

Sustainable consumption and supply chain transparency in emerging jewelry brands

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Abstract

This paper explores the ways in which new jewelry brands, based in the U.S., incorporate sustainable consumption and supply chain transparency and the impact that these initiatives have on consumer trust, consumer loyalty and readiness to pay a premium. This study used a convergent parallel mixed-methods design and combines qualitative case studies of five sustainability-focused brands (Brilliant Earth, Vrai, Soko, Do Amore and Mejuri) with quantitative survey data from 200 U.S. consumers aged 20-45. Thematic analysis of brand communications revealed three key sustainability themes: ethical sourcing, digital transparency and eco-friendly packaging. Survey results showed that conflict-free diamonds, recycled metals and digital traceability were the most valued features. The regression analysis has proved that digital transparency has a strong positive correlation with consumer trust and disclosure of ethical practices has a strong positive correlation with willingness to pay the premium. The results emphasize the fact that transparent sustainability is not just a brand booster but a necessity of the market. The cost-effective traceability tools, certifications and storytelling can be used to create competitive advantage in the values-driven U.S. jewelry market by emerging brands.

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1. Introduction

Long-term growth is desirable for sustainability in consumption and production [1]. The role of innovation and efficient use of resources ensures long-term economic sustainability [2], [3]. In this respect, the luxury jewelry industry faces an irreversible and radical change, which is predetermined by the growing world requirements of sustainability, openness and ethical conscience [4]. What used to be a field that was mostly defined by exclusiveness and rarity, as well as visual lavishness, is now being redefined by values that are based on environmental responsibility and societal accountability. This evolution reflects not merely shifting consumer tastes but a broader socio-economic and technological realignment in how luxury is produced, consumed and evaluated [5]. In this regard, the incorporation of Environmental, Social and Governance (ESG) has abandoned corporate sustainability reporting and has incorporated them in the heart of the consumer brand

relations. This is affecting the purchasing patterns in the segments and, more so, in the luxurious markets.

The U.S. consumers, who are between 20 and 45 years old, including millennials and Generation Z, are among the drivers of such a change. These generations are also more environmentally aware than the previous ones and are more technologically sensitive and value-based in their buying patterns [6]. Recent studies indicate that this demographic actively seeks jewelry that reflects ethical production values that include the use of recycled and traceable metals, conflict-free diamonds, carbon-neutral production and plastic-free biodegradable packaging [7]. Gen Z consumers in the U.S. expressed willingness to pay a premium for products that align with their sustainability values, and jewelry emerged as one of the top three categories in which ethical attributes influence purchase decisions [8]. This shift signals that for many consumers, jewelry is no longer just a symbol of wealth or sentiment, but it is a statement of ethical identity.

The key principle of this new consumer-brand relationship is traceability, which is the systematic capability to track the path of a product since the extraction of raw material to all the manufacturing, distribution and sales processes [9]. This is in the jewelry sector, where it is reported to trace the source of gemstones, certify the responsible sourcing of gold and silver, and record production activities along the value chain. With the increasing controversy of forced labor, environmental destruction and mineral wars in the world, traceability has become a critical tool that brands use to justify their claims of ethical sourcing, as well as to avoid reputational losses [10]. Besides being a working instrument, traceability currently plays a communicative role in the sense that it helps the brands demonstrate the conformity of ESG and consults the stakeholders on the issue of transparency, authenticity and accountability.

To address this increasing need to be seen, a flood of technological advancements has been implemented in the industry [11]. Legacy players and new brands are equally adapting blockchain-based authentication systems, QR code allows tracking interfaces, diamond and AI-based supply chain audits in the form of a digital passport, among other developments [12], [13]. Such tools not only guarantee the integrity of the information and avert fraud but also allow consumers to verify the assertions of ethical sourcing in real time using smartphones and web-based solutions. Luxury jewelry, beyond ethical expectations, has enhanced sustainability as a byproduct of brand management and customer engagement strategies [14].

Irrespective of such changes within the industry, scholarly interest remains undeveloped regarding how new jewelry brands, particularly newer, more digital native and mission-driven companies, navigate and utilize sustainability and traceability as competitive tactics. While extensive literature on sustainable practices in the fashion and cosmetics industries exists [15], [16], a significant gap is present in the jewelry sector, where product lifecycles, sourcing challenges and consumer touchpoints differ significantly. Emerging brands are particularly worthy of attention as they tend to be more responsive to innovations and open in communication, yet are constrained by specific limitations related to scale, certification and customer confidence.

