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Lighting as a Pen: Exploring the Role of 3D Virtual Stage Lighting in the Emotional Pull of Dance Creation through 'The Great Qin'

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Abstract

This study focuses on the emotional guidance and constructive potential of 3D virtual stage lighting in dance creation, taking the stage work "The Great Qin" as the core case. It explores how virtual lighting transforms from visual decoration into an active element of dance composition. Based on theories of emotional cognition, symbolic interactionism, perceptual aesthetics, and choreographic construction, the paper integrates visual analysis and semi-structured interviews to comprehensively examine the multiple functions of virtual lighting in the process of dance creation. The research shows that virtual lighting not only creates narrative atmosphere and spatial perception but also stimulates movement generation, inspires creative thinking, and alters stage scheduling through its characteristics such as color, rhythm, intensity, and trajectory. The three interviewees responded from different perspectives to the emotional impact and structural power of the lighting, indicating its potential to reshape choreographic approaches in the context of a virtual stage. This paper proposes the concept of "participatory creation through virtual lighting," emphasizing the nonlinear, interwoven relationship between light and movement, and suggesting it as a driving force for innovation in dance creation under new media environments. The study concludes that virtual lighting, with its preset capability, spatial-temporal control, and narrative structure, can guide dance creation into a polyphonic system centered on light, expanding the logic of movement generation and the narrative possibilities of the stage.

Keywords : 3D virtual stage lighting, dance creation, emotional guidance, visual analysis

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Introduction

With the continuous integration of digital technology into stage art creation, 3D virtual stage lighting has emerged as a new visual medium, reshaping stage language and dance creation logic in innovative ways. Its role has gradually shifted from a "supporting element" in the traditional stagecraft system to a "creative participant" capable of guiding emotions, advancing narratives, and even shaping structural frameworks. Especially with the rapid development of virtual engines and lighting modeling technologies, lighting is no longer merely a tool for illumination, but has become a key variable in spatial orchestration, rhythmic organization, and emotional stimulation, increasingly demonstrating its creative value and narrative potential. In the ongoing expansion of stage design languages via 3D virtual stage-building systems such as Capture Visualisation[1], WYSIWYG[2], and Blender[3], the plasticity and structurality of lighting are further unleashed. The boundaries among dancers, choreographers, and technical designers are becoming increasingly blurred. As a result, an important question arises: can lighting serve as a source of inspiration in dance creation? Can choreography begin with lighting?

This paper is driven by such a line of inquiry. The research originates from a viewing experience of the large-scale stage production The Great Qin, presented in 2024. This work was produced by Shaanxi Cultural Industry Investment Group Co., Ltd., directed by Zhou Liya and Han Zhen, with lighting design led by Donald Hoddle, a Tony Award-winning lighting artist from Broadway. (Figure 1.) The official case archive of WYSIWYG includes the project profile of The Great Qin as a sample of large-scale stage performance design. As a scholar in the field of dance, although not trained in lighting programming or operation, I was deeply struck during the viewing of this work by the dominant role played by lighting. Stage lighting typically refers to the use of contrasts among color, intensity, and shadows to enhance the spatiality of a physical stage, to broaden expressive possibilities, or to suggest narrative atmospheres and emotions through light and shadow. Ancient Greek

[1] Capture Visualisation (https://www.capture.se/) An intuitive and easy-to-use software, Capture has become a natural part of any lighting designer's toolkit due to its accessibility and powerful visualization capabilities.
[2] WYSIWYG (https://cast-soft.com/wysiwyg/) A leading industry-standard suite for "What You See Is What You Get" lighting design and real-time visualization, widely adopted in professional stage production workflows.
[3] Blender (https://www.blender.org/) A free and open-source software committed to providing the world's best 3D computer graphics technology to artists, making advanced modeling, rendering, and animation tools widely accessible.

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philosophers once ascribed allegorical meanings to light, stating that "light allows us to see the world, though we cannot see light itself." Light was seen as an embodiment of beauty—not beauty in the aesthetic sense, but rather a metaphysical and objective beauty, akin to the perfection of the divine (Tarrant, 1960). In the world of dance, choreographers have long aspired to harness both the creative beauty of dance and the "true" beauty of natural light. Therefore, this paper emphasizes that lighting should no longer be viewed solely as an auxiliary presence that "illuminates" the dancer. Instead, through spatial movement, color transitions, rhythmic variation, and intensity control, lighting actively guides the dancer's bodily trajectory and becomes an implicit system within the emotional structure of the choreography. Lighting technologies—beams, color washes, projections—form a unique visual language. This language can be expressed independently in three-dimensional space without relying on other media. Even without props or scenic setups, it can construct the stage image on its own. Stage lighting is evolving into an expressive art form in itself. The audience's emotional response is often triggered or altered in the instant when lighting changes, suggesting its capacity for psychological suggestion and symbolic meaning. From this observation arises a second layer of inquiry: can lighting guide choreography in reverse—not merely as a supplement to pre-designed movements, but as a generative force in dance creation?

