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Research on the dual narrative expression logic and design practice of urban industrial heritage landscapes

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Abstract: Industrial heritage landscapes carry unique and place-specific industrial heritage cultures, yet they also face crises such as the homogenization of cultural and creative industrial parks and the dissolution of heritage place culture following industrial transformation. Taking Jingdezhen Taoxichuan as a case study, this paper applies a design expression method based on the theory of dual narrative landscapes to test design practices at Taoxichuan. The results show that: 1) This study constructs for the first time a framework for the Dual Narrative Landscape Theory. Through testing the theory's fit and high responsiveness in the narrative practice at Taoxichuan, the theory is proven to be applicable. 2) The commonality between the dual narrative landscape theory and conventional narrative theories lies in the development of landscape plot structures, while the key difference is the creative construction of the implicit progression of landscapes. 3) The construction of the Dual Narrative Landscape Theory can meet the multiple needs of industrial heritage protection, inheritance, innovative development, and sustainable reuse. The overall identity of industrial heritage landscape sites is enhanced, while the homogenization of cultural and creative industrial parks and the cultural crisis of heritage places are mitigated and eliminated, thereby shaping local cultural advantages to address inter-city competition. This paper highlights the special value of implicit narrative progression in landscapes, constructs the Dual Narrative Landscape Theory, provides theoretical methods and approaches for future innovations in dual narrative progression for different types of landscapes, and further explores the potential future development of the Dual Narrative Landscape Theory.

Keywords: Dual narrative progression; industrial heritage landscape; expression logic; Taoxichuan

1.Introduction

In the context of globalization, inter-city competition [1,2], and cultural heritage protection [3], industrial heritage is facing a crisis of cultural homogenization under cultural globalization [4], characterized by the convergence of local cultures and the disappearance of indigenous culture. On the one hand, cultural homogenization leads to a loss in the expression of heritage culture [5], as well as the convergence and

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weakening of local images, resulting in a crisis of local identity, reducing local attractiveness, and even putting the locality at a disadvantage in inter-city competition. On the other hand, biased or one-sided transmission of local culture can cause discrepancies in the expression of heritage culture and easily create tensions between regenerated heritage landscapes and the identity of marginalized groups within local communities [6], hindering urban capital inflow and economic development. As a unique form of local culture, the understanding and expression of industrial heritage are of great significance for transmitting cultural heritage, establishing local identity, rescuing the crisis of disappearing indigenous culture, and promoting comprehensive local development.

The multifaceted authentic expression of industrial heritage culture should remain consistent internally and externally, so that future generations can fully understand the true cultural character behind the heritage landscape. In research related to industrial heritage landscapes, several important branches include the recognition of cultural connotation attributes [7-10], heritage protection and transmission [11-16] and sustainable regeneration and reuse [17-22]. However, research on narrative expression design specifically for industrial heritage landscapes remains limited, both in theoretical studies and design practice. Interdisciplinary research on landscapes and narratology has produced notable achievements [23-25], but constrained by previous interpretive frameworks of narratology, most studies have focused on the dimension of plot development [26]. In interpreting the regeneration of industrial heritage landscapes, existing research has largely emphasized themes of cultural innovation, development, and sustainable reuse following industrial transformation and upgrading, while weakening or dissolving the construction of indigenous culture, heritage place culture, and collective memory. The innovation concerning the “implicit progression” in dual narrative [27] offers an opportunity to reconnect with the protection and construction of indigenous culture and heritage place culture in industrial heritage landscapes. This study constructs a dual narrative landscape framework to address the problem of cultural bias or aphasia in the expression of industrial heritage landscape regeneration, using it as a means of cultural transmission to help industrial heritage with specific cultural connotations achieve original, aesthetically valuable [28] artistic expression and transmission. By shaping the unique overall landscape character and expressive tension of local industrial heritage culture, the narrative appeal of regenerated industrial heritage landscapes and the individuality of local culture are enhanced, thereby stimulating more complex responses from viewers and fully restoring and expressing the historical and cultural authenticity, social multifacetedness, political dimensions, and complexity of the heritage [29]. Taking Jingdezhen Taoxichuan as a case study, this paper tests the applicability of the Dual Narrative Landscape Theory, providing new perspectives and methods for the understanding and expression of industrial heritage landscapes.

