

From Cultural Symbols to Identity: A Visualization Analysis of Contemporary Jewelry Cultural Creativity

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Abstract: Cultural creativity is a symbol that carry the mission of cultural dissemination, and jewelry, as one of the forms of cultural creative products, brings about embodied cultural perception through its wearability, which is an important connecting path for wearers to gain identity recognition from it. In order to understand the principle of the role of jewelry culture and creativity in conveying culture through embodiment, and further grasp the research progress and future trends in the field of contemporary jewelry culture and creativity, this article uses the bibliometric analysis software CiteSpace to visually analyze the literature data related to contemporary jewelry culture and creativity research in the CNKI database and Web of Science database, in order to present the current research status and analyze its future trends. The results show that the overall development of contemporary jewelry cultural and creative fields has been on the rise in the past 20 years, but there is still significant research space. Based on the hot topics and trends of domestic and international research, it is predicted that there will be a research boom in contemporary jewelry cultural and creative fields in the future, such as "cross-border integration", "digital innovation", "deepening connotation", and "sustainable development", providing interdisciplinary research references for the transformation of jewelry cultural and creative from cultural symbols to cultural identity recognition.

Keywords: Contemporary jewelry; Design of cultural and creative products; Citespace; Visual analysis

1. Introduction

Contemporary jewelry is interwoven with art, culture and design, transcending the traditional emphasis on the value of precious metals and gemstones or the decorative attributes of form. It increasingly focuses on the insights into life, socio-cultural, and natural elements from creators, makers, and wearers themselves, integrating these into jewelry to become a cultural icon and a symbol of identity. This breaks through the traditional jewelry's role as a medium for conveying external aesthetics and endows it with a unique aesthetic experience. In the context of China's emphasis on promoting cultural confidence and self-strengthening, cultural and creative products, as derivatives of cultural symbols, are tangible cultural consumption products. Meanwhile, contemporary jewelry cultural and creative products are cultural and creative products focused on the field of jewelry, closely related to "body-human-culture," and serve as an artistic form organically combined with the cultural and creative industry. They not only provide the public with a unique aesthetic experience but also offer a new embodied approach for cultural inheritance and innovation.

After reviewing the literature, it is found that there is still a lack of overall understanding among domestic and foreign scholars in the field of contemporary jewelry cultural creativity research, and there is a scarcity of review studies in this area. In terms of contemporary jewelry research, Husi Le and others discussed the origin and development status of China's "jewelry" in the article "A Review of Chinese Jewelry Research" and proposed that China's jewelry research will tend towards interdisciplinary integration, archaeological perspectives, and semiotic perspectives for future development.^[1] In addition, other review literature focuses on the traceability research of a particular ethnic group's "jewelry" and a specific category of consumer markets or jewelry materials. In the field of cultural and creative product design, Wang Ying, in the article "Visual Analysis of Chinese Cultural and Creative Product Design from the Perspective of Knowledge Graph," used knowledge graph analysis to divide the basic development period, prosperous development period, and innovative development period of China's cultural and creative product design, and summarized the research hotspots corresponding to each stage.^[2] Wang Yuanyuan and others, in "Visual Analysis of New Cultural and Creative Research Based on CiteSpace

and VOSviewer," used the China National Knowledge Infrastructure database's nearly ten years of new cultural and creative literature data to conduct a visual analysis of new cultural and creative hot topics and research trends, discussing the connotation of new cultural creativity and the future development direction of the cultural and tourism industry towards digitalization and IPization.^[3] However, there is currently a lack of research combining contemporary jewelry with cultural and creative product design. Therefore, this study uses the Citespace bibliometric tool to draw a knowledge map, exploring the development process of the contemporary jewelry cultural and creative field at home and abroad over the past 20 years, aiming to assist relevant researchers in understanding the current research hotspots and field status, while identifying the current development limiting factors in the jewelry cultural and creative design field, and promoting the continuous innovation and development of relevant theories and methods in the field of contemporary jewelry cultural and creative design.

2. Research Summary

2.1. Description of Research Content

With the evolution of culture and the development of society, contemporary jewelry cultural and creative products not only have decorative functions, but also carry rich cultural connotations and symbolic meanings. Therefore, the integration of jewelry research with cultural and creative industries has become a hot topic. In order to gain a deeper understanding of the current status of jewelry cultural and creative research both domestically and internationally, this article uses Citespace software for bibliometric visualization analysis. The core databases of Web of Science and CNKI are used as search sources to compare and analyze the distribution of annual literature quantity, research fields and institutions, keywords, and highly cited literature, in order to grasp the overall development trend of contemporary jewelry cultural and creative research.