Promotional Poster for The Great Qin (Figure 1)

On the basis of these initial observations, this study proposes a research concept: to consider 3D virtual stage lighting as a potential medium of dance composition and to investigate its mechanisms of emotional traction in expressive choreography. Lighting is not only a visual enhancement tool—it may also function as a "stage language" that evokes emotion, organizes meaning, and constructs movement semantics. From this perspective, the relationship between lighting and dance might not be a one-way logic where choreography comes first and lighting follows. Instead, there may be a bidirectional interaction, or even a reversal in the order of generation.

To explore this hypothesis, this study takes The Great Qin as a core case and conducts visual analysis of performance footage alongside in-depth interviews with three audience members. Integrating theories from stage arts, emotional cognition, symbolic interactionism, aesthetic perception, and dance creation, this interdisciplinary framework aims to uncover how virtual lighting functions as an emotional driver in dance creation and assess its potential as a starting point for choreographic design.

Building on the theoretical foundation, this study draws upon the Appraisal Theory from emotion cognition—particularly Lazarus's framework—to emphasize how audiences actively interpret the emotional cues conveyed by stage lighting. Lighting is not merely an external influence, but a medium of affect that can be felt, evaluated, and imbued with meaning. Secondly, Symbolic Interactionism provides a sociocultural dimension, framing lighting as a "symbolic language" on stage. Its color, movement, and spatial trajectory are perceived by audiences as emotionally and culturally coded signifiers. Thirdly, Perceptual Aesthetics focuses on immersive, multi-sensory experiences; virtual lighting, through its spatial distribution, rhythm, and visual cadence, creates environments that resonate physically and emotionally with the audience. Lastly, Dance Dramaturgy emphasizes that choreography is not limited to movement design, but encompasses the orchestration of stage language and the construction of dramaturgical structure—within which lighting may play a crucial role in shaping scenic structure, pacing narrative rhythm, and sculpting visual imagery.

In terms of research methodology, this study adopts a qualitative approach through case observation and semi-structured interviews. It includes frame-by-frame visual analysis of stage lighting from both official and third-party video documentation of The Great Qin, supplemented by recollections of specific scenes. Three interviewees—each from backgrounds in dance, theatre, and media—responded to two central questions: first, how did lighting affect their overall understanding and emotional reception of the dance work; and second, can virtual lighting potentially serve as a starting point for future dance creation?

Through a combination of case analysis and theoretical reflection, this paper argues that virtual lighting should not only be regarded as a spatial design tool, but redefined as a creative agent for emotional and narrative construction. By advancing the concept of "using light as a pen," this study aims to provoke a shift in how dance creators approach stage design—demanding new skills and perceptual shifts while also offering innovative methods for cross-media, cross-cultural, and interdisciplinary performance practices. To structure this investigation into the idea of "light as choreographic language," this paper will be organized into three parts:

1. A focused analysis of the stage lighting in The Great Qin, examining key scenes in terms of color, direction, rhythm, and spatial construction, drawing upon visual recollection (due to copyright restrictions on recording);

2. Audience responses based on interviews with three individuals from diverse artistic backgrounds, exploring how lighting influenced their perception and interpretation of the dance;

3. A theoretical reflection on the transformation of lighting from a technical accessory to a creative participant, proposing the conceptual possibility of light-led dance creation.

To clearly outline the research framework and analytical structure of this paper, the following chart presents the overall research path:

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No.	Research Pathway	Description
1	Viewing Experience	The work The Great Qin
2	Problem Raised	Can lighting serve as a starting point for dance composition?
3	Case Selection	Lighting scenes from The Great Qin
4	Research Methods	Lighting image analysis + semi-structured interviews
5	Theoretical Framework	Emotional cognition + semiotics + aesthetics + choreographic theory
6	Argumentation on Lighting	"Emotional traction" and "compositional potential"
7	Conclusion & Future Insights	Dance creation through “lighting as a pen”

Research Pathway (Table 1)

Stage Lighting from a Macro-Theoretical Perspective: The Emotional Engine of Virtual Construction

With the continuous development of 3D virtual stage lighting technologies, their function in the field of dance has shifted significantly—from merely enhancing visual effects to becoming a generative creative tool. Virtual lighting is now capable of guiding emotional responses, structuring meaning, and even participating in the choreographic process. To gain deeper insight into how virtual lighting contributes to dance creation, this study constructs its theoretical framework from four perspectives: emotion cognition theory, symbolic interactionism, perceptual aesthetics, and dance dramaturgy. These theories not only provide analytical tools for understanding the emotional expression of lighting but also offer interdisciplinary support for redefining its importance in dance choreography.

