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A Study on the Authenticity, Symbolism and Radical Style of Sound Narration in Nolan's Films

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Abstract

Nolan's films have a distinct personal style in the handling of sound. His treatment of human voices, background music, and decorative sound effects all have a certain degree of unconventional characteristics. In response to this phenomenon, this article analyzes Nolan's artistic exploration of the sound medium from the perspectives of sound ontology, media narratology, and symbolism. This article attempts to connect the technical principles and aesthetic tendencies in Nolan's films through multidisciplinary approaches such as physical acoustics, electronic engineering, aesthetics, and phenomenology of the spirit, to interpret how he uses sound to express the experiential world, represent emotional values, and construct spatiotemporal cognitive views, and then to explain the avant-garde and modern nature of the aesthetic features of his film sound.

Keywords: Nolan, sound, symbol, digital twin, modernity

1. The Dispute Between Digital Twin and Naturalism: Reconstructing the Auditory Order of the Screen

1.1 Defective Dialogue: Distortion or Authenticity?

As a vital medium in filmmaking, sound plays a pivotal role in storytelling. However, its inherent characteristics and practical value are often overlooked due to the difficulty in defining and describing this medium. While sound itself lacks inherent semantic direction, when integrated with visual elements and textual content, it reinvigorates the process of meaning-making.

It's easy to find that Christopher Nolan's distinctive approach to film sound design has significantly shaped his artistic identity, through meticulous handling of dialogue, sound effects, and musical arrangements, he establishes a unique cinematic language. One of the core functions of movies is to reproduce the sensory experience of reality and provide the audience with an extremely immersive feeling. The authenticity of the dialogue in a film is of great significance to its narrative. The quality of the dialogue production often directly affects whether the audience can be drawn into the story. Nolan prioritizes natural speech delivery, crafting dialogues that feel like everyday conversations rather than scripted lines. This "authenticity" may can be reinterpreted as "kinship", which makes the relationships between the characters more believable and enhances the audience's immersion in the film. To achieve this goal, he usually uses live recording equipments to capture actors' natural performances rather than relying on post-production dubbing. This method preserves the delicacy of live acting, making dialogues more vivid and lifelike.

However, the sense of intimacy does not equate to absolute realism. Nolan's personal preference of minimizing or eliminating ADR (Automated Dialogue Replacement)[1] can be interpreted as an aesthetic philosophy that deliberately blurs the distinction between dialogue and ambient sounds. This creates a watching barrier where audiences may experience discomfort or insecurity due to unclear audio. This phenomenon is particularly evident in Tenet. Regarding the theater screening situation of Tenet, some cinemas in the United States had to post notices to clarify that it was not due to equipment failure: "The volume of the entire film is not consistent. The current mixing situation is in line with the expectations of the filmmakers. If you have any further doubts or feedback, please feel free to inform our staff at any time."

Audiences generally have two main reactions to Nolan's film dialogues: 1. Voices like Banes in The Dark Knight Rises — vague and unsettling to the ear, yet intelligible. 2. The muffled dialogue in Interstellar that make many viewers complaining about missed details, such as Matthew McConaughey's character shouting instructions while driving a car with two children chasing a UAV through cornfields, which audiences found completely

incomprehensible. The above-mentioned Tenet is even more obvious in this aspect. In Tenet, the protagonist is transported to the reverse world with oxygen masks, causing voices to become muffled within the sealed environment. However, this sound ambiguity differs from Bane's artificially distorted voice typical of post-production. Do these two scenarios both represent distortions in Nolan's audio processing?

The principles behind these two cases are fundamentally different. In the former one, it represents an artistic approach to sound effects. In The Dark Knight Rises, Bane's distinctive vocal timbre stems from his perpetually worn custom-made mask (As shown in Figure 1). The plot reveals that Bane, having sustained severe facial injuries that left terrifying scars, wore this specialized mask to conceal his wounds while using it to inject drugs into his brain. This mask thus achieves a dual effect of grotesque horror through both visual and auditory media.

