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## CREATING ADDICTIVE BEHAVIOR TO ENHANCE SUSTAINABLE FASHION CONSUMPTION: A BEHAVIORAL PSYCHOLOGY APPROACH

BY

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**Abstract.** The fashion industry faces a critical sustainability challenge, with fast fashion contributing significantly to environmental degradation and social inequity. This research explores how behavioral psychology principles, habit formation mechanisms, and gamification strategies can be leveraged to create engaging, potentially addictive behaviors that promote sustainable fashion consumption. Drawing on recent research, we examine the psychological drivers of consumer behavior, the attitude-behavior gap in sustainable consumption, and innovative interventions including nudging, choice architecture, and eco-gamification platforms. Key findings indicate that gamification elements such as progress tracking, rewards systems, and social competition can effectively engage consumers in sustainable practices. However, the application of addictive design patterns raises important ethical considerations regarding consumer autonomy and transparency. This article provides a comprehensive framework for designing behavioral interventions that balance effectiveness with ethical responsibility, offering practical applications for fashion brands, policymakers, and digital platform designers seeking to promote circular economy practices in the textile and clothing sector.

**Keywords:** addiction, behavior, consumption, fashion, sustainability.

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## 1. Introduction

The global fashion industry stands at a critical juncture, facing mounting pressure to address its substantial environmental and social impacts. Fast fashion's linear "take-make-dispose" model has contributed to resource depletion, pollution, and exploitative labor practices, prompting urgent calls for a transition toward circular economy principles and sustainable consumption patterns, a transition also emphasized in recent systematic literature on consumer behaviour and circular economy in sustainable fashion (Marinelli, 2025). While consumer awareness of these issues has grown significantly, a persistent gap remains between positive attitudes toward sustainability and actual purchasing behavior—a phenomenon known as the attitude-behavior gap (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024; McEachern *et al.*, 2020).

This manuscript explores an innovative yet ethically complex approach to bridging this gap: leveraging behavioral psychology principles and gamification strategies to create engaging, potentially addictive behaviors that promote sustainable fashion consumption. The concept of "addictive behavior" in this context refers not to harmful compulsions, but rather to the design of positive habit loops that make sustainable choices intrinsically rewarding and self-reinforcing. By understanding the psychological mechanisms that drive consumer behavior and applying insights from behavioral economics, game design, and digital engagement strategies, we can develop interventions that make sustainable fashion consumption not merely a rational choice, but an enjoyable and habitual practice.

The rationale for this approach stems from recognition that traditional information-based campaigns and voluntary eco-labeling mechanisms have achieved limited success in changing consumer behavior (McEachern *et al.*, 2020), while green marketing research further highlights the relevance of behavioral economics for sustainable business practices in the fashion industry (Abidin and Zahid, 2025). Consumers often lack the knowledge to distinguish sustainable from non-sustainable fashion products, face higher prices for eco-friendly alternatives, and encounter structural barriers that make sustainable choices inconvenient (Mizrachi *et al.*, 2024). To overcome these obstacles, researchers and practitioners have increasingly turned to behavioral interventions that work with, rather than against, human psychology—designing choice environments and digital experiences that make sustainable behaviors easier, more rewarding, and more socially desirable.

This manuscript synthesizes recent research on behavioral psychology applications in sustainable fashion, examining three interconnected domains: (1) the theoretical foundations of behavior change, including self-determination theory, behavioral economics, and social practice approaches; (2) the practical

mechanisms of habit formation and consumer engagement, including triggers, rewards, and feedback systems; and (3) the implementation of gamification strategies through digital platforms and retail interventions, including digital recommendations and consumer-segmentation approaches relevant to sustainable fashion choices (Munsch *et al.*, 2025; Preece and Schultz, 2025). We analyze case studies ranging from simple progress-tracking tools to sophisticated eco-gamification platforms, evaluating their effectiveness and exploring the ethical implications of using persuasive design to influence consumer behavior.

The structure of this manuscript proceeds as follows: Section 2 establishes the theoretical foundations by reviewing key behavioral psychology principles relevant to sustainable fashion consumption. Section 3 examines habit formation mechanisms and how they can be applied to create lasting behavior change. Section 4 explores gamification strategies and their implementation in digital platforms. Section 5 discusses consumer engagement techniques including nudging and choice architecture. Section 6 presents practical applications and case studies. Section 7 addresses ethical considerations and limitations. Section 8 outlines future research directions and recommendations for practitioners. Section 9 concludes with key takeaways and implications for the fashion industry's sustainability transition.

## **2. Theoretical Foundations: Behavioral Psychology in Sustainable Fashion**

### **2.1. The Attitude-Behavior Gap**

One of the most persistent challenges in promoting sustainable fashion consumption is the attitude-behavior gap—the discrepancy between consumers' stated environmental values and their actual purchasing decisions. Multiple studies have documented this phenomenon, revealing that positive attitudes toward sustainable products frequently fail to translate into actual purchases (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). This gap is often attributed to several factors: higher prices for sustainable alternatives, limited accessibility, lack of knowledge about how to identify truly sustainable products, and the extra effort required for sustainable consumption (Waydel-Bendyk, 2020; Mizrachi *et al.*, 2024).

Research by McEachern *et al.* highlights that traditional policy approaches using economic and social psychology frameworks, including information-based campaigns and voluntary eco-labeling mechanisms, have had limited success in closing this gap (McEachern *et al.*, 2020). The authors note that "nudge" campaigns and eco-labeling initiatives often fail to account for the complex, practice-based nature of consumption behaviors, which are embedded in social contexts and daily routines rather than being purely rational decisions. This insight suggests that effective interventions must go beyond simply

providing information or appealing to environmental values; they must address the practical, social, and emotional dimensions of fashion consumption.

