

Creativity as a Successful Market Strategy for Sustainable Fashion Products

Yoo Jeong Park · Yoon Kyung Lee[†]

Instructor, Dept. of Fashion Design and Marketing, Seoul Women's University, Seoul, South Korea

Assistant Professor, Dept. of Clothing and Textiles, Pusan National University, Busan, South Korea

Abstract This study investigates how sustainability-related constraints can stimulate creativity in fashion design. Treating limited resources as an exogenous motivator, we analyzed fashion products from three successful sustainable brands—FREITAG, PEATSMAMA, and RE;CODE—that utilize recycled materials. Creativity was assessed by 15 fashion experts in Korea using two established frameworks: Bessemer's Creative Product Analysis Matrix (CPAM), focusing on novelty, resolution, and elaboration, and Amabile's Consensual Assessment Technique (CAT). The results show that sustainable fashion products scored significantly higher in creativity ($M = 4.20$) than conventional products ($M = 2.55$). This suggests that environmental constraints can positively influence creative performance. These findings provide strategic insights for fashion brands aiming to develop innovative and sustainable products and offer implications for design education by demonstrating how material limitations can foster greater ideation and originality in the design process.

Keywords Sustainability, Creativity, Limited resources, Fashion products, Recycled materials.

Citation Park, Y. J. & Lee, Y. K. (2025). Creativity as a successful market strategy for sustainable fashion products. *International Journal of Costume and Fashion*, 25(2), 1-16.

Introduction

The Fourth Industrial Revolution has reshaped the traditional linear flow of fashion—from production to consumption—into a more sustainable, circular model where consumption also feeds back into production. The life cycle of sustainable fashion products is characterized by a virtuous loop of production, use, recycling, and re-creation. Such products are often developed from existing resources or repurposed materials, requiring continuous innovation within strict environmental constraints. Paradoxically, sustainability demands constant change: sustainable fashion must persistently reinvent itself within finite conditions, uniting two seemingly opposing forces—resource efficiency and the dynamic nature of fashion (Lee & DeLong, 2018).

In this context, creativity emerges as a central success factor in both the development and consumer appeal of

sustainable fashion products. Unlike conventional fashion, which often emphasizes seasonal trends and aesthetic novelty, sustainable fashion calls for ingenuity in problem-solving. Designers must creatively respond to constraints by utilizing recycled materials, implementing low-impact production techniques, and embedding ethical or narrative dimensions into their designs (Gwilt, 2014). These creative interventions not only enhance product function but also establish emotional resonance, authenticity, and symbolic meaning—qualities increasingly sought by value-driven consumers (Niinimäki & Hassi, 2011).

The creativity found in sustainable fashion is, therefore, more than a matter of visual expression; it is integrative, meaning-making, and mission-driven. While conventional

Received May 2, 2025; Revised August 27, 2025; Accepted September 13, 2025

[†] Corresponding Author: pollinalee@pusan.ac.kr

fashion typically expresses creativity through surface-level innovation, sustainable fashion transforms constraints into opportunities to redefine aesthetics and consumer values. This multidimensional creativity enhances the social and cultural capital of products, ultimately reinforcing their appeal in a competitive marketplace.

Despite its growing importance, sustainable fashion faces several practical barriers: limited access to affordable eco-friendly materials, challenges in scaling production, consumer resistance to unfamiliar styles, and low levels of sustainability literacy. These obstacles slow down mainstream adoption. Yet, creativity plays a strategic role in overcoming such barriers—turning material limitations and system-level constraints into innovation triggers that lead to novel design languages, compelling brand narratives, and differentiated market offerings. Lee (2022) identified creativity—especially in product design—as a key factor in the commercial success of sustainable fashion brands. This finding resonates with Amabile’s (1996) model of creativity, which positions motivation as central to the creative process, particularly under conditions shaped by external constraints such as sustainability requirements.

Drawing on these theoretical foundations, this study investigates how sustainability-induced external motivation influences creativity in fashion design. Specifically, we examine the creative outcomes of fashion products developed under resource constraints. To evaluate creativity, we adopted the 4P model (person, process, product, press) proposed by Rhodes (1961), along with two validated assessment tools: Amabile’s Consensual Assessment Technique (CAT) and Bessemer’s Creative Product Analysis Matrix (CPAM). Furthermore, we conducted a comparative analysis of conventional and sustainable fashion products to identify creativity-enhancing design factors that can inform both industry practice and sustainability-focused design education.

Background

Sustainable fashion and limited resources

The fast-paced and ever-evolving fashion industry is under

increasing pressure to respond to global demands for sustainability. The traditional fashion system’s dependence on virgin materials and linear production processes poses a serious threat to long-term ecological balance. Fashion production consumes both renewable and nonrenewable resources, generates excessive solid waste, and emits harmful substances into the environment throughout the product life cycle (Winter, 2004). The environmental consequences—ranging from soil and water contamination due to toxic dye chemicals to the accumulation of non-biodegradable post-consumer textile waste—are well documented (Allwood et al., 2008; Chen & Burns, 2006).

Accelerated by consumerism and fast fashion culture, the frequency of clothing purchase and disposal has intensified, making unsustainable fashion consumption a pressing social and environmental issue. Sustainable consumption seeks to moderate the pace of consumption and minimize resource depletion and toxic waste production (Banbury et al., 2011; Fletcher & Grose, 2012). While social campaigns and normative influence may encourage sustainable behavior, long-term behavioral change depends on fostering environments in which consumers willingly choose sustainable products over conventional alternatives (Schor, 2005).

Recent scholarship reinterprets the concept of “limited resources” not solely as a constraint, but as a foundation for circular economy strategies. These strategies include recovering and recycling textile waste—both pre-consumer (e.g., manufacturing scraps) and post-consumer (e.g., discarded garments)—as core design inputs (Paço et al., 2021). This shift away from linear production enhances resource efficiency and repositions material scarcity as a catalyst for innovation and design creativity (de la Motte & Östlund, 2022). By transforming limitations into design opportunities, sustainable fashion offers a triple value proposition—functional, ethical, and emotional—that distinguishes it from conventional fashion.

Among these, emotional value plays a particularly pivotal role. Sustainable products often evoke environmental pride and offer avenues for self-expression, which are key predictors of consumer attitudes and purchase intentions (Kim, Jung, & Lee, 2021). In this way, resource constraints

foster not only ecological consciousness but also psychological attachment between consumers and brands. Scarcity, when approached creatively, becomes a strategic asset that deepens symbolic value and long-term consumer engagement (de la Motte & Östlund, 2022; Paço et al., 2021).

