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Putting people at the centre of the circle: an agenda for behavioural research on the circular economy

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In a discourse characterised by technical innovation, alternative business models and material flows, the seemingly mundane, everyday forms of individual action toward circularity that can and are being taken by members of the public can sometimes feel overlooked. Whilst the importance of behaviour change is often acknowledged, in-depth conceptual engagement around circular behaviours remains uncommon in the field of circular economy research. In this perspective article we advocate for a person-centred perspective on circular behaviours, viewing people as not just consumers or users of circular products, but as individuals, nested within social groups, whose everyday, yet complex, relationships with material goods must undergo a shift if a circular economy is to be achieved. Drawing on insights from the wider field of pro-environmental behaviour research, we explore how we conceptualise circular behaviours themselves and how the behavioural theories we apply may constrain the ambition of the policy action our research supports. In doing so, we set out a person-centred agenda for research on circular behaviours, recommending: (1) greater application of systems-oriented approaches; (2) conceptual development on categorising circular behaviours, and (3) interdisciplinary efforts to integrate theory from across social science disciplines to underpin behavioural analyses and public engagement and action on the circular economy.

KEYWORDS

circular behaviours, behaviour change, circular society, pro-environmental behaviour, consumption, waste

1 Introduction

Circular economy (CE) principles have become a central feature of environmental policy development, from the international to local levels (Steenmans and Lesniewska, 2023). The appeal of the CE to policymakers lies not only in its potential to address the global environmental challenges of halting the degradation of the natural environment and supporting the transition to climate neutrality by reducing resource use, but also in the promise of significant economic and social benefits (Stahel, 2016).

Moving toward a CE necessitates a whole system shift, yet this need for systemic change has often been overlooked within the CE discourse, at the expense of a focus on less ambitious recycling objectives, incremental efficiency measures and technological innovation (Casson and Welch, 2021). To understand how a genuinely transformational approach to implementing CE can be supported it is necessary to go beyond consideration of business models and production processes within the CE. To comprehend how systemic change might be possible, we also need to consider how people feature: what does life in a CE look like? What does a CE demand of us, as individuals, as households, as communities? What kinds of behavioural changes are necessary for circularity to happen, and will those changes enrich our lives or otherwise?

Whilst behavioural change is often acknowledged as an important element of transition, little attention has been paid to the conceptualisation of behaviour in the CE literature. In this perspective article, we argue the need for conceptual development in relation to the behavioural dimensions of the CE and draw on insights from the behavioural sciences to propose a future research agenda on circular behaviours. Specifically, we frame circular behaviours as a subset of pro-environmental behaviours (PEBs), highlighting what we can learn from environmental and social psychology and arguing for a more person-centred approach to behavioural CE research.

2 Behaviour change and the CE: a person-centred approach

Thus far, CE research has tended to focus on industrial and technical production-side problems, yet everyday consumption and waste-related behaviour will undoubtedly play a pivotal role in the success or failure of policy aiming to accelerate the transition to the CE (Georgantzis Garcia et al., 2021). Behaviour within households sits at the heart of systems of production and consumption, influencing the upstream decisions (e.g., in product design) and downstream processes (e.g., in enabling reuse and recycling) within businesses and institutions. At the same time, and individuals can exert agency through reducing their own consumption and extending the use/life of products. In short, people are central to all loops in the CE. However, whilst behavioural change on the part of householders is often acknowledged as necessary, little attention has been paid to the conceptualisation of behaviour in the literature (Muranko et al., 2018).

Behavioural aspects of the CE tend to be represented through investigations of consumers as actors in the economic system. Gomes et al. (2022) emphasise the importance of psychology and behaviour in circular consumption systems, i.e., 'the systems in which consumers meet their needs through circular transactional processes: the acquisition, use and post-use of circular products and services' (p. 1). However, to develop understanding of circular behaviours and, importantly, how to promote behaviour change, we must go beyond conceptualising circular behaviours in transactional terms. Rather than considering behaviour purely within the context of the economic system, there is value in a perspective which considers behaviours pertaining to resource use as embedded within complex social-ecological systems (Ostrom, 2009). This necessitates greater consideration of the social, cultural and environmental contexts in which behaviour occurs, and recognition that behaviour is not only shaped by rational decision-making processes through which