Figure 1. Bane

Regarding the processing of Baine's voice, this post-production technique alters the frequency and spatial reflections of an actors original sound, a method commonly used in Hollywoods sound production systems. Firstly, the production team must provide an original sound signal with excellent signal-to-noise ratio (SNR) to post-production engineers. Then, tools like "Speaker Phone" or "Space" are employed to shape the sound within a container, creating material resonance and short reflections. This simulates the auditory experience of sound reflection and resonance within a small enclosed space. Such techniques are typically applied to characters embodying malevolence, mysterious forces, or large-bodied figures, differentiating the voices of such characters is a necessary part of the plot setting. This dealing method is prevalent in Hollywoods industrial ecosystem, as seen in the alien Klyntar from Venom and mechanical life forms in Transformers. From a technical perspective, applying ADR to Baine's voice proves necessary, as this post-production technique transforms originally clean dry sound into heavy reverb and intense noise — a process transitioning from "silence" to "noise". If actual sound recording were used, the original audio would not meet technical processing standards.

By leveraging modern technology and digital signal systems, we can create various acoustic waveforms which don't exist in the natural world — a groundbreaking advancement for the film industry. This is similar to the situation of electronic music in the field of music, where artificially enhanced sound products deliver a surreal sensory experience beyond natural existence. The aesthetic subjects spiritual essence seems to transcend into an "external realm", making this technique particularly effective for supernaturalism or romanticism themes.

Regarding the second issue of unclear dialogue, Nolan addressed this in an interview with The Hollywood Reporter: "We made carefully considered creative decisions... There are particular moments in this film where I decided to use dialogue as a sound effect, so sometimes it’s mixed slightly underneath the other sound effects or in the other sound effects to emphasize how loud the surrounding noise is. It’s not that nobody has ever done these things before, but it’s a little unconventional for a Hollywood movie." [2] This clarification dispelled lingering doubts. Undoubtedly, a big-budget film's audiovisual elements should be very carefully crafted rather than accidental mishaps. Nolan's attitude to sound design clearly leans toward naturalism.

1.2 The Trade-Off Between Technological Proliferation and Sensory Simulation

The social response to Nolan's cinematic dialogue style offers a critical perspective on auditory authenticity: While modern digital film technology employs ADR and post-production techniques can enhance the clarity, contrast

ratio, and spatial depth of audio sources, directors like Nolan deliberately reject such technical enhancements, as if pursuing a kind of sensory minimalism. The sound textures created through ADR are no longer authentic recordings from the original filming environment. No matter how sophisticated the technology is, compared with the sound text that occurs immediately at that time, this is still just a kind of "digital twin", it creates sensory simulacra under technological amplification, undermining the authenticity of human perception. Consequently, audiences with differing aesthetic preferences react differently: The ambiguity of sound creates an illusion of actors have taken a step backward, retreating spatially from the audience. The possible reactions of the audience in European and American cinemas at this moment might be: 1. More nervous, trying to hear clearly; 2. More relaxed, believing that this part doesn't need to be understood. However, in China, the industry norm for showing foreign films is to provide bilingual subtitles. Therefore, the audience's listening experience is always limited by the availability of the subtitles. Suppose the subtitles simply omit the shouting of the characters in the cornfield chase scene of Interstellar, then the audience would temporarily assume that this part doesn't require understanding. But when they look back and think carefully later, they might overturn the previous tacit acceptance.

Regarding this difference in aesthetic perception, supporters argue Nolan deliberately incorporated accented dialogues and preserved ambient noises to achieve authenticity. However critics raise a question: While the auditory relationship between the audience and the characters in the play is isomorphic. Since the audience cannot hear the dialogue clearly, then the characters themselves should also be unable to hear each other clearly. How can they communicate smoothly? Another technical group of critics argue that: it's not the case that the background noise masking dialogue, but rather an audio-visual synchronization problem caused by abrupt transitions between on-screen sound and background music. There is no need to elevate this technical flaw to the level of aesthetic ideals.

Human auditory habits can be shaped. The sound effects in films are usually artistically processed, the way the film handles sound is primarily to serve the overall style and tone of the entire film, and secondarily based on the personal aesthetic preferences of the director and the post-production engineers. In the real world, the volume of human speech is not uniform — generally, starting strong and fading into weak and vague by the end. Hollywoods industrial system routinely applies compression, gain adjustment, equalization, and EQ to vocal dialogues. For example, Palpatine's opening line in Star Wars: Episode IX-The Rise of Skywalker — "A new empire... you shall rule the galaxy as its Emperor" — This passage adopts the above-mentioned audio techniques. Such processing creates rich, balanced vocals which have no need to avoid the interference of music or decorative sound effects. Such vocal effect evokes a sense of wonder, ideal for magical dialogues or profound narration in supernatural themes, created a supernatural and surrealistic experience. However, the current film industrys overuse of such sound technology may lead audiences to develop auditory fatigue from prolonged exposure, eventually resulting in a dependence on distorted sounds. This is similar to the abuse of filters and post-production color correction in visual media, which may prevent viewers from directly viewing the visual imperfections such as real skin blemishes.

