The Influence of Piano Accompaniment Music on the Psychology and Expressiveness of Sports Dancers

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Abstract

As the foundational element of sports dance, music serves as its quintessential "soul," profoundly influencing the artistic allure and evolutionary trajectory of the discipline. Frequently, it unveils the distinctive charisma of sports dance to global audiences through its intricate rhythmic patterns, melodious compositions, and fervent and uninhibited style. Given the imperative of harmoniously integrating sports dance technique with musical artistry to enhance its expressive capacities, this research endeavours to scrutinize the impact of piano accompaniment music on the psychology and expressive dimensions of sports dancers. Experimental findings substantiate the noteworthy influence of piano accompaniment music training on the expressive prowess exhibited by sports dance athletes. This investigation systematically scrutinized the expressive capacity inherent in sports dance art through the lens of music. By methodically analysing pertinent factors encompassing music training and the expressive capabilities inherent in sports dance art, the pivotal role of music training in augmenting the expressive potency of sports dance art was validated. To corroborate this assertion, a pedagogical experiment employing a single-factor comparative analysis was adopted, elucidating the artistic manifestation within sports dance from an empirical vantage point. Following the experimental intervention, the measurement scores of students within the experimental cohort exhibited a statistically significant elevation in comparison to those of the control group ($P < 0.05$). These outcomes underscore the pronounced impact of music training on the rhythmic acuity and coordination of sports dancers. Moreover, post-experiment performance in sports skills demonstrated a notable enhancement within the experimental cohort relative to the control group ($P < 0.05$), further affirming the beneficial effects of music training on sports performance. By honing the rhythmic sensibility instilled through dance music, mastering sequences of movements, grasping the intricacies of dance music, and undergoing collaborative training integrating music with choreographed routines, the artistic expression of dance athletes can be significantly enhanced. Facilitating the fusion of artistry and athleticism, policymakers are encouraged to advocate for the amalgamation of art and sports, thereby fostering an environment conducive to the development of sports dance. This entails provisioning of enhanced artistic resources and training opportunities tailored specifically for sports dance athletes, including guidance and collaboration in musical accompaniment. Provision of professional accompaniment teams is recommended, with policymakers contemplating the establishment of dedicated piano accompaniment teams for sports dance athletes to ensure the calibre and adaptability of musical accompaniment, thereby elevating athletes' performance standards.

Keywords: Sports Colleges, Sports Dance, Expressiveness, Music Training.

Introduction

Competitive sports dance emerges as a symbiotic amalgamation of musical artistry and athletic grace. Findings from surveys underscore the necessity for athletes to internalize the fusion of movement and music, transmuting it into a conduit for their own emotional resonance. Leveraging external modalities such as bodily posture, technical prowess, and facial expressions, athletes adeptly convey this internal narrative, captivating both audience members and adjudicators alike. This pursuit aims for the seamless integration of athletes' intrinsic spiritual disposition with their outward physical execution, as elucidated by Terry and Karageorghis (2006).

In accordance with the evaluative criteria delineated within the scoring parameters of competitive sports dance, judges tasked with assessing "artistic quality" scrutinize various facets of athletes' performances, among which lies the criterion of performance accuracy, as expounded by Terry et al. (2020). This criterion encompasses the amalgamation of expressiveness and movement synchronization with music, constituting a pivotal aspect of performance appraisal (Terry et al., 2020). Athletes' capacity to captivate audiences is further augmented through the embodiment of vigour, dynamism, passion, emotional acuity, and self-assurance, as evidenced in the work of Laukka and Quick (2013).

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Notably, the allocation of artistic scores assumes a paramount significance within the overall scoring schema of athletes, exerting a substantive impact on their cumulative scores. In an era characterized by heightened levels of overall competitiveness, the significance of performance acumen is magnified, underscoring its centrality within the competitive landscape, as elucidated by Kind (2022).

The symbiotic relationship between sports dance and music parallels the essential interdependence of fish and water. Music functions as the essence, or soul, of sports dance, while expressiveness constitutes the primary vehicle for manifesting the intrinsic essence of music, thereby serving as the quintessential elevation of sports dance artistry (Larsson & Karlefors, 2015; Robson, 2004). The meticulous curation and manipulation of music selections wield a direct influence on the performance outcomes of dance athletes. Factors such as the suitability of music choices to athletes' characteristics, public reception, and emotive resonance play pivotal roles in shaping athletes' performances (Camurri et al., 2004; Stevens et al., 2014).

Despite lacking the narrative depth or explicit ideological content characteristic of traditional dance forms, competitive sports dance nonetheless demands a nuanced approach to music selection, necessitating athletes to embody music's essence through their movements, physicality, allure, and vitality, all while remaining congruent with the unique attributes of sports dance (Gavanda et al., 2022). The discernment exercised in choosing music materials holds profound implications, influencing athletes' capacity to fully realize and demonstrate their prowess (Bojner Horwitz et al., 2022; Fuyan, 2019; Nannyonga-Tamusuza, 2014).