consumers seek to meet material needs but also by emotions, values, identities and automatic processes that may have little to do with consciously maximising utility. This understanding of circular behaviour is in line with an emerging narrative in the CE literature refocusing attention on the 'circular society', emphasising the role of actors across society in the transition to circular systems of resource use (Jaeger-Erben et al., 2021). In this paper we focus in on the role of private citizens or members of the general population in the circular society, although it should be recognised that private citizens also exert agency within their roles in organisations, within communities, or as public figures. Furthermore, whilst we frame questions around the agency of individuals in terms of 'behaviour', we also recognise that this is but one of many ways to centre the 'people' part of circular systems, with insights from across social science disciplines contributing to understanding of what we discuss as circular behaviour. This includes, for example, work on practises, habits and social action, and perspectives focusing more explicitly on group processes and place than behaviour at the individual level.

In moving from a transactional, economic, focus on behaviour in the CE, the default use of the term 'consumer' to denote a person acting as a private citizen becomes problematic. Hobson and Lynch (2016) critiqued the predominant conception of the individual as a passive consumer whose role is to accept or reject circular business models and the products and services they generate. Transitioning to a CE, it is argued, demands a much more fundamental shift in our everyday existence and relationship with the material world. Furthermore, the lines between consumption and production become blurred in the CE, with householders acting both as producer and consumer, in a process of 'prosumption' (Ritzer, 2014). This dual role can be seen in the creative repurposing of items or materials, and the repair, transformation and exchange of used goods.

Another role commonly assigned is as 'user' of products. Whilst 'consumer' centres the commodity, 'user' centres the product; both terms prove deficient when the focus is on describing a circular society, or socio-ecological system of resource use. Korsunova et al. (2021) describe a plurality of roles for those living in a circular society (including as repairer, maker, trader and benefactor), moving away from the narrower view of individuals as consumers/users. Some researchers have moved towards the term 'circular citizen' to describe members of the public (Hobson, 2021; Korsunova et al., 2021), recognising these broader active and social roles people can play as participants in the circular economy.

3 Circular behaviours—definitions and classification

3.1 Defining circular behaviours

The terms 'circular behaviour'/'pro-circular behaviour' are increasingly adopted to describe behaviours that are relevant to the CE transition. Whilst many sources exploring behavioural aspects of the CE fail to define such terms, a few authors have sought to do so (see Table 1).

Muranko et al. (2018) provide an early definition, upon which Gomes et al. (2022) draw on in their framing of circular behaviour. Whilst the Muranko et al. (2018) definition is most expansive, it raises important questions relating to *goal-direction* and *consequences* of

TABLE 1 Definitions of (pro)circular behaviours in literature.

Muranko et al. (2018)	An action which is brought about due to prioritising resource efficiency. This behaviour benefits or at least reduces damage to the environment, economy and society (p. 133)
Gomes et al. (2022)	Circular consumer behaviour is one that promotes resource efficiency, as well as the flow of circular value, in consumption systems (p. 2).
Arias et al. (2022)	Those consumer behaviours necessary in a circular economy (p. 3)
Zibell et al. (2021)	Consumer behaviour aligned with circular economy goals and principles (p. 3)

behaviours. Circular behaviours are proposed as an expression of conscious prioritisation of resource efficiency over other goals. The centrality of goal-direction has been contested within the wider literature on pro-environmental behaviours (PEB) (Gatersleben, 2018). Not only are PEBs (including circular behaviours) liable to be motivated by multiple goals, of which reducing environmental impact is only one, they are often underpinned by psychological processes that are neither conscious nor rational. Similarly, incorporating consequences of behaviours within their definition also becomes problematic. Whilst CE is purported to serve all three pillars of sustainability—economic, environmental and social—in practise trade-offs between these multiple objectives will inevitably arise and action in one context will have different impacts to the same action performed in another context.

Others define circular behaviours with respect to their alignment to CE specifically (Zibell et al., 2021; Arias et al., 2022). Given the proliferations of different conceptualisations of CE itself (Kirchherr et al., 2017) and imaginaries of the future CE which shape present day policy and action (Casson and Welch, 2021), any definition which classifies a behaviour as circular only on the basis of its alignment with achieving a CE or CE principles leaves too much room for interpretation.