2.2. Research Methods

This study mainly includes methods such as literature analysis, data processing, and visualization. Literature analysis promotes understanding of the research field, clarifies research questions, selects appropriate research methods, and provides valuable information for decision-makers, promoting knowledge accumulation and innovation. The visualization of literature data can help researchers present relevant information on the current research status of the field more intuitively through graphics, charts, and graphs, which not only improves research efficiency but also provides researchers with clearer insights.

The software used for data processing in this paper is CiteSpace, developed by Professor Chen Chaomei, a renowned international expert in information visualization. This software, based on JAVA applications, is capable of showcasing the evolutionary process of research in a specific field through a citation network knowledge map, using a multi-dimensional, time-based, and dynamic visualization language. It is used for in-depth analysis and visual presentation of scientific literature,^[4] tracking research hotspots, and detecting research trends. Previously, scholars could gain a deep understanding of the content of a research field by reading a large number of documents but found it difficult to comprehensively sort out research hotspots or themes. CiteSpace software can conduct in-depth mining and quantitative analysis of a large volume of literature. Its functions such as keyword co-occurrence, clustering, and co-authorship networks provide quantitative tools for visually tracking the dynamic changes of research hotspots, significantly enhancing the scientific rigor and precision of literature reviews.^[5]

2.3. Data Sources

To scientifically and effectively collect literature in the field of contemporary jewelry cultural and creative products, this paper selects Chinese and English databases as the statistical sources for bibliometric analysis, with a search time span from January 1, 2003, to September 1, 2023. Specifically, the China National Knowledge Infrastructure (CNKI) database uses the topics "contemporary jewelry," "jewelry," or "jewelry cultural and creative products," with the source category selected as "core journals," "SCI," "CSSCI," "EI," and "CSCD," resulting in a preliminary collection of 632 Chinese-language documents. In the "Web of Science Core Collection" database, the topics used are "contemporary jewel*" or "jewel* cultural product," with document types limited to Article and Review, resulting in a preliminary collection of 133 English-language documents. To ensure the quality of the

papers, each paper was screened based on its title, abstract, keywords, and core arguments, manually excluding duplicate documents, non-academic information, and documents unrelated to the research scope of contemporary jewelry cultural and creative products, totaling 312 documents. Ultimately, 392 valid Chinese-language documents and 61 valid English-language documents were obtained.

3. Basic Situation of Contemporary Jewelry Cultural and Creative Research

3.1. Analysis of Annual Publication Volume

The temporal distribution of research literature related to contemporary jewelry cultural and creative products is shown in Figure 1. Combining the relevant literature data, it is known that academic research in this field began in 1992. Over the 20-year period from 2003 to 2023, academic literature on contemporary jewelry cultural and creative products has shown a certain upward trend, with a higher proportion of Chinese-language documents compared to English-language documents. In terms of the total number of documents, there has been a gradual increase from 12 in 2003 to 22 in 2023, showing an overall upward trend. Although there were minor fluctuations in the number of publications after 2007, the overall trend remained unchanged. Notably, 2016 and 2018 were two significant peaks, with 29 and 28 documents published, respectively. This indicates that academic research related to contemporary jewelry cultural and creative products has seen a significant increase over the past 20 years, with growing attention from researchers in this field. It can be anticipated that the output of research results in this area will continue to increase year by year.

