frontiers in Sustainability

TYPE Original Research
PUBLISHED 26 March 2026
DOI 10.3389/frsus.2026.1718473

OPEN ACCESS

EDITED BY
Nikos Kalogeras,
Zuyd University, Netherlands

REVIEWED BY
Arockia E. J. Ferdin,
National University of Malaysia, Malaysia
Daria Wijler,
Zuyd University, Netherlands

*CORRESPONDENCE
Jessika Luth Richter
jessika.richter@iiiee.lu.se

RECEIVED 06 October 2025
REVISED 05 February 2026
ACCEPTED 27 February 2026
PUBLISHED 26 March 2026

CITATION
Svensson-Hoglund S, Sirgy MJ, Russell JD, Little VJ, Richter JL, Webb D, Ekici A, Gallego-Schmid A, Milios L, Grousset R, Yu GB, Novich L and Wooliscroft B (2026) Circular economy behaviors and well being: identifying the conditions that matter most. *Front. Sustain.* 7:1718473. doi: 10.3389/frsus.2026.1718473

Circular economy behaviors and well being: identifying the conditions that matter most

Sahra Svensson-Hoglund[1], M. Joseph Sirgy[2], Jennifer D. Russell[1], Vicki J. Little[3], Jessika Luth Richter[4]*, Dave Webb[5,6], Ahmet Ekici[7], Alejandro Gallego-Schmid[8], Leonidas Milios[9], Rich Grousset[10], Grace B. Yu[11], Laura Novich[12] and Ben Wooliscroft[13]

[1]Department of Sustainable Biomaterials, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States, [2]Pamplin College of Business, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States, [3]The Business School, RMIT University, Ho Chi Minh City, Vietnam, [4]IIIEE, Lund University, Lund, Sweden, [5]UWA Business School, University of Western Australia, Perth, WA, Australia, [6]Sunway Business School, Sunway University, Sunway City, Selangor, Malaysia, [7]Faculty of Business Administration, Bilkent University, Ankara, Türkiye, [8]Tyndall Centre for Climate Change Research (Manchester), School of Engineering, University of Manchester, Manchester, United Kingdom, [9]UNESCO Chair in Life Cycle and Climate Change ESCI-UPF, Barcelona, Spain, [10]ReuseAbility, New York, NY, United States, [11]Department of Business Administration, Duksung Women's University, Dobong-Gu, Seoul, Republic of Korea, [12]Hyloh, New York, NY, United States, [13]Faculty of Business, Economics and Law at Auckland University of Technology, Auckland Central, Auckland, New Zealand

Circular economy (CE) behaviors, such as reuse, repair, and sharing, are crucial to sustainable consumption; however, how and when such behaviors influence product users or consumers' personal well being remain underexplored. Specifically, limited insights exist regarding how engagement may foster feelings of enjoyment, a sense of mastery, or social belonging, as well as the contextual conditions under which these outcomes are most likely to emerge. This paper introduces the "Key Aspects of CE Behaviors for Product User Well Being" Framework, which identifies 13 high-level conditions of CE behavior engagements that shape product user well being outcomes. Drawing on interdisciplinary literature and validated through a Delphi study with experts in CE, sufficiency, and consumer well being, the Framework presents a comprehensive theorization of product user well being (PUWB) within the CE context. The Framework serves as an analytical tool for academics and consultants to examine actor influences, while also empowering stakeholders and decision-makers (e.g., businesses, policymakers, and product users) to identify and optimize levers within their respective spheres of influence. Emphasizing integrated application and actor coordination, the Framework provides actionable guidance for fostering supportive social, policy, and infrastructure environments that promote well being. Thus, the Framework lays foundational groundwork for designing people-centered CE strategies that advance both environmental sustainability and quality of life.

KEYWORDS
circular behaviors, circular economy, happiness, sustainable consumption, well being, circular consumption

1 Introduction

The notion of the Circular Economy (CE) offers both a paradigm for sustainable development and an organizing logic for redesigning provisioning systems to keep materials in use for as long as possible (e.g., Geissdoerfer et al., 2017; Kirchherr et al., 2023). Closely aligned with broader models of sustainable consumption (e.g., Jackson, 2014; Spaargaren, 2020), the CE reframes individuals not as passive consumers but as product users who actively engage in resource conservation practices, such as reuse, repair, refurbishment, sharing, and redistribution (e.g., Macklin and Kaufman, 2023). To achieve widespread adoption, however, these CE behaviors must offer well being benefits that meet or exceed those of linear consumption. In this paper, we define *Product User Well Being* (PUWB) as the multidimensional experience of individual and collective benefits, challenges, and values that arise from engaging in CE behaviors, spanning momentary emotional responses to long-term developmental outcomes. See Section 2.2 for more details.

The conditions, tensions, and trade-offs that are salient to PUWB are not well understood. For example, a recent literature review on CE behavior identified a range of elements salient to well being, including activities (e.g., reduce and repurpose) and conditions (e.g., monetary and non-monetary costs and community interactions; Svensson-Hoglund et al., 2025a). However, the impact of these CE-related behaviors on PUWB was not explicitly addressed. This paper addresses that gap by introducing a new framework that identifies the key conditions under which CE behaviors, including sufficiency-oriented practices, can support and sustain individuals' well being in their role as product users of durable consumer products (e.g., clothing, electronics, and appliances). Unlike existing frameworks, focused on generic life domains in a CE (e.g., housing or work; e.g., Clube and Tennant, 2023), the KA-PUWB Framework captures product user experiences specific to product- and behavior-level CE engagement, and integrates individual and contextual dimensions (e.g., effort, skill, and social norms) often excluded from sustainability assessments. Also, the KA-PUWB Framework is transparently grounded in established theories in well being and consumption research and verified by experts in this area, unlike previous frameworks of circular consumption and well being (e.g., Petreca et al., 2025).

1.1 The need for compelling CE narratives and implementation

While CE behaviors are desirable and essential, enacting them may not be advantageous to individuals. Compared with conventional consumption, CE behaviors can be more time-consuming, effortful, and cognitively demanding. Therefore, scaling requires both individual willingness and structural shifts in social norms, material infrastructures, and economic systems (Boström, 2021; Callmer and Boström, 2024; Colley et al., 2024; Matschoss et al., 2025; Samson and Freudendal-Pedersen, 2022). The need for systems transformation is broadly recognized; however, the question is how to proceed with this transition in light of modest public engagement and political commitment (Lage, 2022; Mont et al., 2022). Increased public engagement requires a narrative that frames CE behaviors as pathways to enhanced individual and collective well being rather than sacrifice or constraint (Borrello et al., 2022; Di Giulio et al., 2023). This perspective aligns with the "double dividend" concept, in which sustainable practices simultaneously support environmental objectives and improve quality of life (Jackson, 2008), such as in zero-waste communities, slow fashion, and household recycling (Bai et al., 2021; Liu et al., 2022; Zhan, 2022). This falls under efforts to

> "establish a recoupling between resource flow and human well being to enable consumers to be active agents of change in new cultures of CE consumption." (Jewitt et al., 2025, p. 2)

However, while the repositioning of more sustainable living as a source of immediate well being, rather than deferred satisfaction or moral obligation, may help reduce inertia and resistance (Jackson, 2005; Petreca et al., 2025; Shiota et al., 2021; Spangenberg, 2011), such outcomes remain underexamined in CE scholarship (Svensson-Hoglund et al., 2025a).

1.2 Gaps in guidance on well being outcomes

For a CE to foster a high quality of life, it must offer value beyond economic benefits, such as affordability (e.g., Verma et al., 2025). Existing evaluative frameworks for CE transitions have considered broad life domains, such as shelter, food, education, and social relationships (Clube and Tennant, 2020, 2023; Di Giulio et al., 2023; Guillen-Royo, 2007). However, they tend to overlook the full spectrum of well being outcomes that product users may experience through everyday engagement with CE behaviors, ranging from momentary emotional gratification (e.g., pride or joy) to enduring senses of satisfaction and purpose (Bardey et al., 2022; Vollebregt et al., 2024). Thus, a holistic view of well being in the context of CE behavior is needed (Petreca et al., 2025; Svensson-Hoglund et al., 2025a). Another gap includes limited attention to the diversity of CE behaviors (e.g., repurposing an item vs. purchasing one secondhand), the benefits they confer (e.g., saving money, social interaction, and creative expression), and the contextual conditions that shape product user experiences (e.g., physical effort, time and monetary costs, and prevailing social norms; Svensson-Hoglund et al., 2025a). Petreca et al. (2025) proposed a framework for circular fashion of consolidated well being concepts, such as "community," "playfulness," and "self-worth." While their framework offers valuable practical insights for the design of well being-enhancing consumer experiences with textile products, as demonstrated by Jewitt et al. (2025), it lacks clear connections to established well being theories used in consumption research (see Section 2; Lee and Sirgy, 2025; Svensson-Hoglund et al., 2025a).

Multiple actors drive CE initiatives, including policymakers introducing "right to repair" legislation (Svensson-Hoglund et al., 2021), firms reconfiguring business models around durable, high-quality products (Beyeler and Jaeger-Erben, 2022), and local

organizations, both formal and informal, organizing clothing swaps and peer-to-peer sharing (Camacho-Otero et al., 2020; Ho and Yanagisawa, 2023). Individuals likewise integrate CE behaviors into their everyday life, for instance, by reducing purchases of new products (Bly et al., 2015; Rabiu and Jaeger-Erben, 2022). These actors require robust guidance on how to design and support CE behaviors that effectively enhance PUWB.

The goal of this paper is to identify the key conditions or aspects of CE behaviors that shape product users' well being outcomes to support a better understanding of how to optimize both individual and system outcomes. To this end, we introduce a new framework—the Key Aspects of CE Behaviors for Product User Well being (KA-PUWB) Framework. The KA-PUWB Framework is developed through the synthesis of interdisciplinary literature, followed by validation and refinement through a sequential, interdisciplinary Delphi study comprising two expert panels: one focused on consumer well being and the other on CE and sufficiency. The resulting Framework provides a conceptual tool for guiding decisions on how to make CE behaviors well being-enhancing, thereby supporting the necessary CE transition.

We begin by reviewing the literature relating to well being and CE behavior contexts, highlighting the need for a holistic, evaluative approach to well being. Next, we present the core concepts regarding how engagement in CE behaviors results in well being outcomes (Section 2), which inform the development of the KA-PUWB Framework. We then describe the Delphi study used to validate and refine the Framework across interdisciplinary expert groups (Section 3). The final Framework is presented (Section 4), followed by an outline of the Delphi feedback (Section 5). Finally, we discuss how the resulting Framework can support decision-makers in the CE transition, such as product developers, service providers, and policymakers.

Notably, the original KA-PUWB Framework—as refined by the Delphi study participants—was considered too complex for manageability. As such, a simplified framework was developed for the purpose of publication (Section 4). The detailed framework is available in Supplementary File B.

2 From CE behavior to well being: the core concepts

This section introduces foundational concepts and definitions: Product User, Well Being, Product User Well Being, and CE Behaviors. It explains the value of attending to PUWB in CE contexts, thus setting the stage for the development of the KA-PUWB Framework.

In the marketing literature, product user well being (PUWB) is considered alongside consumer well being (Lee and Sirgy, 2012, 2025). Consumer well being encompasses multiple domains, including values (Bhardwaj and Kalro, 2024), financial and psychological factors (Dahiya et al., 2024), and concepts and measurements (Lee and Sirgy, 2012; Sirgy, 2021a). However, insights on impactful conditions are scattered (e.g., Grzeskowiak et al., 2014)—making it challenging to formulate holistic guidance. Moreover, there is little focus on CE behaviors in particular.

To understand the relationship between CE behaviors and PUWB outcomes, it is helpful to distinguish between four elements: (1) *inputs* in the form of conditions, both external or contextual (e.g., the travel distance to a provider or reigning social norms) and internal to the individual (e.g., skills and preferences); (2) *outputs* in the form of immediately experienced frictions (e.g., financial cost or annoyance) and rewards (e.g., saved time or enjoyment) pertaining to specific areas of the experience of CE behaviors (e.g., moral and social); (3) *(sub-) outcomes* (e.g., positive affective outcomes in the work life domain or negative developmental outcomes in the social life domain); and (4) *comprehensive outcomes* in terms of the product user's overall well being outcome. These core concepts are illustrated in Figure 1 and explained below.

Importantly, the goal of this paper, namely, to identify the key aspects of CE behaviors that shape PUWB outcomes, concerns these inputs (see Figure 1).

2.1 The inputs (what goes in) and outputs (what immediately comes out)

"Inputs," referring to the conditions that make up the product user's experience of CE behaviors, are located in the external environment of the product user (i.e., the Micro Systems Level of the larger CE systems; Svensson-Hoglund et al., 2025b; see Figure 2).

The Micro level of CE systems can be contrasted with the more distal meso and macro levels, which are outside of the product user's direct experience (e.g., Svensson-Hoglund et al., 2025b). Salient components of the Micro level have been found to consist of: the Product (e.g., its design, condition, and brand); Product Upkeep (e.g., repair services or Do-it-yourself); Outer Capabilities (e.g., tools, spare parts, information, and transportation options), and Social Norms (i.e., what society values; Svensson-Hoglund et al., under publication[1]; see Figure 2).