With these considerations in mind, we define circular behaviours as *those behaviours that align with a wider system change towards circularity and resource efficiency in everyday life*. This definition avoids assumptions about the goal-directedness or multiple outcomes of behaviours, instead emphasising more proximate impacts on resource use, as well as situating circular behaviours as part of everyday relationships with material goods. It is important, however, in conceptualising circular behaviours to avoid solely concentrating on increasing efficiency—'Jevons Paradox' (Jevons, 1871) highlights the risk of rebound effects whereby increasing efficiencies can lead to a net increase in resource use due to efficiency gains being outstripped by increasing demand. Thus, behaviours aligning to a rejection of overconsumption and consumerism have a central role to play achieving sustainable circular systems of production and consumption.

3.2 Aligning behaviours and resource flows—typologies of circular behaviours

Behaviours relating to consumption and waste are commonly conceptualised within frameworks that broadly correspond to the waste hierarchy, with activities prioritised according to their impact or desirability. Such hierarchies are dominated by 'R-terms' (e.g., 'reduce', 'reuse' and 'recycle'). Reike et al. (2018) recorded 38 different

R-terms in use in the academic literature on CE, creating a typology of 10 R-terms representing different processes through which resource value can be retained in a circular system (see Figure 1). It is important to note that these R-terms *do not represent behaviours in themselves*, rather processes that may include a behavioural element to a greater or lesser degree. The R-terms at the top of the hierarchy (R0:Refuse to R3:Repair) refer to 'short-loop' processes, where the product stays with users in a 'loop back' to use (rather than undergoing further processing as part of production or waste management processes) (Reike et al., 2018). These 'short-loop' processes are where householders have a primary role in driving circularity, and which require little re-framing to isolate the behavioural component of the processes described by the R-terms. R-terms lower down the hierarchy (e.g., R5: remanufacture etc.), tend to fall more within the domain of producers and the waste management sector, yet householder behaviours can still influence these processes through demand-creation (e.g., for refurbished or recycled products) and material supply (e.g., of sorted waste for recycling).

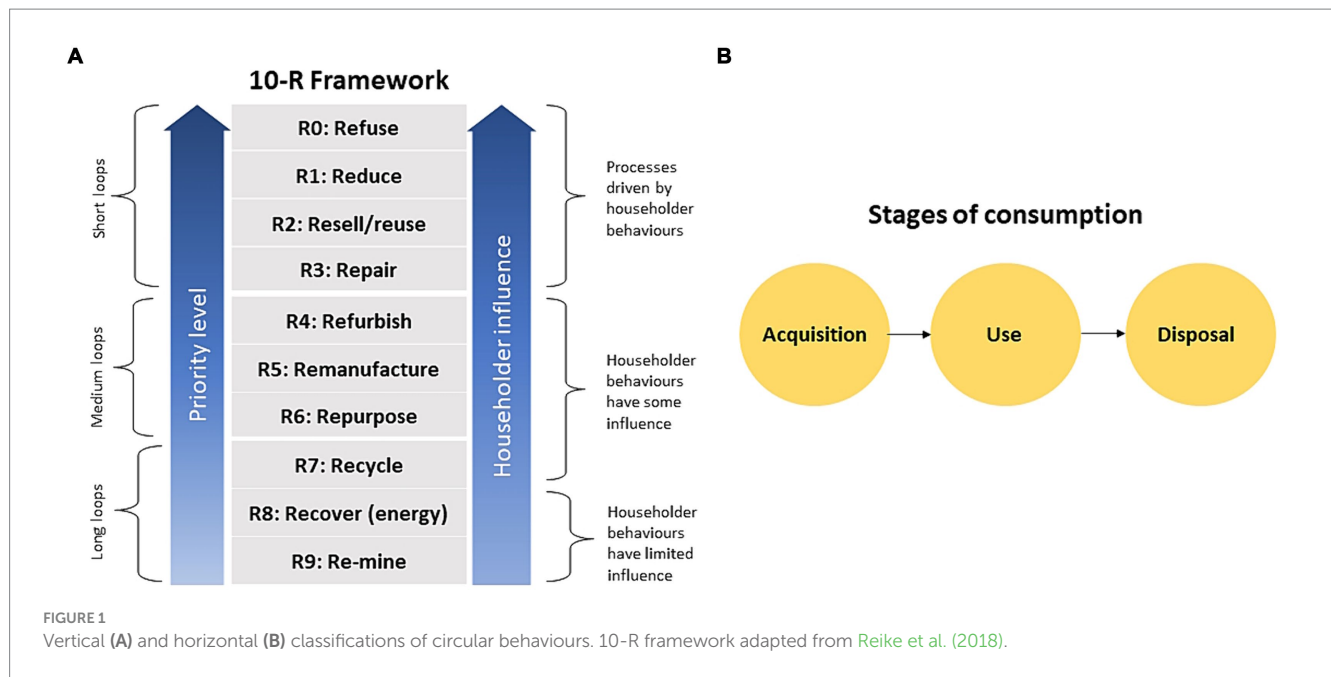
Circular behaviours can also be conceptualised in relation to temporal stages of consumption from the perspective of the consumer (Zibell et al., 2021; Arias et al., 2022). These stages include *acquisition* behaviours (purchasing or otherwise acquiring items), *use* behaviours (actions taken to prolong the lifespan of a product), and *disposal* behaviours (discharge of used products, e.g., through returning to producers, reselling, sorting for recycling etc.). This conceptualisation, although more linear in nature, arguably start from a more behaviour-oriented position (as opposed to the more resource-flow/process centred R-term hierarchies) as it takes into consideration the temporality of product lifespans as they are experienced by the individual and highlights the multiple points at which people can exert agency on the processes encapsulated in R-term hierarchies.

