable activities throughout the entire purchase decision-making process is essential to understanding consumer behaviour in the context of the CE loop. The consumer behaviour in each stage is broken down as follows.

2.1.1 Pre-purchase stage

The buying process starts when the buyer recognises a problem or need triggered by internal or external stimuli (Kotler et al., 2024). Customers recognise the need for a particular product or service, and they start to place more value on environmental concerns and sustainability. While weighing a product's end-of-life possibilities and environmental impact, consumers may decide that it is necessary. They might give priority to items that are recyclable, durable, or repairable (Shevchenko et al., 2023).

After recognising the need, customers actively look for information regarding the sustainability aspects of the goods, such as eco-friendliness, recyclable nature, recycled content, and ethical sourcing. Product labels, brand promotional materials, and the internet are possible sources they could employ (Szilagyi et al., 2022). A revision of EU consumer law is being proposed by the European Commission (2020). The proposal seeks to guarantee that consumers are provided with relevant and reliable information about products at the point of sale, including information about their lifespan and the availability of repair services, spare parts, and repair manuals.

In the next step, the consumer evaluates available alternatives. In CE, criteria for evaluation go beyond traditional elements such as cost and characteristics. A growing need for longer-lasting products that are also made to be easily repaired or upcycled (Gomes et al., 2023).

2.1.2 Purchase decision stage

The actual purchasing process requires several other decisions, including those on the vendor, amount, timing, and payment type (Sachdeva, 2015). Customers make decisions about goods and services after fully comprehending the features of the CE. A preference for brands that actively advance CE and sustainability. When deciding which circular product to buy, consumers consider many aspects such as product certifications and brand reputation (Bucur, 2023).

Customers may give priority to shopping at businesses that support sustainable practices, like take-back, refill, or second-hand choices. If consumers believe that a

product's lifetime, repairability, and durability justify the additional expense, they may be willing to pay more for sustainable solutions.

Payment methods in line with consumer values, including supporting businesses that practice sustainability, may be given preference by consumers. Buyers are prepared to pay more for long-lasting, ecological items that follow the guidelines of the CE. a preference for finance arrangements that encourage lease or shared use rather full ownership.

2.1.3 Post-purchase stage

Research on environmentally conscious consumer behaviour is widely available, however there are few research on environmental concerns during use, assessment, and disposal (Nittala and Moturu, 2023). Customers actively contribute to extending the life cycle of products and decreasing individual ownership by participating in sharing platforms, product-sharing groups, or renting services. To extend the lifecycle of circular products, minimise waste, and optimise their utility, consumers can rent or share them.

Instead of quickly replacing defective products, consumers actively seek out repair services. This extends the life of the product, minimises waste, minimises disposal, and helps to promote a more sustainable pattern of use. To ensure that materials are reused in the production cycle and to close the resource consumption loop, customers responsibly recycle products after use. They show interest in products that have easily recyclable components and provide guidance on how to recycle them. Recycling brings attention to the consuming process at the end of its useful life as well as the flow of goods and materials from one consumer to the next in the economy (Shevchenko et al., 2023). The availability of recycling information and disposal practices has been linked in several studies. When consumers have access to recycling information, they may participate in recycling (Domina and Koch, 2002).

Through innovative upcycling, consumers extend the life cycle of old products and resources by giving them a new life and added functionality. They participate in online or community forums that support upcycling concepts and initiatives. Arman and Mark-Herbert (2021) stress the significance of consumers engaging in responsible consumption. This approach has significance in reducing waste, which aligns with the Sustainable Development Goal of Responsible Consumption and manufacturing (SDG 12). It can be attained by delaying product life as part of a cradle-to-cradle system. However, it's important to find out if customers are prepared to use reusable products to extend their lifespan.

Extending and intensifying the usage phase of consuming is referred to as 'reusing'. This can take many different forms, such as sharing networks or rental companies, where the consumer is not the only owner of the goods (Luukkonen et al., 2024).

Returns are essential to optimising value in the post-purchase phase of a CE because they encourage resource efficiency, waste reduction, and sustainable activities. Secondary markets can be used to resell returned goods, particularly those that are still in good condition or have been used sparingly. By extending the useful life of products, this encourages reuse, lowers the need for new ones, and supports the concepts of the CE.