The attitude-behavior gap also reflects deeper psychological tensions. Consumers may experience cognitive dissonance when their purchasing behavior conflicts with their environmental values, leading to rationalization or avoidance rather than behavior change. Additionally, the temporal distance between purchasing decisions and their environmental consequences makes it difficult for consumers to perceive the direct impact of their choices (Falcone and Fiorentino, 2025). Understanding these psychological barriers is essential for designing interventions that can effectively bridge the gap between intention and action.

## **2.2. Self-Determination Theory and Intrinsic Motivation**

Self-Determination Theory (SDT) provides a powerful framework for understanding how to motivate sustainable behavior change. As applied in the eco-gamification research by Alves et al., SDT identifies three intrinsic psychological needs that drive human motivation: relatedness (feeling connected to others), competence (feeling effective and capable), and autonomy (feeling in control of one's choices) (Alves *et al.*, 2023). These needs are considered resources that can be shaped by environmental changes to promote motivation and influence behavior patterns.

The application of SDT to sustainable fashion consumption suggests that interventions should not rely solely on external rewards or punishments, but should foster intrinsic motivation by satisfying these fundamental psychological needs. For example, gamification platforms that allow users to connect with like-minded individuals (relatedness), track their progress and achievements (competence), and make personalized choices about their sustainability goals (autonomy) are more likely to create lasting engagement than those that simply offer material incentives.

The Gameful Design Heuristics (GDH) framework, which is heavily based on SDT and behavioral economics, has been successfully applied to motivate consumers toward circular economy practices in the textile and clothing sector (Alves et al., 2023). This approach recognizes that sustainable behavior change is most effective when it aligns with individuals' intrinsic values and provides psychological satisfaction beyond the instrumental goal of environmental protection. By designing interventions that make sustainable fashion consumption personally meaningful and emotionally rewarding, we can create the conditions for habit formation and long-term behavior change.

## **2.3. Behavioral Economics and Choice Architecture**

Behavioral economics offers valuable insights into how subtle changes in choice environments can significantly influence consumer decisions. The

concept of "nudging"—using choice architecture to guide people toward better decisions without restricting their freedom of choice—has gained considerable attention in sustainability research (Mizrachi *et al.*, 2024; Falcone and Fiorentino, 2025; Smoczyk, 2022). Nudges work by leveraging cognitive biases and heuristics that shape decision-making, such as default effects, social proof, and framing effects.

Research by Mizrachi *et al.* examined the effects of choice architecture on sustainable fashion consumption through field experiments in a major shopping center (Mizrachi *et al.*, 2024), while segmentation studies of second-hand fashion consumers show that nudging strategies may need to be adapted to consumers' propensity to purchase pre-owned clothing (Preece and Schultz, 2025). The study investigated several types of nudges: providing information about sustainability, increasing accessibility to sustainable alternatives, and appealing to social identity and norms. The findings revealed that offering alternatives to consumers constituted the most effective way to nudge consumers toward more sustainable purchasing behavior, though information provision and strengthening social norms also contributed to behavior change (Mizrachi *et al.*, 2024).

Falcone *et al.* explored how nudging can promote a circular bioeconomy in the fashion industry, specifically facilitating market adoption of sustainable textiles from food waste (Falcone and Fiorentino, 2025). Their research identified psychological factors such as environmental responsibility and awareness as significantly impacting sustainable behaviors, and categorized consumer profiles based on psychological and behavioral characteristics. The study found that gender, education, and political orientation were associated with different levels of engagement in sustainable practices, suggesting that nudging interventions should be tailored to specific consumer segments.

However, the effectiveness of nudging interventions is limited by consumers' knowledge and structural barriers. Mizrachi *et al.* found that most participants reported not knowing how to distinguish between sustainable and non-sustainable fashion, nor did they believe that the clothes they purchased were actually sustainable (Mizrachi *et al.*, 2024). This finding underscores the need for policies that increase both the accessibility and the transparency of sustainable fashion options, combining choice architecture with information provision and credible certification systems.

### **3. Habit Formation Mechanisms for Sustainable Consumption**

#### **3.1. The Psychology of Habit Loops**

Habits are automatic behaviors triggered by contextual cues, performed with minimal conscious deliberation. The habit loop consists of three components: a cue (trigger), a routine (behavior), and a reward (positive

reinforcement). Understanding this loop is crucial for designing interventions that can establish sustainable fashion consumption as a habitual practice rather than a series of effortful decisions.

In the context of sustainable fashion, habit formation requires identifying appropriate cues that can trigger sustainable behaviors, designing routines that are easy to perform, and ensuring that these behaviors are followed by meaningful rewards. The challenge lies in competing with the well-established habits of fast fashion consumption, which are reinforced by convenience, low prices, social trends, and the immediate gratification of acquiring new items.

Research suggests that habit formation is most successful when new behaviors are linked to existing routines and when the rewards are both immediate and intrinsically satisfying. For sustainable fashion, this might involve creating cues around existing shopping behaviors (e.g., prompts to check second-hand options before buying new), simplifying sustainable routines (e.g., one-click access to clothing rental services), and providing immediate positive feedback (e.g., visualizing environmental impact savings or earning rewards points).

A comprehensive visual representation of the habit formation mechanisms for sustainable fashion consumption is presented in Fig. 1.