There is potential value in combining these two approaches to conceptualising circular behaviours, to develop frameworks which represent both vertical (hierarchical, relating to resource flows) and horizontal (temporal) dimensions. Further research will, however, be needed to explore the utility of such frameworks for analysing behaviours.

4 Behavioural theory in circular economy research

We have argued that defining and classifying circular behaviours is important. However, to better understand circular behaviours and promote behaviour change, behavioural models are needed to provide theoretical grounding for the development of hypotheses and design of interventions. Whilst it is not uncommon for behavioural research within the CE domain to employ existing behavioural theories, we would argue that overall, theory has been applied in a rather limited and uncritical way.

A review of consumption-focused CE literature by Camacho-Otero et al. (2018) observed that the most commonly adopted theoretical models by far are the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and related models, e.g., Theory of Reasoned Action (Fishbein and Ajzen, 1975) and extensions of TPB such as the pro-circular Change Model (Muranko et al., 2018). The dominance of TPB as a theoretical framework in behavioural CE research appears to continue to date, reflecting an increasing use of the TPB in



consumption research more broadly (Rozenkowska, 2023). The reliance on the TPB may be limiting progress, as the model has been widely critiqued. It is not well suited to understanding habitual behaviours in which there is a significant element of automaticity, rather than reflection and conscious decision-making (Verplanken and Whitmarsh, 2021). Similarly, a reliance on the TPB underplays the role of emotions in motivating behaviour (van Valkengoed et al., 2022). Other criticisms also apply to other behavioural models commonly employed in PEB research—contextual factors and temporal dimensions of change are often poorly represented, and the linearity of many behavioural models leads to overly reductionist and deterministic ways of thinking (Whitmarsh et al., 2021). The danger is that relying on the TPB results in an evidence base that poorly serves research users attempting to apply theory in good faith to behaviour change interventions in the real world.

In a broader sense, the dominant theoretical models of PEB research, originating in psychology and economics, have also been critiqued for their individualised approach. The individual is taken as the primary unit of analysis, yet the outcomes of many consumption, conservation and waste disposal behaviours are expressed at the household (rather than individual) level. This problem of mismatch between individual-level theories and household-level outcomes can mean that important social dynamics within households, e.g., in the division of labour associated with ‘consumption work’ (Wheeler and Glucksmann, 2013) are overlooked. Despite long-standing calls from sociologists and geographers for a greater focus on the household as a meso-level locus of change (e.g., Reid et al., 2010), psychology-led pro-environmental behaviour research seldom incorporates theoretical insights from wider research paradigms which could support the integration of individual-level and household-level analyses, as well as better representation of other group-level processes pertinent to understanding the ‘people’ dimension of circular economy. There is, therefore, considerable potential for greater application of multi-level perspectives and integrative interdisciplinary approaches combining psychological theories of behaviour with, e.g., social practise theory and critical theory including feminist theory.