In reality, untrained voices often carry inherent flaws. Excessive refinement or artificial enhancement tends to give films an expressionist feel, whereas Nolan's approach to filming realistic scenes emphasizes preserving the authenticity of natural sound. Under this cinematic style, the textual dialogue inevitably leads to some deficiencies. Yet this mirrors our lived experience: many sensory informations are blocked or omitted during the transmission process. However, our perception automatically extends in this environment of missing and broken sensations, generating an understanding of meaning. As phenomenology repeatedly stresses: return to the essence of things. Nolan's attitude toward dialogue seems to guide audiences back to the raw reality of their surroundings — returning to pure sensory perception.

2. Establish a New Aesthetic of Auditory Senses in the Midst of Illusion, Grandeur and Anti-Conventionality

2.1 External Sound and Inner Hearing Jointly Construct the Perceptual World

A films sound system primarily consists of two components: dialogue and audio effects. Audio effects encompass ambient sounds (AMB), special effects (SFX), and Foley sound. The sound effects play a crucial role in the narrative. In many cases, their significance is even greater than that of the visuals, yet they are often overlooked. Sound media defy preservation and linguistic definition. their functional logic often start with intuition, skipping over the stages of perception and consciousness, and directly reaching the realm of cognition.

Although working within Hollywoods industrial ecosystem, Nolan demonstrates distinctive personal characteristics in sound design. He excels at using ambient sounds to enhance scene authenticity and lay the groundwork for narrative structure. In Inception, sound designer Richard King is skilled at using the humidity and dryness of the sound as a hint to indicate the progression of the plot, thereby depicting the transformation of dream

levels. Acoustic humidity refers to the relationship between sound sources and spatial reflections: the more open the space where a sound source resides, the stronger the reverberation effect and higher the sounds "humidity," while conversely, the tighter the space makes the sound drier. In Inception, as the characters' dreams progress layer by layer, spatial reverberation gradually diminishes. Initially characters in the real world, the sounds reflection field resembles echoes in actual streets or rooms. As the dream deepens, the spatial sense becomes increasingly confined, when culminating in the "Limbo" realm where characters dialogues and friction sounds whisper in the audiences ears. It is a process of becoming drier. Conversely, the recurring dream-awakening cue song No, Je Ne Regrette Rien grows progressively louder in reverberation as the dream layers accumulate. This design reveals the creator's profound understanding of Freud's psychoanalytic theory. The increasingly dryness sound effects in dreams represent subjective auditory perceptions within the characters' minds, mirroring how brain activity evolves with layered dream progression. The conscious mental activity area gradually narrows until reaching the final realm of Limbo (the subconscious zone). Piaf's song serves as a tangible sonic source of the objective world. As the dream progresses layer by layer, external sounds seem to be progressively blocked by successive barriers. Thus, in terms of auditory perception, the reverberation intensifies and the reflection coefficient of the sounds gradually increases, amplifying the dreamlike and surreal atmosphere of the scene. Such sound design not only adheres to scientific principles of the objective world but also adds an idealized narrative dimension to the film, while simultaneously prompting viewers to contemplate what constitutes the experience of multiple dreams.