To promote the uptake of sustainable fashion, consumers must perceive that such products are not only environmentally responsible but also desirable and competitive when compared to non-sustainable alternatives. Creativity—manifested through uniqueness, novelty, and innovation—is a defining attribute of sustainable fashion (Lee, 2022). In particular, the creative resolution of material limitations is key to developing products that reflect ethical values while also enabling self-expression and personal fulfillment. When a consumer's self-image aligns with a brand's values and aesthetics, they tend to form stronger emotional bonds and exhibit increased purchase intentions (Graeff, 1997; Abel et al., 2013; Lee, 2022).

Ultimately, within the context of limited resources, creativity operates not only as a practical response to constraints but also as a symbolic and emotional amplifier. By reconceptualizing scarcity as a driver of meaning, identity, and innovation, sustainable fashion bridges the divide between ecological responsibility and consumer appeal.

Efficiency and creativity with limited resources

The concept of creativity in fashion design has been variously defined, but commonly includes the ability to produce something new and appropriate. Lubart (1994) views creativity as the ability to produce new and original work in response to task conditions, whereas Plucker et al. (2004) define creativity as the interaction between aptitude, process, and environment that facilitates producing an output that can be perceived as new and useful in society. Successfully positioning sustainable fashion products as a unique domain requires that sustainable attributes are creatively expressed as unique and distinctive characteristics within the product design, which are then brought to the market as products, leading to sustainable consumption behavior (Lee, 2022).

Three general criteria are required for a sustainable fashion product to be considered creative: novelty, intentionality,

and appropriateness (Runco, 2007; Sternberg, 2006; Ward, 2007; Weisberg, 2006). Creativity is relevant to problem-solving in sustainable products. Triggering the creative process often involves identifying a problem or issue and using creative thinking to determine alternative solutions (Weisberg, 2006). For a sustainable fashion product to be judged as a creative outcome or output through various definitions of creativity, two key elements—novelty (original, new) and appropriateness (useful, meaningful)—must be met simultaneously. In addition to making tangible efforts to make their products environmentally friendly and ethically responsible to consumers who use them, sustainable fashion brands also focus on storytelling to encourage consumers to relate to the product's story and use the product. Thus, companies demonstrate a sustainable commitment to the environment by being transparent about their production processes and business operations while telling the story of their products.

Explicitly defined external constraints that affect creativity have been studied in the context of art (Stokes, 2001), in which artists are limited to painting the same subject matter over and over again in different ways, and fashion (Stokes, 2006), in which designers focus on achieving the intended function of a garment. These studies show that, rather than limiting creativity, external constraints can stimulate creators to think more carefully and promote surprisingly high levels of novelty and utility. Koberg and Bagnall (1974) describe the design and problem-solving process as follows: "If you suddenly imagine a truly unique idea, you will automatically be in the minority" (p. 16). Designers must discover or invent specific themes (quasi-themes) that are tenuously present within the problems associated with a particular situation (Margolin & Buchanan, 1996), and must build on their skills, knowledge, and experience to develop solutions that optimize the moment of inspiration (Navinchandra, 1991).

Each new design situation is unique and requires creative application of strategies to pose and solve problems (Hargrove, 2012; Lee & DeLong, 2016). For example, divergent creativity operates within a framework with few boundaries and often results in distinct and easily recognizable changes. Conversely, convergent creativity

operates within given parameters and provides value, although the evidence may be less discernible (Weisberg, 2006). In the context of fashion apparel, divergent creativity is activated when fashion leaders design and produce luxury apparel, consumers expect the unexpected, and the product is directly perceived as an expression of creativity. At the budget level, however, successfully synthesizing the constraints related to low prices, wide distribution, and mass appeal is a major challenge for expressive creativity. In this convergent situation, the expression of creativity moves from the product to the product development process, and is not visible to causal observers (Ruppert-Stroescu & Hawley, 2014; Stacey & Eckert, 2010). Therefore, for sustainable fashion products to successfully enter the market and lead to sustainable consumption behavior among consumers, they must not only meet the basic requirements of a fashion product but also have creative elements that make them appealing to consumers.

Methods for Assessing Creativity

Amabile's Consensus Assessment Technique (CAT)

The Consensual Assessment Technique (CAT), developed by Amabile (1996), is a widely accepted method for evaluating creativity through expert judgment. In this approach, creativity is assessed by domain-specific experts—such as those in literature, visual arts, music, or fashion—who independently and subjectively evaluate creative outputs. Importantly, researchers themselves do not conduct the assessments; rather, evaluation is delegated to professionals with expertise in the relevant field, thereby enhancing objectivity and ecological validity.

According to Amabile, creative production emerges from the interaction of three essential components: (1) domain-relevant skills (knowledge and technical proficiency), (2) creativity-relevant processes (divergent thinking, risk-taking, and flexible cognition), and (3) task motivation, which includes both intrinsic interest and synergistic extrinsic factors (Jeon, 2010). In practice, expert evaluators typically rate creativity using Likert-type scales (e.g., 1 = low

creativity to 5 or 7 = high creativity) or categorical judgments (e.g., creative vs. non-creative). The final creativity score is derived from aggregated expert evaluations, emphasizing consensual agreement across independent judgments.

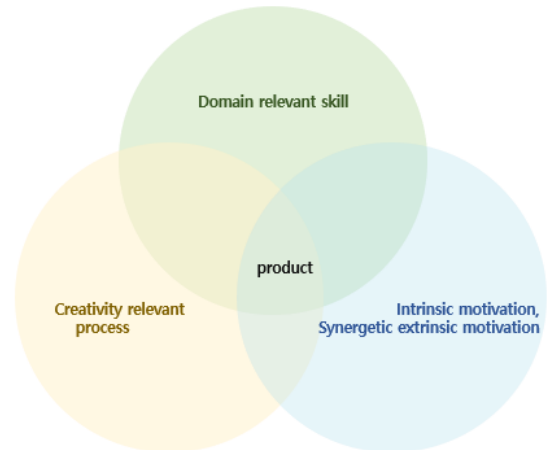


Figure 1. Amabile's model of creativity

Besemer's Creative Product Analysis Matrix (CPAM)

The Creative Product Analysis Matrix (CPAM), developed by Besemer and Treffinger (1981), offers a structured framework for assessing product creativity based on three major dimensions: novelty, resolution, and elaboration/synthesis.