2. Methods of dual narrative expression logic in landscapes

2.1. Origins of dual narrative theory

Dual narrative progression is an innovative achievement by Shen Dan in the field of literary studies. Previous critics almost exclusively employed the traditional Aristotelian framework of plot development. However, Shen Dan, with a groundbreaking approach, uncovered a hidden narrative current behind the conventional interpretative framework—the implicit progression. Existing beneath

the surface of plot development, the implicit progression forms an independent thread running through the entire narrative text. It is often composed of seemingly trivial or digressive elements and is characterized by concealment, interactivity, marginality, pervasiveness, and holism, frequently overlooked by readers. Plot development and implicit progression together constitute the dual narrative progression, with the two strands advancing in parallel, interacting with each other, jointly enriching and deepening the thematic connotations, adding structural layers, enhancing narrative semantic density, and elevating the aesthetic value of the text [30]. (Figure 1)

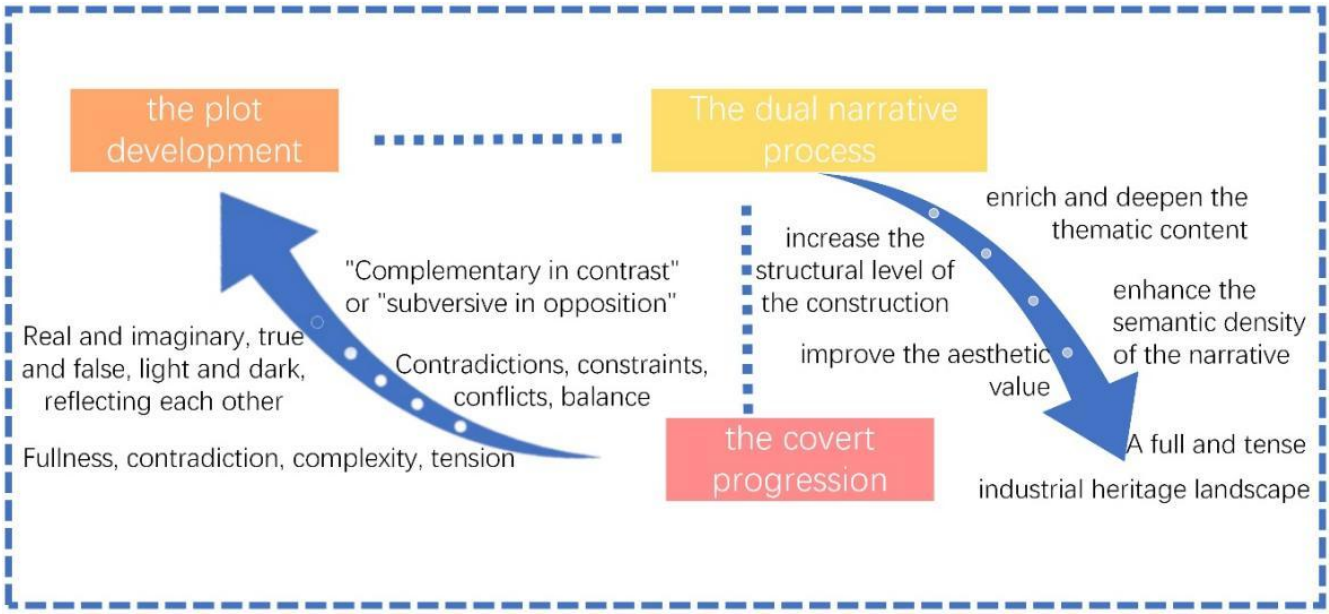


Figure 1. Diagram of the attributes of dual narrative progression (drawn by the author).

2.2. Landscape expression model of dual narrative landscape

Based on the theoretical foundation of dual narrative, the author has adapted the theory to develop a dual narrative landscape model toolkit suitable for industrial heritage landscapes, facilitating direct selection and application by designers. The author defines the dual narrative progression of landscapes as a narrative process jointly constructed by landscape plot development and landscape implicit progression. First, plot development serves as the overt focal dynamic of landscape narrative, while implicit progression serves as the covert focal dynamic. Second, both the overt and covert narrative dynamics can be composed of either a single basic focal path or dual basic focal paths. Third, the unique cultural attributes and complexity inherent to different industrial heritage landscapes determine the diversity of combinations of overt and covert focal paths, thereby giving rise to multiple possibilities for dual narrative combinations in landscapes. These combinations can be summarized into four types of overt–covert focal pairings: one overt–one covert, two overt–one covert, two covert–one overt, and two overt–two covert. Finally, corresponding dual, triple, and quadruple narrative dynamic models are generated, enabling designers to select the most appropriate model for the narrative design of deactivated industrial heritage landscapes (Figure 2).

2.3. Theory of dual narrative landscape expression

2.3.1. Theoretical methods of landscape plot development

Landscape plot development is jointly constructed by the overt focal theme mechanism, compositional mechanism, element mechanism, and transmission mechanism.