Inputs (see Figure 1) are also located at the Individual Systems Level (Figure 2; i.e., made up of components internal to the individual), namely "values, preferences and motivation" (e.g., degree of environmental consciousness and materialistic mindset) and "inner capabilities" (i.e., the user's own skills and knowledge, e.g., knowing how to repair a broken bike or assess the condition of a reused bag for sale). These internal components are derived from the external context; inner capabilities (i.e., knowledge and skills) come from available resources for learning while collective social norms and values form the individual's own values, motivation, and preferences (Svensson-Hoglund et al., under publication see text footnote 1; Figure 2).

As to "outputs" (Figure 1), the product user's experience of CE behaviors, including of the system components (i.e., inputs; Figure 2), has been conceptualized as consisting of eight areas, or domains (Svensson-Hoglund et al., under publication, see text footnote 1). Various frictions and rewards are involved in each area.

1 Svensson-Hoglund, S., Sirgy, M., Joseph, Russell, J. D., Little, V., Ganglamair-Wooliscroft, A., et al. (under publication). *Capturing Product User's Experience of Circular Economy Behavior Engagement: Using an Interdisciplinary Delphi Survey*.

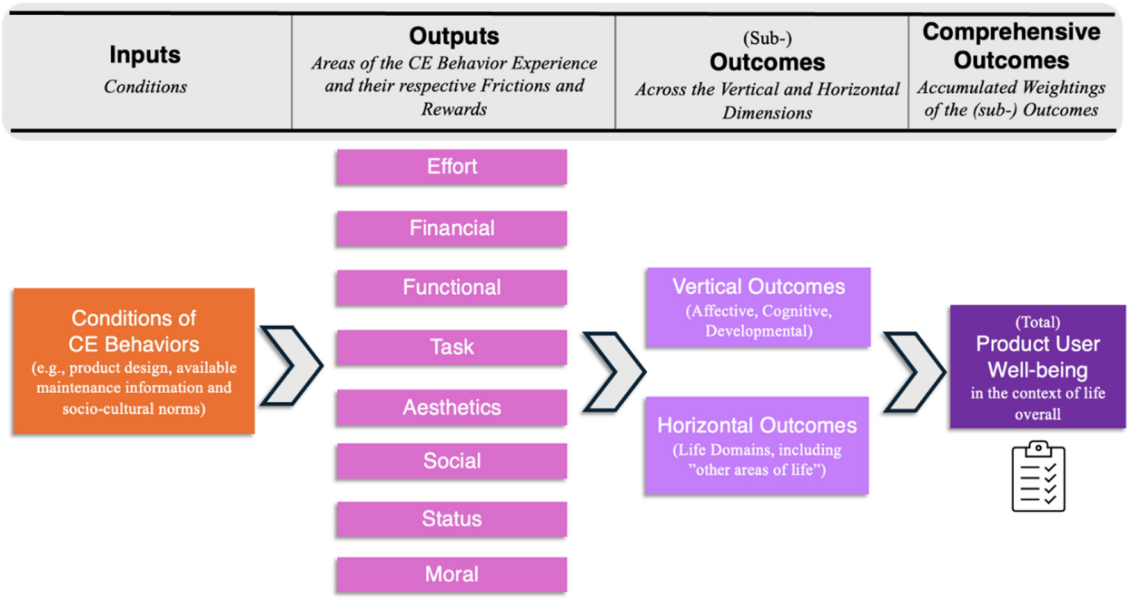

FIGURE 1
The relationship between CE behaviors and product user well-being (PUWB) by inputs, outputs, (sub-) outcomes, and comprehensive outcomes (adapted from Lee and Sirgy, 2025; Holbrook and Hirschman, 1982; Svensson-Hoglund et al., 2025a; Sirgy, 2020).

Effort consists of cognitive and behavioral exertion, as well as the amount of time required to engage in a CE Behavior (e.g., searching for a product or provider; Hobson et al., 2021; Macklin and Kaufman, 2023). *Financial* refers to monetary outputs and inputs that arise in CE Behaviors, such as the accessing of products (e.g., through rental or sharing), services (e.g., professional restoration), Do-it-yourself activities (e.g., purchasing spare parts and tools to conduct a repair), and transportation (e.g., pickup or visit by a provider). Financial inputs may arise from renting out one's product or reselling it at the end-of-use (e.g., peer-to-peer reuse). Notably, engaging in a CE behavior entails a trade-off between monetary and non-monetary expenses (i.e., doing the work oneself vs. hiring someone else). It is well known that the comparatively high transaction costs associated with sustainable consumption, compared to traditional linear consumption, present a barrier to consumer well being (Da Silva Zanão et al., 2023). The *Functional* area of CE behaviors focuses on product functionality (i.e., the extent to which the product performs as intended) and safety. *Task* concerns immersion into task performance, such as a repair (Wolf and McQuitty, 2011) or repurposing (Bly et al., 2015). *Aesthetics* involves sensory inputs and hygiene, such as the smell in a thrift store (De Groot, 2021). The *Social* area concerns opportunities to socialize, such as in a voluntary simplicity community (Zhan, 2022) or a repair community (van der Velden, 2021). (Social) *Status* among peers concerns social images derived from the CE behavior engagement. Salient factors may consist of the product make, model, and condition, as well as activities, such as how one's leisure time is spent, both of which may be subject to conversations and social feedback (Wieser and Tröger, 2018), depending on reigning social norms. Lastly, the *Moral* area concerns the perception of right or wrong with respect to the CE behaviors (e.g., Binder et al., 2020; Figure 2).

2.2 (Sub-) outcomes and comprehensive outcomes: product user well being

A wide range of well being concepts is used in sustainable consumption research, with non-established relations, creating the need for a comprehensive framework to advance the research (Svensson-Hoglund et al., 2025a). In Figure 1, we divide well being outcomes into *(sub)-outcomes* vs. *comprehensive outcomes* (i.e., holistic product user well being, considering the individual's life beyond consumption). Below, we introduce each.

(Sub-) outcomes are horizontal and vertical (Figure 3).

As to vertical outcomes (Figure 3), the framework distinguishes between three levels: *affective* (i.e., momentary pleasure or pain), *cognitive* (i.e., more enduring satisfaction or dissatisfaction), and *developmental* (i.e., long-term engagement and growth).

> Individuals' experience of an affective state concerns "being happy *in* [their] life" (i.e., affective). This is different from an individual's evaluative process of assessing one's circumstances and "being happy *with* [their] life" (i.e., cognitive; Sirgy, 2021b, p. 26). These are also distinct from individuals
>
> "... being happy *fulfilling* [their] life...," entailing continuous growth, learning, working toward a purpose, and reaching one's potential by
>
> "... becoming a fully functioning human being in a social context ...." (Sirgy, 2021b, p. 26; see also Ryan et al., 2013)

Accordingly, developmental well being relies on morality and, as such, differs from cognitive well being, which relies more on comparisons with peers (Sirgy, 1998, 2021a,b).

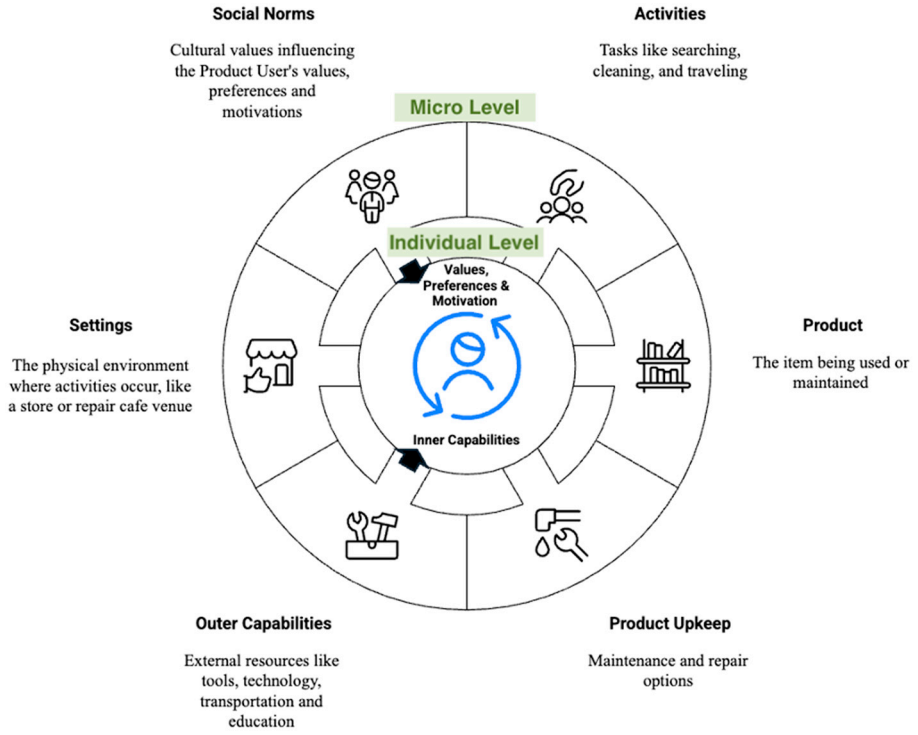

FIGURE 2
The "Inputs" (Figure 1) are components at the micro (i.e., contextual) and individual (i.e., internal to the individual) system level. "outer capabilities" (e.g., informational resources) form inner capabilities (e.g., knowledge), and "social norms and values" have a strong influence on the individual's "values, preferences, and motivation" (adapted from Svensson-Hoglund et al., under review[2]).

Horizontally (Figure 3), CE behaviors affect various life domains, including material, leisure, and social domains, as well as the overlapping experiential areas (e.g., status and moral; Section 2.1). Some life domains will benefit from the CE behavior (e.g., the acquisition of a refurbished bike can support the leisure domain). Across both axes (Figure 3), this is referred to as CE behaviors' *direct effects* on well being outcomes (e.g., satisfying the developmental need for belonging in a community repair event). The engagement can cause dissatisfaction in other life domains (El Hedhli et al., 2013; Sirgy et al., 2020), primarily through *indirect effects,* referring to how CE behaviors deplete finite resources (i.e., the product user's money, time, and effort) and give rise to opportunity costs (e.g., the money spent on a reused bag means that other financial pursuits are forfeited), implicating both axes (Figure 3).

As such, PUWB requires a balance between engagement in consumption activities and aspects of life outside of such activities (Ekici et al., 2018; Sirgy et al., 2020). The importance of balance is evident in how materialistic consumers (i.e., those primarily concerned with material aspects of life) often experience lower levels of well being (Dittmar et al., 2014). However, not all forms of materialism are disadvantageous. Valuing material possessions as a sign of success (i.e., success-oriented materialism) may increase life satisfaction by motivating progress and future (material) contentment, whereas equating the possession of material goods with happiness (i.e., happiness-oriented) can undermine satisfaction across all aspects of life (Sirgy et al., 2021). To this end, "instrumental materialism," in which products are seen as a means to an end (e.g., experiencing satisfaction with the product's functionality and using a bike as a means of transportation), is more favorable compared to "terminal materialism," in which product ownership and use are seen as the end goal (e.g., display an expensive watch for social status; Csikszentmihalyi and Rochberg-Halton, 1981, p. 230ff; Tay et al., 2017).

Well being outcomes from CE behavior engagement vary in terms of "significance", determined by the outcomes' scope and importance. Scope (i.e., breadth or quantity) of the well being outcome concerns the number of levels on the vertical axis (e.g., affect and developmental well being), as well as the number of life domains and/or experiential areas impacted (Figure 3). Importance, on the other hand, refers to the criticality or quality of the outcome, determined by individuals' subjective preferences (measured through, e.g., customer surveys) or by using insights from well being research (i.e., objective; Svensson-Hoglund et al., under review, see text footnote 2). For instance, participating in a bartering event may yield higher-significance outcomes if it enhances both affective well being (through enjoyment and social connection) and developmental well being (through acquiring skills) while positively influencing the social and material domains of life. On the other hand, the occasional donation of

2 Svensson-Hoglund, S., Sirgy, M. J., Little, V., Ganglamair-Wooliscroft, A., Ekici, A., Webb, D., et al. (under review). *Comprehensive "Product User" Well-being in Sustainable Consumption: Using a Delphi Survey*.