Emotion Cognition Theory: The “Emotional Guiding Power” of Light

Emotion cognition theory posits that emotions are not merely physiological reactions, but the result of individual cognitive appraisals of external stimuli (Lazarus, 1991). In the context of stage performance, lighting constructs spatial atmospheres through color, intensity, and movement paths—often triggering immediate emotional reactions from the audience. Lazarus’s appraisal model suggests that viewers actively interpret the significance of a scene, with lighting being one of the first elements to initiate this meaning-making process. Warm-toned lighting may evoke feelings of comfort, security, and cohesion, while cool or high-contrast lighting can signal tension, alienation, or sorrow. In The Great Qin, this principle is vividly illustrated in the combat scenes between Qin soldiers and enemy forces (Figure 2), where alternating red and cold white lights create a psychological field of tension, pressure, and fatalistic energy.

Lighting in the combat scene between Qin soldiers and enemy troops (Figure 2)

Symbolic Interactionism: The “Meaning-Making Function” of Light

According to symbolic interactionism, developed by G.H. Mead and H. Blumer, individuals construct understanding through interpretation and communication of social symbols (Blumer, 1986). On the stage, lighting is not merely a technical element but a visual symbol open to interpretation and reconstruction. The color, speed, and directionality of light can carry symbolic connotations, resonating with audiences’ cultural and social backgrounds. In The Great Qin, for example, warm yellow and side-cast orange lighting in the “Qin people’s labor” scene (Figure 3) constructs a collective image of diligent workers, reinforcing historical realism, ethnic identity, and narrative tone. From this perspective, lighting transcends its role of

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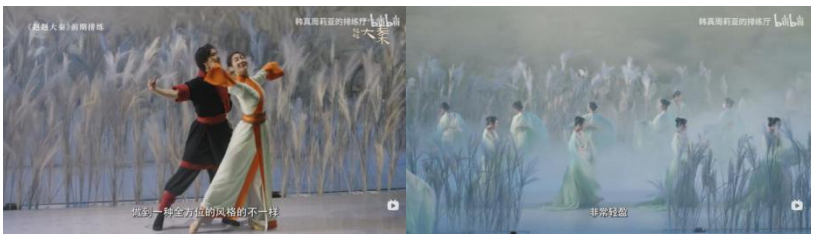
"illuminating the stage," becoming a dynamic form of cultural discourse and a vital layer in the audience's narrative comprehension.

Lighting in the "Qin People's Labor" dance segment (Figure 3)

Perceptual Aesthetics: The "Immersive Spatial Power" of Light

Perceptual aesthetics emphasizes that the artistic experience is constructed through multisensory interaction. Audiences engage with a performance not only visually but also through spatial and auditory perception (Shusterman, 2000). In virtual stage environments, 3D projection, structural movement, and rhythmic lighting composition create immersive spaces that extend beyond two-dimensional visuals. In The Great Qin, the duet and ensemble scenes set among the reeds (Figure 4) exemplify this: the use of blue and white light produces a dreamlike atmosphere in which dancers appear to move between reality and illusion. The fluid movement of light guides emotional engagement and draws viewers into the staged environment. Lighting thus functions as a spatial construction tool—its sense of boundary, layering, and texture intensifies the temporal and spatial dimensions of the stage.



Lighting in the reed-field duet and group dance scenes (Figure 4)

Dance Dramaturgy: The "Creative Agency" of Light

Traditionally, dance dramaturgy centers on bodily movement, but recent scholarship has advocated for greater attention to "non-bodily" elements—especially lighting, sound, and space—as active components of the creative process (Butterworth & Wildschut, 2012). In 3D virtual choreography, lighting design can reverse the traditional order of creation, structuring the rhythm of segments, shaping movement intensity, and setting the atmosphere. This allows visual cues and choreographic construction to emerge simultaneously. In this framework, lighting can be considered an "organizer of movement" or a "rhythmic engine," interacting dynamically with the dancer. The temporal design of lighting has increasingly become an indispensable part of the choreographic system, expanding the depth and scope of creative practice.

Together, these four theoretical dimensions provide a multidimensional foundation for this study. From emotional arousal to symbolic meaning, and from perceptual immersion to dramaturgical construction, lighting has gradually acquired a multifaceted identity in dance creation—as spatial constructor, narrative shaper, and emotional guide. This evolution not only redefines the functional role of lighting in stage performance but also raises a provocative question: in future choreographic practice, could lighting serve as the point of departure? Might dance be choreographed through light in an innovative, light-led creative process?