The temporal cadence of sports dance manoeuvres mirrors the rhythmic ebbs and flows inherent in piano music, with dancers achieving heightened precision, fluidity, and dynamism by synchronizing their movements with the meter and rhythm of piano compositions. Sports dance, as a creative medium of passion and expression, finds resonance in the rich emotional tapestry often woven into piano music. Dancers adeptly convey their inner emotional states through the interpretative lens of body language and choreographed movements, leveraging the emotive atmosphere cultivated by piano compositions to imbue their performances with profound emotional depth and narrative resonance.

Within stage productions, piano music assumes the role of a guiding and supportive accompaniment, providing dancers with a melodic framework that closely mirrors the rhythmic fluctuations and dynamic contours of their choreographed movements. The harmonious fusion of piano melodies and dance rhythms engenders a captivating and evocative performance milieu, characterized by infectious dynamism and dramatic allure. Moreover, piano music serves as a wellspring of inspiration for the creative genesis of sports dance compositions, with choreographers drawing upon the melodic motifs, emotional nuances, and rhythmic cadences inherent in piano compositions to conceive innovative and expressive dance works.

In essence, the symbiotic bond between piano music and sports dance is underscored by the judicious integration of rhythmic cadences, emotive resonances, and expressive modalities inherent in piano compositions. Through adept utilization of piano music's rhythmic intricacies, emotional depth, and expressive potential, dancers can elevate their technical proficiency and artistic expressiveness, thereby crafting captivating and emotionally resonant dance performances.

Individuals' proficiency in music varies, and the cultivation of musical expressiveness necessitates a certain level of musical acumen among athletes. Broadly speaking, the development of musical competence primarily unfolds through avenues such as experiential immersion in music, formal music education, and practical application of musical principles (Fuyan, 2019). Enhancing the author's musical literacy entails fostering a conducive musical environment for athletes, wherein they are continually exposed to musical stimuli. Subsequent to this, athletes undergo structured music instruction to instil foundational theoretical knowledge. This serves as a cornerstone for further enrichment of their musical proficiency. Central to this endeavour is the practical application of music, wherein athletes engage with music to deepen their understanding of its dynamic interplay with physical movement and to harness its expressive potential. A meticulous analysis of the musical style employed in competition routines, coupled with adept handling of expressive forms within choreographed sequences, further refines athletes' musical acumen (O'Connell et al., 2022).

Ensuring athletes attain a robust theoretical grasp of music and nurturing their expressive capabilities are pivotal aspects of enhancing musical literacy. Delving into the practical realm, athletes immerse themselves in the experiential exploration of music's symbiotic relationship with bodily movements, thereby honing their musical expressiveness. A discerning examination of the stylistic nuances, emotional resonance, and thematic underpinnings of music utilized in competitive settings, alongside adept modulation of expressive forms within choreographic arrangements, further amplifies athletes' musical acuity (Torkamandi et al., 2020).

The ideal music selection possesses an innate capacity to captivate and inspire, serving as a catalyst for athletes' emotional engagement and facilitating rapid immersion into training regimens. Beyond its role in formal training sessions, music serves as a potent tool for attenuating fatigue, regulating muscular tension, optimizing motor performance, and fostering precision and concentration in movement execution (Blasco-Lafarga et al., 2022). Tailoring music choices to align with athletes' training phase, individual proclivities, and movement aesthetics ensures maximal efficacy in training interventions, thereby augmenting training outcomes through judicious music utilization.

In conclusion, the effective integration of sports dance technique and musical artistry hinges upon enhancing athletes' capacity for artistic expression. To this end, the research objective centres on exploring the impact of piano accompaniment music on the psychology and expressive capabilities of sports dancers.

This study explores the impact of piano accompaniment music on the psychological and expressive abilities of sports dance athletes, aiming to enhance the artistic expression of sports dance by integrating technology and music art. Through experiments, it was found that piano accompaniment music training significantly enhances the expressive power of sports dance athletes. Analysing factors such as music training and expressive power in sports dance art confirms the importance of music training in improving artistic expression. The study delves into rhythmic synchronization, movement comprehension, and coordination training, demonstrating that these aspects effectively boost the artistic expression of sports dance athletes.

The research is structured into five chapters: an introduction discussing the study's main focus, a literature review examining previous research, a methodology section detailing sampling techniques and research design, a data analysis and findings section, and finally, a discussion of findings and conclusion.