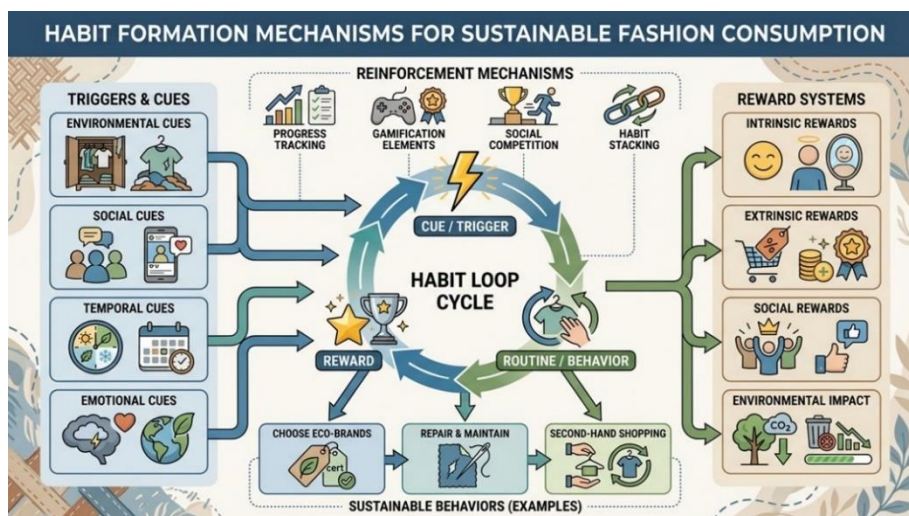


Fig. 1 – Habit formation mechanism for sustainable fashion consumption.

### 3.2. Triggers and Cues in Fashion Consumption

Effective behavior change interventions must identify and leverage appropriate triggers that can initiate sustainable fashion behaviors. Several studies have explored different types of cues and their effectiveness in promoting sustainable consumption.

The WearMe30Times initiative, discussed in multiple papers, uses a dedicated QR code on garment labels as a physical trigger that prompts consumers to track how often they wear an item (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). This simple cue serves multiple functions: it reminds consumers of their commitment to wear items multiple times, provides a mechanism for tracking progress, and creates a moment of reflection about clothing use patterns. The goal of wearing garments at least 30 times, inspired by eco-activist campaigns, provides a clear target that makes the abstract concept of "sustainable use" concrete and actionable.

Digital platforms can also create triggers through push notifications, reminders, and contextual prompts. The eco-gamification platform studied by Alves *et al.* uses immediate feedback via push notifications to reinforce sustainable behaviors such as transferring garments to extend their lifespan or recycling (Alves *et al.*, 2023). These digital triggers can be timed to coincide with moments when consumers are most receptive to sustainable choices, such as when they are browsing fashion websites or considering new purchases.

Social cues also play a powerful role in triggering sustainable behaviors. Research on social norms and peer influence suggests that making sustainable fashion consumption visible and socially desirable can create powerful triggers for behavior change (Mizrachi *et al.*, 2024; McEachern *et al.*, 2020). When consumers see their peers engaging in sustainable practices—whether through social media sharing, community challenges, or visible markers of sustainable choices—they are more likely to adopt similar behaviors themselves.

### 3.3. Reward Systems and Reinforcement

The reward component of the habit loop is critical for establishing and maintaining sustainable fashion behaviors. Rewards can be extrinsic (tangible benefits like discounts or prizes) or intrinsic (psychological satisfaction, sense of accomplishment, social recognition). Research suggests that while extrinsic rewards can be effective for initiating behavior change, intrinsic rewards are more important for long-term habit formation.

The eco-gamification platform developed by Alves *et al.* incorporates multiple types of rewards to motivate sustainable behaviors (Alves *et al.*, 2023). Users earn experience points (XP) and coins by completing challenges related to circular economy practices, which can be used to purchase aesthetic assets or coupons. The platform also provides badges and achievements for reaching milestones, and features multiplayer leaderboards that create social recognition for top performers. This multi-layered reward system addresses both extrinsic motivation (tangible benefits) and intrinsic motivation (competence, relatedness, and status).

Progress tracking itself can serve as a powerful reward mechanism. The WearMe30Times tool allows consumers to visualize their progress toward the goal of 30 wears, providing a sense of accomplishment with each tracked use (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). The Circularity Score (CS) tracked by eco-gamification platforms quantifies users' eco-friendly actions and the lifecycle of owned items, providing ongoing feedback that reinforces sustainable behaviors (Alves *et al.*, 2023).

However, the design of reward systems must be carefully considered to avoid unintended consequences. Research by Bardey *et al.* highlights the risk of rebound effects in consumer psychology, where consumers who engage in one sustainable behavior may feel licensed to engage in less sustainable behaviors elsewhere (Bardey *et al.*, 2026). Additionally, over-reliance on extrinsic rewards can undermine intrinsic motivation, a phenomenon known as the "overjustification effect". Effective reward systems should therefore emphasize intrinsic satisfaction, social recognition, and alignment with personal values, using extrinsic rewards strategically to initiate engagement rather than as the primary motivator.

## 4. Gamification Strategies for Sustainable Fashion

### 4.1. Core Game Mechanics and Elements

Gamification—the application of game design elements in non-game contexts—has emerged as a promising strategy for promoting sustainable fashion consumption. Core game mechanics that have been successfully applied include points, badges, achievements, leaderboards, challenges, progress bars, and levels. These elements tap into fundamental psychological drivers such as achievement motivation, social comparison, mastery, and the desire for status and recognition.

Research by Das *et al.* and Arnesson and Westman demonstrates that gamification can effectively influence consumer attitudes and intentions toward sustainable fashion behaviors (Das *et al.*, 2024; Arnesson and Westman, 2022; Berger and Koch, 2024). The application of game mechanics makes the experience of sustainable consumption more interactive, enjoyable, and engaging, transforming what might otherwise be perceived as a sacrifice or inconvenience into an entertaining challenge.