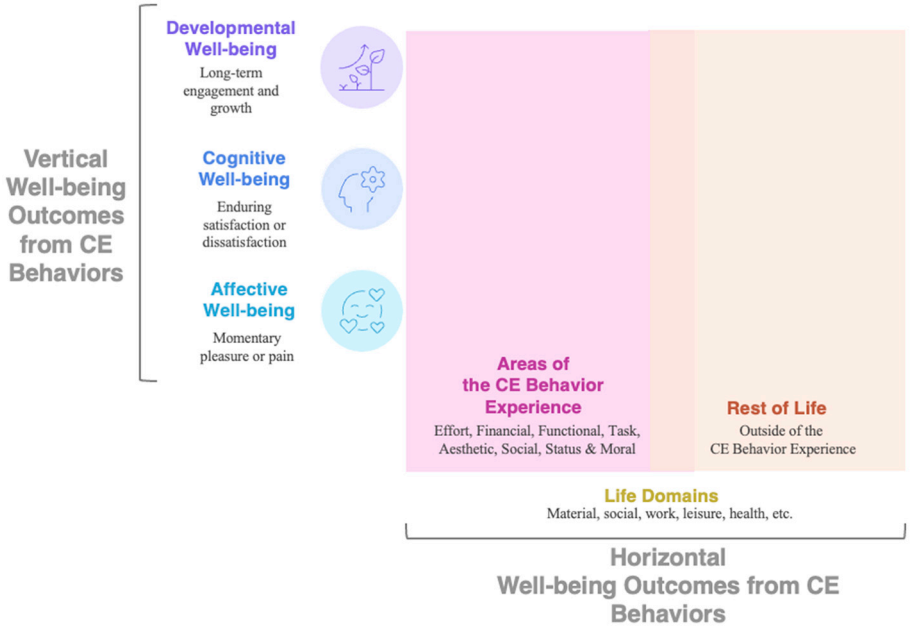

FIGURE 3
Vertical and horizontal well being outcomes from CE behavior engagement (adapted from the comprehensive product user well being (C-PUWB) framework from Svensson-Hoglund et al., under review, see text footnote 2).

used clothing to a local collection bin may represent a lower-significance well being outcome. Its scope is narrow, as it typically influences only the material life domain (i.e., contributes to decluttering and/or satisfaction from acting responsibly), nor is the donation likely to engage multiple well being levels (e.g., affective and developmental; Figure 3). Similarly, its importance is presumably low; while the activities may briefly evoke a sense of relief from cluttering or a feeling of doing good, it generally holds limited personal meaning or long-term impact on an individual's overall well being. Nevertheless, the importance of these outcomes varies depending on the life priorities of the individual.

Following this two-dimensional logic (Figure 3), three features of PUWB optimization was discerned: (1) prioritizing CE behaviors with *higher-impact* (i.e., significance), both vertically and horizontally; (2) fostering vertical *richness*, referring to positive outcomes at all (vertical) well being levels; and (3) achieving horizontal *balance*, referring to positive outcomes across the horizontal axis (Svensson-Hoglund et al., under review, see text footnote 2)[3]; (see Figure 4).

2.3 Product user well being and (sustainable) consumption

In terms of *affective well being*, the literature on consumption in general shows that it can be "fun" in terms of, e.g., the adventure, value, and socialization it entails (Arnold and Reynolds, 2003). Both the process of consumption and the product itself can elicit a wide range of emotions, including arousal, surprise, and disgust (Rick et al., 2014; Westbrook, 1987). While CE behaviors, such as repurposing, can be pleasurable (Bly et al., 2015), the demands on effort, time, and overall reduced convenience may make the engagement unpleasurable (Ganglmair-Wooliscroft and Wooliscroft, 2019).

In terms of *cognitive well being*, the findings are mixed with regard to which consumption pattern generates the highest levels of life satisfaction (Veenhoven et al., 2021; see also Ganglmair-Wooliscroft and Wooliscroft, 2019; Welsch and Kühling, 2010). What can be said with certitude is that cognitive well being is based on the individual's evaluation of the current state against subjective and objective standards—so-called "reference points" (Sirgy, 1998)—derived from media and peer groups, which can drive materialism and may counter satisfaction from sustainable consumption practices (Gu et al., 2020; Kilbourne and Pickett, 2008).

As to *developmental well being* (i.e., psychological functioning; Deci and Ryan, 2008; Sirgy, 2020, p. 99), CE behaviors, such as recycling, can give rise to a positive self-image, or identity (e.g., as a "Do-it-yourself" person), if conducted voluntarily (Bai et al., 2021; Binder et al., 2020; Brown and Kasser, 2005). Sharing and bartering communities (e.g., reduce and zero waste), and DIY efforts, such as repair, are associated with socialization and affiliation (Collier and Wayment, 2018; Guillen-Royo, 2019; Kasser, 2017; Tsurumi et al., 2021). A sense of empowerment can arise from meeting one's needs outside the formal market, such as through bartering, reusing, and borrowing from friends and family (McGouran and Prothero, 2016). To this end, repairing a bike offers more opportunity for mastery than simply buying a replacement product (Kasser, 2017). This aligns with individuals' need for "participation" in their consumption experience rather than simply being "served"

3 The method used to develop the vertical and horizontal concepts of PUWB, including the validation through a Delphi study, can be found in the Supplementary File, Section A.

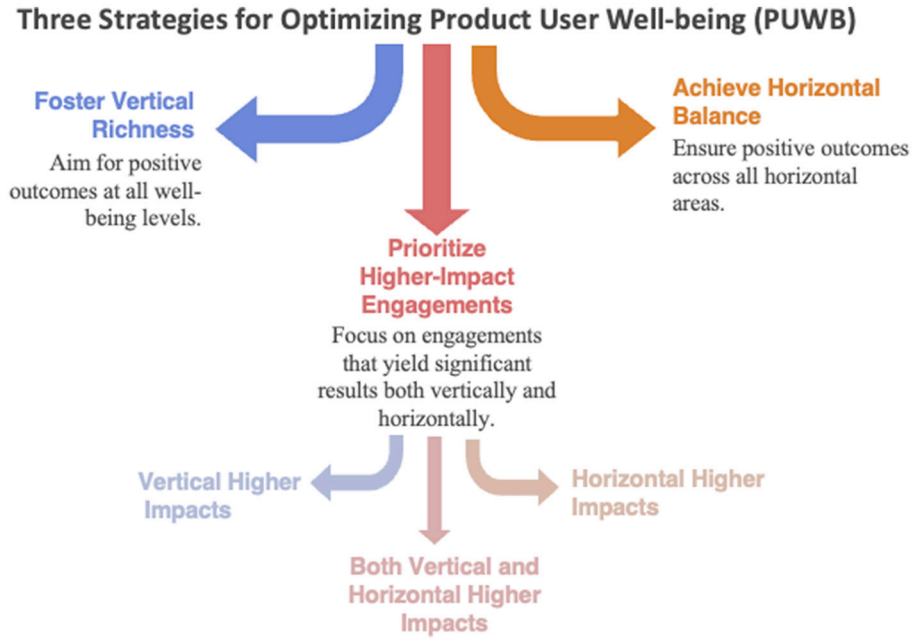

FIGURE 4
The three product user well being (PUWB) optimization strategies.

(Briceno and Stagl, 2006; Ehrenfeld, 2001). Moreover, compared to following fast-moving fashion trends, reusing, and repurposing clothing opens up for more enduring self-expression and creativity (Bardey et al., 2022; Bly et al., 2015). Consumption behaviors aligned with one's values are beneficial because the individual feels that they are contributing to the kind of world they want, such as environmentally sustainable (Taufik et al., 2016; Tosun and Sezgin, 2021; Zhan, 2022).

In terms of horizontal outcomes (Figure 3), CE behaviors can impact a range of life domains and experiential areas, such as the social life domain through bartering (Tsurumi et al., 2021), the status area through pride from second-hand luxury consumption (Khochman and Batat, 2022) or shame from holding on to older product models (Wieser and Tröger, 2018). Also, CE behaviors can take away resources from other life domains by being laborious (Bai et al., 2021; Hobson et al., 2021), or perhaps save time, effort and money (Collier and Wayment, 2018; Guillen-Royo, 2019; Tosun and Sezgin, 2021), depending on the context, such as the availability of repair tools and spare parts (Nazli, 2021).

These varying well being outcomes from CE behaviors need to be considered comprehensively (Svensson-Hoglund et al., under review, see text footnote 2).

3 Method

This section describes the multi-stage Delphi method used to develop and refine the KA-PUWB Framework. It details the iterative development of the framework, expert panel compositions, survey design, and analysis, including validation feedback.

The KA-PUWB Framework was developed in two stages and 5 steps (see Figure 5).

In Stage 1 (Figure 5), the initial KA-PUWB Framework was developed, based on the literature (Section 2) and the main authors' assessments (see Section 3.1). In Stage 2 (Figure 5), the initial Framework was tested through a two-panel Delphi study, and modified accordingly (Section 3.2). The resulting complete Framework can be found in Supplementary File B, Section A. Next, to render the complex Framework more accessible, it was simplified by the main authors (see Section 4 for the result). Initial rounds of the Delphi process were anonymous to preserve methodological integrity. Following the conclusion of the study, participants were invited to co-author the manuscript, consistent with participatory research ethics.

3.1 Developing the initial framework

The initial KA-PUWB Framework (Stage 1; Figure 5) was developed in four steps, with the optimal goal of capturing the conditions of CE behaviors that are most impactful for product well being. This effectively entailed an operationalization of the C-PUWB Framework (see Figure 3).

In Step 1 (Figure 5), the vertical and horizontal well being constructs in Figure 3 were defined. These constructs can, depending on theories and schools of thought within the field of quality-of-life studies, take different forms. To operationalize *affective well being*, we equated the CE behavior experience areas' (Figure 2) frictions with pains (i.e., negative emotions) and rewards with pleasures (i.e., positive emotions). Next, *cognitive well being* was defined as centered on comparisons between expectations and standards vs. the actual state. Dissatisfaction results from a disadvantageous comparison, and satisfaction occurs when there is alignment between actual vs. expected states (Schiebler et al., 2025). Lastly, *developmental well being* was defined as positive

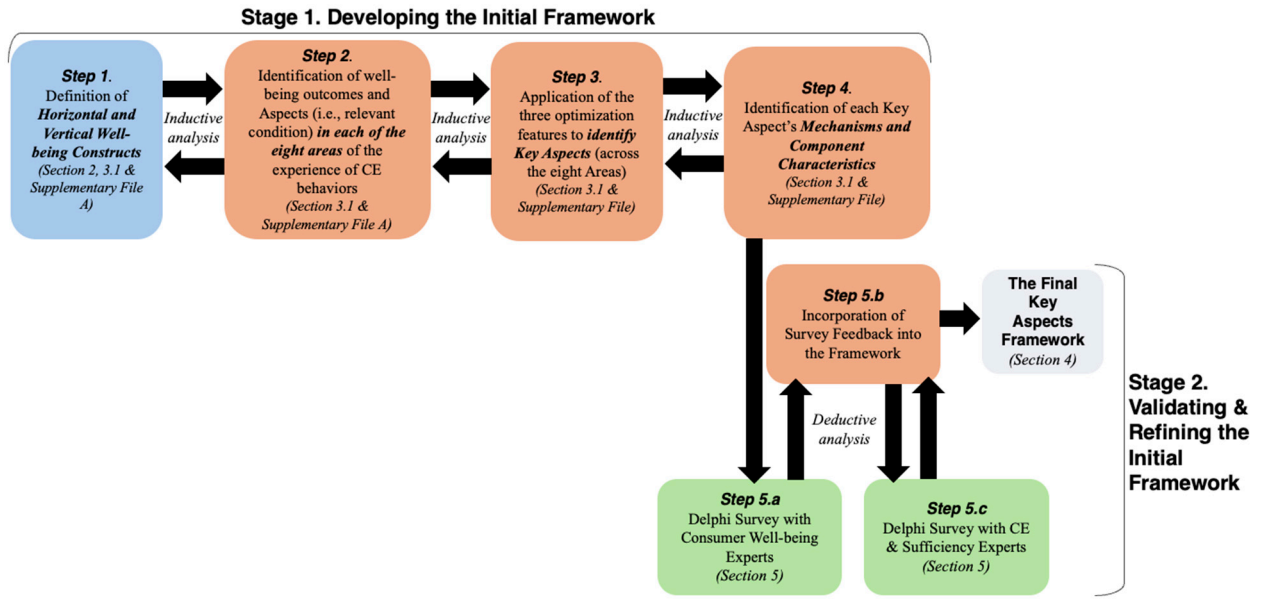

FIGURE 5
The two stages of this research process (adapted from Prinzing, 2021; Gbededo and Liyanage, 2020). Blue indicates data gathering from the literature, orange analysis, and green empirical data gathering and validation.

psychological traits, such as self-acceptance (i.e., feeling good about oneself), positive relations with others (i.e., quality social relationship to others and enjoying, and being, a resource for one's community), autonomy (i.e., decision-power), environmental mastery (i.e., feeling capable), purpose in life (i.e., pursuing meaning in life), and personal growth (i.e., experiencing persistent personal development; adapted from Abbott et al., 2010; Huppert and So, 2013; Ryff, 1989; Sirgy, 2019).

Next, horizontal well being constructs (Figure 3) was defined, in addition to the eight experience areas (Section 2.1), in terms of the following six *life domains*: material (e.g., standard of living); financial (e.g., financial ability); leisure (i.e., free time and hobbies); health (i.e., physical and mental state); work (i.e., paid and voluntary work); and social (i.e., family and friends, as well as community relations; adapted from Cummins, 1996; Cummins et al., 2003; Lee and Sirgy, 2012; Sirgy, 2020, p. 65ff).