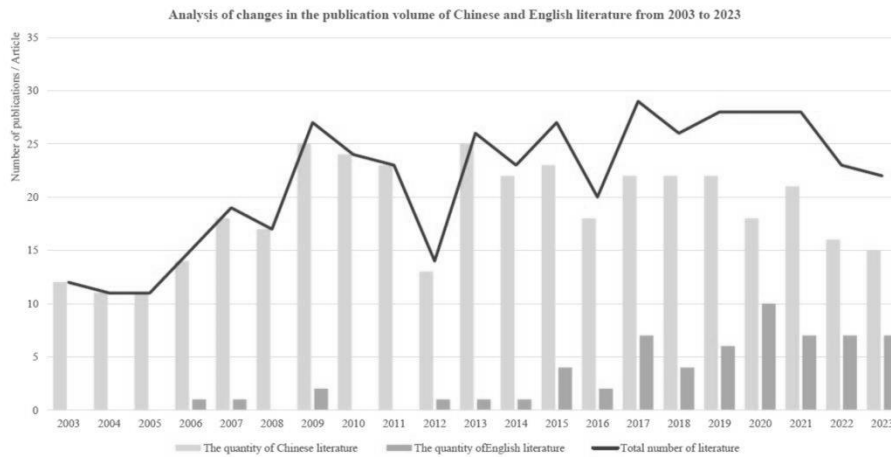


Figure 1: Analysis of changes in annual publication volume

3.2. Analysis of the Evolution Path of Research

The purpose of creating a timeline graph of literature keywords and conducting analysis and research is to explore the evolution trend of domain knowledge from a temporal dimension by examining the year in which the keywords first appeared in each cluster and their evolution process under the cluster.^[5] The timeline graph of Chinese and English literature keywords obtained through Citespace analysis software found that keywords such as "jewelry", "jewelry design", and "jewelry and precious metals" appeared earlier, followed by keywords such as "gender", "religion", "development trend", and finally more specific keywords such as "vacuum deposition." Based on this data, it can be analyzed that the research evolution path in the field of contemporary jewelry cultural and creative products has gradually refined from macro to micro, showing a trend of diversification. Research focusing on specific angles is also gradually emerging.

Firstly, the keywords "jewelry", "jewelry design", and "jewelry" appeared earlier, reflecting that researchers initially focused on the macro level concept of jewelry, as well as its production, design, and materials. As research gradually deepened, researchers began to pay attention to the deeper meaning of jewelry, and factors such as gender and religion gradually became the focus of research, indicating that jewelry as a cultural symbol and a symbol of identity began to attract widespread attention. Subsequently, the emergence of specific technical and process related keywords such as "vacuum evaporation" reflects the increasing attention paid to technological innovation in the contemporary jewelry cultural and creative field. Researchers have begun to explore new materials and production processes to promote

innovation and sustainable development in jewelry production. Based on the above analysis of the research path, it reflects the gradual deepening of the academic research on contemporary jewelry cultural and creative industries, as well as the continuous evolution and innovation of jewelry as a cultural medium and creative industry.

4. Analysis of Research Hotspots

4.1. Keywords Analysis

Keywords are concise expressions of the main content and viewpoints of an article, and analyzing keywords in specific fields is crucial for researchers to gain a deeper understanding of relevant research hotspots. By analyzing keywords with high frequency in literature, researchers can identify the main research directions in the current field, discover knowledge gaps within the field, and establish collaborative relationships based on corresponding research institutions. In addition, keyword analysis also helps researchers track research trends, understand the evolution of corresponding research fields over time, and promote scientific innovation.

In CiteSpace, the co-occurrence network graph of keywords helps to visualize the presentation of research hotspots. The size of nodes reflects the frequency of keyword occurrence, and attention is closely related to frequency. The higher the frequency, the higher the attention. The connections between nodes represent correlation, and the thicker and denser the connections, the closer the connections.^[5] Therefore, this article conducted keyword co-occurrence and clustering on the collected literature data, and finally selected the top 10 keywords with co-occurrence frequency on the co-occurrence map to summarize in Table 1.

Table 1: High frequency keywords and their frequency list (from 2003 to 2023)

Rank	Count	Chinese Article Keywords	Initial Year	Rank	Count	English Article Keywords	Initial Year
1	50	jewelry	2003	1	7	jewelry	2007
2	33	jewelry design	2004	2	6	jewellery	2017
3	15	Jewellery	2003	3	3	gold	2007
4	8	analytical chemistry	2009	4	3	fashion	2018
5	6	ceramic jewelry	2009	5	3	death	2012
6	6	design	2006	6	2	design	2021
7	4	anti fingerprint film	2022	7	2	evolution	2017
8	4	jewelry industry	2004	8	2	memory	2012
9	4	vacuum deposition	2022	9	2	jewelry design	2017
10	3	innovation	2009	10	2	grave good	2012