The effectiveness of different game mechanics varies depending on the target behavior and audience. Points and progress tracking are particularly effective for behaviors that require repetition and consistency, such as wearing items multiple times or regularly using second-hand platforms (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). Badges and achievements work well for milestone behaviors, such as

completing a first clothing swap or reaching a certain number of sustainable purchases. Leaderboards and social competition are most effective for users who are motivated by social comparison and status, though they may be less appealing or even demotivating for others (Alves *et al.*, 2023).

#### 4.2. Digital Platforms and Eco-Gamification

Digital platforms provide the infrastructure for implementing sophisticated gamification strategies at scale. The eco-gamification platform studied by Alves *et al.* represents a comprehensive approach to promoting circular economy practices in the textile and clothing sector (Alves *et al.*, 2023). Research on the Ant Forest social media app also indicates that green advertising can moderate the relationship between gamification and sustainable consumption behavior (Huang *et al.*, 2023). This decentralized application (DApp) integrates multiple gamification elements into a cohesive system that tracks users' sustainable behaviors, provides immediate feedback, and creates a community of engaged participants.

Key features of effective eco-gamification platforms include:

- Comprehensive tracking systems: The platform tracks users' Circularity Score (CS) based on owned items and eco-friendly actions, providing a holistic measure of sustainable behavior (Alves *et al.*, 2023). This goes beyond simple purchase tracking to encompass the full lifecycle of garments, including use frequency, care practices, repair, resale, and recycling.

- Varied challenges and goals: The platform offers diverse challenges that cater to different aspects of sustainable fashion consumption, from extending garment lifespan to participating in clothing swaps to choosing sustainable materials (Alves *et al.*, 2023). This variety maintains user interest and allows individuals to engage with sustainability in ways that align with their preferences and circumstances.

- Social features: Multiplayer leaderboards, community challenges, and social sharing features create a sense of relatedness and social accountability (Alves *et al.*, 2023). Users can see how their efforts compare to others, join teams or groups, and celebrate collective achievements.

- Customization and autonomy: The platform allows users to set personalized goals, choose which challenges to pursue, and customize their experience (Alves *et al.*, 2023). This supports the autonomy component of Self-Determination Theory, making users feel in control of their sustainability journey rather than being externally controlled.

- Immediate feedback: Push notifications and progress bars provide real-time feedback on sustainable actions, reinforcing positive behaviors and maintaining engagement (Alves *et al.*, 2023).

The WearMe30Times tool, while simpler in design, demonstrates that even basic gamification elements can be effective (Ševčíková *et al.*, 2024;

Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). By using QR codes on garment labels for progress tracking and combining this with social media challenges, the initiative creates an engaging experience that encourages consumers to extend clothing lifespan—one of the most impactful sustainable fashion behaviors.

### 4.3. Social Competition and Community Engagement

Social elements are among the most powerful components of gamification for sustainable fashion. Humans are inherently social beings, and our behaviors are strongly influenced by social norms, peer comparison, and the desire for social recognition. Gamification strategies that leverage these social dynamics can create powerful motivators for sustainable consumption.

Leaderboards create social competition by ranking users based on their sustainable behaviors, tapping into achievement motivation and status-seeking (Alves *et al.*, 2023). However, research suggests that leaderboards should be designed carefully to avoid demotivating users who rank lower. Strategies such as showing users their position relative to similar peers, highlighting personal improvement over time, and creating multiple leaderboards for different types of achievements can make social competition more inclusive and motivating for a broader range of users.

Community challenges and collaborative goals can harness social dynamics in a more cooperative way. Rather than competing against each other, users work together toward collective sustainability targets, creating a sense of shared purpose and mutual support. This approach may be particularly effective for promoting systemic change, as it emphasizes the collective impact of individual actions and builds a community identity around sustainable fashion.

Social media integration extends the reach of gamification beyond dedicated platforms, allowing users to share their achievements, challenges, and progress with their broader social networks (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). At the same time, social-media-driven hedonic and impulsive consumer behavior must be considered when designing sustainable fashion marketing interventions (Ciocodeică *et al.*, 2025).

This visibility can normalize sustainable fashion behaviors, create social proof, and inspire others to participate. The #30Wears campaign associated with WearMe30Times demonstrates how social media challenges can amplify the impact of gamification initiatives, creating viral momentum and cultural conversations around sustainable consumption.

## 5. Consumer Engagement Techniques

### 5.1. Nudging and Choice Architecture Interventions

Nudging interventions work by subtly altering the choice environment to make sustainable options more salient, accessible, or attractive without restricting consumer freedom. Research by Mizrachi et al. provides empirical evidence on the effectiveness of different nudging strategies in retail settings (Mizrachi *et al.*, 2024).

**Table 1**

*Nudging and Choice Architecture Interventions (Mizrachi et al., 2024)*

<b>Offering alternatives:</b>	The most effective nudging strategy identified was simply offering sustainable alternatives alongside conventional options (Mizrachi <i>et al.</i> , 2024). This intervention works by reducing the effort required to choose sustainable products and making them a visible part of the choice set. In retail environments, this might involve placing sustainable fashion items at eye level, creating dedicated sustainable fashion sections, or ensuring that online platforms display eco-friendly options prominently in search results.
<b>Providing information:</b>	Information provision about the environmental and social impacts of fashion choices can influence consumer behavior, though its effectiveness is limited by consumers' ability to process and act on this information (Mizrachi <i>et al.</i> , 2024). Effective information nudges are simple, concrete, and presented at the point of decision. For example, displaying the carbon footprint or water usage of different garments, or providing clear labels indicating sustainable certifications, can help consumers make informed choices.
<b>Appealing to social identity:</b>	Nudges that appeal to consumers' social identity and values can be effective, particularly when they align sustainable fashion with desirable social identities (Mizrachi <i>et al.</i> , 2024). For example, framing sustainable fashion as a marker of sophistication, creativity, or social consciousness can make it more appealing to consumers who identify with these attributes. Marketing messages that emphasize the social benefits of sustainable fashion—such as supporting fair labor practices or being part of a community of conscious consumers—can also strengthen engagement.
<b>Default effects:</b>	While not extensively studied in the reviewed literature, default effects represent another powerful nudging strategy. Making sustainable options the default choice (with the ability to opt out) can significantly increase their adoption. For example, online fashion platforms could default to showing sustainable products first, or clothing rental services could be presented as the default option with purchase as an alternative.