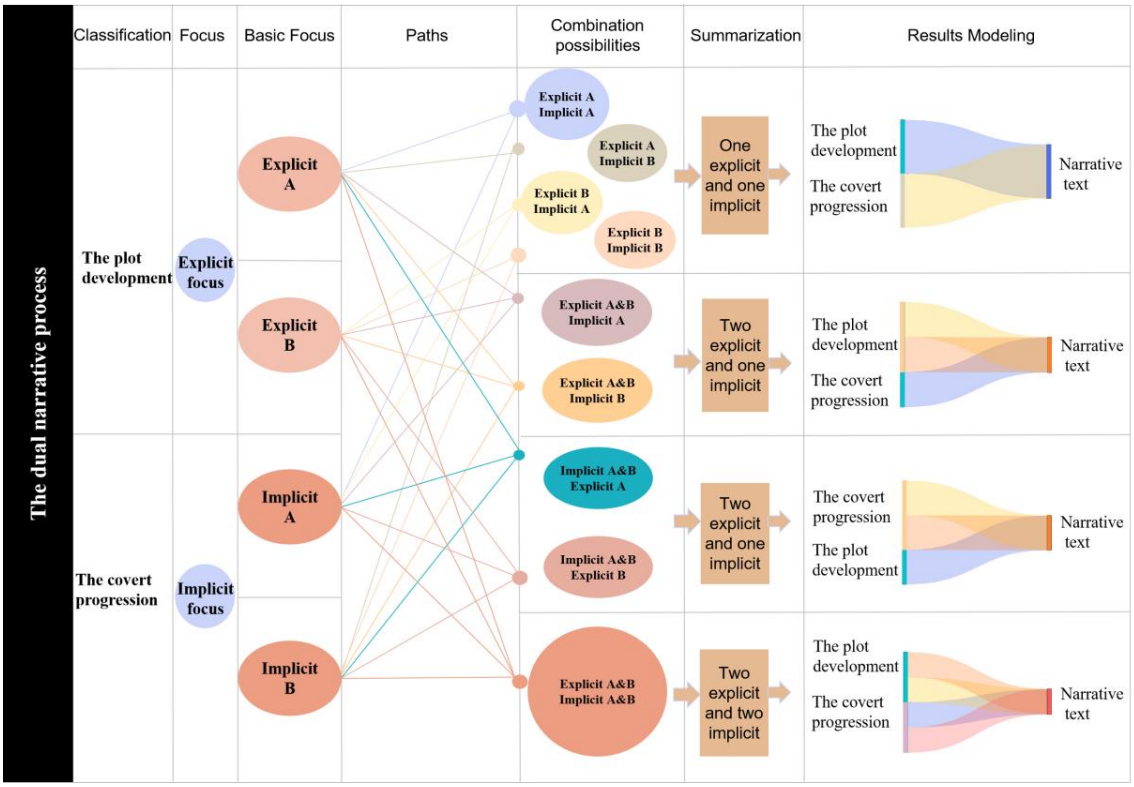


Figure 2. Toolkit of design expression models for dual narrative landscape progression (drawn by the author).

First, the overt focal theme mechanism can determine a single (Theme A overt / Theme B overt) or dual (Themes A & B overt) basic focal overt theme based on the excavation and recognition of the unique cultural attributes and complexity of the industrial heritage.

Second, the compositional mechanism of overt focus requires corresponding sequential arrangement according to the single or dual overt focal narrative dynamics. For instance, when there are two overt themes, a dual compositional sequence track must be arranged from beginning to end for the dual overt narrative dynamics. In terms of compositional sequencing, conventional linear, multi-linear (Sequence 1, Sequence 2, Sequence n), and reverse/anticipatory/flashback linear narratives can be used as compositional techniques. Moreover, the arrangement of overt focal sequence tracks should follow the compositional characteristics of plot-orientation, prominence, and easy recognizability. The shared overt–covert focal method (section 3.3.3) can be employed. This facilitates the overall and prior recognition of the overt focus's plot characteristics by viewers, giving them a "preconceived" landscape cultural experience of the overt focal part of the landscape's cultural attributes, thereby forming an explicit narrative style and enhancing artistic appeal.

Third, in the element mechanism, the overt focal elements of an industrial heritage landscape often appear crucial in plot development. The extraction of overt focal elements should be based not only on

major landscape elements such as topography, pathways, water bodies, landscape features, plants, buildings, physical spaces, and non-physical spaces, but also on the arrangement of the overt focal landscape sequence, to facilitate subsequent adaptive element implantation.

Finally, in the transmission mechanism, the overt focal landscape elements are activated using the shared overt–covert focal method (section 3.3.3), while echoing the overt focal theme, completing the narrative dynamic design of the entire landscape plot development.

2.3.2. Theoretical methods of landscape implicit progression

The theory of landscape implicit progression consists of the covert focal theme mechanism, compositional mechanism, element mechanism, and transmission mechanism.

First, the covert focal theme of landscape implicit progression can form a single (Theme A covert / Theme B covert) or dual (Themes A & B covert) basic focal theme. Moreover, these are established based on the excavation and recognition of the cultural attributes of industrial heritage, serving to supplement or subvert the overt focal theme of the landscape, thereby creating a new undercurrent of landscape narrative.