The clustering results of Chinese literature yield 5 main clusters, namely Jewelry, Jewelry Design, Gems and Jewelry, Development Trends, and Vacuum Deposition; the clustering results of English literature yield 3 main clusters, namely jewelry, gender, and religion. By synthesizing the labels from the keyword clustering maps of both Chinese and English literature, it can be understood that current research in the field of contemporary jewelry cultural and creative products tends to focus more on the perspective of jewelry, with less involvement in applications combined with cultural and creative product design. "Jewelry," as the most frequently cited keyword, corresponds to a cluster of literature that covers various aspects of jewelry, including economic analysis, market research, and material science. Secondly, the cluster for the keyword "Jewelry Design" emphasizes the key role of design in jewelry making, including the application of modern technology and the training of jewelry design professionals. The cluster corresponding to "Gems and Jewelry" focuses more on the study of gems and materials, highlighting the centrality of material science and gemology. The "Development Trends" cluster mainly discusses the future development directions of the jewelry field, such as the enhancement of cultural creativity, strategic research on corporate brand strength, and optimization of market structure. In addition, this cluster also pays attention to the relationship between cultural values like gender and religion and jewelry, with an emphasis on the imagery and connotations of jewelry works. Lastly, the "Vacuum Deposition" cluster represents a key technology in jewelry making that is also a research focus within this field.

It is noteworthy that the data export charts covering both Chinese and English literature in the field of contemporary jewelry cultural and creative products show a relatively low overall betweenness centrality. This phenomenon reflects that the field of contemporary jewelry cultural and creative products, as a branch of interdisciplinary research, has certain issues with weak knowledge or not closely connected academic links, resulting in a more fragmented characteristic of the related research.

Top 10 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2003 - 2023
jewelry	2003	5.12	2003	2008	
jewelry industry	2003	2.07	2004	2007	
ceramic jewelry	2003	1.79	2009	2016	
work integrated learning	2003	1.51	2010	2013	
jewelry design	2003	3.49	2012	2015	
design	2003	1.61	2013	2016	
creative design	2003	1.49	2014	2017	
3D printing	2003	1.26	2016	2021	
jewellery	2003	2.68	2017	2019	
analytical chemistry	2003	1.33	2018	2021	

*Figure 2: Prominent Keywords in Chinese Literature Research (2003-2023)***Top 3 Keywords with the Strongest Citation Bursts**

Keywords	Year	Strength	Begin	End	2006 - 2023
fashion	2006	1.04	2018	2021	
jewelry	2006	0.78	2019	2020	
design	2006	0.8	2021	2023	

Figure 3: Prominent Words in English Literature Research (2003-2023)

Figures 2 and 3 were obtained using the Burstness feature in CiteSpace for detecting emerging keywords. Emerging keywords refer to terms that appear frequently in a short period, indicating a sudden increase in research related to these keywords. By analyzing the emerging keywords in different time periods, it helps to clarify the evolution of research hotspots, predict future popular research fields, identify directions worthy of further exploration, and address the shortcomings in existing research. According to the data in the charts, we can observe that under the rapid development of digital technology, keywords such as "3D printing," "fashion," and "analytical chemistry" began to stand out after 2016. This reflects a turning point in the research direction of the contemporary jewelry cultural and creative field, where digital technology and modern fashion elements are gradually becoming the focus of attention. This also implies that future research will pay more attention to the application of digital manufacturing technology in the design and production of jewelry cultural and creative products, as well as the significant role of fashion trends and analytical chemistry in the field. The emergence of these new keywords suggests that researchers and scholars will find interesting research topics in these areas to promote the development and innovation of the contemporary jewelry cultural and creative field.

Based on the insights and analysis of the literature keywords related to contemporary jewelry culture and creativity, it is found that the current research directions cover multiple aspects such as jewelry itself, design, material science, market research, cultural creativity, gender studies, and religious culture. These diverse research clusters together constitute the current research pattern in this field. The research in the contemporary jewelry cultural and creative field is diverse and full of potential, and future research directions may focus more on emerging fields to promote the development and innovation of this field.

4.2. Analysis of Highly-Cited Literature

Highly-cited literature represents research results that have received significant attention and recognition within a specific research field, reflecting the academic and societal recognition of such research.^[6] Therefore, analyzing highly cited literature can help researchers understand the cutting-edge dynamics and research hotspots in the field, and clarify the main trends. At the same time, it also provides a reference for potential research partners for researchers, which helps promote academic exchange and cooperation.

Tables 2 and 3 respectively show the top 20 cited Chinese and English literature in the effective literature retrieved. Based on information such as literature topic and citation frequency, we can further understand the research focus of contemporary jewelry cultural and creative fields. Firstly, the value analysis and market conditions of the jewelry industry have received high attention, emphasizing the importance of jewelry economy and value.^[7] Research on the jewelry industry from an economic perspective helps to understand consumer demand and purchasing decisions, providing opportunities for cost assessment and competitiveness enhancement in design development.^[8] The research on materials science, such as the application of zirconia and platinum group metals, highlights the crucial role of materials science in jewelry production.^[9] The study of jewelry culture and history, especially the relationship between traditional Chinese culture and jewelry, has become a research hotspot.^[10] The application of digital technologies such as 3D printing and VR in the field of jewelry art has also received attention.^[11] In addition, cultural creativity is highly valued in enhancing corporate brand power, and

research on the correlation between jewelry and factors such as gender and occupation has also been explored.