## 5.2. Information Provision and Transparency

Despite the limitations of information-based approaches when used in isolation, transparency and information provision remain important components of comprehensive engagement strategies. Consumers consistently report lacking the knowledge to distinguish sustainable from non-sustainable fashion products (Mizrachi *et al.*, 2024), and this knowledge gap undermines the effectiveness of other interventions.

Effective information provision goes beyond simple eco-labels to provide comprehensive, accessible, and credible information about products' sustainability attributes. Several papers discuss the role of blockchain technology and Digital Product Passports (DPP) in enhancing transparency (Jastrzębska, 2024; Tichoniuk, 2024). These technologies can provide consumers with detailed information about a garment's content, production history, supply chain, and environmental impact, accessible through QR codes or other digital interfaces.

Educational programs and campaigns can also play a role in building consumers' sustainability literacy (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). These initiatives should focus on practical knowledge that empowers consumers to make better decisions, such as how to identify quality garments that will last longer, how to care for clothes to extend their lifespan, and how to evaluate sustainability claims critically.

However, information provision must be carefully designed to avoid overwhelming consumers or creating decision paralysis. Research in behavioral economics suggests that too much information can be counterproductive, leading consumers to rely on simple heuristics or default to familiar choices. Effective information strategies therefore prioritize the most relevant and actionable information, present it in simple and visually appealing formats, and integrate it seamlessly into the decision-making process.

## 5.3. Social Norms and Identity Appeals

Social norms - the perceived standards of behavior within a social group - exert powerful influence on individual behavior. Research consistently shows that people are more likely to engage in sustainable behaviors when they believe these behaviors are common and socially approved (Mizrachi *et al.*, 2024; McEachern *et al.*, 2020).

Interventions that strengthen social norms around sustainable fashion can take several forms:

- **Descriptive norms:** Communicating that sustainable fashion behaviors are becoming increasingly common can encourage adoption. For example, messages like "Join the millions of people choosing second-hand fashion" or

"Most people in your community wear their clothes at least 30 times" can create social proof that normalizes sustainable behaviors.

- **Injunctive norms:** Communicating that sustainable fashion is socially approved and valued can motivate behavior change, particularly for individuals who are sensitive to social approval. Marketing campaigns that feature respected influencers, celebrities, or community leaders endorsing sustainable fashion can strengthen injunctive norms.

- **Peer influence:** Making sustainable fashion behaviors visible within peer networks creates direct social influence. The social media integration of gamification platforms and challenges like #30Wears leverages peer influence by making sustainable behaviors visible and shareable (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024).

Identity appeals work by linking sustainable fashion consumption to valued aspects of self-identity. Research by Kim *et al.* integrates self-congruity theory and self-completion theory to explore how self-identity drives sustainable fashion consumption (Kim *et al.*, 2025). The study found that when sustainable fashion aligns with consumers' self-concept - whether as environmentally conscious individuals, creative trendsetters, or socially responsible citizens - they are more likely to engage in sustainable behaviors. Marketing and engagement strategies should therefore emphasize how sustainable fashion allows consumers to express and reinforce valued aspects of their identity.

## 6. Practical Applications and Case Studies

### 6.1. WearMe30Times: Progress Tracking for Extended Use

The WearMe30Times initiative represents a simple yet effective application of behavioral psychology principles to promote sustainable fashion consumption (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Tichoniuk, 2024; Krzywonos *et al.*, 2024). Developed by Maakola in partnership with Genuine Way, this tool addresses one of the most impactful sustainable fashion behaviors: extending the use phase of garments, in line with intervention strategies that encourage reduced and more reflective clothing consumption (Joanes *et al.*, 2025).

**Mechanism:** The tool uses a dedicated QR code attached to garment labels. Consumers scan the code each time they wear the item, tracking their progress toward the goal of 30 wears. This goal is inspired by research suggesting that extending the active life of clothing from one to two years can reduce carbon, water, and waste footprints by 20-30%.

Behavioral principles applied:

- **Goal-setting:** The specific, measurable goal of 30 wears provides a clear target that makes abstract sustainability concepts concrete and actionable.
- **Progress tracking:** Visual feedback on wear count provides a sense of accomplishment and competence, reinforcing continued use.
- **Commitment device:** The act of scanning the QR code creates a moment of conscious engagement with the sustainability goal, strengthening commitment.
- **Social engagement:** Integration with social media challenges (e.g., #30Wears) creates social accountability and normalizes the behavior.
- **Effectiveness:** While comprehensive effectiveness data is not provided in the reviewed literature, the initiative demonstrates how simple technological interventions can create engagement with sustainable behaviors. The tool requires minimal effort from consumers while providing meaningful feedback and social connection.
- **Scalability:** The QR code approach is highly scalable, as it can be implemented by any fashion brand at low cost. The simplicity of the intervention also makes it accessible to a broad range of consumers, regardless of their technological sophistication.