Similarly, the film Interstellar which is a science fiction movie, also has a realistic undertone. Nolan's attitude to sound design remains fundamentally essentialist: "What if we don't use any of that, just use the production sound and enhance it a little bit? So, you're hearing the footsteps on set, it's not all cleaned up and it's very grubby, very real... But that had the right sort of 'non-sound-designed' quality."[3] The film explores how astronauts navigating multidimensional space construct cosmic imagination through sound, weaving their profound love for Earth into this narrative. This process involves a complex cognitive engagement: cosmic entities like galaxies，space and the universe are beyond human sensory perception, typically represented through animated visuals or special effects. When these fantastical constructs merge with abstract concepts like "multidimensional universes" or "time tunnels", they become hard to understand. Consequently, some massive material clusters such as galaxies are further enveloped by intangible and fluid concepts like "Time". Conveying such imagery through sound demands exceptional creative mastery. Hans Zimmer handled it this way: In Interstellar, Cooper returns to NASA to save his home and pilots a spaceship to explore space, where the roar of engines, metallic friction, cosmic silence, and the steady PAD[4] sound symbolizing emotional and temporal flow intertwine to create a grand and mysterious cosmic atmosphere. As three astronauts work in the cockpit, the narration states: "Fiercely, fiercely, against the fading light," with the PAD sound progressing steadily. When the narration concludes, the camera cuts to an external view of celestial bodies and vast cosmic space, the PAD volume suddenly rises, evoking an imagination of infinite universe material existence, then a sudden oppressive feeling of fear swept. This demonstrates how sound narratology can establish Sublime emotions. In Memento, the opening sequence transitions from black screen to the main title using progressively louder PAD sounds, which laying a psychedelic foundation for the protagonists fragmented time perception and memory loops.

In the production conventions of PAD sound effects, Hollywoods audio system almost has a distinct pattern: First comes a thunderous "Boom" (a Bass Drop effect mimicking a bass drum), followed by a sustained high-pitched PAD sound with escalating volume, then a high-frequency binaural beats.[5] This three-part sequence is typically set pattern in scenes depicting massive explosions or psychological breakdowns, where the binaural beats signal to the audience that now viewers should enter a state of mental exhaustion or distraction alongside the characters. In Hollywood systerm, this three-part sound design has almost been symbolized as the auditory hallmark of "Guilty Pleasure Film". But Nolan rarely employs these three sounds consecutively. In Memento, prolonged scenes showcasing the protagonists mental derangement are accompanied by binaural beats. Meanwhile, the PAD sound consistently serves as a philosophical reflection and compassionate undertone throughout Nolan's multiple works.

2.2 The Movement of Time in the Representation of Sound Media

Of particular note is the sound design in Tenet. This film employs thunderous volume and relentless drumbeats to heighten tension. When Neil first arrives at Oslo Freeport, the pulsating Freeport blares over the narrators monologue, which immediately emphasizing the missions objective: to retrieve the missing item rather than engage in dialogue. While this sonic approach has been criticized as "overly explosive" and even causing cinema audio systems to fail, but it undeniably showcases Nolan's bold experimentation with sound design. The film sets up a time-reversal mechanism with a paradoxical motion logic where events in "reverse timelines" appear backward to our linear perspective. To achieve this story setting, the film only needs to reverse the normal filmed moving images in the aspect of image processing. At the same time, the sounds must also be reversed, for instance,

the soundtrack Retrieving the Case used in the high-speed car chase scene is actually the reverse playback of one of the loops[6] from the soundtrack Rainy Night in Tallinn for the theater attack scene. This temporal inversion creates suspenseful interweaving of multiple timelines. People are more familiar with the motion patterns of reversed images, which are the geometric symmetrical relationships of the forward movement of objects. However, the auditory experience brought by audio reverse playback is very strange. It creates an unsettling asymmetry sensation, which breaking the natural flow of perception. This reversed audio sounds like a huge alien beast roaring, or like a sudden outburst of a torrential rain. The reversed sound surpasses people's ordinary aesthetic habits in terms of auditory perception, and brings a sense of strangeness and terror to the listener. Beyond conventional aesthetic norms, this reversed audio evokes a sense of unfamiliarity and horror. In Tenet, multiple instances of reversed sound perfectly demonstrate the challenging audio-visual relationship within the "reverse time" premise. Here, the reversed audio medium masterfully illustrates the inherent nature of temporal movement itself.