Considering these dynamics, the present paper aims to study the incorporation of sustainability and supply chain transparency into the business of the U.S.-based emerging jewelry brands and the impact that these practices have on consumer perceptions and economic performance. In particular, it discusses the relationships between ethical product characteristics, transparency tools and consumer satisfaction, including trust, loyalty and willingness to pay a premium. This paper provides both theoretical and practical insights to navigate the changing needs of the ethical luxury market space by linking the case information on a brand-by-brand basis with the consumer-level survey data.

1.1. Literature review

1.1.1. Sustainability and ESG in fashion and cosmetics

Research on sustainability and ESG factors has been extensive in high-consumption industries such as fashion and cosmetics. Several studies, including Niinimäki et al. [17] and Olivar Aponte et al. [18], have examined the environmental and social repercussions of fast fashion and demonstrate how consumer demand for

affordable luxury conflicts with sustainable production. When it comes to cosmetics, Nguyen et al. [19] found that inaccurate or unconfirmed sustainability claims can have a negative impact on the consumer trust, particularly among Gen Z population. The two industries have received significant academic attention due to their regular product cycles and substantial environmental footprints [20], [21]. However, they differ from luxury jewelry in such fundamental aspects as the materials life cycle, the integrity of the supply chain and the reasons for purchase.

1.1.2. The jewelry sector: underrepresented in ESG literature

In comparison to fashion and cosmetics, jewelry production has been relatively under-researched in the context of academic ESG debates. Most sustainability-oriented jewelry studies have focused on legacy companies or high-profile conglomerates. For instance, Shashi et al. [22] investigated the ways in which corporate luxury brands incorporate circularity into their operations, but their conclusions are less applicable to small-scale or agile companies. In their literature review analysis, Bilancia et al. [23] found that ethically sourced jewelry is a topic of interest among consumers, but existing research pays little attention to how smaller brands adopt and promote these practices. This gap has widened with the consumers increasing demand for greater traceability, ethical labor practices and environmentalism in luxury goods.

1.1.3. Emerging jewelry brands as strategic ESG actors

Emerging U.S.-based jewelry brands are structurally placed to ensure that they incorporate ESG practices into their models at the beginning stage instead of adapting sustainability into the current systems. According to Bagathi et al. [24], the brands do not rely on the conventional supply chain rigidity associated with lab-grown diamonds. Instead, they embrace recycled metals and blockchain-based traceability platforms as their core principle. They are also more responsive to the socially conscious consumers who use sustainability as a competitive differentiator. Similarly, Sun et al. [25] emphasized that frequent ethical reporting helps to build reputation capital and brand trust. However, empirical research on the impact of such disclosures on consumer behaviors including loyalty, perceived value or willingness to pay a premium remains limited, particularly in the U.S. jewelry setting.

1.1.4. Digital transparency and consumer trust

Recent studies in related sectors suggest that digital transparency can influence consumer trust and willingness to pay. Sovtić et al. [26] argue that blockchain-based traceability significantly increases consumer confidence in product authenticity and social responsibility. However, their study focused on the fashion sector. Similarly, research by Chaplynska et al. [27], and Yele and Litoriya [28] showed that QR-code-enabled supply chain visibility positively affects perceived brand credibility, especially among Gen Z consumers. However, these findings have not yet been empirically validated within the emerging jewelry sector in the U.S., where trust and symbolic value play a central role in purchase decisions.

1.1.5. Marketing ethics and consumer behavior

Marketing ethics and consumer behavior are closely related [29], [30]. In this regard, Machado and Goswami [31] investigated how sustainability messaging in the jewelry industry affects consumer loyalty by relying on experimental data from Brazil. They discovered that social impact messages and ecological outcome messages increased the word-of-mouth behavior and brand attachment. They propose that sustainability stories are potentially a strong marketing tool, but the results of the study are contextual and cannot be applied to the U.S. market. Similar experimental or survey-based studies of the reception of such messaging by ethically conscious U.S. jewelry purchasers are lacking.