## 6.2. Eco-Gamification Platforms for Circular Economy

The eco-gamification platform studied by Alves et al. represents a more comprehensive and sophisticated approach to promoting sustainable fashion consumption (Alves *et al.*, 2023). This decentralized application (DApp) integrates multiple behavioral interventions into a cohesive digital ecosystem designed to engage consumers in circular economy practices throughout the textile and clothing value chain.

Key features:

- **Circularity Score (CS):** A comprehensive metric that tracks users' sustainable behaviors across the full lifecycle of garments, including acquisition, use, care, repair, resale, and recycling.
- **Multi-layered reward system:** Users earn experience points (XP) and coins for completing sustainable actions, which can be redeemed for aesthetic assets or coupons. Badges and achievements recognize milestone accomplishments.
- **Multiplayer leaderboards:** Social competition features allow users to compare their performance with others, creating motivation through social comparison and status-seeking.
- **Varied challenges:** The platform offers diverse challenges that cater to different aspects of sustainable fashion, maintaining user interest and allowing personalized engagement.

- **Immediate feedback:** Push notifications and progress bars provide real-time feedback on sustainable actions, reinforcing positive behaviors.
- **Customization:** Users can set personalized goals and choose which challenges to pursue, supporting autonomy and intrinsic motivation.
- **Theoretical foundation:** The platform is based on the Gameful Design Heuristics (GDH) framework, which integrates Self-Determination Theory and behavioral economics principles. This theoretical grounding ensures that the gamification elements support intrinsic motivation by satisfying the psychological needs for competence, relatedness, and autonomy (Alves et al., 2023).

Behavioral principles applied:

- **Self-Determination Theory:** The platform satisfies the three intrinsic psychological needs (competence, relatedness, autonomy) that drive sustained motivation.
- **Habit formation:** Regular engagement with challenges and tracking creates habit loops around sustainable behaviors.
- **Social influence:** Leaderboards and community features leverage social comparison and peer influence.
- **Feedback loops:** Immediate feedback reinforces positive behaviors and maintains engagement.
- **Potential impact:** By creating a comprehensive ecosystem for sustainable fashion engagement, the platform has the potential to shift consumers from occasional sustainable actions to sustained participation in circular economy practices. The integration of multiple behavioral interventions addresses different motivational drivers and creates multiple pathways for engagement.

### 6.3. C2C Apps and Second-Hand Fashion Markets

Consumer-to-consumer (C2C) platforms for second-hand fashion represent another important application area for behavioral psychology and gamification strategies. Research by Arnesson et al. examines how gamification can impact consumer attitudes and intentions to use C2C apps for circular fashion (Arnesson and Westman, 2022). Such approaches are also relevant for consumers interested in upcycled fashion products and for younger consumer segments, including university students (Oncioiu and Ifrim, 2022; Rani *et al.*, 2025).

**Behavioral barriers:** C2C platforms face several psychological barriers to adoption, including:

- Perceived inconvenience compared to buying new items
- Concerns about product quality and hygiene
- Lack of social status associated with second-hand fashion
- Unfamiliarity with platform interfaces and processes

**Gamification solutions:** Gamification elements can address these barriers by:

- Making the browsing and purchasing process more enjoyable and engaging, reducing perceived inconvenience
- Creating achievement systems that reward regular use of C2C platforms, building habit formation
- Leveraging social features to normalize second-hand fashion and create positive social associations
- Providing tutorials and onboarding challenges that familiarize users with platform features

**Normative beliefs:** The research highlights the importance of normative beliefs - perceptions about what behaviors are common and approved within one's social group - in shaping intentions to use C2C apps (Arnesson and Westman, 2022). Gamification strategies that make second-hand fashion consumption visible and socially valued can strengthen these normative beliefs, creating a virtuous cycle where increased adoption further normalizes the behavior.

**Integration with broader strategies:** C2C platforms can be integrated with other behavioral interventions, such as nudging consumers to check second-hand options before buying new, providing information about the environmental benefits of second-hand fashion, and creating social challenges around building wardrobes from pre-owned items.

## 7. Ethical Considerations and Limitations

### 7.1. Autonomy and Transparency in Persuasive Design

The application of behavioral psychology and gamification to promote sustainable fashion consumption raises important ethical questions about consumer autonomy and the transparency of persuasive techniques. While the goal of promoting sustainability is widely viewed as socially beneficial, the use of psychological manipulation - even for good ends - requires careful ethical consideration.

Spanellis explores these ethical issues in depth, arguing that gamification for sustainable consumption must accept its fundamentally persuasive nature while ensuring transparency of purpose, autonomy, and appropriate ambiguity in design (Spanellis, 2023). The author proposes four principles for ethical gamification design:

**Table 2***The four principles for ethical gamification design (Alves et al., 2023; Spanellis, 2023)*

<b>Accepting persuasive nature:</b>	Rather than disguising or downplaying the persuasive intent of gamification, designers should acknowledge that these systems are explicitly designed to influence behavior. This honesty is essential for maintaining trust and respecting consumer autonomy.
<b>Ensuring transparency:</b>	Users should understand how gamification systems work, what behaviors are being encouraged, and why. This includes being transparent about data collection, how scores and rankings are calculated, and the goals of the intervention. Transparency allows users to make informed decisions about whether and how to engage with gamified systems.
<b>Supporting autonomy:</b>	While gamification inevitably influences behavior, it should preserve meaningful choice and avoid coercive elements. Users should be able to opt out, customize their experience, and pursue sustainability in ways that align with their values and circumstances. The autonomy principle of Self-Determination Theory is particularly relevant here (Alves et al., 2023).
<b>Appropriate ambiguity:</b>	Some degree of ambiguity in gamification design can be beneficial, allowing users to interpret and engage with the system in personally meaningful ways. However, this ambiguity should not extend to the fundamental purpose and mechanisms of the system, which should remain transparent.