Illuminative Inspirations in Micro-Practical Strategies: From Physical Stage to Virtual Construction

In traditional stage arts, lighting design was often regarded as the final step in creating the overall stage atmosphere, serving established stage choreography and narrative structures. However, driven by technological advancements in recent years—especially the development of virtual simulation technologies—lighting has gradually evolved from a decorative feature into a structural element, becoming an active force in dance creation (Abulafia, 2015). With the increasing popularity of professional 3D stage simulation software such as WYSIWYG, stage designers are now able to conduct highly precise and immersive lighting programming and simulated rehearsals prior to performance, significantly enhancing the level of detail and visual expressiveness in scenographic conceptualization (Zhen W. & Luan L., 2021).

As a representative work of China's recent achievements in stage aesthetics and lighting design, The Great Qin features complex spatial compositions and rhythmically dynamic lighting—elements that are evidently beyond the capabilities of traditional manual programming. This indirectly suggests that a 3D virtual lighting simulation system may have been employed during its production. Although, as viewers, we cannot directly access the behind-the-scenes workflows and technical procedures, the high consistency of lighting visuals, the precision of lighting movement, and the dynamic coherence

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of the color system allow us to reasonably speculate that virtual lighting planning was deeply integrated into the work's creation and rehearsal phases. This study selects The Great Qin as a key case for analysis, aiming to extract practical strategies for future virtual stage lighting creation through a detailed visual breakdown of its stage imagery. To ensure comprehensive observation and comparison, over 50 key frames were captured from official and third-party videos—especially from interviews featuring the director, dancers, lighting designers, and set designers. These frames were categorized and analyzed according to four dimensions: light-color composition, spatial movement, lighting-emotion expression, and action-guidance function. This approach not only reveals the integrative role of lighting in storytelling and structural formation, but also provides visual evidence and practical references for building a logic of virtual stage creation. Although The Great Qin is not itself a virtual stage production, its highly programmed and digitized lighting language serves as a reverse-mapped reference for virtual stage creation. Specifically, the lighting narratives, spatial transitions, and emotional transmissions observed in this real-world performance offer valuable insights for future stage works built using systems such as WYSIWYG or Capture. More precisely, the lighting design in The Great Qin demonstrates the following notable characteristics:

Narrative Zoning through Light and Color Stratification

In The Great Qin, the lighting system serves not only to enhance visual aesthetics, but also to reinforce the narrative power of the stage through differentiated use of color and spatial divisions (Dreyer, 2019). By using varying color schemes and spatial configurations—or by applying different lighting arrangements within a single color range—the design creates distinct spatial and emotional hierarchies. The following section analyzes two representative scenes.

The first is the scene titled Qin People at Work – Transporting Supplies (Figure 5). Here, the lighting design employs a warm-cool color division across the left and right sides of the stage to intensify the sense of opposition and directional movement. A warm orange-yellow spotlight illuminates the left side, while a cool white spotlight brightens the right. Sidelights help to enhance the three-dimensionality of the space, adding dynamic tension to the overall composition. The use of fog in the center simulates dust stirred up during transport, making the scene more vivid and enhancing the sense of time and space. Furthermore, the projected imagery of staircases in the background blends seamlessly with the actual stage structure, expanding the viewer's perceptual experience. When the scene transitions to close-ups of the characters, the lighting shifts to multiple top-positioned follow spotlights in cold white, highlighting facial expressions and movement trajectories. This transformation from ambient to emotional lighting reflects a layered progression from macro-atmosphere to micro-emotion—an approach frequently employed to reflect shifts in character perspective.

Lighting distribution in the "Qin People at Work – Transporting Supplies" scene, including left-right division and multipoint spotlights (Figure 5)

The second example is from the Battle in the Rain dance sequence, which serves as one of the dramatic peaks of the production, simulating a fierce battle among Qin soldiers in a rainstorm (Figure 6). Artificial rain is released continuously from above the stage. A single-source cold white light intensifies the urgency of the combat atmosphere. In terms of lighting choreography and stratification, the scene uses symmetrical sidelights on both sides to clearly illuminate the dancers. Simultaneously, the central stage area, where rainwater accumulates and reflects the light, enhances spatial depth and three-dimensionality.

Lighting distribution in the "Battle in the Rain" scene (Figure 6)

During a wire-harness aerial movement, a strong white spotlight from above interacts with falling water to produce a glowing aura effect (Figure 7), creating a "motion trail" through the fusion of light and water. This synergy among movement, lighting, and scenographic context offers a vivid, multidimensional expression.