3 Methodology

This study is quantitative in nature, employs a deductive research methodology, and follows the positivist paradigm. A scale suitable for measuring the intended construct was developed using the methodology proposed by Churchill (1979). According to Churchill (1979), the first stage in creating an appropriate marketing scale is to read up on the targeted construct's theoretical foundations and/or investigate related concepts. The researcher should be able to create items utilising these theories and relevant material in the following phase.

Green consumers tend to be younger than regular consumers (Witek and Kuźniar, 2020). The increasing number of people who care about the environment is mostly due to young customers. Given that they will be the ones making decisions in the future, possess adaptable attitudes, and are well-versed in the specifics of sustainable marketing, they are perfect for this field (Mohammed et al., 2020; Soomro et al., 2020). This study targets young consumers in the Middle East region.

The researcher conducted a thorough, methodical analysis of the literature to identify concepts and the ways in which they connect to the CE's consumer behaviour. Then, structured interviews with experts are conducted as part of the validation process for the structures, dimensions, and questions to confirm their relevance and comprehensiveness. The study employs non-probability sampling and exploratory factor analysis (EFA) to modify the scale items during a pre-test with 98 respondents. The process is carried out via SPSS. The EFA resulted in 27 items under seven dimensions. Finally, to verify the scale's validity and reliability, the final proposed scale is put to the test using a survey and confirmatory factor analysis (CFA) on the sample size of 233 responses. AMOS software is used to carry out the process.

4 Findings and discussion

4.1 Exploratory factor analysis

The results from the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, along with the total variance explained from principal component analysis (PCA), provide critical insights into the suitability of the data for factor analysis and the underlying structure it represents. The KMO measure of 0.772 suggests that the sample size is adequate for factor analysis, as values above 0.70 are generally considered good. Bartlett's test of sphericity yields a chi-square of 1,215.011 with 406 degrees of freedom and a significance level of less than 0.001, indicating that the correlation matrix is significantly different from an identity matrix. This result confirms that the variables have sufficient correlations to justify the use of factor analysis.

The PCA results, coupled with Varimax rotation, present a clear delineation of item loadings across the seven extracted components, as well as their respective reliability. Table 1 helps to understand which items load heavily on which components, suggesting potential underlying factors that each component represents. The reliability scores, calculated using Cronbach's alpha, indicate the internal consistency of items within each component.

Table 1 Rotated factor matrix

			1	*2*	*3*	*4*	*5*	*6*	*7*	*Reliability*
Pre-purchase stage – need recognition	NR1	When recognising a need for a product, I often consider its potential impact on the environment.	0.768							0.777
	NR2	When recognising a need for a product, I often look for how easy it is to repair it.	0.687							
	NR3	When recognising the need for a product, I often look for eco-friendly options first.	0.630							
Pre-purchase stage – information gathering	IG1	I consider how the product was manufactured, used, and how it will be disposed of when gathering information before a purchase.		0.772						0.759
	IG2	I gather information about companies that take back their products for recycling or offer services to extend the product's life.		0.668						
	IG3	I investigate whether the product is made from recycled or sustainably sourced materials.		0.581						

Notes: Extraction method: principal component analysis.
Rotation method: Varimax with Kaiser normalisation.
[a]rotation converged in 11 iterations.

Table 1 Rotated factor matrix (continued)

			1	*2*	*3*	*4*	*5*	*6*	*7*	*Reliability*
Pre-purchase stage – evaluation of alternatives	EA1	I compare different products to see which one has the best environmental credentials.			0.787					0.814
	EA2	Before making a purchase, I evaluate the product's environmental impact and sustainability credentials.			0.764					
	EA3	I evaluate whether a product has certifications indicating it meets sustainability standards.			0.687					
	EA4	I evaluate the disposal options that are environmentally friendly for the product.			0.658					
	EA5	I assess the availability of sustainable products.			0.444					
Purchase decision stage	PD1	I buy products that are designed for easy maintenance and repair.				0.818				0.664
	PD2	For lifespan products, I am willing to pay a higher price.				0.563				
	PD3	I buy products that can be easily recycled, refurbished, or repurposed after use.				0.529				

Notes: Extraction method: principal component analysis.
Rotation method: Varimax with Kaiser normalisation.
[a]rotation converged in 11 iterations.