In Step 2 (Figure 5), the well being constructs defined in Step 1 were applied to each of the eight areas of the experience of CE behaviors (e.g., functional and moral; see Section 2.1) to define the relevant vertical and horizontal outcomes in each area, such as the possibility of positive relations to others (i.e., developmental outcomes) in the social domain of the CE behavior experience (e.g., in a local sharing pool or bartering event). Here, we primarily used logical deduction (e.g., identifying the relevant developmental well being outcome, such as autonomy vs. personal growth, for each experiential domain), complemented by the literature (Section 2.3). Such logical mapping is commonplace in the development of interdisciplinary conceptual frameworks (Geiger et al., 2018). Also, as the KA-PUWB Framework was empirically tested in the Delphi surveys (see Section 3.2), the method corresponds with "conceptual engineering" (i.e., an iterative process of normative theorizing, empirical investigation, and conceptual revision), used in well being studies to articulate well being concepts for a novel, specific purpose (Prinzing, 2021). This approach enabled the reasoned extension of core well being definitions to contexts of CE behaviors, where the literature is scarce and scattered (see Sections 1 and 2), and these extensions were subsequently verified by experts (e.g., Gbededo and Liyanage, 2020). Nevertheless, the well being outcomes in each experience area (e.g., developmental outcomes in the moral area) would naturally vary depending on the specific circumstance and the individual in question.

For each of the identified well being outcomes, relevant CE behavior aspects, or conditions (i.e., for each well being outcome), were discerned. For guidance, the micro-level components (e.g., product, setting, and capabilities; Figure 2) were used. For example, social CE behaviors require settings, such as a café to host a repair or a venue to meet for bartering.

The exercise resulted in seven sets of CE behavior aspects—one for each CE behavior experience area (see Supplementary File A, Section C for these sets). The effort and financial areas were merged into a single set.

In Step 3 (Figure 5), the most important aspects (i.e., key aspects) across the seven sets of aspects from Step 2 were discerned, using the three PUWB optimization strategies: higher-impacts, richness, and balance (Figure 4). For example, higher-impacts outcomes were discerned based on the estimated significance (i.e., importance and scope; Section 2.2) of the well being outcomes. See the Higher-Impact Aspects in Supplementary File A, Section C.

In Step 4 (Figure 5), to contextualize and ground the key aspects identified in Step 3, we identified the mechanisms of the key aspects (i.e., the processes or underlying pathways through which these conditions come about). For example, Key Aspect #1 on accessibility of high-functioning products reflects two mechanisms: (a) the ability to acquire high-functioning products; and (b) the ability to keep products high-functioning. Each mechanism is, in turn, shaped by particular components (e.g., repair tools) and their characteristics (e.g., availability), which were also outlined.

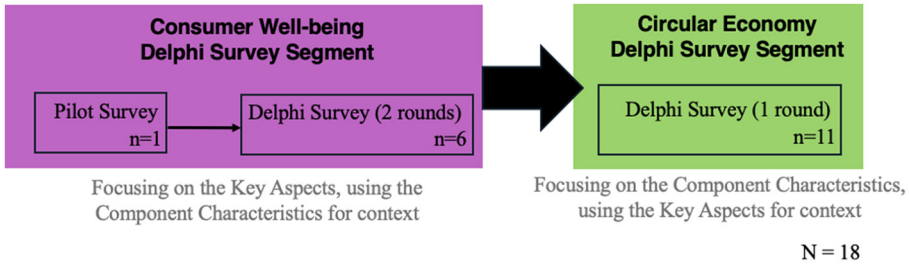

FIGURE 6
The Delphi study spanning two expert panels.

For more details on these steps, see Supplementary File A, Section B.

3.2 Validation and refinement of the framework (stage 2)

The KA-PUWB Framework was validated and refined in a Delphi study (Stage 2; Figure 5) that spanned two expert panels and survey segments (see Figure 6).

In the first segment, a total of seven consumer well being experts assessed the Framework (one pilot and one regular survey round), presented in video format. This group was asked to focus on the Key Aspects (i.e., Column 1, Table 1; Supplementary File B, Section A). The refined Framework was thereafter presented to 11 CE and Sufficiency experts who were asked to focus on the mechanisms and component characteristics (Column 2, Table 1; Supplementary File B; Figure 2).

The experts across the two groups were affiliated with academia, industry, non-profit organizations, and government. All consumer well being experts had academic affiliations (Figure 7).

The core task of the two expert panels was to provide critical feedback and commentary about the overall intuitiveness of the Framework and the level of detail. As such, the experts were asked to rate their level of agreement, provide general comments, and make tracked edits to the Framework in an editable table format. In addition, they were asked to share any insights prompted by the Framework and thoughts on its novelty and anticipated usefulness.

Acceptance rates were measured using a scale from 1 to 7, with "7" representing full agreement and "1" full disagreement. General and specific feedback from experts was coded and characterized into three categories: clarifications, corrections, or changes. Feedback was categorized as a *clarification* if it consisted of suggested alterations that would serve to *increase understanding* of the Framework's elements. Clarifications were incorporated into the Framework unless they added significant details, in which case the Delphi participants were asked to vote in the subsequent review round. Feedback was categorized as a *correction* if it consisted of suggested alterations that would serve to *address an omission or misrepresentation*. Corrections were always incorporated. Lastly, feedback was treated as a *change* if it involved suggestions to *alter the main idea* of the Framework. These changes, if suggested by more than 50% of participants, were automatically incorporated into the revised Framework. Changes suggested by more than 25% of participants were put to a Delphi vote in the subsequent round and were decided by a majority vote.

The participants were invited to co-author this manuscript, resulting in a manuscript-draft feedback mechanism resembling a process of "peer check" (Belk et al., 2013).

For more details on the Delphi study, including expert selection criteria, see Supplementary File A, Section D. For the survey documents used, see Supplementary File A, Section E.

In response to the Delphi participants' feedback (see Section 5), the KA-PUWB Framework was simplified (see Section 4). See Supplementary File B, Section A for the detailed version. The simplified version in Figure 10 was developed by the main authors after the Delphi study was finalized.

4 Results

This section presents the final KA-PUWB Framework and its components.

4.1 The logic behind the KA-PUWB framework

The KA-PUWB Framework serves as a design and evaluation tool for optimizing Product User Well being (PUWB) in CE behavior contexts. It defines PUWB optimization as achieving a "high" status across the 13 Key Aspects. Optimization depends on the deliberate design and alignment of the *Component Characteristics* (e.g., product affordability, availability, and maintainability; access to transport and tools; and prevailing social norms and values) that shape the *Mechanisms* through which CE behaviors occur. The mechanisms represent the actionable or functional facets that compose each Key Aspect (Figure 8).

4.2 The simplified KA-PUWB framework

The final number of key aspects, after synthesis, amounted to 13. The PUWB optimization strategy (Figure 4) that each emanated

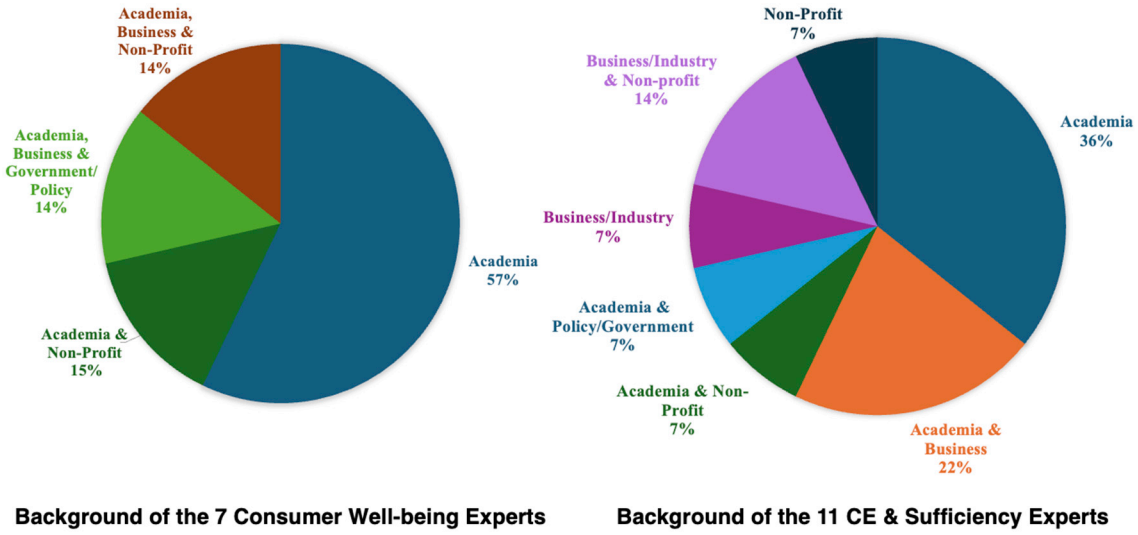

FIGURE 7
Expert panel compositions.

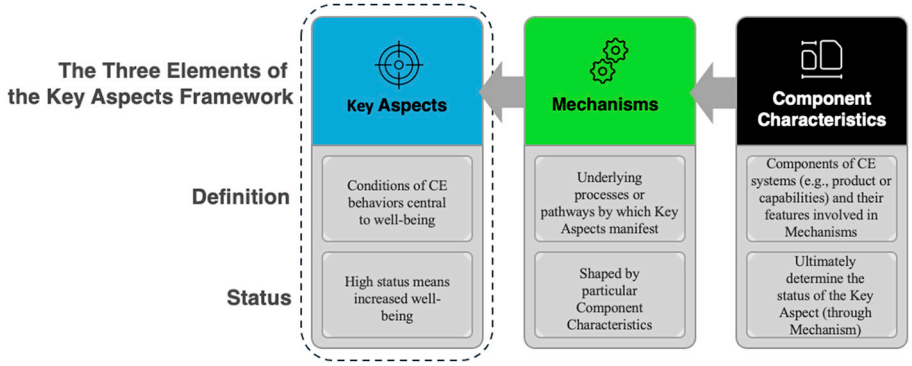

FIGURE 8
The three elements of the KA-PUWB framework.

from is illustrated in Figure 9, with their core focus, normatively expressed, outlined to the right.

The Simplified KA-PUWB Framework is captured in Figure 10, including the key aspects' respective mechanisms and examples of components characteristics.

For simplicity, the components in the Framework (Figure 10) are limited to the micro-level of CE systems (i.e., what the product user experiences directly; Figure 2). Naturally, the component characteristics (Figure 10) are structurally situated and influenced by a range of higher-level system actors and processes, such as various providers and policies. We discuss this further in Section 6.

While the three PUWB optimization strategies (Figure 4) and their respective Key Aspects (see Figures 9 and 10) can be conceptualized as distinct pathways for enhancing product user well being, each involves specific trade-offs and context-dependent adaptations. As such, comprehensive PUWB optimization necessitates their integrated implementation. The realization of all 13 Key Aspects requires systematic consideration of their interdependencies, including synergies and tensions (see Supplementary File B, Section A), and thus calls for strategic, evidence-informed prioritization of trade-offs rather than a checklist-based application. This orientation underscores the need for system-level strategies that address all relevant conditions concurrently, as selective or "cherry-picked" interventions may inadvertently compromise other aspects of well being; for example, emphasizing "Durability" (Key Aspect #1: access to high-functioning products) may conflict with "Affordability" (Key Aspect #4: accessibility of goods). Consequently, PUWB optimization requires rigorous trade-off analysis to balance interdependent CE and well being objectives, rather than relying on isolated design or policy levers (see Figure 1). We discuss this more in Section 6.

The KA-PUWB Framework positions PUWB as the primary performance metric in the design of CE products, services, organizational models, and policies, by explicitly linking component characteristics to the status of Key Aspects, each associated with particular well being outcomes (see Figure 10).

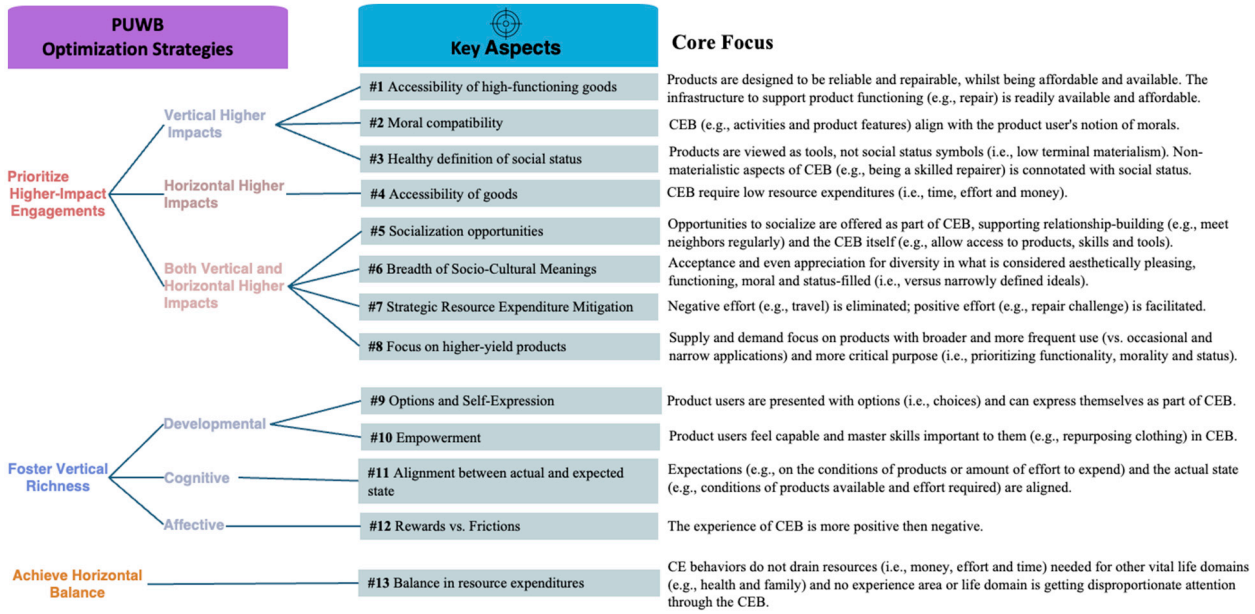

FIGURE 9
The 13 key aspects and their core focus. The PUWB optimization strategy they emanated from is illustrated to the left, and their core focus is to the right. CE behaviors are abbreviated "CEB".