Second, the compositional mechanism of covert focus also requires corresponding sequential arrangement according to the covert theme, proceeding side by side with the narrative dynamic of plot development from beginning to end. Next, in the composition of covert focus, its characteristic trivial/digressive and marginal nature can be utilized to construct covert focus sequences using the trivial/digressive method and the marginal method. Covert landscape sequences can be interspersed and scattered around the overt landscape sequences in trivial or marginal landscape areas, or beyond the maximum threshold of human vision. Completeness of covert compositional structure can also be achieved by subsequently endowing overt focal landscape elements with symbolic meanings related to the covert focus. If the characteristics of the covert focus are ignored, the overt–covert focal sequence paths may become blurred and invalid. In such cases, the designer can use the shared method (section 3.3.3) to achieve the deviation from plot, concealment, and secondary recognizability of the landscape implicit progression.

Third, in the element mechanism, the covert focal elements of the landscape appear unimportant in plot development. Moreover, the extraction of covert focal elements is also based on major landscape elements such as topography, pathways, water bodies, *etc.*, and depends on the arrangement of the covert landscape sequence, so that covert elements can be adaptively implanted into the covert compositional sequence.

Finally, in the transmission mechanism, the covert focal landscape elements are activated using the shared overt–covert focal method (section 3.3.3), while echoing the covert focal theme, completing the narrative dynamic design of the entire landscape implicit progression.

2.3.3. Shared overt–covert focal methods in dual narrative landscape

The author summarizes four shared overt-covert focal methods: compositional technique, overt-covert differentiation, rhetorical devices, and imagery method.

First, the compositional technique incorporates Iser's "theory of blanks" [31,32] to coordinate landscape sequences. Blank techniques can be achieved through summarization, interruption, reversal, omission, *etc.*, in the compositional arrangement of landscape sequences. On the one hand, in overt focus, they can provide viewers with unique experiences or stimulate thought and imagination,

enhancing the interest and appeal of landscape narrative. On the other hand, in the sequential arrangement of covert focus, given its fragmented and discontinuous nature, the setting of blanks can expand imaginative space, increase the narrative tension of the covert focus, lengthen the intervals between landscape sequence points, and improve the concealment of the covert sequence, thereby facilitating the overt-covert distinction in dual narrative.

Second, the overt-covert differentiation method can be used not only in the compositional mechanism—by controlling and designing the overall height, movement *vs.* stillness, color, size, distance, openness *vs.* enclosure, reality *vs.* emptiness, and proportion of overt and covert sequences to distinguish the explicit and implicit in the dual narrative landscape text, thereby constructing the dual narrativity of the surface track of the industrial heritage landscape—but also in the transmission mechanism, to achieve the tension, multifacetedness, complexity, and deep semantics of place meaning transmission in industrial heritage landscapes.

Third, rhetorical devices serve as an important means of artistic transmission of deep semantics. Landscape designers can use rhetorical methods such as blank, straightforward expression, reproduction, parallelism, simile, and transposition to artistically empower landscape nodes and elevate their aesthetic quality. Among these, the use of blanks in rhetorical devices can also strengthen the tension of dual narrative. Blank techniques mainly include metaphor, symbolism, double meaning, and contrast. They not only enhance the aesthetic effect and artistic appeal of landscape plot development and implicit progression but also increase the concealment and imaginative space of the implicit progression, thereby enriching landscape narrative density and narrative tension.

Finally, the imagery method, *i.e.*, the five-senses design method. Designers can also use five-senses design to guide viewers in forming mental images, thereby creating the atmosphere of dual narrative landscapes. This method conveys the deep semantics of overt and covert foci respectively, as well as the aesthetic experience generated by their interaction, triggering viewers'new landscape experience of industrial heritage cultural cognition (Figure 3).

Dual Narratives	Operation mechanism		Methods of expression	The common methods
The plot development	1	theme mechanism	Explicit A theme method、Explicit B theme method、Explicit A&B theme method	
	2	organization mechanism	Regular linear method、Multi-linear method、flash\pre-narration\narration interposed linear method	Construction technique：Overview, interruption, reversal, omission, etc. The division of the emplict and the implict: height,
	3	factor mechanism	Terrain, roads, water bodies, landscape artifacts, plants, buildings, physical spaces, non-physical spaces	
	4	communicatio n mechanism	Common methods: rhetorical techniques, imagery method	Rhetorical techniques: blank (metaphor, symbol, pun, foil), straightforward, reproduction, parallelism, explicit , displacement, etc. Imagery method (five senses design method): sight, hearing, smell, touch, taste
The covert progression	1	theme mechanism	Implict A theme method, implict B theme method, implict A&B theme method	
	2	organization mechanism	Trivial off-topic method, edge method	Construction techniques: overview, interruption, reversal, omission, etc. The division of the explict and the implict: height, movement, color, size, distance, opening and closing, real and imaginary, proportion
	3	factor mechanism	Terrain, roads, water bodies, landscape artifacts, plants, buildings, physical spaces, non-physical spaces	
	4	communicatio n mechanism	Common methods: rhetorical techniques, imagery method	Rhetorical techniques: blank (metaphor, symbol, pun, foil), straightforward, reproduction, parallelism, explicit , displacement, etc. Imagery method (five senses design method): sight, hearing, smell, touch, taste

Figure 3. Theoretical framework of the dual narrative expression method for industrial heritage landscapes (drawn by the author).