Table 2: Top 20 Highly-cited Literature Rankings by CNIKI

Rank	Article Title	Source Journal	Cited Frequency
1	Economic Analysis of Perceived Value and Purchase Intention of Jewelry	Market modernization	141
2	Kind and Application of Zirconia Material	China Ceramics	111
3	Current Situation and Enlightenment of Cultural and Creative Products Development in the British Museum and the British Library	Journal of the National Library of China	89
4	Research on the Competitive Situation of China's Jewelry Industry	Shanghai Journal of Economics	60
5	A Discussion of the Du: Women's Items in Early China - Boxes for Headgear, Makeup and Perfumes	Palace Museum Journal	52
6	The Cultural Functions of the Traditional Costumes of Chinese Minority	Heilongjiang National Series	52
7	World demand and analysis of supply and demand of platinum-group metals	Resources Science	49
8	Research on the Optimization Strategy of Market Structure in China's Jewelry Industry	Journal of Zhongnan University of Economics and Law	35
9	Jewelry: a Carrier of Spirit	Art Research	35
10	The supply and demand prediction and suggestions of platinum-group metals in China	Geological Bulletin of China	32
11	Women's Jewelry and Hairpins in Dunhuang Murals: A Study of Makeup Culture Part 6	Dunhuang Research	32
12	Gold Mine Resource Supply and Demand Situation Analysis of the World	China Mine Magazine	31
13	The Flower tree coronet and Phoenix coronet—Research on the Coronet of Court women in Sui to Ming Dynasty	Art & Design Research	28
14	Encountering Modern Art Jewelry	Art Research	28
15	Innovative Application of Traditional Auspicious Patterns in Modern Design	Packing Engineering	27
16	Research on the Design Application of 3D Printing Technology in the Art Field of Contemporary Metal Jewelry	Art & Design	26
17	Research on Tax Policies for the Outward Flow of Luxury Consumption in China	Journal of Zhongnan University of Economics and Law	26
18	Culture Creativity Promotes the Power of Independently Developed Brand in an Enterprise	Hundred Schools in Arts	26
19	Types and styles of gold and silver jewelry unearthed from Southern Song	Archaeology and Cultural Relics	25
20	Hairpin in Ming Dynasty	Journal of National Museum of China	25

Table 3: Top 20 Highly-cited Literature Rankings by WOS

Rank	Article Title	Source Journal	Cited Frequency
1	Micro-Raman Investigations of Early Stage Silver Corrosion Products Occurring in Sulfur Containing Atmospheres	Journal of Raman Spectroscopy	49
2	Vanadium-rich Ruby and Sapphire within Mogok Gemfield, Myanmar: Implications for Gem Color and Genesis	Mineralium Deposita	43
3	The Treasure of Guarazar: Tracing the Gold Supplies in the Visigothic Iberian Peninsula	Archaeometry	35
4	Spondylids of Eastern Pacific Ocean	Journal of Shellfish Research	15
5	Modeling and Fabrication of Artistic Products based on IFS Fractal Representation	Computer-aided Design	15
6	Financializing the Poor: Dead Capital, Women's Gold and Microfinance in Pakistan	Economy and Society	10
7	Diamonds are a Girl's Best Friend ...? Examining Gender and Careers in the Jewellery Industry	Organization	9
8	Beginning of the Metal Age in the Central Balkans according to the Result of the Archeometallurgy	Journal of Mining and Metallurgy Section B-metallurgy	9
9	Raman Investigations to Identify Corallium Rubrum in Iron Age Jewelry and Ornaments	Mineralsi	9
10	Hybrid Craft: Showcase of Physical and Digital Integration of Design and Craft Skills	Leonardo	9
11	I'm Glad She Has Her Glasses On. That Really makes the difference!: Grave goods in English and American death rituals	Journal of Material Culture	8
12	Production/Consumption and the Chinese City/Region: Cultural Political Economy and the Feminist Diamond Ring	Urban Geography	8
13	Social Life-Cycle Assessment of a Piece of Jewellery. Emphasis on the Local Community	Resources-base	7
14	Spondylids of Eastern Pacific Ocean	International Journal of Design	7
15	Principles of Reshoring Development in Luxury Goods Sector	International Journal of Management and Economics	5
16	Fashion for a Reason: Oral Jewellery to Aid Forensic Odontology	Journal of Forensic and Legal Medicine	5
17	Application of VR Technology in Jewelry Display	Mathematical Problems in Engineering	4
18	Rothschilds, Rubies and Rogues	Journal of the History of Collections	4
19	Early Medieval Jet-like Jewellery in Ireland: Production, Distribution and Consumption	Medieval Archaeology	4
20	Exploring the Chinese Gem and Jewelry Industry	Gems & Gemology	4