Table 1 Rotated factor matrix (continued)

			1	*2*	*3*	*4*	*5*	*6*	*7*	*Reliability*
Purchase decision stage	PD4	I buy products that are built to last and have a lower impact on the environment.				0.763				
	PD5	I buy products that are durable and have a long lifespan.				0.735				
Post-purchase stage – reuse, repurpose, and recycle	RR1	I often find new uses for products that I no longer need in their original form.					0.733			0.751
	RR2	I prefer to donate or sell items that I no longer use rather than discarding them.					0.712			
	RR3	I am likely to recycle materials whenever possible after I stop using a product.					0.667			
	RR4	I am familiar with how to recycle the products I purchase.					0.560			
	RR5	I am likely to participate in take-back or recycling programs for products I no longer use.					0.450			
Post-purchase stage – return and disposal	RD1	I am likely to return products for reasons other than defects or dissatisfaction (e.g., upgrading, outgrown, etc.).						0.700		0.625

Notes: Extraction method: principal component analysis.
Rotation method: Varimax with Kaiser normalisation.
[a]rotation converged in 11 iterations.

Table 1 Rotated factor matrix (continued)

			1	*2*	*3*	*4*	*5*	*6*	*7*	*Reliability*
Post-purchase stage – return and disposal	RD2	I avoid throwing away products in the regular trash and prefer to find alternative disposal methods.						0.679		
	RD3	I look for convenient ways for returning products for participating in circular economy.						0.480		
Post-purchase stage – sustainable consumption	SC1	I buy second-hand products.							0.635	0.568
	SC2	I often keep products for a long time before considering replacing them.							0.632	
	SC3	I regularly use the products I purchase until they are no longer functional or needed.							0.532	

Notes: Extraction method: principal component analysis.
Rotation method: Varimax with Kaiser normalisation.
[a]rotation converged in 11 iterations.

4.2 Confirmatory factor analysis

Table 2 presents the sample characteristics. The sample consists of 233 respondents, with 57.1% male and 42.9% female. Most participants are between the ages of 18–22 years (56.2%), followed by 23–26 years (18%), 31–34 years (15%), and 27–30 years (10.7%). In terms of education, most respondents hold a BA degree (50.6%), with 24% having completed high school, 15.5% holding a postgraduate degree, and 9.9% having a diploma.

As shown in Table 3, the descriptive statistics show that most constructs have moderate to high mean values, ranging from 3.26 to 4.42, indicating general agreement across the indicators. Standard deviations are mostly around 1.0, reflecting moderate variability in responses. Higher agreement is observed for purchase decision items (e.g., PD5 = 4.42), while reuse, repurpose, and recycle (RR4 = 3.26) and sustainable consumption (SC1 = 3.39) exhibit slightly lower means. Some items, such as RR4 and SC1, show higher variability, suggesting more diverse respondent opinions in those areas.

Table 2 Sample characteristics

		N	*%*
Sex	Female	100	42.9%
	Male	133	57.1%
Age	18–22 year	131	56.2%
	23–26 year	42	18.0%
	27–30 year	25	10.7%
	31–34 year	35	15.0%
Education	BA	118	50.6%
	High school	56	24.0%
	Diploma	23	9.9%
	Postgraduate	36	15.5%