3. Research design

This study adopts a mixed-methods approach, including five methods: field survey, questionnaire survey, face-to-face interviews, telephone interviews, and semi-structured interviews. The aim is to investigate the satisfaction of 300 different stakeholders with the narrative construction of Taoxichuan. Raw data are subsequently processed using the Questionnaire Star platform and the SPSS platform. The above procedures did not infringe upon the privacy of the respondents; all participants' names have been anonymized. The results of the field investigation and the collected data form the basis of this study.

This study aims to investigate the applicability, feasibility, and suitable application scenarios of the dual narrative landscape theory for industrial heritage, as well as whether the innovation and advanced features of the dual narrative landscape theory can enhance the overall identity of industrial heritage landscapes. To answer these questions, it is necessary to identify and conduct in-depth research on actual cases of industrial heritage landscapes that align with the dual narrative landscape theory. The research focuses on deconstructing and comparing such cases, with special attention to the construction of landscape implicit progression, which has often been overlooked in previous narrative expressions. This study conducts field investigation and data collection in the Taoxichuan district, formerly the Jingdezhen Cosmic Porcelain Factory [33], to address the following research questions: Is the dual narrative landscape theory proposed in this paper applicable to the Taoxichuan district? What are the similarities and differences between industrial heritage landscapes designed using this theory and those designed using conventional narratological theories, and what are their respective suitable contexts?

To address the above questions, the following research hypotheses are proposed: the dual narrative landscape theory in this paper is applicable to explaining the narrative construction of the Taoxichuan district. The dual narrative expression of the district does not exhibit homogenization or aphasia/bias in local indigenous culture. Moreover, the construction of dual narrative can not only satisfy the multiple needs of industrial heritage landscapes across different time periods (before, during, and after industrial transformation) but also enhance the overall sense of identity in industrial heritage landscape places, thereby establishing local identity and promoting comprehensive local development. Finally, based on the research findings and a discussion that integrates research data, phenomena, and theories, the hypotheses are repeatedly examined, and the dual narrative landscape theory is compared with conventional theories, summarizing the respective suitable contexts for the two theories.

4. Sustainable design practice of dual narrative in industrial heritage landscapes

4.1. Narrative status quo of Taoxichuan and assessment of applicability of the dual narrative landscape theory

The author deconstructed the narrative dynamics of the district and found that the district encompasses the narrative of site growth and innovation, the narrative of local ceramic culture, the narrative of the crisis of local intangible cultural heritage (ICH), and the narrative of intergenerational identity (between the older and younger generations of the site). Because the narrative of site growth and innovation and the narrative of the new generation's identity are key to the current transformation and future sustainable development of the industrial heritage, they are defined as the plot development narrative of the Taoxichuan landscape. In contrast, the narrative of local ceramic culture, the narrative of the crisis of

local ICH, and the narrative of the older generation's identity appear digressive from the plot development narrative focused on the present and future. However, they respectively constitute a new narrative undercurrent: as cultural capital in current inter-city competition, and as actions to rescue endangered local culture and alleviate tensions between the older generation and the site under gentrification. This undercurrent complements the plot development, enriches the thematic significance of the district, stimulates more complex responses from viewers, and highly restores the authentic historical memory, historical context, social relations, and other cultural attributes behind the industrial heritage. This is defined as the landscape implicit progression of Taoxichuan. It is ultimately determined that the district, within the dual narrative landscape framework constructed by the author, follows a quadruple dual narrative dynamic model of two overt and two covert foci. Specifically, the focal themes of plot development are the narrative of innovative growth through industrial transformation and the narrative of sustainable development after transformation; the focal themes of implicit progression are the narrative of local ceramic culture, the narrative of the crisis of local ICH, and the narrative of historical collective memory of the site [33] (Figure S1). These results indicate that the dual narrative landscape theory proposed in this paper is applicable to explaining the narrative construction of the Taoxichuan district.