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Lighting setup for aerial stunt in "Battle in the Rain" scene (Figure 7)

Light-Guided Mechanisms in Spatial Movement

In stage narrative, the movement of dancers does not solely rely on choreographic logic and musical rhythm; lighting also plays a crucial guiding role. Particularly in productions with complex spatial structures and frequent character transitions, lighting becomes an invisible director of "visual trajectories" through its design of color temperature shifts, projection angles, and beam paths (Freeman & Maloney, 2021). This function is clearly evident in The Great Qin, where two key segments demonstrate how lighting guides both spatial transitions and emotional momentum.

The highly symbolic "Inverted Terracotta Warriors" configuration serves as a primary visual framework of the stage (see Figure 8), alluding to the collapse of civilization and the brutality of war. In terms of lighting setup, high-position sidelights are symmetrically installed on both sides of the stage to illuminate the inverted warrior figures. Red and orange lights alternate in a pulsating rhythm, producing a vivid blood-like visual effect in the dim atmosphere. This creates a sacrificial solemnity and constructs a visual narrative of historical trauma. A character standing at center stage is fixed in place by a row of yellow overhead spotlights, emphasizing his role as the emotional nucleus within the collective structure. Meanwhile, the soldiers fighting on the ground are lit by low-position yellow-green sidelights, which intersect with yellow spotlights from the side, forming a vertical light axis that stretches from ground-level combat to the suspended weight of history. This entire lighting composition not only conveys symbolic layers of time and space, but also visually sculpts a sense of vertical depth on stage.

Lighting distribution of the inverted Terracotta Warriors and ground-level soldier combat (Figure 8)

From a female perspective, in contrast to the grand and vigorous wartime sequences, The Great Qin also includes several narrative segments centered on female characters. Lighting in these scenes focuses on detailed expression and emotional transitions. In one memory sequence depicting a woman's solitude, backlighting outlines the figure in silhouette, using the contrast of light and shadow to express internal sorrow. The resulting blurred outline enhances the poetic quality of emotional narration. Another scene portrays court dancers (Figure 9), where lighting creates multiple soft-colored zones. Warm orange-yellow lights are projected from both sides of the stage to evoke a cozy courtly ambiance, while soft white overhead light moderates the scene, allowing the dancers to move fluidly within the illumination. Intriguingly, a single dim purple spotlight is precisely aimed at the trailing edges of the dancers' long skirts. As they twirl and glide, the light intermingles with movement, producing a mysterious effect of shifting shadows. This localized lighting design not only enhances the visual impact of the dancers' motions but also creates an atmosphere of viewing guided through light and shadow.

Lighting distribution for court dancers (Figure 9)

The Dual Function of Psychological Suggestion and Spatial Reconstruction

In The Great Qin, the lighting strategy intricately interweaves the creation of psychological atmosphere with the construction of spatial environments. Lighting serves not only as a visual tool for narrative expression but also as a psychological device that guides the audience into specific emotional states (Olson, 2025). More specifically, through precise color selection, directional lighting, and distribution design, the production constructs a stage architecture rich in symbolism and emotional guidance.

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In the scene depicting soldiers in a snowy landscape (Figure 10), the overall lighting employs a cold blue-and-white palette, reminiscent of aurora-like color temperatures. This combination evokes a chilling and solemn visual experience. The choice of color not only aligns with the natural setting of snow but also intensifies a collective emotional state of coldness and solitude. Here, lighting transcends environmental simulation to become an emotional cue—inviting the audience to viscerally experience the soldiers' calm resolve and sorrow before departing for battle. This strengthens the emotional tension between movement and setting.

Lighting distribution for soldiers in the snow (Figure 10)

In another sequence emphasizing "military strength and morale" (Figure 11), the lighting design shifts toward a more structured and ceremonial arrangement. The sides of the stage are illuminated with red, yellow, and white tones, arranged with low yet uniform intensity, forming a stable horizontal spread that mirrors the orderly formation of the soldiers. Simultaneously, a row of overhead spotlights at the rear of the stage projects a powerful beam of light straight toward the audience, cutting through the aligned formation. This strong vertical light axis not only enhances the stage's sense of depth but also symbolizes centralized control and the extension of military will. Visually, it constructs a kind of "spiritual totem" that conveys force and authority. At this point, lighting is no longer a secondary accompaniment to movement; rather, it becomes the key element that shapes the atmosphere and drives audience emotion.

Lighting distribution for the display of military strength (Figure 11)

Through these strategies, The Great Qin achieves a transition from environmental simulation to psychological construction. Lighting serves to materialize emotion and embody consciousness, exhibiting a highly procedural and design-oriented concept of virtual stage construction in live performance. This provides a compelling and practical model for the creation of virtual stages using 3D simulation software such as WYSIWYG.