1.1.6. Industry-led ESG initiatives

Sector-wide initiatives, such as Watch & Jewelry Initiative 2030 and Kering's Jewelry Award, aim to standardize sustainable practices across brands of all sizes. In this regard, Ciurel [32] noted that these efforts

emphasize decarbonization, gender equity and responsible sourcing. Nevertheless, the actual implementation and impact on the emerging U.S. jewelry companies have not been documented in peer-reviewed literature. These initiatives have not been thoroughly examined academically, and little research has been done to determine the interplay of such frameworks with consumer perception and brand differentiation.

1.1.7. Identified research gap

Although the issue of ESG values in the jewelry market is increasingly discussed among consumers and addressed through industry commitments, the scholarly literature is still behind. The majority of current literature concentrates either on legacy brands or the international market, leaving the U.S.-based emerging jewelry brands underrepresented. Although the concept of sustainability in fashion and cosmetics is thoroughly researched, jewelry is an industry with unique issues, including the ability to trace the origin of valuable products and intricate working processes. Moreover, unlike the effects of digital traceability and ethical communications in related industries, their impact on consumer behavior in the U.S. jewelry market has not been experimentally tested. Few quantitative studies also exist that link ESG disclosures to measurable consumer behaviors related to trust, loyalty and willingness to pay. This gap quickly highlights the necessity of mixed-method studies that can describe practices at a brand level and consumer perceptions in this dynamic area.

1.2. Research goal and questions

Considering the above, the current study explores how U.S.-based emerging jewelry brands integrate sustainable consumption practices and transparent supply chain mechanisms. It also aims to understand how these elements influence consumer perceptions and behaviors. To examine how emerging jewelry brands in the U.S. integrate sustainable consumption practices and supply chain transparency, and to assess their impact on consumer trust, loyalty and willingness to pay a premium, the following research questions are proposed:

- RQ1: Which sustainability elements (e.g., ethical materials, eco-friendly production, sustainable packaging) are most valued by U.S. jewelry consumers?
- RQ2: How does digital supply chain transparency (e.g., blockchain, QR-code certification) influence consumer trust in emerging jewelry brands?
- RQ3: To what extent does the disclosure of ethical production practices affect U.S. consumers' willingness to pay a premium for jewelry?

The stated research questions are formed to support a mixed-methods approach, which combines qualitative insights from brand-level case studies and marketing communications with quantitative data from a structured consumer survey. This dual strategy aims to examine both how brands are adopting sustainable practices and how these practices are received by target consumers.

1.3. Scope of the study

This study is dedicated to the U.S.-based emerging jewelry brands founded within the last 20 years that incorporate sustainability and transparency in their work and target the audience of ethically minded consumers. The consumer sample will be narrowed down to the age range between 20 and 45, including both millennial and Gen Z. It is also believed that the luxury retailing environment is changing due to their preferences and Internet literacy. The study was designed as a mixed-methods study that includes the qualitative case study of a few jewelry brands that embrace transparency and ESG principles, and a quantitative survey on the attitude of U.S. consumers towards ethical sourcing, digital traceability and sustainability reports. Such approaches are utilized to guarantee the creation of in-depth knowledge of the transformation of sustainable approaches into consumer benefits in this new branch of the jewelry market.

The rest of this paper is organized as follows. Section 2 outlines the methodological approach, which comprised the convergent parallel mixed-method design that was applied to collect and analyze qualitative

and quantitative information. The results are introduced and discussed in Section 3. Section 4 draws conclusions based on the analysis and points out theoretical contributions and practical implications for emerging jewelry brands. Lastly, Section 5 presents the recommendations on practice and the future research directions.

2. Research method

2.1. Research design

The study follows a convergent parallel design that is based on qualitative and quantitative data collection and analysis that is performed simultaneously and independently and subsequently followed by an analysis to generate a strong and multidimensional interpretation [33]. The design is especially adapted to research the intricate convergence of brand behaviors and consumer beliefs in the changing environment of ethical consumption in the jewelry industry [34].

The qualitative section will deal with the case study analysis to research the implementation of sustainability and transparency practices by new jewelry brands in the United States. At the same time, the quantitative section uses a structured consumer survey to determine the impact of these practices on trust, loyalty and paying a premium. The two strands combined will ensure that the joint result will show both the supply-side (firm behavior) and demand-side (consumer behavior) dynamics of sustainable branding.