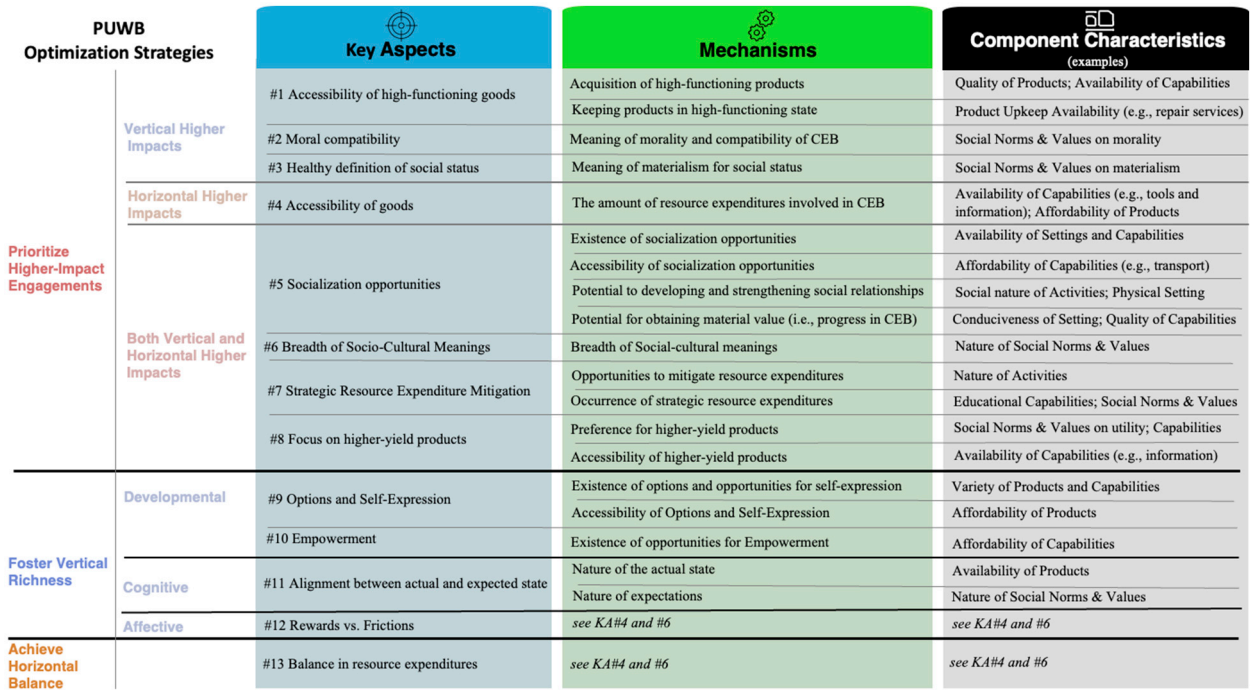

FIGURE 10
The simplified KA-PUWB framework (For the detailed framework, see Supplementary File B, Section A).

5 Main Delphi survey results and analysis

The 18 experts largely agreed on the accuracy and credibility of the Detailed KA-PUWB Framework (Supplementary File B, Table A); the average agreement was 86% across the two groups (Consumer Well being 92% and CE 83 %).

In this Section on the Delphi results, experts on consumer well being are referred to as "CWB" experts, and members of the CE

and Sufficiency group are denoted as "CE" experts. Key Aspects are abbreviated "KAs".

5.1 Framework corrections and clarifications

Three corrections were made to the Framework. These included expanding the definition of materialism to focus on the importance of wealth and the degree of terminal (i.e., end-goal) materialism (vs. instrumental; KA#3; Table 1). It was also noted that negative impacts from resource expenditures could be minimized, but not entirely eliminated. Lastly, more detailed capabilities were added under resource expenditures (KA#7). Clarifications consisted of, for example, changing "width" of meanings to "breadth" in KA#6.

See Supplementary File B, Section B, for full details on the corrections and clarifications implemented following the Delphi study findings.

5.2 Feedback on initial framework development process

As part of Survey Round 1, the consumer well being experts were given the option to review the process through which the KA-PUWB Framework had been developed (see Supplementary File, Section E). References were omitted from this document to reduce the cognitive load and test the intuitiveness of the Framework.

Of the seven CWB experts, six chose to include this document in their Framework evaluation. When asked if they agreed with the process employed, five agreed, while one found the outline unsatisfactory. This expert felt slightly uncomfortable with the lack of access to the underlying literature and definitions, especially materialism (which was changed; Section 5.1). This expert found that:

> "I have looked at the Supplementary material quite extensively, but I simply can't see where these things come from…."

However, the remaining five experts, who did feel satisfied after having reviewed the framework's development process, expressed sentiments such as:

> "I did review the Supplementary materials and found within these the clarification of definitional parameters most useful." (one CWB)

On the Framework's intuitiveness, one expert stated that:

> "As the framework is self-explanatory, I was interested in also seeing the process followed." (one CWB)

The Framework's intuitiveness is discussed below.

5.3 Insights, usefulness, and limitations of the framework

This section reflects on the value of the KA-PUWB Framework for research, policy, and business contexts, as identified by the Delphi study participants. It discusses its strengths, how it builds on and differs from existing CE and well being approaches, and addresses known limitations (e.g., complexity, academic bias, and scope). The experts' feedback outlined in this section is summarized in Table 1.

5.3.1 Insights and takeaways

Two CWB experts pointed out the intuitiveness of the Framework (i.e., how it was "obvious"). In contrast, one CWB expert found

> "that there are so many aspects that don't match with the existing literature and the model, therefore it is almost 'pseudo-scientific' to me." (one CWB)

For this expert, a major point of disagreement consisted of the definition of materialism, which was changed (Section 5.1). Another CWB expert found that

> "I think some key aspects are outlined really well, and its relationship with the PUWB is delineated really well."

One CWB expert and two CE experts commented on how the Framework captures the depth and complexity of the issue, including overlaps and interactions between, and within, the Key Aspects, Mechanisms, and Components Characteristics. In terms of its accuracy, a CE expert clarified that

> "more nuances [will] come out when it is actually applied, and then it is a question of whether it is missing something." (one CE)

We discuss this more in Section 6.

The Framework generated a range of insights in the consumer well being panel, including "the linkages" between the experience of CE behaviors and PUWB (one CWB) and the various variables involved in consumption affordability and accessibility, such as social costs (one CWB). The CE experts, on the other hand, reported insights related to, for example, the well being framing (Sections 2.1 and 2.2; three CEs). One CE expert shared that the Framework confirmed their suspicions regarding the oversimplification of prevailing assumptions regarding the relationship between CE behaviors and PUWB, saying that "money is a key indicator";

> "I always feel like that seems to miss a lot of the reasoning behind it." (one CE)

This speaks to the Framework's usefulness (Section 5.3.3).

5.3.2 Newness

The Framework was found novel by all participants (Table 1), sharing some properties with self-determination theory (one CE and one CWB). One expert also shared that

> "Since [the Key Aspects] are objectively formulated, they resemble some other objective evaluations of well being, however, the consideration of the synergistic interactions can be viewed as the novelty" (one CWB; see Supplementary File B, Table A)

The newness lies primarily in the combination of elements (two CE and one CWB) that leads to comprehensiveness. One CE expert shared that

> "it is a quite comprehensive overview of stuff that I otherwise need to look for in a range of different papers and disciplines" (one CE)

—speaking to the Framework's usefulness (Section 5.3.3). Perhaps due to this "patchwork" of elements, one CWB expert shared, upon deeper reflection, that

> "I'm not seeing something radical or particularly new".

In terms of comprehensiveness, one CE expert explained that while the logic of the Framework corresponds with the sustainable consumption research (e.g., how repairs rely on many factors),

> "I have never seen these organized, defined, and/or mapped so coherently. This really synthesizes and extends anything I've seen so far" (one CE)
>
> "These are very complex systems, and you deeply explore product user well being in a manner that is uncommon" (one CE)
>
> and not seen in organizational
>
> "matrices to determine how products/service design meets customer/user needs" (one CE expert)

Another CWB expert found that:

> "The richness (another word for complexity but more positively intended) of the [Framework] is very informative in understanding PUWB on another level. This model has the potential to make a significant contribution to knowledge." (one CWB)

5.3.3 Usefulness

Four CE experts highlighted how the Framework can enhance understanding of the inhibitors and drivers related to engagement with circular product offerings, as well as strategies to increase the uptake of circular products and services. The Framework can be used

> "to analyze CE system designs … to identify potential weaknesses and to improve the system designs." (one CE)

The same CE expert went on to say that the Framework could also be used for

> "digging into how different consumer segments (behavioral, demographic, etc.) interact differently with CE systems, depending on product and system elements, as well as their own skills and abilities. This may help develop CE systems meeting the needs of the different segments." (one CE)

To this end, a CE expert summarized that:

> "The categorization is valuable for mapping all key aspects and [component] characteristics of CE behaviors. It can be beneficial for theory building and for extracting specific knowledge segments for further operationalization. But as a whole, it appears to be overcomplicated to be used holistically."

This was later remedied by simplifying the Framework (see Figures 9 and 10).

Other experts saw a pathway toward applicability. While the entire Framework applies to academia,

> "specific segments [of the Framework] can be isolated for marketing/business modeling purposes, in the context of a CE." (one CE expert)

Another CE expert expressed that:

> "I think that this will be very useful; however, the actors that are affected by or who affect different Key Aspects and Mechanisms will be very different. Some parts of this will be instrumental to inform policymaking and design decisions (e.g., accessibility-related aspects and mechanisms). In contrast, others will be more personal to an individual in a decision-making moment (e.g., personal meaning and the role of individual values and perspectives, as well as socio-cultural)" (one CE)

Aligned, a third CE expert conveyed that

> "There is no doubt that this [Framework] is useful – but it will be useful in different ways, for different actors, in different contexts."

In response to six CE experts and one CWB expert pointing out that the Framework requires further demonstration of applicability [e.g., "Some guidance is needed to ensure the Framework is accessible and understandable (so it can be used!)"] (one CE), one CE expert proposed that:

> "the Framework can and should be modified to meet the needs and areas of influence of different stakeholder groups – e.g., which parts of the Framework are relevant just for policy-makers, vs. just for business decision-makers, vs. just for community-scale operators or small enterprises, vs. the individual who wants to engage in CE Behaviors. Not all parts of the Framework will be relevant to all actors at all times… so perhaps presentation/communication of the Framework can consider different target users" (one CE).

Notably, one CWB found that: "The usefulness of this model/table is not restricted to CE," but applies also to other economic models (two CWBs).

5.3.4 Limitations

Five CE experts and one CWB expert pointed to the high level of detail (e.g., "there is a lot going on"; one CE) and how the Framework is "too arid and complex for a general audience," such as policy and industry (one CE), and contains abstract language. Due to the amount of "jargon" being used in the Framework, it "feels very impenetrable and hard to understand," according to one CE expert. Another CE expert "found [that] the framework is not easy to understand" and that

> "As a 'product' the [Framework] lowers my well being!" (one CE)

To this end, a CWB expert conveyed that:

> "This is just trying to do too much." (one CWB)

The simplified KA-PUWB Framework (Figure 10) addresses this feedback.

On the contrary, others complained at the lack of further details; "Overall there's a real issue with the linear model in a systems world," and the Framework fails to capture how

> "repeat" engagement in CE behaviors entails "skills, search capacity, social aspects, etc. etc." (one CWB)

To this end,

> "Making this circularity and the feedback loops explicit would strengthen the mode." (same CWB)

Adding further complexity, a CE expert shared that:

> "I've grappled with whether the influence of 'place' is sufficiently captured here. Place is more than the loci of activity; it brings with it a set of complex interrelated factors that can influence behavior. You capture some elements around settings, social norms and 'outer capabilities'" (one CE).

One CE and one CWB expert noted how the Framework is too open for interpretation;

> "I can imagine everything fitting into this by own interpretation" (one CE)

and

> "Some of these boxes become so complicated that they are in danger of referring to everything and nothing" (one CWB)

In contradiction, another CE expert found such openness to be

> "necessary when there can be so many variables in the vast number of situations and circumstances." (one CE)

Thus, the flexibility was seen as a potential strength.