4.2. Overall satisfaction feedback of different stakeholder groups with the dual narrative of the district

Digital questionnaires containing 14 questions (single-choice, multiple-choice, and open-ended questions) were distributed to 300 individuals from different groups via the Chinese digital survey platform Questionnaire Star. The questionnaires aimed to collect different groups' satisfaction with the narrative construction of Taoxichuan and the positive influencing factors regarding feedback on the district's dual narrative expression. Data processing and analysis revealed that both the older and younger generations of residents, as well as tourists, reported high satisfaction with the district's narrative construction, with scores all above 8 (out of 10). This indicates that Taoxichuan's narrative construction has not led the district into the crisis of homogenization of cultural and creative industrial parks under cultural globalization or the aphasia of local culture. Instead, it presents a strong local cultural atmosphere, a vibrant integration and blending of old and new cultures, and a high degree of local identity and community cohesion among the two generations of the community.

4.3. Overt A and Covert A: narrative of site growth and innovation, and narratives of local ceramic culture and intangible cultural heritage

When the survey data on tourists' deep impressions of the district from Questionnaire Star were imported into SPSS for analysis of response rates and prevalence rates, it was found that the innovative integration of old and new (Overt A) and the strong local cultural atmosphere (Covert A) left a deep impression on tourists (Figure S2). Face-to-face interviews also revealed that most tourists appreciated the strong local cultural atmosphere of Covert A, and some expressed a desire for more participatory activities related to intangible cultural heritage. Meanwhile, the average satisfaction scores of the younger generation and local residents regarding Overt A narrative elements were all above 8, and the younger generation's satisfaction scores regarding the Covert A narrative were also above 8 (Figure S3). Analyzing the reasons, the construction of Overt A Sequence 1 not only created a dramatic effect of integrating old and new on the

site but also formed a new type of aesthetic value combining the aesthetics of declining landscapes and contemporary architectural landscape aesthetics. Sequence 2, through the creation of a large-scale ceramic culture-themed urban complex, enriched the functionality of the site, activated the vitality of the space, and enhanced tourists' experience and satisfaction. Covert A, focusing on the inheritance and protection of the district's local traditional culture—including the rescue of the national-level intangible cultural heritage "Jingdezhen handmade porcelain craftsmanship"—promoted the protection and development of local ICH and simultaneously created a strong local cultural atmosphere (Figure S1).

In interviews with the younger generation in the district, most expressed willingness to "drift to Jingdezhen" (migrate for work/art) or start businesses there because of the fertile soil and conditions offered by the local culture, and many showed a strong willingness to learn ICH skills. In interviews with local residents, the strong local cultural atmosphere and the restorative, reconciliatory, and friendly representation of collective memory were found to be harmonious and welcoming to indigenous residents. This has led to an initial return flow of talent from the original factory, providing periodic training and guidance to ceramic enthusiasts from around the world and promoting cultural exchange between local old and new generations. In open-ended questions, residents suggested encouraging folk ceramic artisans to pass on ceramic culture and become century-old shops, as well as calling for more diverse business formats and nighttime projects. It is evident that local residents have constructive willingness regarding the narrative of site cultural growth, and operators could update narratives based on this feedback to make the site's growth and innovation and local cultural soil more fertile and distinctive.

These results collectively indicate that Overt Focal Theme A (narrative of site growth and innovation) and Covert Focal Theme A (narrative of local ceramic culture) show high feedback, further demonstrating the successful construction of plot development Overt A and implicit progression Covert A. This has fostered a symbiotic relationship between the narrative of site growth and innovation in plot development and the narrative of local ceramic culture in implicit progression, serving as cultural capital in current inter-city competition to attract tourists and capital. Their interaction has enhanced the fertility of the local cultural soil.

4.4. Overt B and Covert B: narratives of site identity with the new generation and site identity with the older generation

When analyzing the response rates and prevalence rates of tourist impressions, it was found that feedback on Overt B and Covert B was secondary to that on Overt A and Covert A. However, Pareto chart and frequency analysis of tourist impressions revealed that four narrative foci—the reconstruction of historical and cultural memory, the innovative integration of old and new, the strong local cultural atmosphere, and the creation of a diversified business complex—were all crucial elements of the district's narrative dynamics. Therefore, the narratives corresponding to Overt B (reconstruction of historical and cultural memory) and Covert B (creation of a diversified business complex) also received high feedback (Figure S4), with frequencies second only to Overt A and Covert A, indicating that Overt B and Covert B hold a significant position in the district's narrative (Figure S5).

Both the Pareto chart and frequency comparison chart collectively demonstrate that the construction of Overt B and Covert B plays a considerable role in attracting tourists, further indicating the rationality,

feasibility, and importance of constructing Overt B and Covert B. In open-ended questionnaire questions and interviews, some tourists suggested adding guiding signs with cultural stories within the district, indicating that the wayfinding system could be updated in a more readable and place-specific manner by incorporating local cultural stories. The author believes that paying attention to and adopting visitors' suggestions would, on the one hand, facilitate the district's narrative update of the wayfinding system in a place-specific manner, enriching the narrative of the district's historical and cultural functional value in Overt A Sequence 2. On the other hand, based on visitors' discovery of the functional value of local culture, a secondary wayfinding strategy could guide visitors toward the concentrated historical and cultural collective memory narrative of Covert B in the museum, making it more readable and enriching visitors' understanding and reflection on industrial heritage.