The High Coupling of Lighting Rhythm and Bodily Rhythm

In The Great Qin, the stage choreography demonstrates that lighting is not merely a passive response following the dancers' movements, but rather, it intervenes within the action structure with a high degree of synchrony (Bulut, 2018), illustrating a deep coupling between the dancer's bodily rhythm and the rhythm of the lighting. Lighting design not only switches instantaneously with the action beats but also interacts with the dancer's physical form through transitions, atmosphere changes, and body extensions, thus making light itself an integral part of dance expression.

Analysis of the performance materials reveals that in many tightly-paced battle scenes, a combination of "flash+color change" is used. In the climax of group dances, the lighting rapidly shifts through red and orange tones, mimicking the intense atmosphere of battle. Additionally, at crucial moments such as jumps and rolls, powerful spotlights are precisely directed, enhancing the force and visual rhythm of the movements. This "rhythmic synchronization" of lighting essentially transforms the musical beats into visible "resonance," increasing the audience's emotional engagement and physical response. More symbolically, in The Great Qin, the lighting rhythm often takes on the role of the "lead dancer." For example, in sections where the movement rhythm is unstable, lighting first follows the rhythm to create spatial progression or color transitions, offering a rhythmic reference for the dancers. At this point, light becomes the leader of the temporal sequence, and the body follows, creating a reversal of roles within the creative mechanism.

The panoramic stage construction diagram compiled for this study (Figure 12) further reveals the technical foundation behind this high synchrony. From the visual materials, it is clear that the stage structure features highly organized "spatial zoning" and "light path presetting." These zoned and programmed designs provide a clear framework for planning the dancers' movement paths and controlling the rhythm of their actions.

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Stage construction scene (Figure 12)

Simultaneously, the lighting control panel (Figure 13) demonstrates that the lighting control system supports multidimensional light track binding, beat mapping, and timeline animation programming. This allows for real-time interaction with the dance movements and the possibility of "pre-rehearsal alignment."

Lighting control panel (Figure 13)

It can be said that The Great Qin exemplifies the close synchronization between lighting and bodily rhythm. This is not only an aesthetic complementarity but also the outcome of system control and creative collaboration from a technical perspective. This form of rhythmic co-construction provides a valuable reference for future virtual stage creations where movement and lighting effects are integrated into a single programming framework. It also serves as a reminder that the rhythmic system of dance construction is no longer solely dependent on the body's rhythm, but rather on a hybrid rhythmic system composed of both the body and the lighting.

Theoretical Reflection and Practical Validation: Analysis Based on Semi-Structured Interviews

As mentioned earlier, the theoretical hypothesis that virtual stage lighting can serve as a catalyst for dance creation needs further validation. To support this, a semi-structured interview was conducted with three audience members from the fields of dance, theater, and media. The aim was to explore, from the audience's perspective, the possibility of using lighting as a creative tool in dance, or "lighting as a pen."

Interview Question Design (Open-ended)

Question 1	*During your viewing of The Great Qin, did you notice the impact of stage lighting on the overall work? Did it evoke any particular emotional response at certain moments or scenes? Please describe in detail.*
Question 2	*Do you think that future dance creators could start their creative process with "virtual stage lighting"? In other words, do you find it feasible or appealing to create dance starting from lighting?*

Interview Questions (Table 2)

Interview Content (Dialogues Organized)

Audience A[4] Dance Field	*Answer to Question 1: "I found the lighting in The Great Qin to be quite striking, especially during the section where the red and gold tones alternated. It gave me a strong epic feeling, as if telling the story of a nation's transition from war to glory. Particularly when the dancers slowed down, the lighting intensified, almost as if it were complementing the emotions, which truly resonated with me."* *Answer to Question 2: "I hadn't thought of lighting as a starting point for creation before, but now I feel that if the lighting were set first, dancers could design movements that align with that atmosphere. Especially since virtual lighting can simulate extreme or unrealistic effects, it could really spark creativity. It's worth trying."*

[4] Audience A [Dance Field, Fan XX, 1998, Master's degree in Dance Choreography]

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Audience B[5] **Theater Field**	*Answer to Question 1: "What left the deepest impression on me was the 'coordination' between lighting, music, and movement. For instance, there was a segment where the dancer was almost surrounded by darkness, with only a white light striking them at key moments. The sense of loneliness and struggle was very strong. I feel that lighting in emotional expression is akin to cinematic shots, it has a narrative function."* *Answer to Question 2: "I think it's possible, especially since younger generations of dancers are very familiar with multimedia. If they understand lighting software, the starting point of creation could absolutely begin with a beam of light or a color. Dance might no longer be about 'dancing first and then lighting,' but rather 'lighting first and then dancing.'"*
Audience C[6] **Media Field**	*Answer to Question 1: "At first, I didn't pay much attention to the lighting, but as the performance continued, I realized that lighting does more than just 'illuminate the stage.' Its colors, angles, and rhythm were constantly influencing my understanding of the dancers' states. For example, under the cold blue light, the slow dance reminded me of sacrifice and melancholy. If the lighting atmosphere changed, that same section could feel completely different."* *Answer to Question 2: "Virtual lighting is a pretty new concept for me, but I think it could definitely become a 'script' for future dance. The changes in lighting itself have rhythm and logic. If dancers start by building movements from lighting, it's a reverse but reasonable way of creation. I think it's worth exploring."*