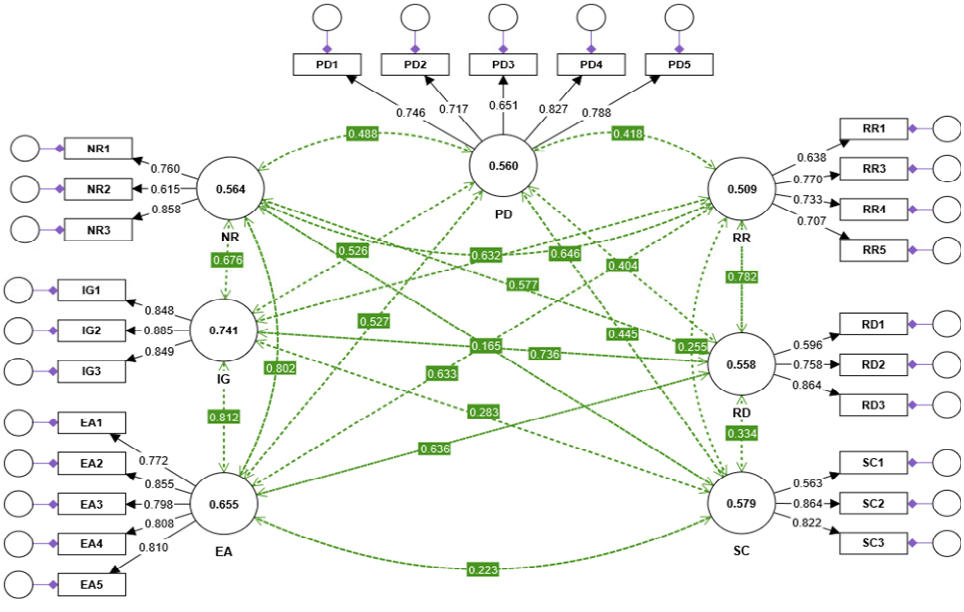
Table 3 Descriptive analysis

	Mean	*SD*
Need recognition		
NR1	3.66	1.075
NR2	4.05	0.950
NR3	3.62	1.100
Information gathering		
IG1	3.54	1.118
IG2	3.48	1.186
IG3	3.52	1.189
Evaluation of alternatives		
EA1	3.85	1.112
EA2	3.56	1.128
EA3	3.66	1.115
EA4	3.57	1.061
EA5	3.74	1.022
Purchase decision		
PD1	4.33	0.803
PD2	4.26	0.898
PD3	4.02	0.938
PD4	4.20	0.819
PD5	4.42	0.756
Reuse, repurpose, and recycle		
RR1	3.75	0.986
RR2	4.12	0.902
PR3	3.70	1.020
RR4	3.26	1.161
RR5	3.67	1.007

Table 3 Descriptive analysis (continued)

	Mean	*SD*
Return and disposal		
RD1	3.88	1.097
RD2	3.83	1.065
RD3	3.74	0.985
Sustainable consumption		
SC1	3.39	1.166
SC2	3.97	0.960
SC3	3.91	0.974

Figure 1 CFA model output of SmartPLS 4 (see online version for colours)



The scale's CFA evaluated the questionnaire's importance based on the EFA's outcome. The covariance matrix of the confirmatory dataset was utilised to evaluate the model fit using maximum likelihood estimation (refer to Figures 1 and 2). The results of the calculations included the chi-square value, the standardised root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). By improving these indices, the goodness-of-fit index (GFI) and comparative fit index (CFI) were used to assess model fit (Browne and Cudeck, 1992). According to the standard for determining model fit, a fit that is good is indicated by a value of 0.90 or higher for the GFI and CFI, and values that are near to 0.90 for the GFI (Faulkner and Laschinger, 2008; McCoach et al., 2013).

Figure 2 CFA output of AMOS (see online version for colours)