2.2. Qualitative component: case study analysis

This study analyzes U.S.-based jewelry brands recognized for their commitment to environmental and social responsibility. The purpose is to explore brand-level sustainability initiatives. Selected brands include Brilliant Earth, Vrai, Soko, Do Amore and Mejuri. They are chosen based on clear, documented practices such as the use of lab-grown diamonds, carbon-neutral production, eco-friendly packaging and supply chain traceability technologies (e.g., blockchain or QR-code certifications).

Data for the case studies are collected from publicly available sources, including official brand websites, published sustainability reports, marketing communications, social media posts (especially Instagram) and reputable third-party articles (e.g., Retail Dive, Forbes, The Guardian). These sources provide insights into both operational practices and brand narratives that shape public perception.

The data analysis follows a thematic approach, a flexible qualitative method that identifies repetitive patterns within and across brands. The themes of ethical sourcing, minimizing environmental impact, digital traceability and social equity initiatives were coded using NVivo software. This approach allows for a direct comparison of sustainability strategies and their implementation in emerging jewelry brands.

2.3. Quantitative component: consumer survey

A quantitative survey is conducted by targeting U.S. consumers aged 20 to 45, with an emphasis on Gen Z and millennial cohorts who are most engaged with ethical consumption. The purpose is to complement the brand-level analysis. Participants are selected using convenience sampling through online platforms such as Qualtrics and SurveyMonkey. A total of 200 valid responses is taken into consideration. This is to ensure adequate statistical power for inferential analysis.

The survey instrument consists of closed-ended questions using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure three primary dimensions: (1) perceived importance of sustainability features (ethical materials, eco-friendly production, sustainable packaging), (2) consumer trust in digital supply chain transparency (blockchain, QR certification), and (3) willingness to pay a premium for ethically produced jewelry. Open-ended questions were also included to gather qualitative insights into the specific sustainability factors influencing jewelry purchasing decisions. Before the mass deployment, the survey was piloted with 10-15 individuals from the target population to ensure clarity, internal consistency and content validity.

In the pilot study, minor issues were found regarding the question phrasing and response options which were refined to improve clarity and internal consistency (Cronbach's α raised from 0.72 to 0.85). These refinements ensured that the final survey instrument reliably captured perceptions of sustainability, trust and willingness to pay a premium. Following the refinement of the instrument, based on responses to pilot testing, the final survey was conducted in 2-3 weeks. The participation was voluntary, informed consent was obtained digitally, and all data were collected anonymously.

Descriptive statistics were applied to analyze quantitative data to summarize consumer preferences and behavior patterns, especially regarding RQ1. The analysis of the correlation between perceived transparency, consumer trust and willingness to pay a premium to answer RQ2 and RQ3 is conducted by using regression analysis. Statistical analysis is done with the help of SPSS, R and Excel. It is important to note that the use of convenience sampling via online platforms may introduce biases because the participants could be more digitally engaged or ethically conscious than the average consumer. This method limits the generalizability of the findings.

The regression model in this study included control variables such as age, gender, and prior purchase experience to account for potential confounds. In the analysis, the assumptions of normality, linearity and multicollinearity were assessed using standard diagnostic tests and no violations were detected.

2.4. Data integration

After the qualitative and quantitative analysis, the findings are triangulated to strengthen the validity and reliability of the findings presented in this study. The convergence (where findings are consistent), complementarity (where findings complement each other), and divergence (where findings are inconsistent) come in at the interpretation stage, which enables integration.

2.5. Ethical considerations

All ethical protocols were strictly observed. In the quantitative survey, informed consent was sought from all the participants, who were also assured of anonymity and confidentiality of their responses. Participants were made aware of the right to drop out at any time without any consequences. No personally identifiable data were gathered or stored. For the qualitative part, publicly available data were used, thus eliminating the necessity of direct contact with the representatives of the brand or other proprietary data. The intellectual property of every source was respected, and the analysis was objective due to the cross-validation of findings on many platforms and perspectives.