Interview Content Summary (Table 3)

Theoretical Response and Discussion

The results from the interviews confirm the significant role of lighting as an "emotional narrative language." Audience A's emotional experience with the red and gold lighting responds to Appraisal Theory regarding how the audience cognitively interprets external stimuli. Audience B's description of the "white light on the lone figure" aligns with dance composition theory on visual rhythm and symbolic focal point construction, while Audience C perceives lighting's dominance in meaning construction through "gradual perception," which corresponds to Blumer's (1986) assertion: "People's actions towards things are based on the meanings those things have for them, and these meanings are derived through social interaction." This aligns closely with the "symbolic interpretation" pathway in Symbolic Interactionism.

More notably, all three viewers recognized the creative potential of starting with lighting. They agreed that lighting is not merely a decorative or auxiliary element but rather a crucial creative tool that sparks the creation process. This perspective is in line with the theory of perceptual aesthetics, where the texture, rhythm, and distribution of light are not just visual stimuli but also elements that trigger emotions and shape the dance concept. According to the interviews, virtual lighting is no longer a passive technical method serving dance, but rather a primary medium for the audience to feel emotions and understand symbolic meanings. Its ability to evoke emotions and control rhythm positions it as a potential leader in dance creation. The non-linear, pre-set, and highly reproducible characteristics of lighting make it a controllable source of theatrical imagination for creators. This further validates the fundamental hypothesis of this study, which posits that virtual stage lighting holds the potential to become a primary factor in dance creation and could act as a driving force for transforming dance creation in the context of new media environments.

Dimensional Analysis of the Impact of Virtual Lighting on Dance Creation

This section focuses on how 3D virtual lighting influences the process of dance creation. It systematically explores five creative dimensions—movement generation, inspiration triggering, stage choreography, emotional shaping, and narrative construction. Drawing on both theoretical perspectives and interview data, it examines the interactive forms between specific lighting properties and dance activities, further clarifying how virtual lighting becomes a constructive medium that opens new avenues for choreographic development.

In terms of movement generation, virtual lighting fosters "bodily language initiated by light." Traditionally, lighting has been regarded as a supplementary or accentuating element in dance. However, the precise control and spatial presets enabled by virtual lighting endow it with the capacity to actively inspire movement. In virtual spaces, dancers often generate movement in response to lighting attributes. For example, a stationary beam of cool white spotlight cast at the center of the stage may prompt a dancer to slowly raise an arm, evoking a sense of loneliness and emotional depth. The rhythm and tension of the movement are shaped by the "cold austerity" conveyed by the lighting. Such bodily expressions induced by the color temperature and direction of light embody a transformation from "supporting" to "initiating." In The Great Qin, the alternating pattern of golden and red light creates dynamic trajectories, guiding dancers to perceive the beginning, turning, and conclusion of their steps within the flow of light, forming movement paths that are "driven by light." This phenomenon confirms the virtual lighting's capacity to intervene in the mechanism of movement generation, where its rhythm, delay, and even unpredictability act as creative "cues."

[5] Audience B [Theater Field, Zhang XX, 1989, Drama Director and Teacher]
[6] Audience C [Media Field, Chen XX, 1994, Master's Student in Korean Art and Cultural Management]

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In terms of inspiration triggering, lighting is viewed as “a source of conceptualization.” Dance creation does not always originate from movement; the potential of lighting to serve as a creative starting point is being increasingly recognized. Unlike traditional physical lighting, virtual lighting can be integrated from the very beginning of the creative process. Its flexible configurations and emotional ambiance offer multifaceted stimuli to dancers and choreographers. For instance, in 3D software, a slowly moving sphere of blue-violet light can inspire dancers to follow its motion, while simultaneously evoking associations with dreamscapes or illusions. During an interview, Audience C mentioned that “when a beam of greenish-blue light fell on the dancer’s back from above, it reminded me of a life on the verge of collapse.” Such subjective perceptions provide key references for dancers to capture inspiration. With its symbolic plasticity and liberation from physical constraints, virtual lighting triggers nonlinear and imagistic creative impulses, leading to more abstract and metaphorically rich dance expressions.