- (1) Novelty measures the originality and unexpected use of sustainable materials or forms and includes two sub-factors: originality and surprise.
- (2) Resolution assesses the product's functionality, practicality, and usability, consisting of four sub-factors: value, logic, usefulness, and understandability.
- (3) Elaboration/synthesis evaluates the product's overall cohesiveness and aesthetic refinement, incorporating three sub-factors: organic organization, elegance, and well-craftedness.

Based on these dimensions, O'Quin and Besemer (1989, 2006) developed 11 specific rating items to enable a

comprehensive evaluation of creative outputs (see Table 1 for item details). CPAM has been widely adopted for product design assessments due to its systematic breakdown of creativity into observable criteria.

Methods

Research design

This study conducted a comparative evaluation of creativity in sustainable and conventional fashion products currently available on the market, with the aim of identifying practical design strategies that enhance the market competitiveness of sustainable fashion. Product selection was based not on visual similarity, but on representativeness—designs that best reflected the brand’s identity and embodied the core values and stylistic direction of its broader product line. Two researchers, both holding Ph.D.s in apparel design, conducted a minimum of three consensus meetings to finalize the selections, ultimately choosing the designs that received the highest scores during initial expert screenings.

Creativity was evaluated using Rhodes’ (1961) 4P model of creativity—Person, Process, Product, and Press—with a specific emphasis on the product dimension. Within this framework, the “Press” component—external environment—was conceptualized as the resource constraints inherent in sustainable fashion design, aligning with the notion that environmental limitations can serve as extrinsic motivational triggers for creative output.

To ensure both holistic validity and analytical depth, this study employed two complementary creativity assessment methods: Amabile’s Consensual Assessment Technique (CAT) and Besemer and Treffinger’s Creative Product Analysis Matrix (CPAM). CAT captures domain-specific, intuitive expert judgments that reflect the ecological validity of real-world design assessment, whereas CPAM enables systematic evaluation through clearly defined criteria: novelty, resolution, and elaboration/synthesis.

The combined use of CAT and CPAM is theoretically and empirically supported by prior studies. CAT has proven effective in evaluating creative output in fields such as

product development and visual design (Baer & McKool, 2009; Hennessey et al., 2010), while CPAM has been adopted for its detailed dimensional analysis of creative artifacts (Besemer & Treffinger, 1981; O’Quin & Besemer, 2006). Studies by Kudrowitz and Dippo (2013) and Chang and Chou (2018) have shown that integrating subjective expert judgment (CAT) with structured analytical tools (CPAM) improves the reliability, depth, and interpretability of creativity assessments.

By grounding our methodological approach in this established literature, we provide a theoretically sound and empirically validated framework for assessing the creativity of sustainable fashion products—particularly those developed under material and ecological constraints. This dual-method strategy allows for a nuanced and credible comparison between sustainable and conventional fashion outputs.

Evaluation procedure

Expert evaluators assessed the creativity of selected fashion products using a 5-point Likert scale based on CAT principles, emphasizing independent, intuitive judgments grounded in domain expertise. In parallel, CPAM was applied to deconstruct creativity into three core dimensions—novelty, resolution, and elaboration/synthesis—accompanied by ten refined sub-factors adapted to the sustainable fashion context. Specifically:

- (1) Novelty captured the experimental and innovative use of sustainable materials.
- (2) Resolution reflected functionality, usability, and wearability.
- (3) Elaboration/synthesis evaluated the quality of finish, coherence in design elements, and aesthetic completeness.

Each sub-factor was rated on a 5-point scale (1 = very low, 5 = very high). Table 1 presents the full list of evaluation items and their operational definitions. This dual-assessment approach enabled a nuanced understanding of how creative attributes manifest differently in sustainable versus conventional fashion designs.

Table 1. Evaluation criteria and sub-factors of product creativity

Evaluation Criterion	Sub-factor	Evaluation Item
Novelty	1 Originality	To what extent is the product experimental, novel, and fresh?
	2 Surprise	Does the product satisfy needs that were previously unmet?
Resolution	3 Value	Does the product present a valuable solution?
	4 Logic	Is the product appropriate for consumer needs and does the idea clearly address a specific problem?
	5 Usefulness	Is the product functional and useful?
	6 Understandability	Is the product designed for its intended use and easy to understand/use?
Elaboration / Synthesis	7 Organic	Are the various design details of the product organically interconnected?
	8 Attractiveness	Is the product attractive enough to capture and hold people's interest?
	9 Well-crafted	Is the product's finish of high quality?
	10 Elegance	Does the product exhibit elegance as an end result?

Inter-rater reliability

To ensure consistency and reliability across expert evaluations, this study incorporated multiple strategies to establish inter-rater reliability:

- (1) Calibration session: Before the main evaluation began, a calibration session was conducted with a subset of experts. During this session, evaluators were asked to rate a sample of pre-selected products using both CAT and CPAM-based criteria. This step facilitated a shared understanding of the evaluation criteria, helped clarify ambiguous dimensions (e.g., elaboration vs. attractiveness), and reduced interpretive variance.
- (2) Independent scoring: All experts subsequently evaluated the target product images independently, without discussion or influence from other participants, in accordance with the standard procedure of the Consensual Assessment Technique (Amabile, 1982).
- (3) Statistical consistency check: Inter-rater reliability was assessed using Krippendorff's alpha, a widely accepted statistical measure for assessing agreement among multiple raters. The calculated alpha coefficient was 0.78, which indicates a substantial level of

agreement among the evaluators (Krippendorff, 2004). This result confirms the consistency and validity of the expert evaluations across both CAT and CPAM scoring frameworks.

These steps ensured that the expert assessments reflected not only individual subjective judgment but also a coherent, replicable standard of creativity evaluation aligned with best practices in design research.

Participants

This study involved a total of 50 expert participants based in the Republic of Korea, all of whom held doctoral degrees (Ph.D.) in fashion design, apparel studies, or closely related fields. The decision to include only Ph.D.-level participants was based on the need to ensure consistent interpretation and application of theoretical creativity assessment frameworks, particularly the CAT and CPAM. Prior studies (e.g., Baer & McKool, 2009; Runco, 2007) have shown that domain experts with research experience are more likely to make reliable and valid creativity judgments in structured evaluation settings. While field practitioners offer valuable insight, this study prioritized theoretical familiarity to reduce variability and increase methodological consistency.

Participants were recruited using a combination of convenience sampling and snowball sampling. Initial recruitment began through the researcher's academic network, including Ph.D. holders and professors who had attended fashion-related academic conferences. To mitigate potential sampling bias, the pool was expanded through peer referrals and by collecting publicly available contact information from a wide range of universities across Korea. This process ensured disciplinary diversity and regional representation within the sample.