3. Results and discussion

3.1. Qualitative results: case study analysis

A review of five emerging jewelry brands in the U.S. identifies three key sustainability themes that are commonly emphasized. Ethical sourcing was a core principle across all brands. Brilliant Earth and Vrai focus on traceable or lab-grown diamonds, which are sourced outside conflict-prone mining regions. Do Amore provides documentation of the gems' origin while Mejuri emphasizes its use of recycled metals, which are obtained from RJC-certified gold suppliers. The practices are very much consistent with the values of consumers in terms of provenance and social impact. Moreover, the digital transparency was provided by using QR-code tracking and authentication with the help of blockchain. Brilliant Earth applies blockchain in mine-to-market traceability, and Vrai in serial-coded diamonds tracking. In its turn, Soko presents the information on artisan sourcing and carbon-offset using open-access dashboards, which is a more affordable approach to data sharing and a sign of the flexibility of small businesses. Finally, environmentally friendly packaging and logistics appeared in every case with a different priority. Soko minimizes emissions by packaging in lightweight recycled paper. On the other hand, Do Amore delivers the jewelry in FSC-certified boxes and adds some storytelling elements related to charitable contributions to clean water, while Mejuri

encourages the use of reusable pouches and recyclable packaging. Such initiatives indicate the creativity of new brands in building environmental value into consumer experience at relatively low cost.

The summary of sustainability and transparency practices in five emerging jewelry brands in the U.S. is presented in Table 1. The table points out the comparison in terms of ethical sourcing, traceability systems, environmental efforts and packaging strategies. It illustrates how each brand implements ESG principles differently to create consumer confidence and gain a competitive advantage.

Table 1. Comparison of sustainability features across case brands

Brand	Ethical sourcing	Traceability practices	Environmental initiatives	Packaging approach	Distinctive sustainability strategy
Brilliant Earth	Sources only conflict-free and recycled diamonds in compliance with the Kimberley Process	Uses blockchain verification for select diamond supply chains; detailed provenance reports available online	Carbon-neutral operations through renewable-energy offsets and responsible mining partnerships	FSC-certified and fully recyclable materials with minimal ink printing	Transparency: first brand identity built on verifiable ethical sourcing documentation
Vrai	Utilizes lab-grown diamonds created with renewable energy	Digital certification of each stone's origin using blockchain-based tracking	Zero-emission production facilities powered by hydro and solar energy	Recyclable and compostable packaging; no plastic inserts	Fully integrated carbon-free production chain emphasizing traceable provenance
Soko	Works with small-scale Kenyan artisans under fair-trade guidelines	Traceability managed through the Soko Connect digital artisan platform	Promotes local material sourcing to reduce transport-related emissions	Recycled paper and locally sourced biodegradable materials	Community-based circular production linking social equity and environmental design
Do Amore	Recycles precious metals and uses ethically mined gemstones	Certificate of origin for all stones; QR-code-based supply verification	Donates a portion of profits to fund clean-water projects in mining communities	Plastic-free packaging made from reclaimed wood and paper	Social enterprise model combining ethical sourcing with philanthropy
Mejuri	Partners with RJC-certified suppliers and emphasize recycled gold	Offers product-level transparency pages detailing material origin	Reduces CO ₂ emissions via low-impact supply chain logistics	Reusable pouches and recyclable cardboard boxes	Mainstreaming sustainable luxury through affordability and everyday wearability

3.2. Quantitative results: consumer survey (n = 200)

3.2.1. Descriptive statistics showing sustainability priorities

Table 2 represents summary of the descriptive statistics of consumer choices based on the sustainability characteristics of jewelry buying.

Table 2. Descriptive statistics – importance of sustainability elements

Sustainability element	Mean (1–5)	SD	Rated “Very Important” (%)
Conflict-free diamonds	4.2	0.8	75%
Recycled metals	4.1	0.9	72%
Digital traceability	4.0	0.9	70%
Eco-friendly packaging	3.9	1.0	68%
Carbon-neutral production	3.7	1.1	60%

As Table 2 indicates, conflict-free diamonds received the highest importance rating ($M = 4.2$, $SD = 0.8$), followed by recycled metals ($M = 4.1$) and digital traceability ($M = 4.0$). Even lower-ranked factors like eco-friendly packaging and carbon neutrality scored above neutral. This reflects widespread sustainability concern. Figure 1 displays the percentage of U.S. consumers (aged 20–45) who rated various sustainability elements as "very important" in their jewelry purchase decisions.