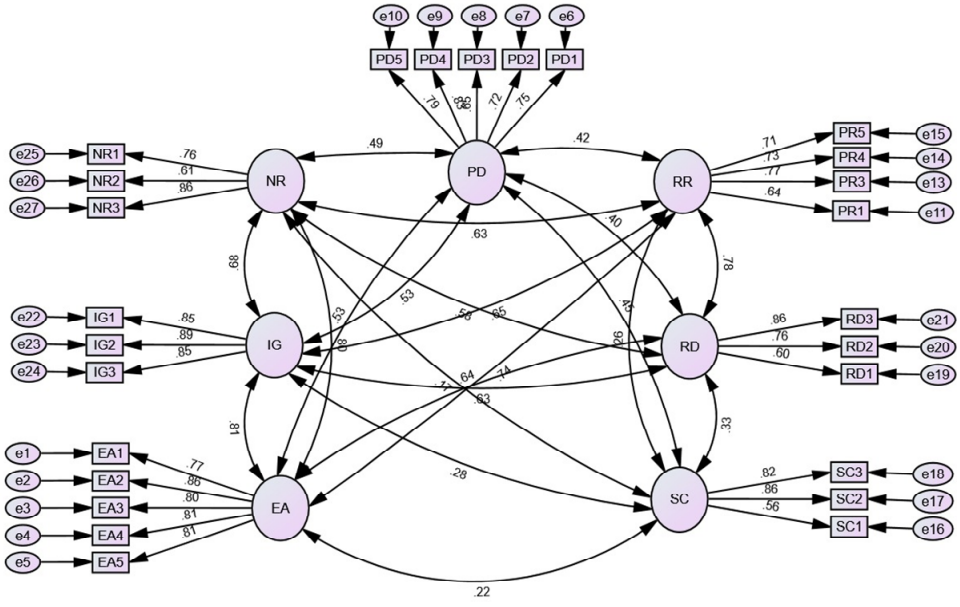


Table 4 Indicator reliability, composite reliability, and convergent validity

Construct	*Indicator*	*Outer loadings ➢ 0.600*	*CR ➢ 0.700*	*AVE ➢ 0.500*
NR	NR1	0.760	0.801	0.564
	NR2	0.615		
	NR3	0.858		
IG	IG1	0.848	0.896	0.741
	IG2	0.885		
	IG3	0.849		
EA	EA1	0.772	0.904	0.655
	EA2	0.855		
	EA3	0.798		
	EA4	0.808		
	EA5	0.810		
PD	PD1	0.746	0.858	0.560
	PD2	0.717		
	PD3	0.651		
	PD4	0.827		
	PD5	0.788		

Notes: EA = evaluation of alternatives, IG = information gathering, NR = need recognition, PD = purchase decision, RR = reuse, repurpose, and recycle, RD = return and disposal and SC = sustainable consumption.

Table 4 Indicator reliability, composite reliability, and convergent validity

Construct	*Indicator*	*Outer loadings ➢ 0.600*	*CR ➢ 0.700*	*AVE ➢ 0.500*
RR	RR1	0.638	0.806	0.509
	RR2		Removed	
	RR3	0.770		
	RR4	0.733		
	RR5	0.707		
RD	RD1	0.596		
	RD2	0.758	0.780	0.558
	RD3	0.864		
SC	SC1	0.563	0.780	0.579
	SC2	0.864		
	SC3	0.822		

Notes: EA = evaluation of alternatives, IG = information gathering, NR = need recognition, PD = purchase decision, RR = reuse, repurpose, and recycle, RD = return and disposal and SC = sustainable consumption.

As shown in Table 4, all the indicator loading is within the threshold value (0.600). Notably, there are some indicators that have loading lower than 0.600. However, since AVE and CR are achieved, these indicators loading are not of concern. The CR values are greater than 0.700 indicating good reality and internal consistency. Adding to that, AVE values are greater than 0.500 indicating that convergent validity is met in the model. It should be reported that PR2 was removed due to lower loading.

To assess discriminant validity, the heterotrait-monotrait (HTMT) ratio was used. According to Hair et al. (2019), HTMT values should be below 0.85 to confirm discriminant validity, and threshold of 0.90 for conceptually related constructs. The findings in Table 5 revealed that all HTMT values are below 0.85, indicating no issues with discriminant validity. This means the constructs are sufficiently distinct from each other.

Table 5 HTMT ratio

	EA	*IG*	*NR*	*PD*	*PR*	*RD*	*SC*
EA							
IG	0.816						
NR	0.792	0.685					
PD	0.541	0.533	0.536				
RR	0.743	0.657	0.660	0.451			
RD	0.613	0.639	0.597	0.428	0.805		
SC	0.258	0.304	0.238	0.456	0.356	0.385	

Notes: EA = evaluation of alternatives, IG = information gathering, NR = need recognition, PD = purchase decision, RR = reuse, repurpose, and recycle, RD = return and disposal and SC = sustainable consumption.

The model fit indices presented in Table 6 demonstrate a good overall fit for the first-order model, with χ^2/df = 1.847, RMSEA = 0.06, and SRMR = 0.061, all within acceptable limits. Additionally, CFI (0.932) exceeds the 0.90 threshold, confirming strong fit. GFI (0.861) is slightly below the ideal but still acceptable overall. The second-order model similarly shows a good fit, with χ^2/df = 1.904, RMSEA = 0.062, and CFI = 0.920, though GFI (0.843) and SRMR (0.068) are slightly lower but remain within an acceptable range.