The study protocol was reviewed and approved by the Institutional Review Board (IRB) of the author's affiliated institution. The online survey was administered between July 30 and September 30, 2023. Participants received a detailed explanation of the study's objectives and methodology and provided informed consent prior to participation. The survey instrument consisted of 22 questions, including 20 creativity evaluation items based on CPAM sub-dimensions and 2 demographic items. A 5-point Likert scale was used to assess each sub-factor of creativity.

Prior to the main data collection, a preliminary validation process was conducted. Five experts with Ph.D.s in fashion-related disciplines reviewed the survey instrument for content clarity and appropriateness. For image validation, a pool three times larger than the final set was created, and each image was evaluated using a 5-point Likert scale to determine its representativeness. The highest-rated images were included in the final assessment.

Analysis of objects

To conduct a comparative evaluation of creativity between sustainable and conventional fashion products, this study selected six brands—three sustainable and three conventional—based on well-defined criteria including product type, price range, design philosophy, and market positioning. All selected brands are active in the fashion accessory market, particularly in bags, which were chosen as the target product category for creativity assessment.

The sustainable fashion brands—FREITAG, PLEATSMAMA, and RE;CODE (see Table 2)—were selected for their proven market success, strong brand identities, and consistent emphasis on upcycling practices. These brands

exemplify the integration of sustainability and creativity by transforming discarded or waste materials into functional, aesthetically compelling products:

- (1) FREITAG (Switzerland): Specializes in transforming used truck tarpaulins, seat belts, and bicycle inner tubes into unique, durable bags that highlight material authenticity and rugged functionality.
- (2) PLEATSMAMA (South Korea): Creates knitted bags from post-consumer PET bottle yarn, emphasizing seamless 3D knitting, lightweight practicality, and minimalist design for daily use.
- (3) RE;CODE (South Korea): Repurposes surplus garments and industrial textiles into fashion-forward accessories and apparel, emphasizing narrative storytelling and deconstruction-based design.

For comparison, three conventional fashion brands (see Table 3)—KUHO, BEANPOLE, and COURONNE—were selected. These brands occupy similar price segments and serve a comparable demographic (mid- to high-end consumers in Korea and Asia). Brand pairings were established based on alignment in product type and stylistic approach:

- (1) KUHO (conventional) and RE;CODE (sustainable): Both emphasize conceptual design rooted in structural form and silhouette innovation.
- (2) BEANPOLE (conventional) and FREITAG (sustainable): Each offers practical, durable bags with an emphasis on everyday functionality and brand heritage.
- (3) COURONNE (conventional) and PLEATSMAMA (sustainable): Share minimalist aesthetics and feminine curved silhouettes, appealing to urban lifestyle consumers.

From each brand, two representative bag products were selected, resulting in a total of 12 product images (6 sustainable, 6 conventional). The selection was guided by the following criteria:

- (1) Product Identity: Each product was chosen to best represent the core design values and visual language of its brand.

- (2) Design Cohesion: Pairings ensured stylistic comparability across sustainable and conventional groups.
- (3) Market Visibility: All selected products were commercially available and featured in recent collections or brand campaigns.

The decision to focus on bags rather than clothing was based on three methodological rationales:

- (1) Visual Evaluability: bags offer clear contours, material finishes, and structural detail that can be reliably evaluated through images, minimizing confounding variables such as garment fit or drape.
- (2) Material Focus: in sustainable design, accessories serve as ideal canvases for showcasing material experimentation, resource reuse, and construction innovation.
- (3) Market Relevance: many sustainable brands strategically introduce accessories as entry-level products due to lower sizing complexity, higher versatility, and greater market acceptance—making them appropriate for evaluating real-world design impact.

All 12 product images were assessed using the Creative Product Analysis Matrix (CPAM) (Besemer & Treffinger,

1981; O’Quin & Besemer, 1989, 2006), which evaluates creativity based on three core dimensions:

- 1. Novelty – Originality and surprise
- 2. Resolution – Usefulness, logic, value, and understandability
- 3. Elaboration/Synthesis – Aesthetic quality, craftsmanship, and organic unity

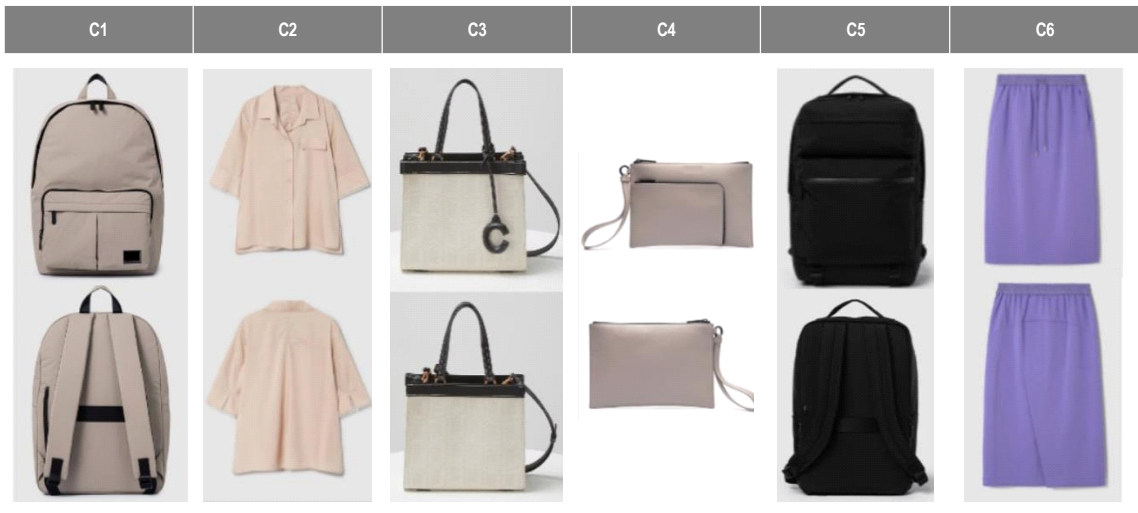
Each dimension was operationalized into 10 sub-factors: original, surprising, valuable, logical, useful, understandable, organic, attractive, well-crafted, and elegant. Evaluations were conducted using a 5-point Likert scale (1 = very low creativity, 5 = very high creativity), adapted to reflect sustainable design contexts where limited resources often catalyze innovation.

A panel of 50 Ph.D.-level fashion experts rated each product independently. The aggregated data were analyzed using IBM SPSS Statistics for descriptive statistics and Pearson correlation analysis to explore relationships among the creativity sub-factors. This approach enabled a systematic comparison of perceived creativity between sustainable and conventional fashion products and illuminated the design attributes that drive creative distinction in resource-constrained environments.