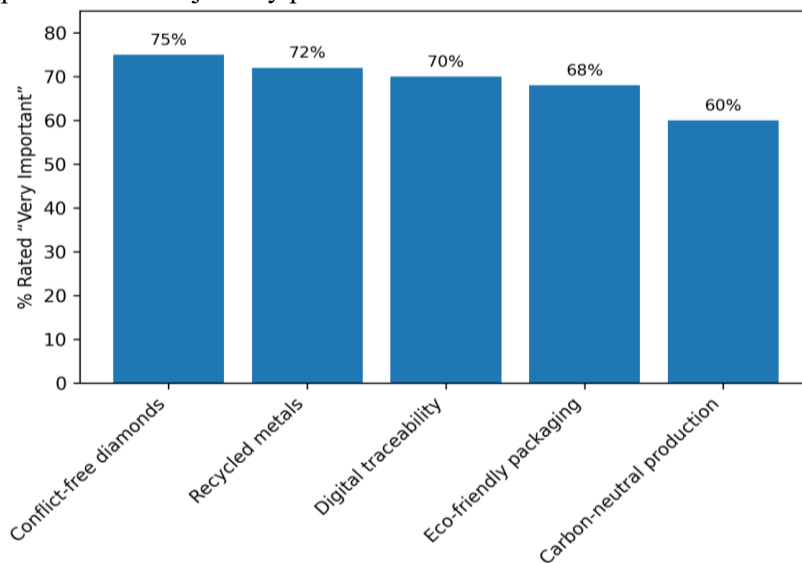


Figure 1. Sustainability elements rated as "Very Important" by U.S. jewelry consumers aged 20–45

As shown in Figure 1, conflict-free diamonds are on top of the list (75%), followed closely by recycled metals (72%) and digital traceability (70%). Eco-friendly packaging and carbon-neutral production were also prioritized, receiving 68% and 60%, respectively. This figure illustrates the percentage of respondents who rated each feature as “Very Important,” consistent with the pattern observed in Table 2.

Furthermore, responses to the open-ended survey questions provided additional insights into consumer priorities. Many participants emphasized the importance of verifiable ethical sourcing, clear digital traceability and storytelling about artisans and environmental impact. These qualitative responses reinforce the quantitative findings, indicating that narrative communication and transparency tools jointly shape trust and willingness to pay a premium.

3.2.2. Regression analysis

Two regressions were made to determine the impact of digital disclosures on consumer trust and readiness to pay a premium on both digital and ethical disclosures. Table 3 presents the results.

Table 3. Regression results

Dependent variable	Key predictor	β	p-value	R^2
Consumer trust	Digital transparency	0.45	0.001	0.30
Willingness to pay premium	Ethical practice disclosure	0.38	0.004	0.27

The Table 3 results confirm that digital transparency significantly predicts consumer trust ($\beta = 0.45$, $p < 0.01$), accounting for 30% of the variance. Similarly, ethical production disclosures significantly influence consumers' willingness to pay a premium ($\beta = 0.38$, $p < 0.01$), explaining 27% of variance. The standard beta coefficients and the intensity of the relationships are summarized in Figure 2.

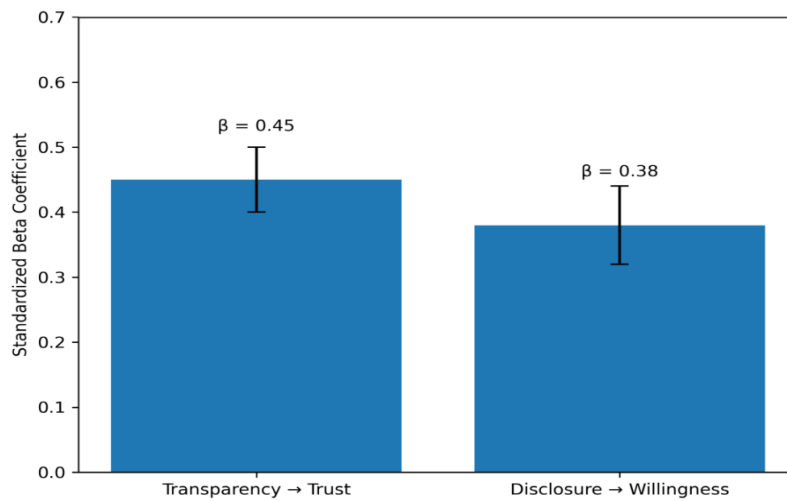


Figure 2. Standardized effects of transparency and ethical disclosure on consumer trust and willingness to pay

Figure 2 shows the findings of the regression analysis on key predictors of consumer behavior. Digital transparency significantly influenced consumer trust ($\beta = 0.45$, $p < 0.01$), while ethical disclosure was associated with increased willingness to pay a premium ($\beta = 0.38$, $p < 0.01$). Error bars indicate standard errors. The regression analysis includes relevant demographic and experience-based control variables. Diagnostic tests confirmed that residuals were approximately normally distributed and variance inflation factors (VIF) were below 5, indicating that problem of multicollinearity is not concern.