A CWB expert conveyed that "Measurement can be challenging," referring to the translation of the Framework (e.g., synergies) into survey format (one CWB), also brought up by a CE expert:

> "I think the limitations [of this Framework's usefulness] are the same as the limitations of the underlying disciplinary understanding of well being. It is complex and challenging to establish a clear cause-and-effect relationship or weigh the different factors. So, the factors [in the Framework] are good. However, we still do not understand which are more important than others." (one CE)

To this end, a CWB expert pointed out the lack of clarity regarding how the Key Aspects are "influenced by" component characteristics, saying that it can be "cumulative" or "use each bullet point as required." (one CWB)

The experts' feedback is summarized in Table 1.

TABLE 1 Summary of Delphi study feedback.

Feedback from Delphi study participants	Details on insights, usefulness and limitations of the CEB framework	No. mentions
Insights Section 5.3.1	Insightful (nuance, PUWB, CE behaviors, other)	14
	Not insightful	3
Newness/Novelty Section 5.3.2	Similarities to existing frameworks	3
	Novelty	10
Usefulness Section 5.3.3	Useful—general and specific purposes (increase understanding, theory-building, interpretation, designing CE initiatives, co-creative initiatives)	11
	Not useful (need validation, too abstract, too complex, causal ambiguity, operationalization, incommensurability with systems logics)	7
Limitations Section 5.3.4	Lack accounting for individual differences and preferences, lack of nuance	6
	Complexity and/or ambiguity and/or reductiveness	6
	Transparency and evidentiary support	1
	Critique of key aspects	4
	Critique of component characteristics	5

One CWB expert shared that

> "We still have not defined what product user wellbeing is – how are the three [PUWB optimization strategies] added/combined, etc., especially as this is supposed to be optimizing something …."

Addressing this point, we discuss the strategies that can be derived from the KA-PUWB Framework in the following section.

6 Discussion: applications for decision-making

The Framework is designed to serve two interconnected purposes, namely, to help CE decision-makers: (1) assess *current or future states* of CE initiatives (e.g., already implemented measures or future CE scenarios); and (2) design *new* CE initiatives. In this section, we discuss broader implications for applying the KA-PUWB Framework in real-world contexts. The Framework is delimited to the product user's direct experience and therefore does not offer explicit guidance on the particular higher, structural system-level actors and processes, such as service providers and policy mechanisms. Nevertheless, we demonstrate how the mechanisms and component characteristics of the key aspects can serve as a departure point for a more holistic system inquiry into their realization. To illustrate the Framework's practical utility, we focus this section on KA#7: *Strategic Mitigation of Resource Expenditures* (Figure 10). We discuss how KA#7 can guide the design of new CE initiatives (Section 6.1), the roles of stakeholders in achieving the key aspect (Section 6.2), and how PUWB optimization requires the joint consideration of all 13 key aspects (Section 6.3).

6.1 Key aspects implementation

The first out of two mechanism underlying KA#7 on strategic resource expenditures concerns the product user's actual resource expenditures involved in CE behaviors (e.g., the types of activities, the financial costs and knowledge required) and opportunities to mitigate said expenditures (Figure 10). Implicitly, KA#7 encourages decision-makers to identify and strategically reduce product users' monetary and non-monetary costs (i.e., resource expenditures) associated with a CE behavior, without indiscriminately eliminating all resource use. Such an application means that product user expenses that either *negatively affect well being or only indirectly facilitate* positive outcomes should be eliminated, to the extent possible. For instance, a city planning a clothes-repair festival may apply KA#7 by acknowledging that product users' spending of money and time traveling to the event is not intrinsically connected to the well being benefits derived from the event itself (e.g., socializing and increasing satisfaction with one's material well being); indeed, removing such expenses could potentially enhance the benefits, as well as making these benefits available to more people. This can be achieved by organizing several smaller, local events, rather than large one, which requires additional funding, volunteers, or staff, and multiple venues.

In contrast, there are resource expenditures in CE behaviors that *directly enable positive well being outcomes*, such as the time and effort invested into repairing the broken garment brough to the repair festival; the effort are integral to the immersive experience and subsequent positive well being outcome (e.g., enjoyment, satisfaction, and a sense of mastery; see Kasser, 2017; Collier and Wayment, 2018). Therefore, to optimize well being, these efforts should not be eliminated, but instead facilitated. For the festival organizers, this entails engaging the festival participants (i.e., product users) in the repairs, not having the volunteers do all the work (see Wackman and Knight, 2020). Facilitation of such an active repair engagement entails provision of the capabilities (e.g., information and tools) needed to get the repairs done; the organizers may ensure that repair stations are staffed with skilled volunteers ready to support the product user and supplied with sufficient equipment, such as a range of tools, thread colors, buttons, zippers, and scraps for mending. Also, to build knowledge

and skills, instructional pamphlets or courses on specific mending techniques may be provided as part of the festival.

At a policy-level, applicable especially to electronics, the facilitation of beneficial resource expenditures can take the form of "Right to Repair" legislation, not only supporting professional repairs but also guaranteeing easy access to high-quality tools, spare parts, and information for product users wanting to conduct repairs themselves (i.e., DIY repairs; Svensson-Hoglund et al., 2021). Also, the introduction of repair indexes that disclose product repairability and spare part availability at the point of purchase may reduce the effort required for product users to determine repairability (Rodríguez et al., 2024).

This categorization of product users' resource expenditures (i.e., as directly beneficial vs. negative/indirectly impactful) during engagement in CE behaviors, as prescribed by KA#7, offers valuable insights for all actors involved—especially those seeking to improve the experience. However, the capacity to either facilitate or eliminate particular expenditures varies across actors, depending on their roles, resources, and level of influence within the system, which we return to below.

The second mechanism behind KA#7 (Figure 10) refers to whether the implemented resource expenditure mitigation measures are indeed strategic (vs. the opportunities for strategic consideration, covered by the first mechanism). Given the Framework's delimitation to the direct experience of the product user, it considers, firstly, the product user's *knowledge* of which type of resource expenditures directly enable positive outcomes (i.e., should be engaged in and facilitated) vs. only indirectly or negatively (i.e., should be avoided). At the Micro-Individual level (Figure 2), this refers to outer capabilities (i.e., education) provided to product users on how CE behaviors impact their comprehensive quality of life (Figure 3; see also Figure 1) and the capacity of the product user to know what constitute well being enhancing choices, within the available choice framework. At higher system levels, this speaks to a wider societal awareness of what leads to well being and how to enhance it, extending to decision-makers.

Second, the second mechanisms behind KA#7 proposes that the degree of strategic resource expenditure mitigation (vs. unstrategic) is influenced by the product user's *values, preferences and motivation* regarding which expenditures to mitigate. At the Micro-Individual Level (Figure 2), this reflects the product user's degree of prioritization of comprehensive well being outcomes vs. other priorities, such as mere convenience aspirations or a preponderance for striving (i.e., imbalanced outcomes across the vertical and horizontal axes in Figure 3). The nature of the product user's priorities inevitably reflects prevailing collective social norms and values, perpetuated by higher system levels actors and institutions. To this end, beyond the Micro-Individual systems levels, aspirations for comprehensive personal well being can extend to policy goals, business missions, and even the purpose of the economic system, rather than a strict focus on economic growth (see Verma et al., 2025).

In summary, the second mechanism underlying KA#7—namely, whether efforts to mitigate resource expenditures are strategic or unstrategic—underscores the importance of both societal and individual *capabilities* (i.e., knowing what the goal consist of and how to reach it) and *willingness* (i.e., motivation to put knowledge into action) to reduce resource use in ways that align with comprehensive PUWB.

6.2 Actor roles in key aspects implementation

As touched upon, the implementation of KA#7 encompasses a broad set of factors, including infrastructure planning, policy incentives, business models, and cultural institutions. To this end, the Delphi participants noted that the 13 KAs (Figure 10) assign different roles and degrees of responsibility to stakeholders, depending on the specific KA and CE behavior context (Section 5.3.3). Consequently, its effective application requires a holistic and system-oriented approach and a consideration for how many actors, product users included, have limited capacity to influence resource expenditure mitigation directly. Actors farther from the individual user, such as municipalities, may also be constrained by systemic factors, such as limited resources for improving product user engagement in waste collection systems (Axelsson et al., 2023). Therefore, assigning responsibility for shaping CE behavior conditions must acknowledge the "intersections of influence" among actors (Wallnoefer et al., 2024).

Effective resource expenditure mitigation depends on close collaboration, or at least coordination, among policymakers, businesses, community organizations, and individuals to co-create enabling environments that balance accessibility, convenience, and engagement. For instance, local organizations and businesses could partner with policymakers and community members to both: (1) facilitate directly beneficial expenditures; and (2) minimize indirect or negative resource use, thereby ensuring that sustainable activities remain meaningful, inclusive, and supportive of product user well being in their local contexts.

6.3 Key aspect overlaps

As outlined in the KA-PUWB Framework (Supplementary File B, Section A), KA#7 (Strategic Mitigation of Resource Expenditures) intersects with several other Key Aspects. The reduction of both monetary and non-monetary costs (i.e., resource mitigation) directly supports KA#12 (Minimize Frictions) and KA#4 (Product Accessibility), as lowering resource demands makes it easier and less burdensome for product users to participate in CE behaviors.

By facilitating expenditures that are essential for positive well being outcomes, KA#7 also operates synergistically with KA#10 (Options and Self-Expression). The provision of access to, e.g., guidance or repair information, allows product users the flexibility to choose how they engage, for instance, by investing time and effort rather than monetary resources. In this regard, facilitation measures not only expand accessibility, particularly by enabling DIY participation that may gain the product user access to products that may otherwise be unaffordable, but it also empower product users to express preferences and agency in their engagement with CE behaviors. This interaction strengthens the overall synergy

among KA#7, KA#4, and KA#10, collectively promoting inclusive and meaningful pathways toward enhanced product user well being (PUWB). Nevertheless, while facilitation can reduce barriers (e.g., by improving access to information, tools, or materials), the active engagement still requires product users to invest personal resources, such as time and effort. As a result, such effort may generate trade-offs with accessibility (KA#4) and introduce friction (KA#12).

This outline illustrates the considerations involved in accounting for key aspect overlaps (i.e., synergies and contradictions), thus making optimal trade-offs when implementing the KA-PUWB Framework. Such consideration helps identify what we term *product user well being (PUWB) optimization levers,* namely interventions that enhance overall PUWB, while minimizing disproportionate and/or unintended negative consequences for vertical or horizontal sub-outcomes (see Figures 1 and 3). This can take the form of, for example, a particular design for a community repair event or a local rental business model that fosters both meaningful social interactions (KA#5) and improves product accessibility (KA#4), without introducing substantial frictions (KA#12).

In summary, the KA-PUWB Framework can serve an analytical purpose for academics or consultants to analyze the actions of involved actors. Furthermore, involved actors, such as product users themselves, can also utilize this Framework by identifying the key aspects, mechanisms, and component characteristics they influence, and take action accordingly.

7 Conclusion

The key contribution of this paper is a novel, theoretically and empirically grounded framework that integrates product user well being into CE behavior evaluation and design and calls for further research to test and refine the framework in applied settings. The Key Aspects of CE Behavior for Product User Well being (KA-PUWB) Framework is an interdisciplinary tool that guides both scholarly inquiry and practical application at the intersection of CE systems and consumer well being—informing the design of CE behaviors to optimize product user well being. We directly address a critical gap in the CE literature, namely the lack of high-level, holistic, and actionable guidance for optimizing Product User Well being (PUWB). The Framework is literature-based and validated through expert consultation across the fields of consumer well being, CE, and sufficiency studies. It offers a novel, multidisciplinary conceptualization of the key conditions shaping product users' well being outcomes from CE behaviors.

In terms of *theoretical contribution*, the Framework offers an early yet robust foundation for theorizing PUWB in CE contexts. Developed using high-level estimates of well being outcomes and validated by interdisciplinary experts, it responds to the literature's current lack of comprehensiveness and interdisciplinary integration (Svensson-Hoglund et al., 2025a). Through the reliance on the C-PUWB Framework (Figure 3)—which constitutes a merging of well being theories—for its development, the KA-PUWB Framework benefits from a more explicit and broad connection to the well being and consumption literature (e.g., Lee and Sirgy, 2025), compared to existing circular consumption frameworks (e.g., Petreca et al., 2025). It also goes beyond theorizing well being outcomes from a CE in generic life domains, such as work and education (e.g., Clube and Tennant, 2020).

From a *practical standpoint*, the Framework supports two interlinked functions: (1) the evaluation of *current or future states* of CE behaviors (e.g., scenarios); and (2) the *formulation of new* CE behavior initiatives. Each key aspect can be seen as a distinct PUWB enhancement strategy, though their full potential is realized only through integrated application and careful navigation of trade-offs, synergies, and contextual constraints. Effective implementation depends on coordination across diverse stakeholder groups, e.g., policymakers, businesses, and community organizers and application of the Framework to these respective audiences. Further applicability relies on future testing and development.