Furthermore, Overt B and Covert B primarily target the younger generation and local residents, respectively. Analysis revealed that the average satisfaction score of the younger generation within the district regarding the formation of a new generation's social network and identity (Overt B) was 7.92, indicating relatively high satisfaction (Figure S6). In surveys of the younger generation, some felt that the high rents in the district could to some extent create a crisis of identity loss for ceramic entrepreneurship. Others believed that the market's business format was monotonous, lacked "liveliness/routine life atmosphere," and that the social network coverage of the younger generation needs enhancement. Moreover, improving the friendliness of booth facilities could strengthen their sense of identity within the district. The author suggests that while reasonably considering group opinions and making friendly improvements, district management could learn from the management mechanism of the plot development Overt B in Shanghai M50 regarding rent issues. For example, the managers of Shanghai M50 attract and support the survival and development of the new generation of artists through preferential policies. This prevents artists from leaving or experiencing identity crises due to high rents, while also ensuring the sustainability of the district's artistic atmosphere [35] Additionally, the author found that local residents' satisfaction score regarding their identity with the district (Covert B) was 8.64 (Figure S6), a relatively high result. Face-to-face interviews revealed that this is because the construction of implicit progression Covert B has highly restored the historical collective memory of residents. Both material and non-material spaces have helped heal the trauma of industrial-era workers who were involuntarily laid off. This has not only alleviated tensions between local residents and the district but has also attracted many veteran artists and workers to return to the porcelain factory, showing an overall sense of community identity and cohesion among original residents [36]. The high satisfaction and cohesion of local residents regarding Covert B further indicate that the construction of landscape implicit progression Covert B plays an enhancing role in the district's overall sense of identity.

4.5. Similarities and differences between the dual narrative landscape theory and conventional plot development landscape theory

The results presented in this study share a similarity with conventional industrial heritage landscape theories constrained by the traditional plot development narrative framework: both involve the construction of landscape plot development. The difference lies in the construction of landscape implicit progression in the dual narrative landscape theory. Landscape implicit progression focuses on rescuing local culture and enhancing the overall identity of the district. It complements the conventional landscape

plot development, preventing the district's construction from presenting cultural aphasia or narrative bias. Through the interplay of overt and covert narrative threads, it reconciles and balances conflicts between the past and present, enhancing narrative tension and aesthetic value. However, in the conventional plot development context, which often focuses on the site's present growth, innovation, and future sustainable development, narrative aphasia or bias can sometimes occur. That is, the site's past collective memory, sense of place, local culture, or displaced groups are forgotten, replaced by post-heritage gentrification. For example, the landscape plot development of Shanghai M50 has formed two overt focal plot development processes (Overt A and Overt B)—similar to Taoxichuan's plot development focusing on the narrative of innovative growth through integrating old and new material spaces, a multifunctional creative industry complex, and the narrative of site identity with the new generation. The difference is that Taoxichuan's plot development focuses on the theme of a local ceramic culture creative park, whereas Shanghai M50 focuses on the theme of an emerging art creative park. A more significant difference is the absence of landscape implicit progression construction in Shanghai M50, which results in the loss of narratives related to local Shanghai Yue Opera culture and the identity of the previous generation of textile mill female workers after industrial transformation. Consequently, the local culture of the Shanghai M50 district has been dissolved under the wave of cultural globalization, and there is also a tense identity relationship between the laid-off textile female workers and the creative park [37].

Research indicates that the collective memory of specific urban central places contributes to public discourse construction and local identity enhancement [38]. On the one hand, Shanghai female textile workers were victims of industrial transformation and a displaced group under urban gentrification; on the other hand, they were closely intertwined with Shanghai Yue Opera as original inhabitants of the factories—an important witness group of the industrial era. The author believes that part of industrial heritage culture belongs to them. Therefore, constructing landscape implicit progression in the district would, on the one hand, contribute to the inheritance and development of local Shanghai Yue Opera culture, and on the other hand, help alleviate tensions between laid-off workers and the creative park.

The strong local cultural atmosphere was a high-frequency item in tourists' deep impressions (Figure S5), indicating that the narrative of a strong local ceramic culture atmosphere plays an important role in attracting tourists. In tourist interviews at Taoxichuan, some expressed a desire for more participatory ICH activities. A study by Ma Haili on Shanghai M50 similarly suggested that narratives promoting Shanghai Yue Opera and narratives about female textile workers and Shanghai Yue Opera would make the district more attractive. The high satisfaction of local residents with the site (Figure S6), along with phenomena such as talent return, high identity, and cohesion, indicates that narratives concerning the site and post-industrial-transformation displaced groups help alleviate tensions between the site and those groups, thereby enhancing the site's sense of identity.