5 Discussion

How we frame behaviour, and the theoretical models we use, influence the type of behaviour change interventions and target behaviours prioritised in research and policy. In this perspective article we have advocated for a person-centred perspective on behaviour change in the circular economy field, viewing people as not just consumers or users of circular products, but as members of society whose everyday relationships with material goods (and maybe with each other) will need to change if a CE is to be achieved. To imagine life in a circular society, and how we might reach that point, we need greater attention to how we conceptualise and understand (pro-)circular behaviours, as well as a more critical application of behavioural theory to explore the psychological, social, and environmental factors influencing their performance. Drawing on (often long-standing) debates and more recent conceptual developments within the wider pro-environmental behaviour literature, we suggest the following priorities for a person-centred future research agenda on circular behaviours:

5.1 Adopting a systems perspective in framing behaviour change in the CE

Transitioning to a circular economy represents a large-scale system change that will require technical solutions and industrial innovation, and widescale behaviour change, amounting to a transformation in consumption and waste culture in civil society. Consumption can be viewed as an everyday activity—we are all involved in some way in the acquisition, use and disposal of goods or materials such that it is part of everyday life. Research seeking to support sustainability transitions, including the shift to more circular economy, would benefit from paying greater attention to behaviour, and the complex social and psychological factors underpinning environmentally (un)sustainable consumption behaviour.

At the same time, critics have long argued that a narrow focus on behaviour change risks deflecting responsibility away from powerful

institutions and on to individuals (Shove, 2010; Kaufman et al., 2021). Behavioural research on the CE, in common with pro-environmental behaviour research more generally, could benefit from a more systems-oriented approach. Such an approach focuses less on persuading individuals to behave differently, and more on questioning which components of the existing system could be leveraged to provide supportive structural conditions for behaviour change. The adoption of a systems perspective also entails consideration of behaviour with reference to multiple units of analysis (nesting individuals within multiple social) and interactions at a range of scales. Such perspectives require more integrative theories (see point 3 below) as well as research methods that admit and reflect complexity. Social simulation using agent-based models is an example of a method that offers significant opportunities for analysing behaviour and multilevel social phenomena from an interdisciplinary systems perspective (Alonso-Betanzos et al., 2017).

5.2 Developing and applying typologies for classifying circular behaviours

Hierarchical frameworks have the potential to help shift attention from 'easy' yet low-impact behaviours, to more challenging high-impact behaviours. However, behavioural literature on the CE has arguably placed too much focus on recycling and less on the more challenging reduce and reuse behaviours higher up the waste hierarchy. At the same time, conceptualising behaviours solely in terms of resource flows fails to represent key behaviourally-relevant dimensions, including (but not limited to) whether a behaviour relates to acquisition, use or disposal of items, whether we expect the outcome of a behaviour to be expressed at the individual or household level, and the extent to which we might expect a behaviour to be driven by rational, reflective processes or automatic, habitual drivers. Further conceptual development is required to pave the way for more robust analyses of circular *behaviours*, as opposed to circular resource flows, in the future. Advancing typologies of circular behaviours could also help support development of behavioural CE indicators. Such social indicators could be used alongside key economic indicators such as private investment in circular business supporting recycling, repair, reuse and rental/leasing models and the value these add to economies (D'Adamo et al., 2024) to inform CE decision-making with a goal of creating systems that support fundamental changes in consumption patterns.

5.3 Developing integrated theoretical models to underpin design of interventions

Behaviour change interventions should be informed by theories appropriate to the types of behaviour targeted, the context and target population. Importantly, we should recognise the role of the dominant behavioural models implicitly shaping the framing of policy and practise about behaviour change. A narrow focus on knowledge deficits and motivational processes has resulted in an overreliance upon information-giving and persuasive communication in interventions, both within the CE field (Zibell et al., 2021) and in the wider pro-environmental behaviour literature (Whitmarsh et al.,

2021). A recent review of theoretical development within the PEB literature by Tian and Liu (2022) identifies theoretical integration as the next important step for PEB research. We argue that such integration, drawing on disciplines including psychology, sociology, geography, politics and economics, is likewise a necessity for behavioural research on consumption and the circular economy. Whilst this is no small endeavour, genuine efforts to develop truly interdisciplinary understandings of our everyday material consumption and waste are necessary if we are to move towards the vision of the circular society at the speed required to respond to the climate and biodiversity crises we currently face.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

KC: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing. AH: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing. JC: Writing – original draft, Writing – review & editing. AL-A: Writing – original draft, Writing – review & editing. TW: Conceptualization, Writing – original draft, Writing – review & editing. PS: Conceptualization, Writing – original draft, Writing – review & editing. GM: Writing – original draft, Writing – review & editing. SA: Writing – original draft, Writing – review & editing. FB: Writing – original draft, Writing – review & editing. TC: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing.

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