Future research should explore how best to modify the Framework to increase its accessibility, presumably by adapting the insights to specific CE behaviors (e.g., reuse vs. sharing) and/or stakeholders. Additionally, a systematic identification of the higher-level system determinants of the components' characteristics is necessary. More theoretically, the Framework is well-suited to future theoretical refinement and testing, for example, with respect to how functional, moral, and social areas of CE behavior relate to well being outcomes (offering 120 possible combinations across three vertical dimensions, eight experiential areas, and six life domains; see Supplementary File A). Additional elements should be incorporated, such as the role of variety and novelty, since predictability and monotony may induce boredom or feelings of entrapment (Toohey, 2012). These feelings can be alleviated by engaging in sharing activities that involve diverse social networks (Luri Minami et al., 2021). Future research needs to find a way to balance clarity and completeness, as the Framework was seen as both too detailed and not detailed enough, with issues of complexity, circularity, and context. A major challenge for future research, related to *limitations* of the Framework, lies in establishing causal relationships and developing methods to weight the relative influence of contextual and behavioral factors on well being (see Section 5.2.4 on the Delphi study feedback) to allow for better guidance in the CE transition. Further limitations of the Framework include its high level of detail, which may have made it challenging for experts to provide comprehensive, clear and consistent assessments. In addition, the small number of experts involved in the two panels limits the breadth of perspectives represented; future research should incorporate larger and more diverse expert samples to strengthen the validity and applicability of the findings.

Ultimately, the framework's *societal contribution* lies in aligning sustainability goals with individual motivations, providing a blueprint for integrating CE transition with meaningful improvements in everyday life. It enables policymakers and practitioners to anticipate and manage quality-of-life trade-offs in future CE scenarios and supports the design of systems that are not only more sustainable but also more livable, inclusive, and satisfying.

Data availability statement

The datasets presented in this article are not readily available because of confidentiality in the Delphi Study. Requests to access the datasets should be directed to Sahra Svensson-Hoglund svenssonhoglund@vt.edu.

Author contributions

SS-H: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. MS: Conceptualization, Supervision, Validation, Writing – original draft, Writing – review & editing. JR: Supervision, Validation, Writing – original draft, Writing – review & editing. JR: Supervision, Validation, Writing – original draft, Writing – review & editing. VL: Supervision, Writing – original draft, Writing – review & editing. DW: Validation, Writing – original draft, Writing – review & editing. AE: Validation, Writing – original draft, Writing – review & editing. AG-S: Validation, Writing – original draft, Writing – review & editing. LM: Validation, Writing – original draft, Writing – review & editing. RG: Validation, Writing – original draft, Writing – review & editing. GY: Validation, Writing – original draft, Writing – review & editing. LN: Validation, Writing – original draft, Writing – review & editing. BW: Validation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declared that financial support was received for this work and/or its publication. Open access funding was provided by Lund University. SS-H was funded by the Institute for Critical Technology and Applied Sciences (ICTAS) at Virginia Tech. JR was funded by Formas grant 2023-00541 and Open Access publication was made possible through the Bibsam Consortium agreement.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frsus.2026.1718473/full#supplementary-material

References

Abbott, R. A., Ploubidis, G. B., Huppert, F. A., Kuh, D., and Croudace, T. J. (2010). An evaluation of the precision of measurement of Ryff's psychological well-being scales in a population sample. *Soc. Indic. Res.* 97, 357–373. doi: 10.1007/s11205-009-9506-x

Arnold, M. J., and Reynolds, K. E. (2003). Hedonic shopping motivations. *J. Retail.* 79, 77–95. doi: 10.1016/S0022-4359(03)00007-1

Axelsson, K., André, K., Dawkins, E., Gerger Swartling, Å., and Xylia, M. (2023). Transitioning toward sustainable consumption at the Swedish local governance level. *Front. Sustain.* 4:1196373. doi: 10.3389/frsus.2023.1196373

Bai, S., Wang, Y., She, S., and Wei, S. (2021). Will costliness amplify the signalling strength of past pro-environmental behaviour? Exploratory study on autonomy. *Int. J. Environ. Res. Public. Health* 18:10216. doi: 10.3390/ijerph181910216

Bardey, A., Booth, M., Heger, G., and Larsson, J. (2022). Finding yourself in your wardrobe: an exploratory study of lived experiences with a capsule wardrobe. *Int. J. Mark. Res.* 64, 113–131. doi: 10.1177/1470785321993743

Belk, R. W., Fischer, E., and Kozinets, R. V. (2013). *Qualitative Consumer and Marketing Research*. publ. Ed. Los Angeles, CA: Sage.

Beyeler, L., and Jaeger-Erben, M. (2022). How to make more of less: characteristics of sufficiency in business practices. *Front. Sustain.* 3:949710. doi: 10.3389/frsus.2022.949710

Bhardwaj, P., and Kalro, A. D. (2024). Consumer well-being—a systematic literature review and research agenda using TCCM framework. *Int. J. Consum. Stud.* 48:e12991. doi: 10.1111/ijcs.12991

Binder, M., Blankenberg, A.-K., and Guardiola, J. (2020). Does it have to be a sacrifice? Different notions of the good life, pro-environmental behavior and their heterogeneous impact on well-being. *Ecol. Econ.* 167:106448. doi: 10.1016/j.ecolecon.2019.106448

Bly, S., Gwozdz, W., and Reisch, L. A. (2015). Exit from the high street: an exploratory study of sustainable fashion consumption pioneers. *Int. J. Consum. Stud.* 39, 125–135. doi: 10.1111/ijcs.12159

Borrello, M., Cembalo, L., and D'Amico, V. (2022). Redefining wellbeing and normality: circular consumption beyond the low hanging fruit. *Resour. Conserv. Recycl.* 179:106034. doi: 10.1016/j.resconrec.2021.106034

Boström, M. (2021). Social relations and everyday consumption rituals: barriers or prerequisites for sustainability transformation? *Front. Sociol.* 6:723464. doi: 10.3389/fsoc.2021.723464

Briceno, T., and Stagl, S. (2006). The role of social processes for sustainable consumption. *J. Clean. Prod.* 14, 1541–1551. doi: 10.1016/j.jclepro.2006.01.027

Brown, K. W., and Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle | SpringerLink. *Soc. Indic. Res.* 74, 349–368. doi: 10.1007/s11205-004-8207-8

Callmer, Å., and Boström, M. (2024). Caring and striving: toward a new consumer identity in the process of consumption reduction. *Front. Sustain.* 5:1416567. doi: 10.3389/frsus.2024.1416567

Camacho-Otero, J., Pettersen, I. N., and Boks, C. (2020). Consumer engagement in the circular economy: exploring clothes swapping in emerging economies from a social practice perspective. *Sustain. Dev.* 28, 279–293. doi: 10.1002/sd.2002

Clube, R. K. M., and Tennant, M. (2020). The circular economy and human needs satisfaction: promising the radical, delivering the familiar. *Ecol. Econ.* 177:106772. doi: 10.1016/j.ecolecon.2020.106772

Clube, R. K. M., and Tennant, M. (2023). What would a human-centred 'social' circular economy look like? Drawing from Max-Neef's human-scale development proposal. *J. Clean. Prod.* 383:135455. doi: 10.1016/j.jclepro.2022.135455

Colley, K., Hague, A., Chen, J., Lorenzo-Arribas, A., Wooldridge, T., Somervail, P., et al. (2024). Putting people at the centre of the circle: an agenda for behavioural research on the circular economy. *Front. Sustain.* 5:1423912. doi: 10.3389/frsus.2024.1423912

Collier, A. F., and Wayment, H. A. (2018). Psychological benefits of the "maker" or do-it-yourself movement in young adults: a pathway towards subjective well-being. *J. Happiness Stud.* 19, 1217–1239. doi: 10.1007/s10902-017-9866-x

Csikszentmihalyi, M., and Rochberg-Halton, E. (1981). *The Meaning of Things: Domestic Symbols and the Self.* Cambridge, MA: Cambridge University Press. doi: 10.1017/CBO9781139167611

Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Soc. Indic. Res.* 38, 303–328. doi: 10.1007/BF00292050

Cummins, R. A., Eckersley, R., Pallant, J., Van Vugt, J., and Misajon, R. (2003). Developing a national index of subjective wellbeing: the Australian unity wellbeing index. *Soc. Indic. Res.* 64, 159–190. doi: 10.1023/A:1024704320683

Da Silva Zanão, K. R., Junior, O. C., and Benitez, G. B. (2023). "Positive emotions for responsible consumption through product design: a review," in *Product Lifecycle Management. PLM in Transition Times: The Place of Humans and Transformative Technologies, IFIP Advances in Information and Communication Technology*, eds F. Noël, F. Nyffenegger, L. Rivest, and A. Bouras (Cham: Springer Nature Switzerland), pp. 443–452. doi: 10.1007/978-3-031-25182-5_43

Dahiya, A., Banerji, D., and Filieri, R. (2024). Consumer well-being: a systematic literature review and future research directions. *Span. J. Mark. – ESIC* 28, 343–368. doi: 10.1108/SJME-12-2023-0355

De Groot, J. H. B. (2021). Smells in sustainable environments: the scented silk road to spending. *Front. Psychol.* 12:718279. doi: 10.3389/fpsyg.2021.718279

Deci, E. L., and Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: an introduction. *J. Happiness Stud.* 9, 1–11. doi: 10.1007/s10902-006-9018-1

Di Giulio, A., Defila, R., and Ruesch Schweizer, C. (2023). Using the theory of protected needs to conceptualize sustainability as 'caring for human wellbeing': an empirical confirmation of the theory's potential. *Front. Sustain.* 4:1036666. doi: 10.3389/frsus.2023.1036666

Dittmar, H., Bond, R., Hurst, M., and Kasser, T. (2014). The relationship between materialism and personal well-being: a meta-analysis. *J. Pers. Soc. Psychol.* 107, 879–924. doi: 10.1037/a0037409

Ehrenfeld, J. (2001). "Designing "sustainable" product/service systems," in *Proceedings of the IEEE International Symposium on Electronics and the Environment*, pp. 12–23. doi: 10.1109/ECODIM.2001.992308

Ekici, A., Joseph Sirgy, M., Lee, D.-J., Yu, G. B., and Bosnjak, M. (2018). The effects of shopping well-being and shopping Ill-being on consumer life satisfaction. *Appl. Res. Qual. Life* 13, 333–353. doi: 10.1007/s11482-017-9524-9

El Hedhli, K., Chebat, J.-C., and Sirgy, M. J. (2013). Shopping well-being at the mall: construct, antecedents, and consequences. *J. Bus. Res.* 66, 856–863. doi: 10.1016/j.jbusres.2011.06.011

Ganglmair-Wooliscroft, A., and Wooliscroft, B. (2019). Well-being and everyday ethical consumption. *J. Happiness Stud.* 20, 141–163. doi: 10.1007/s10902-017-9944-0

Gbededo, M. A., and Liyanage, K. (2020). Descriptive framework for simulation-aided sustainability decision-making: a Delphi study. *Sustain. Prod. Consum.* 22, 45–57. doi: 10.1016/j.spc.2020.02.006

Geiger, S. M., Fischer, D., and Schrader, U. (2018). Measuring what matters in sustainable consumption: an integrative framework for the selection of relevant behaviors. *Sustain. Dev.* 26, 18–33. doi: 10.1002/sd.1688

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., and Hultink, E. J. (2017). The circular economy—a new sustainability paradigm? *J. Clean. Prod.* 143, 757–768. doi: 10.1016/j.jclepro.2016.12.048

Grzeskowiak, S., Lee, D.-J., Yu, G. B., and Sirgy, M. J. (2014). How do consumers perceive the quality-of-life impact of durable goods? A consumer well-being model based on the consumption life cycle. *Appl. Res. Qual. Life* 9, 683–709. doi: 10.1007/s11482-013-9265-3

Gu, D., Gao, S., Wang, R., Jiang, J., and Xu, Y. (2020). The negative associations between materialism and pro-environmental attitudes and behaviors: individual and regional evidence from China. *Environ. Behav.* 52, 611–638. doi: 10.1177/0013916518811902

Guillen-Royo, M. (2007). "Well-being and consumption: towards a theoretical approach based on human needs satisfaction," in *Handbook on the Economics of Happiness*, eds L. Bruni and P. L. Porta (Northampton, MA: Edward Elgar Publishing), pp. 151–169.

Guillen-Royo, M. (2019). Sustainable consumption and wellbeing: does on-line shopping matter? *J. Clean. Prod.* 229, 1112–1124. doi: 10.1016/j.jclepro.2019.05.061

Ho, M.-X., and Yanagisawa, H. (2023). Design for well-being and sustainability: a conceptual framework of the peer-to-peer sharing and reuse platform in the circular economy. *Sustainability* 15:8852. doi: 10.3390/su15118852

Hobson, K., Holmes, H., Welch, D., Wheeler, K., and Wieser, H. (2021). Consumption work in the circular economy: a research agenda. *J. Clean. Prod.* 321:128969. doi: 10.1016/j.jclepro.2021.128969

Holbrook, M. B., and Hirschman, E. C. (1982). The experiential aspects of consumption: consumer fantasies, feelings, and fun. *J. Consum. Res.* 9, 132–140. doi: 10.1086/208906

Huppert, F. A., and So, T. T. C. (2013). Flourishing across Europe: application of a new conceptual framework for defining well-being. *Soc. Indic. Res.* 110, 837–861. doi: 10.1007/s11205-011-9966-7

Jackson, T. (2005). Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change. *Sustain. Dev. Res. Netw.* 15.