In response to the tense relationship between female textile workers and the Shanghai M50 site, a landscape implicit progression narrative action (Covert B) focusing on the site and Shanghai textile female workers could be adopted to address post-industrial conflicts and trauma, enhancing the sense of identity among the overall Shanghai population. At the same time, combined with a landscape implicit progression construction (Covert A) related to local Shanghai Yue Opera culture, a quadruple dual narrative model would be formed, promoting the exchange and symbiosis of new and traditional cultures, strengthening Shanghai's urban cultural identity, and driving comprehensive urban development.

5. Conclusions

Based on the data analysis above, the dual narrative landscape theory proposed in this paper is applicable to explaining the narrative construction of the Taoxichuan district, and the district's narrative expression does not exhibit homogenization or aphasia/bias of local indigenous culture. At the same time, the construction of plot development in the dual narrative landscape can not only satisfy the needs of site growth and innovation during the industrial transformation of industrial heritage landscapes but also facilitate the future sustainable development of the district. The construction of landscape implicit progression, on the one hand, can rescue the endangered local culture from the crisis of loss and disappearance, developing local and intangible cultural heritage into cultural capital that promotes local economic development while achieving sustainable urban development. On the other hand, it can alleviate tensions between the industrial heritage district and displaced groups, further enhancing the overall sense of identity and cohesion of the district. The specific conclusions of the study are as follows:

(1) This study constructs for the first time a dual narrative landscape expression theoretical framework that combines landscape plot development and landscape implicit progression, and this framework has proven applicable through practical testing. The author adapted the dual narrative progression theory proposed by Shen Dan to develop a dual narrative progression suitable for the expression of industrial heritage landscapes. The expression models of dual narrative landscape include dual, triple, and quadruple models, enabling designers to select the appropriate model for the narrative design of deactivated industrial heritage landscapes. The theoretical method is jointly constructed by landscape plot development and landscape implicit progression, forming a complete system of dual narrative landscape theory across four mechanisms: theme, composition, element, and transmission.

(2) The similarity between the dual narrative landscape theory and conventional landscape narrative theory lies in the construction of landscape plot development, while the difference lies in the innovative construction of landscape implicit progression. The landscape implicit progression complements the conventional landscape plot development, reconciling and balancing past and present conflicts through the interplay of overt and covert threads, thereby presenting rich and complex narrative tension and enhancing the thematic meaning, structural layering, semantic density, and aesthetic value of the text.

(3) The construction of dual narrative landscape can meet the multiple needs of industrial heritage protection, inheritance, innovative development, and sustainable reuse, enhance the overall identity of industrial heritage landscape sites, rescue the crises of homogenization of cultural and creative parks and the cultural dissolution of heritage sites, thereby improving local image and addressing inter-city competition. In the analysis of the dual narrative landscape of the Taoxichuan district, this paper finds that landscape plot development can satisfy the needs of site innovation, development, and sustainable reuse during the middle and late stages of industrial transformation, while landscape implicit progression can satisfy the needs of protecting and transmitting the culture and historical collective memory of the industrial heritage from the pre-transformation period.

The limitation of this study is that the model construction of the dual narrative landscape theory stops at the quadruple model. However, the model may in the future develop quintuple, sextuple, or even more models to enrich the thematic connotations, structural levels, textual density, and aesthetic value of dual narrative in industrial heritage landscapes, leaving considerable room for further research. Although the primary object of explanation for the dual narrative landscape theory used in this study is

industrial heritage landscapes, its inherent spatiotemporal characteristics give it certain applicability to the narratives of other landscape architectures such as industrial heritage and memorial sites, providing ideas for future theoretical updates and enrichment in landscape architecture.

Declaration of Generative AI and AI-assisted Technologies

During the preparation of this manuscript, the authors used generative AI and AI-assisted technologies only for language editing and improving the readability of the manuscript.
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Authors' contribution

Conceptualization, X.C. and H.L.; methodology, X.C.; software, J.F.; validation, J.F., H.L. and X.C.; formal analysis, J.F.; investigation, J.F. and K.X.; resources, X.C.; data curation, J.F.; writing—original draft preparation, J.F.; writing—review and editing, H.L. and X.C.; visualization, J.F.; supervision, X.C.; project administration, X.C.; funding acquisition, X.C. All authors have read and agreed to the published version of the manuscript.

Conflicts of interests

The authors declare that there are no conflicts of interest regarding the publication of this manuscript. The authors have no financial, commercial, or personal relationships that could have appeared to influence the work reported in this paper.

Ethical statement

Ethical approval was not required for this study, as the research involved anonymous questionnaire surveys and interviews without any intervention or experiments on human participants. The study ensured the confidentiality and anonymity of all respondents, and informed consent was obtained from all participants prior to data collection.

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