These ethical principles are particularly important given the power asymmetry between platform designers and users. Designers have access to sophisticated behavioral science knowledge and user data, which they can use to create highly effective persuasive systems. Without ethical guardrails, this power could be misused to manipulate consumers in ways that serve commercial interests rather than genuine sustainability goals.

## 7.2. Rebound Effects and Unintended Consequences

Behavioral interventions for sustainable fashion consumption can produce unintended consequences that undermine their effectiveness or create new problems. Bardey et al. highlight the risk of rebound effects in consumer psychology, where engagement in one sustainable behavior may lead to less sustainable behaviors elsewhere (Bardey et al., 2026).

Types of rebound effects:

- Direct rebound: Consumers who save money by buying second-hand fashion or extending garment use may spend those savings on additional fashion purchases, negating some of the environmental benefits.

- Indirect rebound: Consumers who engage in sustainable fashion behaviors may feel licensed to engage in less sustainable behaviors in other domains, a phenomenon known as "moral licensing."

- Psychological rebound: Gamification systems that emphasize extrinsic rewards may undermine intrinsic environmental values, making consumers less likely to engage in sustainable behaviors when rewards are not available.

- Social rebound: If sustainable fashion becomes associated primarily with gamification and rewards rather than genuine environmental concern, it may lose its social meaning and fail to create lasting cultural change.

Mitigation strategies: To minimize rebound effects, interventions should:

- Emphasize intrinsic motivation and environmental values rather than relying solely on extrinsic rewards
- Frame sustainable fashion as part of a broader lifestyle change rather than isolated behaviors
- Provide education about the systemic nature of sustainability challenges
- Monitor and measure total environmental impact rather than focusing on single behaviors
- Design reward systems that encourage overall consumption reduction rather than just shifting consumption patterns

### **7.3. Balancing Engagement with Consumer Welfare**

The concept of creating "addictive" behaviors for sustainable fashion consumption requires careful consideration of consumer welfare. While habit formation and sustained engagement are desirable goals, there is a fine line between creating positive habits and exploiting psychological vulnerabilities.

Potential harms:

- Excessive engagement: Gamification systems designed to maximize engagement may consume excessive time and attention, creating stress or interfering with other important activities.
- Compulsive behavior: For some individuals, gamification elements like leaderboards and achievement systems may trigger compulsive behaviors or unhealthy social comparison.
- Data privacy: Comprehensive tracking systems required for gamification raise privacy concerns, particularly if user data is shared with third parties or used for commercial purposes beyond the stated sustainability goals.
- Exclusion: Gamification systems that require smartphones, internet access, or technological literacy may exclude disadvantaged populations from participating in sustainable fashion initiatives.

Design principles for consumer welfare:

- Implement features that prevent excessive engagement, such as usage limits or reminders to take breaks
- Provide options to disable competitive features for users who find them stressful
- Maintain strict data privacy protections and transparency about data use

- Ensure that sustainable fashion options remain accessible to all consumers, not just those who engage with gamification systems
- Regularly assess user wellbeing and adjust systems based on feedback

The goal should be to create engagement that enhances rather than detracts from consumer wellbeing, supporting sustainable behaviors in ways that are enjoyable and meaningful without becoming exploitative or harmful.

## **8. Future Directions and Recommendations**

### **8.1. Research Directions**

Several important research gaps remain in understanding how to effectively apply behavioral psychology and gamification to promote sustainable fashion consumption:

- Long-term effectiveness: Most studies examine short-term behavior change, but the sustainability transition requires lasting habit formation. Longitudinal research is needed to assess whether gamification-induced behaviors persist over time and whether they generalize beyond the specific contexts in which they are learned.
- Comparative effectiveness: More research is needed to compare different behavioral interventions and identify which strategies are most effective for different consumer segments, behaviors, and contexts. Rigorous experimental designs with control groups and standardized outcome measures would strengthen the evidence base.
- Psychological mechanisms: While we have theoretical frameworks for understanding behavior change, more research is needed to unpack the specific psychological mechanisms through which gamification and other interventions work. For example, how does the design of reward systems affect the balance between intrinsic and extrinsic motivation? How do different types of social features influence behavior through distinct pathways?
- Unintended consequences: Systematic research on rebound effects and other unintended consequences is needed to ensure that interventions produce net positive environmental impacts. This research should examine total consumption patterns rather than focusing narrowly on specific sustainable behaviors.
- Ethical frameworks: Further development of ethical frameworks for persuasive design in sustainability contexts is needed, including empirical research on how consumers perceive and respond to different levels of transparency and autonomy in gamification systems.
- Cultural variation: Most research has been conducted in Western contexts, but sustainable fashion is a global challenge. Research examining how behavioral interventions should be adapted for different

cultural contexts, values, and consumption patterns would enhance the generalizability and effectiveness of these approaches.

## 8.2. Recommendations for Practitioners

The recommendations for fashion brands are:

- Integrating simple behavioral interventions like progress tracking and goal-setting into product design and customer engagement strategies,
- Providing transparency about product sustainability attributes through accessible digital interfaces,
- Creating communities around sustainable fashion that provide social support and normalize sustainable behaviors,
- Designing reward systems that emphasize intrinsic satisfaction and social recognition rather than purely material incentives,
- Ensuring that sustainable options are accessible, affordable, and convenient to reduce barriers to adoption.

The recommendations for digital platform designers include:

- Applying Self-Determination Theory principles to create gamification systems that support competence, relatedness, and autonomy,
- Implementing comprehensive tracking systems that measure impact across the full lifecycle of garments,
- Providing varied challenges and customization options to maintain engagement and accommodate diverse user preferences,
- Building in ethical safeguards including transparency, privacy protection, and features that prevent excessive engagement,
- Conducting ongoing user research to assess wellbeing and adjust systems based on feedback.