Jackson, T. (2008). Live better by consuming less?: Is there a "double dividend" in sustainable consumption? *J. Ind. Ecol.* 9, 19–36. doi: 10.1162/1088198054084734

Jackson, T. (2014). "Sustainable consumption," in *Handbook of Sustainable Development* (Cheltenham, UK: Edward Elgar Publishing), pp. 279–290. doi: 10.4337/9781782544708.00029

Jewitt, C., Golmohammadi, L., Petreca, B., O'Nasciemento, R., Fotopoulou, A., Berthouze, N., et al. (2025). A circular experience toolkit: a dynamic scenario-building resource for designing circular consumer experiences in fashion. *Sustain. Sci. Prac. Policy* 21:2549612. doi: 10.1080/15487733.2025.2549612

Kasser, T. (2017). Living both well and sustainably: a review of the literature, with some reflections on future research, interventions and policy. *Philos. Transact. A Math. Phys. Eng. Sci.* 375:20160369. doi: 10.1098/rsta.2016.0369

Khochman, I., and Batat, W. (2022). "How does second-hand luxury enhance Gen Z consumers' well-being? A transformative luxury research (TLR) approach," in *The Rise of Positive Luxury* (London: Routledge), pp. 154–169. doi: 10.4324/9781003163732-11

Kilbourne, W., and Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *J. Bus. Res.* 61, 885–893. doi: 10.1016/j.jbusres.2007.09.016

Kirchherr, J., Yang, N.-H. N., Schulze-Spüntrup, F., Heerink, M. J., and Hartley, K. (2023). Conceptualizing the circular economy (revisited): an analysis of 221 definitions. *Resour. Conserv. Recycl.* 194:107001. doi: 10.1016/j.resconrec.2023.107001

Lage, J. (2022). Sufficiency and transformation–a semi-systematic literature review of notions of social change in different concepts of sufficiency. *Front. Sustain.* 3: 954660. doi: 10.3389/frsus.2022.954660

Lee, D.-J., and Sirgy, M. J. (2012). "Consumer well-being (CWB): various conceptualizations and measures," in *Handbook of Social Indicators and Quality of Life Research*, eds K. C. Land, A. C. Michalos, and M. J. Sirgy (Dordrecht, the Netherlands: Springer Netherlands), pp. 331–354. doi: 10.1007/978-94-007-2421-1_15

Lee, D.-J., and Sirgy, M. J. (2025). *Happiness in the Marketplace: A Study of Consumption, Consumers and Wellbeing, Social Indicators Research Series*. Cham, Switzerland: Springer. doi: 10.1007/978-3-032-04443-3

Liu, A., Baines, E., and Ku, L. (2022). Slow fashion is positively linked to consumers' well-being: evidence from an online questionnaire study in China. *Sustainability* 14:13990. doi: 10.3390/su142113990

Luri Minami, A., Ramos, C., and Bruscato Bortoluzzo, A. (2021). Sharing economy versus collaborative consumption: what drives consumers in the new forms of exchange? *J. Bus. Res.* 128, 124–137. doi: 10.1016/j.jbusres.2021.01.035

Macklin, J., and Kaufman, S. (2023). How do we change what we cannot describe? A comprehensive framework of user behaviours in a materials' circular economy. *Circ. Econ. Sustain.* doi: 10.31235/osf.io/j8ukm

Matschoss, K., Kajoskoski, T., Laakso, S., and Rinkinen, J. (2025). Editorial: tensions in sustainable consumption and everyday life. *Front. Sustain.* 6:1635889. doi: 10.3389/frsus.2025.1635889

McGouran, C., and Prothero, A. (2016). Enacted voluntary simplicity—exploring the consequences of requesting consumers to intentionally consume less. *Eur. J. Mark.* 50, 189–212. doi: 10.1108/EJM-09-2013-0521

Mont, O., Lehner, M., and Dalhammar, C. (2022). Sustainable consumption through policy intervention—a review of research themes. *Front. Sustain*. 3:921477. doi: 10.3389/frsus.2022.921477

Nazli, T. (2021). Repair motivation and barriers model: investigating user perspectives related to product repair towards a circular economy. *J. Clean. Prod.* 289:125644. doi: 10.1016/j.jclepro.2020.125644

Petreca, B., Jewitt, C., Fotopoulou, A., Golmohammadi, L., O'Nascimento, R., Chamberlin, L., et al. (2025). The wellbeing framework for consumer experiences in the circular economy of the textile industry. *Humanit. Soc. Sci. Commun.* 12:1523. doi: 10.1057/s41599-025-05813-9

Prinzing, M. (2021). How to study well-being: a proposal for the integration of philosophy with science. *Rev. Gen. Psychol.* 25, 152–162. doi: 10.1177/10892680211002443

Rabiu, M. K., and Jaeger-Erben, M. (2022). Appropriation and routinisation of circular consumer practices: a review of current knowledge in the circular economy literature. *Clean. Responsible Consum.* 7:100081. doi: 10.1016/j.clrc.2022.100081

Rick, S. I., Pereira, B., and Burson, K. A. (2014). The benefits of retail therapy: making purchase decisions reduces residual sadness. *J. Consum. Psychol.* 24, 373–380. doi: 10.1016/j.jcps.2013.12.004

Rodríguez, N. B., Chiastra, L., Peeters, J. R., and Favi, C. (2024). Analysis of repairability index to improve disassemblability and serviceability in cooker hoods. *Procedia CIRP* 122, 801–806. doi: 10.1016/j.procir.2024.01.112

Ryan, R. M., Curren, R. R., and Deci, E. L. (2013). "What humans need: flourishing in Aristotelian philosophy and self-determination theory," in *The Best within Us: Positive Psychology Perspectives on Eudaimonia*, ed A. S. Waterman (Washington: American Psychological Association), pp. 57–75. doi: 10.1037/14092-004

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069

Samson, C., and Freudendal-Pedersen, M. (2022). Restructuring urban planning to facilitate sustainable consumption. *Front. Sustain*. 3:918546. doi: 10.3389/frsus.2022.918546

Schiebler, T., Lee, N., and Brodbeck, F. C. (2025). Expectancy-disconfirmation and consumer satisfaction: a meta-analysis. *J. Acad. Mark. Sci.* doi: 10.1007/s11747-024-01078-x

Shiota, M. N., Papies, E. K., Preston, S. D., and Sauter, D. A. (2021). Positive affect and behavior change. *Curr. Opin. Behav. Sci*. 39, 222–228. doi: 10.1016/j.cobeha.2021.04.022

Sirgy, M. J. (1998). Materialism and quality of life. *Soc. Indic. Res*. 43, 227–260. doi: 10.1023/A:1006820429653

Sirgy, M. J. (2019). Positive balance: a hierarchical perspective of positive mental health. *Qual. Life Res*. 28, 1921–1930. doi: 10.1007/s11136-019-02145-5

Sirgy, M. J. (2020). *Positive Balance: A Theory of Well-Being and Positive Mental Health, Social Indicators Research Series*. Cham, Switzerland: Springer. doi: 10.1007/978-3-030-40289-1

Sirgy, M. J. (2021a). Macromarketing metrics of consumer well-being: an update. *J. Macromarketing* 41, 124–131. doi: 10.1177/0276146720968096

Sirgy, M. J. (2021b). *The Psychology of Quality of Life: Wellbeing and Positive Mental Health, Social Indicators Research Series*. Cham, Switzerland: Springer International Publishing. doi: 10.1007/978-3-030-71888-6

Sirgy, M. J., Lee, D.-J., and Yu, G. B. (2020). Shopping-life balance: towards a unifying framework. *Appl. Res. Qual. Life* 15, 17–34. doi: 10.1007/s11482-018-9662-8

Sirgy, M. J., Yu, G. B., Lee, D.-J., Joshanloo, M., Bosnjak, M., Jiao, J., et al. (2021). The dual model of materialism: success versus happiness materialism on present and future life satisfaction. *Appl. Res. Qual. Life* 16, 201–220. doi: 10.1007/s11482-019-09763-8

Spaargaren, G. (2020). "Sustainable consumption: a theoretical and environmental policy perspective," in *The Ecological Modernisation Reader* (New York, NY: Routledge), pp. 318–333. doi: 10.4324/9781003061069-21

Spangenberg, J. H. (2011). Sustainability science: a review, an analysis and some empirical lessons. *Environ. Conserv*. 38, 275–287. doi: 10.1017/S0376892911000270

Svensson-Hoglund, S., Richter, J. L., Maitre-Ekern, E., Russell, J. D., Pihlajarinne, T., and Dalhammar, C. (2021). Barriers, enablers and market governance: a review of the policy landscape for repair of consumer electronics in the EU and the U.S. *J. Clean. Prod*. 288:125488. doi: 10.1016/j.jclepro.2020.125488

Svensson-Hoglund, S., Russell, J. D., Richter, J. L., Kambanou, M. L., Velenturf, A. P. M., Grousset, R., et al. (2025b). Connecting consumption and production systems from the perspective of the product user: a foundational multilevel systems model of circularity realized at the economy-scale. *Front. Sustain.* 6:1698624. doi: 10.3389/frsus.2025.1698624

Svensson-Hoglund, S., Sirgy, M. J., and Russell, J. D. (2025a). The impact of engagement in the circular economy on consumer well-being: a review of outcomes and salient contexts. *Appl. Res. Qual. Life*. doi: 10.1007/s11482-025-10524-z

Taufik, D., Bolderdijk, J. W., and Steg, L. (2016). Going green? The relative importance of feelings over calculation in driving environmental intent in the Netherlands and the United States. *Energy Res.* Soc. *Sci*. 22, 52–62. doi: 10.1016/j.erss.2016.08.012

Tay, L., Zyphur, M., and Batz, C. (2017). "Income and subjective well-being: review, synthesis, and future research," in *E-Handbook of Subjective Well-Being*, eds E. Diener, S. Oishi, and L. Tay (NobaScholar).

Toohey, P. (2012). *Boredom: A Lively History*. New Haven, CN: Yale University Press.

Tosun, P., and Sezgin, S. (2021). Voluntary simplicity: a content analysis of consumer comments. *J. Consum. Mark*. 38, 484–494. doi: 10.1108/JCM-04-2020-3749

Tsurumi, T., Yamaguchi, R., Kagohashi, K., and Managi, S. (2021). Material and relational consumption to improve subjective well-being: evidence from rural and urban Vietnam. *J. Clean. Prod*. 310:127499. doi: 10.1016/j.jclepro.2021.127499

van der Velden, M. (2021). 'Fixing the world one thing at a time': community repair and a sustainable circular economy. *J. Clean. Prod.* 304:127151. doi: 10.1016/j.jclepro.2021.127151

Veenhoven, R., Chiperi, F., Kang, X., and Burger, M. (2021) Happiness and consumption: a research synthesis using an online finding archive. *Sage Open* 11:2158244020986239. doi: 10.1177/2158244020986239

Verma, S., Bhalla, P., and Dutta, T. (2025). "Happiness and circular economy," in: *Innovation and the Sharing Economy* (New York, NY: Routledge), pp. 211–229. doi: 10.4324/9781003535614-11

Vollebregt, M., Mugge, R., Thürridl, C., and van Dolen, W. (2024). Reducing without losing: reduced consumption and its implications for well-being. *Sustain. Prod. Consum*. 45, 91–103. doi: 10.1016/j.spc.2023.12.023

Wackman, J., and Knight, E. (2020). *Repair Revolution: How Fixers are Transforming Our Throwaway Culture*. Novato, CA: New World Library.

Wallnoefer, L. M., Svensson-Hoglund, S., Bhar, S., and Upham, P. (2024). At the intersections of influence: exploring the structure–agency nexus across sufficiency goals and time frames. *Sustain. Sci*. 19, 683–686. doi: 10.1007/s11625-024-01467-9

Welsch, H., and Kühling, J. (2010). Pro-environmental behavior and rational consumer choice: evidence from surveys of life satisfaction. *J. Econ. Psychol.* 31, 405–420. doi: 10.1016/j.joep.2010.01.009

Westbrook, R. A. (1987). Product/consumption-based affective responses and postpurchase processes. *J. Mark. Res*. 24:258. doi: 10.2307/3151636

Wieser, H., and Tröger, N. (2018). Exploring the inner loops of the circular economy: replacement, repair, and reuse of mobile phones in Austria. *J. Clean. Prod.* 172, 3042–3055. doi: 10.1016/j.jclepro.2017.11.106

Wolf, M., and McQuitty, S. (2011). Understanding the do-it-yourself consumer: DIY motivations and outcomes. *AMS Rev*. 1, 154–170. doi: 10.1007/s13162-011-0021-2

Zhan, M. X. (2022). Sustainable consumption and the well-being dividend: insights from the zero-waste movement in Chinese cities. *Sustain. Sci. Pract. Policy* 18, 731–748. doi: 10.1080/15487733.2022.2111925