From this, it can be seen that the research hotspots in the contemporary jewelry cultural and creative field have a certain diversity, including economic analysis, material science, culture and history, market research, art and design, cultural creativity, and social impact, among other aspects. This reflects that contemporary jewelry cultural and creative, as a multidisciplinary and multi-level field, provides scholars with a broad space for research.

5. Summary and Prospects

5.1. Research Summary

This article utilizes CiteSpace software to map the scientific knowledge graph and conducts a statistical analysis of 392 Chinese and 61 English effective documents, revealing the research outcomes and changes in research interest within the field of jewelry cultural and creative products. The analysis indicates that the number of publications in this field has significantly increased over the past 20 years, from 12 in 2003 to 22 in 2023, reflecting the rising academic attention. The research trajectory has deepened from the macro level of jewelry concepts and design to cultural connotations, symbolic meanings, and technological innovation, showing a horizontal diversification and vertical depth development trend. Research hotspots cover various aspects including jewelry, design, material science, market research, and cultural creativity, with emerging keywords such as digital technology and 3D printing gradually gaining attention, indicating future research trends. These findings provide an important perspective for understanding the research dynamics and future development directions in the field of jewelry cultural and creative products.

5.2. Research Prospect

By synthesizing the focus and development of domestic and international literature on contemporary jewelry cultural and creative products, the following trends are predicted:

(1) **Interdisciplinary Integration, Expanding Research Fields:** As an interdisciplinary field of study, contemporary jewelry cultural and creative products require further promotion of exchanges and cooperation between different disciplines and fields. In the future, integrating jewelry with art, culture, technology, and embodied cognition through interdisciplinary integration will help enrich the connotations of jewelry cultural and creative products, bringing new possibilities and aiding the development of related fields.

(2) **Digital Innovation, Leading Future Design:** Future research will tend to more intensively explore how digital technology leads to innovation in jewelry design and manufacturing. The application of technologies such as 3D printing, virtual reality, and artificial intelligence will become hot topics of research.^[12] Researchers can not only focus on the potential impact of digital processes on jewelry creativity and production processes, as well as how digital technology has changed traditional concepts of jewelry, but also use emerging technologies to create an omni-channel, multi-touchpoint layout of diversified jewelry cultural and creative business formats, providing users with more personalized cultural and creative service experiences.

(3) **Cultural Value, Deepening the Profound Connotations of Jewelry:** With the gradual improvement of various jewelry craftsmanship technologies, discussions focusing on "culture-jewelry cultural and creative products-user experience" will become a key point in the design consideration of contemporary jewelry cultural and creative product design. Researchers can more meticulously study the design value and symbolic meaning of jewelry under different cultural backgrounds,^[13] to better promote the alignment of jewelry cultural and creative design with different social cultural values and symbols of identity, showcasing the diversity of jewelry under different cultural backgrounds.

(4) **Sustainable Development, Advocating Environmental Responsibility:** In the context of emphasizing sustainable development, considering the environmental friendliness of materials and production processes in jewelry cultural and creative products will also become an important issue. Researchers can actively explore the application of new environmentally friendly materials to reduce the dependence on natural resources in jewelry production. In addition, research can promote the adoption of greener processes and methods in the manufacturing industry, thereby reducing the negative impact on the environment.^[14] This trend will help advocate for environmental responsibility and push the field of jewelry cultural and creative products towards more sustainable development.^[15]

By organizing the research findings, it is discovered that research in contemporary jewelry cultural and creative products needs to further focus on innovation in design methodology, more profoundly explore the relationship between people, embodiment, jewelry, culture and identity, and actively advocate for the concept of sustainable development. This will further enrich the connotations of contemporary jewelry cultural and creative products and promote their substantial development amidst continuous change.

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