Table 6 Model fit indexes

	Chi-sqr./df	*RMSEA*	*GFI*	*SRMR*	*CFI*
First order	1.847	0.060	0.861	0.061	0.932
Second order	1.904	0.062	0.843	0.068	0.920

As displayed in Table 7, the correlational analysis shows significant relationships among the constructs. Evaluation of alternatives (EA) is highly correlated with information gathering (IG) (r = 0.812) and NR (r = 0.802), indicating strong associations between these decision-making stages. Reuse, repurpose, and recycle (RR) is strongly correlated with return and disposal (RD) (r = 0.782), suggesting that individuals who engage in recycling are also likely to focus on proper disposal practices. Purchase decision (PD) shows moderate correlations with other constructs, particularly with EA (r = 0.527) and SC (r = 0.445), implying that these factors influence purchase decisions.

Table 7 Correlational analysis

	EA	*IG*	*NR*	*PD*	*RD*	*RR*	*SC*
EA	1						
IG	0.812	1					
NR	0.802	0.676	1				
PD	0.527	0.526	0.488	1			
RD	0.636	0.633	0.577	0.404	1		
RR	0.736	0.646	0.632	0.418	0.782	1	
SC	0.223	0.283	0.165	0.445	0.334	0.255	1

Notes: EA = evaluation of alternatives, IG = information gathering, NR = need recognition, PD = purchase decision, RR = reuse, repurpose, and recycle, RD = return and disposal and SC = sustainable consumption.

5 Theoretical and practical implications

By offering a comprehensive framework that incorporates consumer behaviour into the CE, this study adds to the expanding body of research on sustainability and circular consumption. Our framework emphasises sustainable practices like reuse, repurpose, and recycling and considers the whole consumer decision-making process, from NR to post-purchase stage, in contrast to previous research that takes a fragmented perspective of CE. The study improves our understanding of consumer behaviour in sustainable consumption contexts and enriches current theories on decision-making in the CE by incorporating CE-related stages into conventional models. The strong relationships found

between critical stages of consumer behaviour, like IG and alternative evaluation, emphasise how interconnected these stages are and provide fresh perspectives on how consumers rank sustainable behaviours.

The results hold significance for companies, legislators, and instructors who aim to encourage sustainable consumption among youth. This research provides important direction for the development of marketing plans, educational initiatives, and legislative frameworks that support circular behaviours by identifying the factors that influence sustainable decision-making and the obstacles that consumers encounter. Businesses can utilise this knowledge to customise their products and services, facilitating consumer participation in environmentally friendly activities such as upcycling and recycling. Furthermore, especially in areas like the Middle East where CE adoption is still developing, authorities might use the framework to develop programs that assist consumers in making environmentally good decisions.

Businesses should utilise cause-related marketing efforts, eco-labels, and sustainability storytelling to increase consumer commitment. Finally, eco-friendly packaging regulations, product availability in mainstream retail channels, and loyalty rewards for sustainable purchases are examples of behavioural moves that could promote real behaviour.

6 Conclusions, limitations and future directions

With the multidimensional scale this study offers, it is possible to gain a deeper understanding of sustainable consumption by integrating consumer behaviour into the CE. Through the inclusion of CE-related activities like recycling, repair, and upcycling in conventional decision-making models, the research provides important new insights into how young Middle Eastern consumers make decisions about sustainable consumption. The model shows a strong overall fit and highlights important connections between important decision-making elements, highlighting how complicated consumer behaviour is within the CE framework.

This study has limitations even if it offers useful insight. The results may not be as applicable to other demographic groups or geographic areas due to the Middle East's emphasis on youthful consumers. Furthermore, inferences concerning long-term behavioural trends are limited by the cross-sectional structure of the data. The results of the study could be impacted by regionally distinct environmental attitudes and cultural values. Cultures differ in their green buying habits, and what works in one setting might not work in another. Lastly, even if the suggested model fits well, it could still need to be further refined and validated using bigger and more varied sample sizes to improve its applicability in various scenarios.

By examining the behaviour of other demographic groups, such as elderly consumers or those in different geographic regions, future research could solve these constraints. Deeper understanding of how consumer behaviour changes over time within the CE may be obtained through longitudinal studies. Future studies could also investigate how digital technologies support circular consumption, specifically how online platforms and mobile apps affect sustainable decision-making. More research into the social and cultural elements that influence sustainable behaviour in the Middle East may yield more context-specific understandings for promoting CE practices there.

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