Table 2. Sustainable fashion product samples



Table 3. Conventional fashion product samples



Results

Comparison of conventional fashion brand products and sustainable fashion brand products

When examining the creativity of conventional and sustainable fashion brand products, sustainable fashion brand products scored higher in all categories (see Table 4). According to the results of the evaluation, conventional fashion product evaluation scores were as follows: design for purpose (3.66), product maturity (3.63), organically connecting the details (3.43), the results are spectacular (3.21), clearly providing ideas that fit your needs (3.13), providing a useful solution (3.06), usability and future-proofing (2.90), attractiveness (2.73), fulfilling previously unmet needs (2.66), and experimentation, newness, and freshness (2.55).

Conversely, the evaluation of sustainable fashion products was highest for experimentation, newness, and freshness (4.20), followed by attractiveness (4.15) and organically connecting the details and product maturity (4.10), the results were spectacular (4.08), usability and future-proofing (4.05), design for purpose (3.90), fulfilling previously unmet needs (3.85), clearly providing ideas that fit your needs (3.81), and providing a useful solution (3.76).

In the overall creativity category, the degree of

experimentation, newness, and freshness items had the highest scores for sustainable fashion brand products (4.20), whereas designs that fit the purpose (3.66) had the highest values for conventional fashion brand products. Additionally, in the attractiveness category, the scores for sustainable fashion branded products (4.15) and conventional fashion brand products (2.73) had the highest score difference (1.42), followed by the highest score difference (1.65) for the degree of experimentation, newness, and freshness items, indicating that the difference in the degree of newness, freshness, and attractiveness between sustainable and conventional fashion brands was the largest. This can be interpreted as consumers finding the creative novelty of sustainable fashion brands attractive and can be derived as a success factor that can meet consumer needs for sustainable fashion products.

Conversely, conventional fashion brand products scored the lowest in the experimentation, newness, and freshness categories at 2.55. The lowest score for the overall creativity of sustainable fashion brand products was 3.76 for providing useful solutions.

This confirms that the strengths of sustainable fashion brands' creative elements are newness and freshness, which are the weakest elements of conventional fashion brands. These results also confirm that conventional fashion brand products and sustainable fashion brand products differ in

Table 4. Comparison of conventional and sustainable fashion products

Questionnaires	Conventional fashion brand products M (1 to 5)	Sustainable fashion brand products M (1 to 5)
1. Experimental, new, and fresh	2.55	4.20
2. Fulfill previously unmet needs	2.66	3.85
3. Provide a useful solution	3.06	3.76
4. Clearly provide ideas that fit your needs	3.13	3.81
5. Usability and future-proofing	2.90	4.05
6. Design for purpose	3.66	3.90
7. Organically connect the details	3.43	4.10
8. Attractiveness	2.73	4.15
9. Product maturity	3.63	4.10
10. The results are spectacular	3.21	4.08

terms of their appeal to consumers. These results suggest the necessity of verifying whether an environment in which sustainable fashion brand products are designed using limited resources leads to increased originality and uniqueness.

Analysis of the creativity of conventional fashion brand product design

In the creativity evaluation of conventional fashion brand products, BP’s backpack scored the highest on four items (Items 3, 6, 7, 9) and CO’s handbags C3 (Items 8, 9, 10) and

Table 5. Evaluation of the creativity of conventional fashion products

Questionnaires	C1	C2	C3	C4	C5	C6
1. Experimental, new, and fresh	2.27	2.52	2.86	2.94	2.41	2.37
2. Fulfill previously unmet needs	2.69	2.71	2.86	2.94	2.58	2.54
3. Provide a useful solution	3.39	2.94	3.13	3.26	3.18	2.81
4. Clearly provide ideas that fit your needs	3.30	3.05	3.22	3.39	3.20	2.83
5. Usability and future-proofing	2.66	2.81	3.03	2.69	2.60	3.84
6. Design for purpose	3.90	3.66	3.62	3.67	3.75	3.62
7. Organically connect the details	3.64	3.45	3.58	3.58	3.45	3.24
8. Attractiveness	2.66	2.73	3.22	2.88	2.56	2.64
9. Product maturity	3.94	3.56	3.94	3.54	3.77	3.30
10. The results are spectacular	3.39	3.09	3.50	3.30	3.28	3.00

C4 (Items 1, 2, 4) scored the highest in three items (see Table 5). The highest scoring item and product was product maturity, with C1 (BP) and C3 (CO) both scoring 3.94. The next was the design for purpose, with a C1 (BP) scoring 3.90.

The lowest scores were for experimentation, newness, and freshness of, with C1 (BP) at 2.27. The next lowest score for the same item was C6 (BP) with a score of 2.37 for the same item. These results indicate that the items that drive consumers to purchase merchandise are highly appealing in terms of practicality. In particular, these factors are highly represented in fashion accessories such as bags and handbags. For fashion apparel products (C2 and C6), usability, future-proofing, and design for purpose scored relatively high, whereas experimentation, newness, and freshness scored the lowest, similar to the fashion accessories. This shows that conventional fashion products lack design novelty to convey the sense of experimentation, newness, and freshness that leads consumers to purchase. There are also ways to complement these novel elements with their design aspects.

Analysis of the creativity of sustainable fashion brand product design

When analyzing the creativity of sustainable fashion

products, Table 6 has shown that S2 (FR) scored the highest, except for usability and future-proofing. For the usability and future-proofing items, S1 (RE) scored the highest at 4.39 points. Regarding the individual items, S5 (PL) had the highest score (4.47) in the experimentation, newness, and freshness categories. In the experimentation, newness, and freshness categories, S5 (PL) scored 0.59 points higher than S3 (PL), which scored the lowest, and 1.54 points higher than C4 (CO), which scored the highest, and 2.00 points higher than C6 (BP), which scored the lowest. Among the sustainable fashion brands, S2 (FR) had the highest number of design creativity items. S2 (FR) scored highest at 12 (fulfilling a previously unmet need: 4.09), 13 (providing a useful solution: 4.20), 14 (clearly providing ideas that fit your needs: 4.16), 16 (designed for purpose (4.30), 17 (organic connection of details: 4.28), and 18 (attractiveness: 4.41). S6 (FR) scored the highest on 19 (completeness of the product: 4.24) and 20 (great outcome: 4.24). FR products satisfied the highest creativity factor, with S1 (RE) and S5 (PL) scoring the highest on usefulness and futurism at 15 and experimentation, newness, and freshness at 11, respectively.