The recommendations for policymakers consist in:

- Supporting the development and adoption of standardized sustainability metrics and certification systems that enable informed consumer choice,
- Investing in consumer education programs that build sustainability literacy,
- Creating regulatory frameworks that ensure transparency and ethical practices in persuasive design,
- Implementing policies that increase the accessibility and affordability of sustainable fashion options, making behavioral interventions more effective,
- Supporting research on the effectiveness and ethics of behavioral interventions for sustainable consumption.

The recommendations for researchers are:

- Conducting rigorous longitudinal studies with control groups to assess long-term effectiveness,
- Examining potential unintended consequences and rebound effects systematically,

- Developing and test ethical frameworks for persuasive design in sustainability contexts,
- Investigating how interventions should be tailored for different consumer segments and cultural contexts,
- Collaborating with practitioners to ensure research findings are translated into practical applications.

## 9. Conclusions

The transition to sustainable fashion consumption represents one of the most pressing challenges in addressing the environmental and social impacts of the global fashion industry. While consumer awareness of sustainability issues has grown significantly, the persistent attitude-behavior gap demonstrates that awareness alone is insufficient to drive meaningful behavior change. This manuscript has explored how behavioral psychology principles, habit formation mechanisms, and gamification strategies can be leveraged to create engaging, potentially addictive behaviors that promote sustainable fashion consumption.

The evidence reviewed demonstrates that behavioral interventions can be effective in influencing consumer behavior. Nudging strategies, particularly offering sustainable alternatives and strengthening social norms, can guide consumers toward more sustainable choices (Mizrachi *et al.*, 2024; Falcone and Fiorentino, 2025; Smoczyk, 2022). Gamification elements such as progress tracking, rewards systems, and social competition can create engaging experiences that make sustainable behaviors intrinsically rewarding (Das *et al.*, 2024; Arnesson and Westman, 2022; Alves *et al.*, 2023). Practical applications like the WearMe30Times initiative and comprehensive eco-gamification platforms show how these principles can be implemented at scale (Ševčíková *et al.*, 2024; Katarzyna *et al.*, 2024; Tarczyńska, 2024; Cieszyńska, 2024; Wojciechowska, 2024; Jastrzębska, 2024; Alves *et al.*, 2023; Tichoniuk, 2024; Krzywonos *et al.*, 2024).

However, the application of these strategies also raises important ethical considerations. The use of psychological techniques to influence behavior, even for socially beneficial ends, requires careful attention to consumer autonomy, transparency, and welfare (Spanellis, 2023). The risk of rebound effects and unintended consequences means that interventions must be designed and monitored carefully to ensure they produce net positive impacts (Bardey *et al.*, 2026). The concept of creating "addictive" behaviors for sustainable fashion must be balanced against the potential for exploitation and harm.

Moving forward, the field would benefit from more rigorous longitudinal research on the long-term effectiveness of behavioral interventions, systematic examination of unintended consequences, and further development of ethical frameworks for persuasive design. Practitioners should focus on creating interventions that support intrinsic motivation, provide transparency and

autonomy, and are integrated with structural changes that make sustainable fashion more accessible and affordable.

Ultimately, behavioral interventions are not a panacea for the fashion industry's sustainability challenges. They must be part of a comprehensive approach that includes regulatory reform, industry transformation, technological innovation, and cultural change. However, when designed thoughtfully and ethically, behavioral psychology and gamification strategies can play a valuable role in bridging the attitude-behavior gap and creating the sustained consumer engagement necessary for a transition to circular economy practices in the textile and clothing sector.

The fashion industry stands at a critical juncture, and the choices we make today will shape the environmental and social impacts of fashion consumption for generations to come. By understanding and applying insights from behavioral psychology, we can design interventions that make sustainable fashion not merely a rational choice, but an enjoyable, habitual, and socially rewarding practice. This approach offers hope for creating the widespread behavior change necessary to address one of the most significant sustainability challenges of our time.

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CREAREA UNUI COMPORTAMENT DE DEPENDENȚĂ PENTRU A  
ÎMBUNĂȚĂȚI CONSUMUL DE MODĂ SUSTENABILĂ: O ABORDARE DIN  
PERSPECTIVA PSIHOLOGIEI COMPORTAMENTALE

(Rezumat)

Industria modei se confruntă cu o provocare critică în materie de sustenabilitate, fast fashion-ul contribuind semnificativ la degradarea mediului și la inegalitatea socială. Această cercetare explorează modul în care principiile psihologiei comportamentale, mecanismele de formare a obișnuințelor și strategiile de gamificare pot fi folosite pentru a crea comportamente atractive, posibil adictive, care promovează consumul de modă durabil. Bazându-ne pe cercetări recente, analizăm factorii psihologici ai comportamentului consumatorilor, decalajul dintre atitudine și comportament în consumul durabil și intervențiile inovatoare, inclusiv nudging-ul, arhitectura alegerilor și platformele de eco-gamificare. Principalele constatări indică faptul că elementele de

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gamificare precum monitorizarea progresului, sistemele de recompense și competiția socială pot implica eficient consumatorii în practici durabile. Totuși, aplicarea modelelor de design adictive ridică considerații etice importante privind autonomia consumatorului și transparența. Prezentul articol oferă un cadru cuprinzător pentru proiectarea intervențiilor comportamentale care echilibrează eficacitatea cu responsabilitatea etică, oferind aplicații practice pentru brandurile de modă, factorii de decizie politică și designerii de platforme digitale care doresc să promoveze practicile economiei circulare în sectorul textil și al îmbrăcămintei.