In terms of stage choreography, virtual lighting “weaves spatial and rhythmic structure.” Stage choreography involves more than spatial arrangement—it encompasses the logic of space and the rhythm of perception. Virtual lighting possesses strong spatial manipulation capabilities; it can precisely define movement zones and partition the stage into virtual scenic segments through contrasts in brightness. For example, using cold and warm side lighting from opposite directions can create opposing group dynamics, generating rhythms of interaction and resistance between dancer groups. As dancers swiftly cross lighting boundaries, spatial tension increases and visual rhythms emerge. In The Great Qin, the group choreography is structured through lighting rhythms that determine dancer trajectories and formations, presenting a “light-first, dance-follows” logic. Such light-guided spatial strategies effectively disrupt the traditional “rehearse-then-light” sequence, enabling choreographers to incorporate lighting into movement path design at the early stages of creation.

In terms of emotional shaping, lighting creates “an emotional lexicon resonant with psychological states.” One of the most direct functions of lighting is atmosphere creation, and in virtual environments, its emotional language becomes even more diverse and controllable. Dimensions such as color, intensity, and diffusion form a complex “emotional lexicon.” For instance, a soft warm yellow light cast from the side and above, combined with a dancer moving slowly within it, can convey tenderness, reminiscence, or healing. Such emotional transmission relies not on facial expression or plot progression, but on the warmth and directionality of light to evoke audience resonance. The emotional simulation capabilities of virtual lighting align well with the non-narrative and imagistic tendencies of contemporary dance. Gradual color transitions, flickering, and collisions in lighting can serve as emotional timelines. When portraying inner conflict, alternating flashes of blue and purple with piercing white lights can heighten psychological pressure, prompting dancers to execute fragmented steps or curling motions that naturally arise in such atmospheres, achieving an emotional co-construction between the body and the light.

In terms of narrative construction, lighting forms “a symbiotic relationship with meaning.” Virtual lighting not only serves perceptual experience but also participates in storytelling. In The Great Qin, double spotlights projecting forward and backward from a character produce two moving shadows, symbolizing a dual-faced identity as the dancer turns sideways. Audience B noted in the interview: “The changing shadows made me feel the character was in inner turmoil, as if torn in two directions.” Here, lighting transcends its function as stage illumination to become a tool for symbolizing character traits and narrative tension. In more elaborate stage designs, lighting can simulate scenarios such as sunrise, explosions, or rippling water, supporting both concrete and abstract narrative development. For instance, an orange-red beam rising rapidly from the floor and illuminating the dancer’s back may signify an emotional eruption or disorientation brought by historical conflict. The dancer’s explosive leaps or sudden falls in response to this lighting become both visual and narrative responses.

Conclusion

This study centers on the core issue of how 3D virtual stage lighting affects the emotional and narrative expression in dance creation. By employing theoretical review, case analysis, and semi-structured interviews, it explores the multifaceted role of stage lighting within the dance creation process. The findings reveal that virtual lighting not only serves the physical function of constructing space and rhythm but also plays an active and even leading role in emotional arousal, movement generation, inspiration triggering, stage choreography, and symbolic construction.

As a medium of emotional transmission, virtual lighting—through its color, intensity, direction, and rhythm—significantly influences audience emotional reception and symbolic interpretation. The case of The Great Qin demonstrates that the relationship between lighting design and dance movement goes beyond coordination, embodying a "visual dominance–movement response" creative logic. This observation aligns with hypotheses in appraisal theory, choreographic theory, perceptual aesthetics, and symbolic interactionism, which suggest that multiple perceptual cues can evoke emotional and meaningful resonance.

Interview results further validate the potential of virtual lighting as a “creative starting point.” Many audience members noted that the atmospheric settings created by lighting could inspire the generation of dance movements in reverse. Especially in the current context of widespread multimedia technologies and creative software, virtual lighting—with its high degree of preset and experimental flexibility—is poised to evolve from a “tool of illumination” into a “medium of construction.” This transformation not only expands the logical origin of choreographic processes but also offers new interfaces for collaboration between dancers and lighting designers.

This study proposes the concept of “participatory creation through virtual lighting,” emphasizing an interactive, nonlinear, and reversible relationship between lighting and movement, characterized by strong perceptual resonance. Incorporating these elements into the creative process reshapes the choreographer's visual thinking and opens up novel possibilities for interdisciplinary collaboration.

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In conclusion, virtual lighting is shifting from a technical support role to a creative protagonist in dance construction, forming a composite platform for emotional transmission, rhythm shaping, and meaning-making. As dance creation increasingly occurs in virtual environments supported by multimodal perceptual systems, it may be entering a narrative era shaped "by light as brushstroke and illumination as narrative thread."

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Conflict of Interest

The authors declare no conflict of interest.

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