These results show that consumers recognize that sustainable fashion products currently successfully sold in the marketplace are often valued for their creative designs.

Table 6. Evaluation of the creativity of sustainable fashion products.

Questionnaires	S1	S2	S3	S4	S5	S6
1. Experimental, new, and fresh	4.28	4.32	3.88	4.28	4.47	4.37
2. Fulfill previously unmet needs	3.79	4.09	3.69	3.84	4.01	4.01
3. Provide a useful solution	3.50	4.20	3.79	3.60	3.60	4.03
4. Clearly provide ideas that fit your needs	3.60	4.16	3.84	3.62	3.84	4.00
5. Usability and future-proofing	4.39	3.96	3.90	4.15	4.18	4.00
6. Design for purpose	3.56	4.30	4.20	3.67	3.75	4.15
7. Organically connect the details	4.01	4.28	4.11	4.00	4.07	4.20
8. Attractiveness	4.16	4.41	3.92	4.11	4.16	4.32
9. Product maturity	4.03	4.22	4.11	4.03	4.13	4.24
10. The results are spectacular	4.13	4.22	3.98	4.03	4.13	4.24

Additionally, FR is a sustainable fashion brand that best expresses the creative elements perceived by consumers, who rate its minimalist and functional design as creative. However, while FR scored the highest in the majority of the items, S5 (PL) scored the highest in the experimentation, newness, and freshness items, suggesting that new shapes or configurations that have not been seen before are an important factor for consumers to feel new and fresh.

Interpretation and strategic implications

The superior creativity scores of sustainable fashion brands can be attributed to their distinct design philosophies, which emphasize material storytelling, resource transformation, and ethical innovation. Unlike conventional brands that often follow trend-based or utilitarian design strategies, sustainable brands are more likely to embrace constraint-driven creativity, which paradoxically enhances novelty and emotional engagement.

FREITAG, for example, received top scores in categories such as design for purpose, organic integration, and aesthetic craftsmanship. This reflects the brand's clear visual identity, where repurposed materials (e.g., truck tarps) retain visible traces of their former function. The resulting products offer both a compelling backstory and a minimalist utility that aligns with the values of conscious consumers. The design is not only functional but communicative, transforming material constraint into a visual asset.

PLEATSMAMA, on the other hand, excelled in experimentation and newness, reflecting the brand's focus on technological innovation using 3D knitting techniques and PET-based yarns. The sculptural yet lightweight forms of their accessories convey innovation through silhouette and material composition. This suggests that formal experimentation, when grounded in sustainability, contributes to consumers' perception of high creativity.

RE;CODE achieved consistently strong scores in elaboration and aesthetic appeal, due to its conceptual and deconstructive design language. By reconfiguring existing garments and military surplus materials, the brand conveys a post-industrial aesthetic that resonates with avant-garde and ethical fashion markets. This indicates that conceptual layering and symbolic transformation are powerful drivers of

perceived creativity in sustainable fashion.

In contrast, conventional brands such as KUHO and BEANPOLE were positively evaluated in terms of design purpose and product maturity, but lacked perceived novelty or freshness. This gap underscores a strategic challenge: consumers increasingly associate creativity not just with visual design, but with ethical meaning, material experimentation, and emotional storytelling. From a strategic perspective, these findings suggest that sustainable brands can differentiate themselves not only through environmental claims, but by cultivating distinctive creative identities rooted in constraint and transformation. Conversely, conventional brands seeking to enhance consumer perception of creativity may benefit from adopting design strategies that emphasize material innovation, upcycling, or narrative richness—even if full sustainability integration is not yet possible.

Overall, this study confirms that perceived creativity in fashion is not merely a function of aesthetics or form, but is deeply shaped by the values, intentions, and methods behind the design. Sustainable fashion, when approached creatively, offers a multidimensional value proposition that can support brand differentiation, emotional engagement, and long-term loyalty.

Discussion

Interpretation of creativity differences and brand-specific strengths

This study revealed that sustainable fashion products, developed under constraints such as limited materials and circular production practices, scored significantly higher in creativity than conventional fashion products. This outcome suggests that resource limitations may serve as a creative stimulus, prompting designers to generate innovative, meaningful solutions.

The three sustainable fashion brands analyzed—FREITAG, PLEATSMAMA, and RE;CODE—each demonstrated distinctive creative strategies that contributed to their high evaluations in specific areas. FREITAG utilizes upcycled truck tarps, endowing each product with a unique texture and history. This approach scored particularly well in

“resolution” and “elaboration,” reflecting the product’s functional performance and cohesive aesthetic. PLEATS-MAMA combines recycled plastic yarn with 3D knitting technology, generating lightweight, sculptural silhouettes. Its work was praised for “novelty” and “attractiveness,” showcasing how future-facing technologies can drive design innovation. RE;CODE reimagines discarded clothing through deconstruction and reconstruction, offering surprising reinterpretations of existing garments. Its bold experimentation and originality were reflected in high “surprise” and “organic organization” scores.

Conversely, the conventional fashion brands—KUHO, BEANPOLE, and COURONNE—performed better in utilitarian aspects such as “design for purpose” and “logic,” yet were rated significantly lower in terms of “experimentation,” “newness,” and “emotional resonance.” These findings suggest that while conventional fashion prioritizes refinement and functional consistency, sustainable fashion channels creativity through boundary-pushing materiality and narrative depth.

As illustrated in Figure 2, sustainable fashion products cluster in the upper-right quadrant of creative value—combining emotional storytelling, material novelty, and meaningful innovation—while conventional fashion remains

in the lower-left, associated with practical logic and product maturity. Notably, consumer interest appears to peak at the intersection of these axes, where practicality meets creativity. This indicates that the future of fashion may lie in designs that are both purpose-driven and emotionally engaging.

Implications for design education and brand strategy

The findings of this study have meaningful implications for both educational curricula and corporate strategy. From an educational perspective, there is a strong case for integrating creativity-focused pedagogy into sustainable design education. Rather than centering purely on aesthetic styling or seasonal trends, design programs should emphasize constraint-based problem-solving. This includes project-based learning that incorporates recycled materials, zero-waste pattern-making, and iterative prototyping under real-world limitations. Furthermore, incorporating tools such as CAT and CPAM into classroom assessments can help students better understand and refine the creative value of their work.

