

# Towards Circular Economy for More Sustainable Apparel Consumption

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The apparel industry causes environmental problems, particularly due to the shortening life cycle of garments and fast-fashion's throw-away culture. The circular economy provides solutions to minimise and prevent these problems through innovative circular business models, which require changes in consumer behaviours. With the lens of environmental psychology, we analyse consumers' willingness to acquire circular apparel considering four approaches on clothing life-cycle extension. We conducted an online questionnaire among Brazilian and Dutch consumers and tested if the Value-Belief-Norm (VBN) theory can explain the willingness of consumers to purchase circular apparel. Our results indicate that, overall, the variables from the VBN theory explain circular behaviour in the apparel industry and that the paths suggested by the model are supported by our analyses. Additionally, we tested and found that when all of the variables from the VBN theory were controlled for, materialistic values did not explain circular behaviours in the apparel industry among Brazilian respondents. However, they had a positive influence on some circular apparel behaviours among Dutch consumers. Overall, materialistic values did not play an important role in predicting willingness to consume circular clothing. Furthermore, the results suggest that the VBN theory predicts willingness to consume circular apparel better in the Netherlands compared to Brazil, suggesting that this behaviour may be perceived as more effortful for the Brazilian population. However, we highlight the need for future research.

Keywords: circular economy ; environmental psychology ; consumer behaviour ; life-cycle extension

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## 1. Introduction

The apparel industry is one of the oldest and largest industries worldwide <sup>[1]</sup>, being responsible for transforming diverse materials into clothing, footwear, and accessories. The apparel industry is of economic, social, and cultural importance <sup>[2]</sup> but also has a substantial environmental footprint <sup>[3]</sup>. The environmental impacts associated with the fashion industry are the result of the intensive use of resources, e.g., energy and water, the toxicity of solvents, dyes, and finishes employed, and pollutant processes, e.g., textile treatment <sup>[3][4][5][6]</sup>. Moreover, the overflow of new trends, the enlarged production by fast-fashion brands, the substantial increase in clothing consumption, and the premature disposal of apparel items increase the amount of textile waste and consequently the expansion of landfills <sup>[6][7]</sup>. The transition to a circular economy (CE) can decrease this environmental footprint and promote positive effects, namely, economic, social, and environmental benefits<sup>[8][9]</sup>.

## 2. History

The idea of a cyclical ecological system is dated from Boulding <sup>[10]</sup>, which highlights an important circular principle: the considerations of resources' limits and exhaustibility. Spiral (closed) loop systems were then suggested by Stahel <sup>[11]</sup> as part of a self-replenishing economy, minimising the flow of energy and matter and the environmental deterioration without restraining social and economic growth. However, the Circular Economy terminology came later and can be traced to the work of Pearce and Turner <sup>[12]</sup> and based on the law of Energy and Matter Degradation (Thermodynamics), advocating that circular systems patterns are essential to sustain human life.

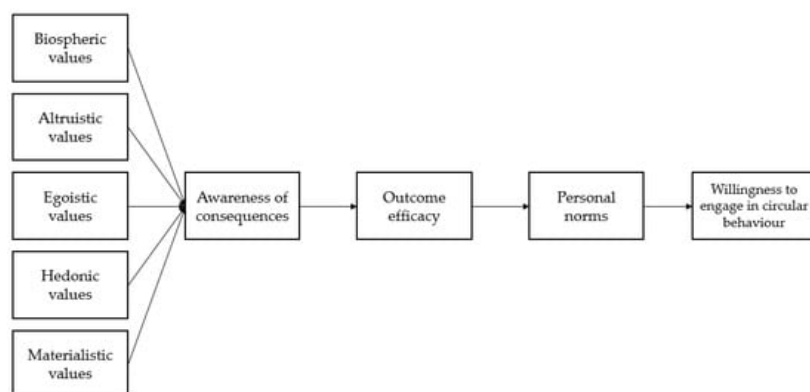
There are different CE definitions across the literature <sup>[13][14][15][16]</sup>. However, the majority of them share some important features: the CE is related to the minimisation of resource demand and the optimisation of resource and energy recirculation; it is a multi-level approach, it is driven towards sustainable development; and, it is closely related to how society innovates <sup>[17]</sup>. For this research, we consider the circular economy as a new economic system that aims to prevent the depletion of resources by proposing a change of paradigm in how human society and nature interrelate <sup>[17]</sup>.

### 3. Development

Shifting to a circular economy entails shifting to nature-inspired cyclical processes that minimise resource demand [3][17][18] and mitigate excessive consumption [19]. This transition is only possible through innovative circular business models (CBMs). CBMs outline how an organisation operates circularly, by creating, delivering, and capturing value with and within closed material loops [20][21][22]. Specifically, circular business models (CBMs) propose to extend products' life-cycle in four ways [18]: (1) **durability**, new products are designed to be durable for a long lifetime; (2) **facilitated reuse**, with or without repair/upgrade; (3) **modular design**, products are designed to be modular so that parts can be replaced to update/upgrade a product without the need to replace the whole item; and (4) **refurbish, repair, remanufacture and recondition**, the product gets a next life by restoring the product's functionality to "as-new" quality.

Circular business models, such as extending products' life cycle, imply consumer behavioural changes [23]. Therefore, consumers are key stakeholders in the CE [24], and individual behaviour is critical to the success of circular business models [25]. The challenges embedded in the circular transition involve engaging consumers in circular systems [19][24], and, to promote the circular behaviours of apparel consumers, we first need to understand which factors influence them.

A theory that has been used to explain many pro-environmental behaviours is the Value-Belief-Norm theory (VBN) [26]. The VBN theory explains pro-environmental behaviour by focusing on normative considerations [26][27][28]. Specifically, it focuses on how values, via awareness of consequences, outcome efficacy, and personal norms, affect people's willingness to engage in pro-environmental behaviour, such as circular behaviour (see **Figure 1**).



**Figure 1.** The Value-Belief-Norm theory.

The VBN theory has been found to explain many pro-environmental behaviours, including the adoption of alternative fuel vehicles [29], interest in smart energy systems [30], biodiversity conservation [31], and sustainable water consumption [32]. However, to the best of our knowledge, it has not yet been tested if the VBN theory applies to circular apparel consumption behaviour. Hence, this research aims to test if the VBN theory can explain the willingness of apparel consumers to engage in circular behaviours, focusing on those that extend the clothing life-cycle.

Furthermore, we test the VBN theory, including materialistic values, among Brazilian and Dutch consumers. These two countries were chosen because apparel life-cycle extension strategies were reported both in Brazil [33][34] and in the Netherlands [35]; however, they are quite diverse in terms of the availability of circular apparel products and income levels.

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