Besides intricate sound effects, Nolan excels at using silence to build tension and anticipation. At critical moments, he frequently lowers or completely silences the volume to emphasize a scene's significance or heighten psychological pressure. In The Dark Knight, The scene where the clown appears is often accompanied by a long period of silence, which actually makes the clown's threat seem even more terrifying and unpredictable. This technique exploits human selective perception: when emotionally charged, the brain automatically filters out ambient sounds while amplifying specific, seemingly insignificant noises. The test explosion scence in Oppenheimer employs time-warping editing to prolong pre-explosion tension. As sound travels slower than light, the film sequentially shows every staffs' body movements and facial expressions before the thunderous explosion occurs, a pivotal moment that elevates the films narrative (As shown in Figure 2). Since audiences lack of firsthand experience with nuclear explosions, this approach masterfully crafts an immersive spectacle. The audiovisual construction of a film can be partially controlled by the creative team. If directed by a director from the "007" or Mission: Impossible series, they might synchronize intense explosion scenes with synchronized sound and visual effects, employing multi-camera editing to amplify dramatic impact – This makes the watching experience more dramatic, but the aesthetic style is somewhat reminiscent of the 20th century. Nolan's unique aesthetic lies in his adherence to pure linear auditory logic while strictly following scientific principles of physical acoustics and auditory physiology. This methodology not only achieves an extreme sense of clarity but also delivers a moment of epiphany: audiences suddenly realize how scientifically measured perception actually works. This precisely embodies the hallmark of media modernity.

Figure 2. Oppenheimer

While Nolan's film employs sound elements largely in line with Hollywood conventions, his personal approach defies standard practice. His grasp of the "noise-quiet" relationship often stands in stark contrast to others. A prime example is his handling of the explosion scene in Oppenheimer, where exaggerated visual imagery accentuates the solemnity of the audio medium. Regarding the extreme silence preceding the explosion, Nolan remarked: "I remember asking the sound mixers to take the sound to absolute silence at a particular moment, just for half a beat, and they wouldn't do it. It took days to convince them. It was something that just wasn't allowed to happen in a Hollywood film."[3] The intense stillness is abruptly followed by the protagonists labored breathing, which seems to originate from the characters inner auditory perception. After nearly two minutes of emotional buildup, the explosion finally erupts. This bold technique clearly deconstructs and reconstructs audience expectations, representing a daring experiment in cinematic storytelling.

3. Constructing the View of Time and Space: Musical Experience Reshapes the Cognition of Time and Emotion

The sound effects and music in a film are often so intertwined sometimes it's hard to tell them apart. Film music is divided into subjective music, also called off-screen music, which can not heard by the characters in the story, and objective music, also called realistic music, which is the musical activity that takes place in the plot.

To date, Hans Zimmer has composed the music for six of Nolan's films. These works are distinguished by their intense rhythmicity and extended bass passages that instantly evoke the cinematic style of Nolan. The rhythm-driven and bass-prioritized scoring style effectively conveys a profound sense of anxiety. In Inception, the original soundtracks Time and Dream Is Collapsing reinforce the boundary between dream and reality through their deep, repetitive melodies, creating a strong sense of ritualistic immersion. Zimmer once remarked that composing for Inception differed significantly from his usual practice. Typically, composers begin working on film soundtracks after receiving director's initial cut versions, but for Inception, Zimmer started composing simultaneously with the director's editing process. Nolan repeatedly instructed Zimmer to follow his artistic vision without considering other aspects of the film. This collaborative mode granted Zimmer immense creative freedom, allowing musical concepts to take precedence and drive subsequent visual and narrative refinements through their aesthetic value.

In Interstellar, Hans Zimmer extensively employs organ music to create an atmosphere of "share a common fate" with the protagonist. The film explores the philosophical question of individual existence within the vast cosmic expanse through its thematic exploration. Centered on a microcosm, the story follows a humble individual navigating infinite time, repeatedly attempting to reverse the timeline through profound emotional attachments to alter their destiny. Zimmers adopted numerous reed instrument sounds mimicking the grand spatial quality of church hymns. As a staple of Christian choir orchestras, the organs timbre has long evoked sacred associations. When the adult Murphys burning cornfield scene alternates with his father's suffocating work in the Canopus star system, the music No Time for Caution plays. This soundtrack intensifies the sense of despair while symbolizing their simultaneous pursuit of divine salvation, revealing the religious narrative script of "sacrifice-redemption." Amidst the majestic musical progression, mechanical clock ticks occasionally punctuate the countdown to the protagonists demise and humanitys existential crisis — a moment of ultimate tension. Here, it is highlighted that a bridge has been built between the physical sense of hearing and existential philosophy.