From a corporate standpoint, the study highlights creativity as a strategic differentiator for sustainable fashion brands. Creative storytelling, functional innovation, and

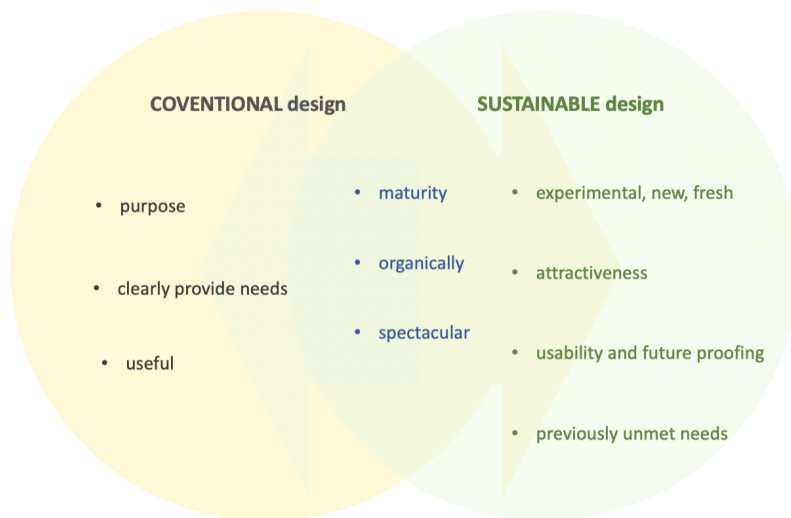


Figure 2. Elements of interaction between conventional and sustainable design for enhanced creativity.

emotional value become essential in compensating for higher production costs or unconventional aesthetics often associated with sustainable design. Brands must therefore adopt a communication strategy that actively shares their material sources, production narratives, and design philosophy with consumers, cultivating emotional engagement and long-term brand loyalty.

Additionally, conventional brands can benefit from reimagining their design strategies through a creative sustainability lens. Instead of viewing constraints as a limitation, they should be seen as opportunities to foster original solutions that resonate with evolving consumer values. Cross-sector collaboration between designers, engineers, and sustainability experts may further facilitate innovative breakthroughs. Ultimately, creativity is not a decorative layer in sustainable fashion—it is the core engine of value creation. Brands and designers capable of transforming environmental challenges into compelling, consumer-centric design narratives will be better positioned to thrive in a future where ecological accountability and emotional resonance are central to market success.

Conclusion

This study examined how creativity functions as a key factor in the perceived value of sustainable fashion products compared to conventional fashion products. By conducting a comparative evaluation using validated creativity assessment tools, we found that sustainable fashion products—especially those developed under constraints of limited resources—were perceived as significantly more creative by expert evaluators. This heightened creativity was particularly evident in categories such as experimentation, novelty, and visual freshness, whereas conventional products scored higher in rational functionality. These findings suggest that consumer value perception in sustainable fashion is closely tied to creative expression that transcends aesthetics and embeds ethical and material narratives.

From a theoretical perspective, this study contributes to the literature on sustainable design by framing material constraints not as limitations but as triggers for creative

ideation and problem-solving. By integrating Rhodes' 4P model and employing both CAT and CPAM, we present a holistic and structured approach to evaluating creativity in fashion. Our results support the argument that sustainability-driven constraints foster innovation, confirming prior theories on motivation and creativity under external pressures.

In practical terms, these insights offer design practitioners, educators, and brand strategists actionable recommendations. For designers, the implication is that creativity in sustainable fashion should focus not only on stylistic innovation but also on narrative depth, material experimentation, and functional novelty. For educators, the findings underscore the importance of exposing students to design processes that simulate real-world limitations. Constraint-based learning environments can cultivate deeper creative thinking and may outperform traditional resource-rich studio models in terms of idea generation and originality.

Nevertheless, this study has limitations. The analysis was confined to a specific set of product types—mainly fashion accessories—and the expert sample was limited to Ph.D.-level academics in South Korea. These factors may limit the generalizability of the results. Future studies should expand to a broader range of fashion categories such as footwear, outerwear, and activewear, and include cross-cultural perspectives and practitioner evaluations. In addition, investigating consumer-side creativity perception and the role of digital co-creation tools could further deepen our understanding of the sustainability-creativity nexus.

In conclusion, creativity serves not only as a differentiating factor but as a strategic enabler for advancing sustainable fashion in today's market. Developing future-ready design education and innovation strategies that prioritize creative responses to sustainability challenges will be crucial for fostering lasting change in the fashion industry.

References

- Abel, J. I., Buff, C. L., & O'Neill, J. C. (2013). Actual self-concept versus ideal self-concept: An examination of image congruence and consumers in the health club industry. *Sport, Business and Management: An Interna-*