3.3. Integration of qualitative and quantitative results

All the case studies and the results of the survey confirm the priority of ethical sourcing and digital transparency. The high consumer demand for conflict-free diamonds and traceability is comparable to brand practices, such as the blockchain integration and open-source data displays. However, a small divergence was observed regarding eco-friendly packaging. Even though 68% of consumers rated it as “very important”, most brands devote limited space to it in their marketing. This indicates a potentially underleveraged area for competitive advantage among emerging brands. Figure 3 incorporates both qualitative and quantitative results through the conceptual map that illustrates how brand sustainability practices and transparency mechanisms may affect consumer trust and readiness to pay a premium.

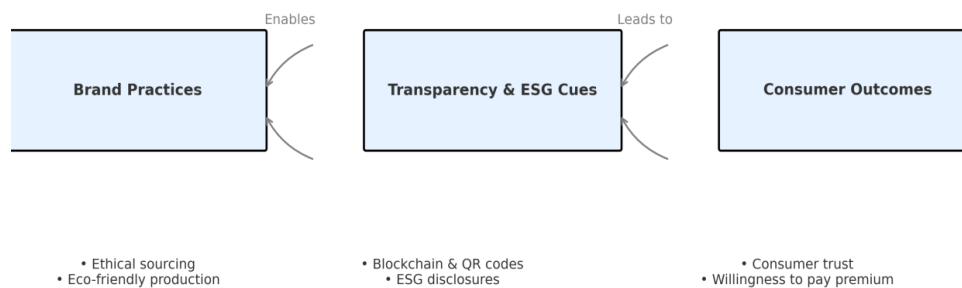


Figure 3. Integrated framework of sustainability–transparency–consumer outcomes

3.4. Discussion

There are many theoretical implications that can be deduced from the outcomes. The results of this study reinforce the ESG-congruent trust model [35], suggesting that transparency can indeed act as a trust substitute for established brand heritage. The importance of ESG was highlighted by many scholars, including Khurshid

et al. [36]. This finding resonates with broader literature in sustainable luxury. For example, Yang and Battocchio [37], Li et al. [38] found that transparency partially mediates the relationship between perceived green brand authenticity and trust, while Vazquez Melendez et al. [39] and Huang et al. [40] reported that blockchain-enabled traceability significantly elevates brand credibility among ethically oriented consumers which is an effect likely transferable to the U.S. market. In general, the role of digitalization in attaining sustainability and efficiency in industry is acknowledged in this study, and supported by the recent literature [41], [42].

Research in sustainable fashion also aligns with our findings: Chu [43] demonstrated that “visible responsibility” – defined as clear, consumer-accessible ESG disclosures – enhances perceived quality and willingness to pay. Likewise, Tran et al. [44] showed that QR-code provenance in food products significantly improved consumer trust and product attachment, supporting our conclusion that traceability fosters credibility where heritage cues are absent. In the context of jewelry, research by Paris and Schulte [45] and Parolin et al. [46] indicated that traceable sourcing of gemstones led to increased willingness to pay among ethically minded consumers in Portugal – mirroring our U.S. sample findings. Similarly, Le [47] qualitatively documented in Chinese emergent brands how QR tracking reduces consumer skepticism and strengthens narrative authenticity, aligning with the theoretical scenario we propose.

Although authenticity is valued across luxury segments, the jewelry industry is characterized by high symbolic and economic interests. Customers are not satisfied with ethical sourcing in a story and require evidence, which can be in the form of a system like a blockchain, Kimberley Process certificate, or laser-engraved serial numbers. This aligns with the results of Wu et al. [48] and Duan et al. [49], who noted that product-attached traceability markers have the potential to supersede brand heritage in the development of consumer trust.