The soundtracks of Tenet was composed by the Swedish composer Ludwig Göransson, whose style is clearly distinct from that of Hans Zimmer. Its extensive use of electronic sound effects establishes a technological and futuristic tone throughout the movie. Beyond creating eerie reverberation effects, the soundtrack pays homage to Bach's "Crab Canon"[7], a musical structure where forward and backward performances produce strikingly similar sounds, evoking visual associations of ascending or descending imagery. The opening piece Meeting Neil achieves perfect synchronization between its forward and reverse versions upon Neil's debut, symbolizing his destiny as a "Redemptor" — a concept echoing the biblical narrative of Jesus incarnation: His arrival marks the zero point of human history, with all preceding events serving as prologue and subsequent ones as redemption. The English word "TENET" itself is written in identical reverse and forward configurations. By the musical arrangement pays tribute to the Crab Canon technique, Nolan establishes an intertextual relationship between audio media and textual content, striving to achieve symmetrical aesthetic harmony across soundscapes, visual narratives, and storytelling dimensions.

Similarly, Hans Zimmer's film soundtracks for Dunkirk, including The Mole and Supermarine, ingeniously employ "Shepard Tone". These are fixed octave counterpoint melodies that repeat in ascending or descending patterns, creating an illusion of infinite pitch ascending or descending. The continuity between these musical segments is achieved through dynamic changes: high notes fade, mid-range notes remain stable, while low notes intensify or diminish, forming a cyclical repetition that creates the sensation of continuous ascent. Shepard Tone is tricking the brain into perceiving the notes as continuously climbing without reaching a peak, triggering a heightened synesthetic response that disrupts linear "Time-Emotion" perception. This technique deconstructs the stability of temporal consciousness, transforming sound into a medium that shapes perceptual frameworks. The use of Shepard Tones also intertwines with the films polyphonic narrative, where alternating high, middle, and low registers symbolize the interwoven timelines of land, sea, and air, amplifying dramatic tension. Aesthetically, both Shepard Tone and Crab Canon utilize the shared sensory similarity between auditory and visual media, shaping visual synesthesia through frequency modulation to create a multisensory perception system that erases the audiences sense of time, allowing for artistic reshaping. Beyond tonal variations, Nolan frequently employs rhythmic shifts in Dunkirk to craft an "artistic temporal variation." For instance, during the opening alleyway battle scene, the contrast between soldiers slow movements and the sudden explosion creates rhythmic tension. When the camera widens to reveal soldiers fleeing toward the sea, the music abruptly stops, highlighting the temporal

density differences across land, sea, and air narrative threads. These deliberate temporal distortions imbue the film's rhythm with refined musicality.

The musical techniques employed in these examples share a common logic: they establish symbolic expressions of temporal progression within narratives through audience perception of music. Typically, visual media employs three symbolic construction steps: referencing, transcending, and reshaping — which collectively form a process of narrowing, decontextualizing, and refocusing. Skilled directors can firstly create partial sensory dissonance in the audiences perception of material media, then reconstruct it into a novel yet distinct version. In cinematic art, time has always been a high-dimensional toy to be played with. While previous directors have extensively explored visual elements in narrative games, Nolan's contributions stand out uniquely in the realm of sound media.

4. Conclusion

Among Nolan's films to date, Oppenheimer has earned the Best Original Score at the 96th Academy Awards, a testament to his teams groundbreaking explorations in sound design. Nolan demonstrates pioneering approaches in both dialogue delivery and audio-music integration. Emerging from Hollywood's production ecosystem, he championed against excessive digital simulation and sensory overload while establishing a distinctive aesthetic benchmark that continues to inspire future directors.

References

[1] ADR stands for additional dialogue recording.

[2] The Hollywood Reporter. (2014, November 15). *Christopher Nolan breaks silence on 'Interstellar' sound (Exclusive)*. https://www.hollywoodreporter.com/movies/movie-news/christopher-nolan-breaks-silence-interstellar-749465/

[3] *Christopher Nolan: A showman's odyssey*. (2024, March). *Sight and Sound, 34*(2).

[4] The PAD sound, also known as the pad tone, is a synthesized timbre created through modulation. It is often used as background music to create a specific atmosphere or emotion. This timbre is similar to the sound of multiple reed instruments playing together in auditory perception. It has a long duration and stable volume, and can blend smoothly with other sound elements.

[5] Binaural beat effect is a specialized technique in audio post-production engineering. It creates a unique auditory experience by sending sound waves of slightly different frequencies to each ear through headphones. When both ears receive these slightly differing frequencies simultaneously, the brain combines them to perceive a new frequency, producing the sensation of pulsating pitch tones.

[6] This music is made up of multiple loops.

[7] It can also be called "Retrograde Canon".

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