- tional Journal*, 3(1), 78–96. <https://doi.org/10.1108/20426781311316915>
- Allwood, J. M., Laursen, S. E., Russell, S. N., de Rodríguez, C. M., & Bocken, N. M. P. (2008). An approach to scenario analysis of the sustainability of an industrial sector applied to clothing and textiles in the UK. *Journal of Cleaner Production*, 16(12), 1234–1246. <https://doi.org/10.1016/j.jclepro.2007.06.014>
- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43(5), 997–1013. <https://doi.org/10.1037/0022-3514.43.5.997>
- Amabile, T. M. (1996). *Creativity and innovation in organizations* (Vol. 5). Harvard Business School.
- Baer, J. & McKool, S. S. (2009). Assessing creativity using the consensual assessment technique. In *Handbook of research on assessment technologies, methods, and applications in higher education* (pp. 65-77). IGI Global Scientific Publishing. <https://doi.org/10.4018/978-1-60566-667-9.ch004>
- Banbury, C., Stinerock, R., & Subrahmanyam, S. (2011). Sustainable consumption: Introspecting across multiple lived cultures. *Journal of Business Research*, 65(4), 497–503. <https://doi.org/10.1016/j.jbusres.2011.02.028>
- Besemer, S. P. & Treffinger, D. J. (1981). Analysis of creative products: Review and synthesis. *The Journal of Creative Behavior*, 15(3), 158-178. <https://doi.org/10.1002/j.2162-6057.1981.tb00287.x>
- Chang, M.-H. & Chou, H.-W. (2018). Enhancing creativity assessment reliability: A comparison of CAT and structured evaluation methods. *Creativity Research Journal*, 30(2), 145–155. <https://doi.org/10.1080/10400419.2018.1446741>
- Chen, H.-L. & Burns, L. D. (2006). Environmental analysis of textile products. *Clothing and Textiles Research Journal*, 24(3), 248–261. <https://doi.org/10.1177/0887302x06293065>
- de la Motte, H. & Östlund, Å. (2022). Sustainable fashion and textile recycling. *Sustainability*, 14(22), Article 14903. <https://doi.org/10.3390/su142214903>
- Fletcher, K. & Grose, L. (2012). *Fashion and sustainability: Design for change*. Laurence King Publishers.
- Graeff, T. R. (1997). Comprehending product attributes and benefits: The role of product knowledge and means-end chain inferences. *Psychology & Marketing*, 14(2), 163–183. [https://doi.org/10.1002/\(SICI\)1520-6793\(199703\)14:2](https://doi.org/10.1002/(SICI)1520-6793(199703)14:2)
- Gwilt, A. (2014). *A practical guide to sustainable fashion*. Bloomsbury Publishing.
- Hargrove, R. A. (2012). Fostering creativity in design education: A conceptual model of metacognitive scaffolding. *International Journal of Technology and Design Education*, 23(4), 717–728. <https://doi.org/10.1007/s10798-012-9211-7>
- Jeon, K. W. (2010). *Measurement of creativity*. Changjisa.
- Kim, I., Jung, H. J., & Lee, Y. (2021). Consumers' value and risk perceptions of circular fashion: Comparison between secondhand, upcycled, and recycled clothing. *Sustainability*, 13(3), 1208. <https://doi.org/10.3390/su13031208>
- Koberg, D. & Bagnall, J. (1974). *The universal traveler: A soft-systems guide to creativity, problem-solving, and the process of reaching goals*. W. Kaufmann.
- Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. *Human Communication Research*, 30(3), 411-433. <https://doi.org/10.1111/j.1468-2958.2004.tb00738>
- Kudrowitz, B. M. & Dippo, C. (2013). Comparing structured and unstructured creativity evaluation methods. *International Journal of Design Creativity and Innovation*, 1(3), 140–155. <https://doi.org/10.1080/21650349.2013.815167>
- Lee, Y. K. (2022). Exploring the value of sustainable fashion products among young Korean consumers. *International Journal of Fashion Design, Technology and Education*, 16(3), 1–12. <https://doi.org/10.1080/17543266.2022.2136251>
- Lee, Y. K. & DeLong, M. (2016). Improving creative design skills. *Journal of the Korean Society of Clothing and Textiles*, 40(2), 397–408. <https://doi.org/10.5850/JKSCT.2016.40.2.397>
- Lee, Y. K. & DeLong, M. (2018). Rebirth product development for sustainable apparel design practice in a design studio class. *Fashion Practice*, 10(1), 34–52.

- <https://doi.org/10.1080/17569370.2017.1413797>
- Lubart, T. I. (1994). Creativity. In R. J. Sternberg (Ed.), *Thinking and problem solving* (pp. 290–332). Academic Press.
- Margolin, V. & Buchanan, R. (Eds.). (1996). *The idea of design*. MIT Press.
- Navinchandra, D. (1991). *Exploration and innovation in design: Towards a computational model*. Springer-Verlag.
- Niinimäki, K. & Hassi, L. (2011). Emerging design strategies in sustainable production and consumption of textiles and clothing. *Journal of Cleaner Production*, 19(16), 1876–1883. <https://doi.org/10.1016/j.jclepro.2011.04.020>
- O'Quin, K. & Besemer, S. P. (1989). The development, reliability, and validity of the revised creative product semantic scale. *Creativity Research Journal*, 2(4), 267–278. <https://doi.org/10.1080/10400418909534323>
- O'Quin, K. & Besemer, S. P. (2006). Using the creative product semantic scale as a metric for results-oriented business. *Creativity and Innovation Management*, 15(1), 34–44. <https://doi.org/10.1111/j.1467-8691.2006.00367.x>
- Paço, A., Leal Filho, W., Ávila, L. V., & Dennis, K. (2021). Fostering sustainable consumer behavior regarding clothing: Assessing trends on purchases, recycling and disposal. *Textile Research Journal*, 91(3–4), 373–384. <https://doi.org/10.1177/0040517520944524>
- Plucker, J. A., Beghetto, R. A., & Dow, G. T. (2004). Why isn't creativity more important to educational psychologists? Potentials, pitfalls, and future directions in creativity research. *Educational Psychologist*, 39(2), 83–96. https://doi.org/10.1207/s15326985ep3902_1
- Rhodes, J. M. (1961). An analysis of creativity. *Phi Delta Kappan*, 42(7), 305–308. <https://www.jstor.org/stable/20342603>
- Runco, M. A. (2007). *Creativity: Theories and themes: Research, development, and practice*. Elsevier Academic Press.
- Ruppert-Stroescu, M. & Hawley, J. (2014). A typology for creativity in fashion design and development. *Fashion Practice*, 6(1), 9–35. <https://doi.org/10.2752/175693814X13916967094759>
- Ruppert-Stroescu, M., LeHew, M. L. A., Connell, K. Y. H., & Armstrong, C. M. (2015). Creativity and sustainable fashion apparel consumption: The fashion detox. *Clothing and Textiles Research Journal*, 33(3), 167–182. <https://doi.org/10.1177/0887302X15579990>
- Schor, J. B. (2005). Prices and quantities: Unsustainable consumption and the global economy. *Ecological Economics*, 55(3), 309–320. <https://doi.org/10.1016/j.ecolecon.2005.07.030>
- Stacey, M. & Eckert, C. (2010). Reshaping the box: Creative designing as constraint management. *International Journal of Product Development*, 11(3–4), 241–255. <https://doi.org/10.1504/IJPD.2010.033960>
- Sternberg, R. J. (2006). The nature of creativity. *Creativity Research Journal*, 18(1), 87–98. https://doi.org/10.1207/s15326934crj1801_10
- Stokes, P. D. (2001). Variability, constraints, and creativity: Shedding light on Claude Monet. *American Psychologist*, 56(4), 355–359. <https://doi.org/10.1037/0003-066X.56.4.355>
- Stokes, P. D. (2006). *Creativity from constraints: The psychology of breakthrough*. Springer.
- Ward, T. B. (2007). Creative cognition as a window on creativity. *Methods*, 42(1), 28–37. <https://doi.org/10.1016/j.ymeth.2006.12.002>
- Weisberg, R. W. (2006). *Creativity: Understanding innovation in problem solving, science, invention, and the arts*. Wiley.
- Winter, D. D. N. (2004). Psychology and consumer culture: The struggle for a good life in a materialistic world. In T. Kasser & A. D. Kanner (Eds.), *Shopping for sustainability: Psychological solutions to overconsumption* (pp. 69–87). American Psychological Association.