Overall, these congruent studies support a refined theoretical model: in luxury categories with strong heritage identities, ESG cues add value to brand credibility, whereas in emerging luxury categories such as start-up jewelry brands, traceable ethics can directly replace established brand pedigree. There are also several managerial implications of the results. New brands do not need a lot of infrastructure to gain consumer confidence and power:

- Implementing digital transparency using tools like blockchain or simple QR-coded documentation
- Sourcing ethically from certified suppliers and communicating this clearly
- Leveraging packaging as both a sustainable and storytelling device (e.g., Do Amore’s FSC-certified charity-linked boxes)
- Collaborating with NGOs or third-party certifiers to co-create trust signals without bearing the full operational burden

However, the study has a few limitations. Convenience sampling restricts the external validity to the overall U.S. consumer population. This sampling method may overrepresent consumers with a higher interest in sustainability, potentially biasing results regarding trust and willingness to pay. The respondents of the survey were self-selected and could be more conscious or sustainability-conscious than an average buyer. The case study insights were also obtained through public sources and might not reflect internal brand issues or inconsistencies. Finally, the cross-sectional design does not allow for causal inference. The use of purchase simulations, the use of in-depth interviews, or longitudinal tracking might be adopted in future research to investigate behavioral responses over time and across different market segments.

4. Conclusions

The aim of this research was to find out how sustainable consumption patterns and supply-chain transparency of the new jewelry brands in the U.S. impact consumer attitudes and behavior. Therefore, three insights were made in relation to the mixed-method evidence. First (RQ1), consumers aged 20–45 place the highest value

on conflict-free diamonds, recycled metals and digital traceability. Second (RQ2), digital transparency – operationalized through blockchain certificates and QR-coded tracking, proved a strong, positive predictor of consumer trust. Third (RQ3), the public disclosure of ethical production practices directly increases consumers' willingness to pay a premium. Collectively, these results indicate that provenance assurance and visible ESG disclosures are converted into measurable economic results for up-and-coming jewelry brands.

It is widely acknowledged that digitalization and marketing innovations are key factors influencing sustainable outcomes in businesses [50], [51]. The jewelry market in the United States is an important and competitive one. Sustainability and transparency are no longer a trend that can be shunned, but a pillar of the market expectations on which trust, differentiation and long-term loyalty are based. Verifiable ethics appears to do the same in an industry that has long been subject to criticism due to its opaque supply chains and accomplishments of social harms, serving as a requirement of legitimacy among Gen Z and millennial consumers, who constitute the revenue core of the industry in the future. Lack of traceable sourcing and verifiable environmental stewardship by brands will cause them to lose credibility and market share fast, despite design aesthetics and heritage stories.

In addition, the following practical recommendations are stated for emerging jewelry brands:

- Adopt establishing sourcing certifications like the Kimberley Process for conflict-free diamonds and Fairmined or Fairtrade gold, and prominently display these certifications online and at the point of sale
- Switch to FSC-certified, plastic-free packaging and quantify the environmental savings (e.g., reduced CO₂ or plastic weight) on pack inserts or digital dashboards, converting a cost center into a marketing asset
- Implement lightweight digital-traceability tools: QR-code links to provenance pages or plug-and-play blockchain services so consumers can verify origin, carbon footprint, and labor conditions in real time
- Use narrative storytelling on social media: short videos, carousels, provide interactive infographics making artisans look more like humans, showing recycling process, and visualizing metrics of impact (e.g., wells filled with clean water with every ring sold). Regular and transparent narrative increases trust and returns observed in the regression models

The trend in regulation is toward compulsory digital certification, ESG reporting of luxury products, and traceability platforms which are expected to become standard rather than a competitive edge in the industry in the upcoming future. To fight greenwashing and illegal trade, policymakers and trade organizations might need to adopt a standard provenance data scheme.

Future research directions in this respect do exist as well. The literature ought to take this investigation a step further (a) to non-U.S. markets, in which different transparency levels might be dictated by different cultural factors and regulatory frameworks, and (b) the scalability and cost-effectiveness of blockchain to small brands, including testing open-source ledgers versus proprietary ones. The causal pathways that have been identified here would also be confirmed by longitudinal studies as actual purchase behavior, not stated preference. In sum, transparent sustainability is the new currency of credibility in jewelry; emerging brands that invest early and communicate authentically will be best positioned to capture both consumer goodwill and premium margins in an increasingly values-driven marketplace.

Declaration of competing interest

The author declares that they have no known financial or non-financial competing interests in any material discussed in this paper.

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