Literature Review

Sports dance, an amalgamation of artistic and athletic prowess, necessitates athletes to exhibit exceptional skills and expressiveness. Within the realms of training and competition, the inclusion of piano accompaniment music holds significant sway, exerting a positive influence on athletes' psychological well-being and expressive capabilities. The psychological state assumes paramount importance in sports dance, wherein athletes contend with the rigors of training, the pressures of competition, and the demands of performance (Hill et al., 2020; Karageorghis et al., 2021; Спесивих et al., 2019). Piano accompaniment music serves as a salient mechanism for inducing relaxation, assuaging stress, and alleviating anxiety through its melodic beauty, harmonic resonance, and rhythmic cadence. The rhythmic patterns and emotional nuances embedded within the music contribute to athletes' ability to regulate their psychological states, bolster self-assurance, and enhance focus and concentration (Karageorghis et al., 2021). Moreover, piano accompaniment music exerts a profound influence on the expressive prowess of sports dance athletes (Lase et al., 2021). The rhythmic cadences and emotive qualities inherent in music serve to invigorate athletes' creativity and expressive acumen (Juslin, 2019; qizi Mardaeva, 2022). Melodious compositions wield a profound influence on athletes' rhythmic acuity, thereby enhancing the coordination and fluidity of their movements (Chen & Li, 2020; Mino - Roy et al., 2022). Moreover, the evocative qualities and narrative richness inherent in music serve to inspire athletes' emotional expression, imbuing dance performances with heightened poignancy and infectious appeal (Ghazel et al., 2022). In a study conducted by Ghazel et al. (2022), the impact of music on short-term exercise performance across different menstrual cycle stages (MCPs) was assessed. Fourteen female handball players, aged 21 to 24 years, underwent various tests under conditions of music (with a fast rhythm of 140 bpm) and no music across different MCPs (menstrual period (MP), luteal phase (LP), and follicular phase (FP)), including squat jump (SJ) test, counter movement jump (CMJ) test, agility T test (TT), and repetitive sprint ability (RSA). Additionally, participants completed the Profile of Mood States (POMS) questionnaire across different MCPs, with perceived exertion levels recorded at the conclusion of TT and RSA. The findings indicate that MCP did not significantly affect the performance of SJ, CMJ, TT, and RSA. However, compared to LP and FP, MP was associated with elevated levels of anxiety, anger, and confusion. Music enhanced SJ performance across different MCPs, particularly post-warm-up in all MCPs (Ghazel et al., 2022).

In summary, piano accompaniment music exerts a notable impact on the psychological state and expressive prowess of sports dance athletes. It facilitates relaxation, stress reduction, and performance enhancement, thereby fostering the development of dance skills. Through engagement with music, athletes can amplify their personal artistic flair and individuality, culminating in standout sports dance performances (Bocado et al., 2022). Research by Fernández-Argüelles et al. (2015) delves into the impact of music, including piano accompaniment, on

dancers' performance, focusing on psychological and emotional aspects. Similarly, Qu (2021) investigates the influence of piano accompaniment music on sports dancers' emotional states, analysing factors like tempo and dynamics. Additionally, Sala and Gobet (2020) explore how piano accompaniment enhances dance expressiveness and artistic interpretation, shedding light on its benefits in sports dance routines. Overall, these studies underscore the significance of piano accompaniment music in shaping the psychology and expressiveness of sports dancers.

Methodology

Subjects

The subject of investigation comprises 12 male students affiliated with a sports college's sports dance team. Random allocation resulted in the division of participants into two groups: an experimental group and a control group, each consisting of six individuals.

Experimental Teaching Content

The instructional material employed for the experiment consists of "secondary prescribed movements" within the domain of national competitive sports dance.

Test Indicators Before Experiment

(1) Systematically record the fundamental demographic data of students, encompassing parameters such as age, stature, body mass, and additional relevant particulars.
(2) Using the piano accompaniment music metronome test, the initial data of students from both the experimental and control groups were measured and recorded. Subsequently, an analysis was conducted to ascertain any disparities between the two groups. If no discernible differences were observed, indicating conformity to the fundamental conditions of the experiment, the experimental and control groups proceeded with the designated experiments.

Test Indicators After Test

(1) Following the experiment, the rhythm of both groups was assessed and compared using the piano accompaniment music metronome test.
(2) The technical performance of students in both the experimental and control groups was assessed using the criteria outlined in the "second level of national competitive sports dance". It's worth noting that the test music was not employed for instructional purposes.
(3) During the technical evaluation, meticulous attention was paid to the trainees' adherence to movement specifications, proficiency levels, coordination between music and movement, physical strength during movements, and expression in movements. A tabulated record of the data was compiled, facilitating a comparative analysis of discrepancies between the two groups.

Control of Experiment

To mitigate the influence of extraneous subjective and objective factors and uphold the integrity of data and evaluations, stringent control over various variables potentially affecting the experiment's integrity is imperative. This entails ensuring divergence between the experimental and control groups regarding teaching plans, instructional content, equipment, environment, progression, duration, and instructors remain absent. During the technical evaluation phase, scoring is conducted by 2-3 seasoned teachers or experts possessing extensive experience in sports dance instruction.

(1) Test time: Scheduled from May 2022 to July 2022, spanning a duration of two months encompassing a total of eight weeks, with three classes conducted per week. Each class comprises two instructional hours, accumulating to 48 instructional hours in total. The pre-experiment test will be conducted in the week preceding the experiment, while the post-experiment test is slated for the subsequent week.
(2) Place of experiment: Sports Dance Hall.
(3) Experimental Equipment: 1 CD player; The supporting CD of "National Competitive Sports Dance Class II Required Actions"; PC9903 sports stopwatch 1; 1 NIKKO mechanical metronome; Pen and paper.

Mathematical Statistics

This research employs statistical analysis utilizing SPSS 19.0 and Microsoft Excel software to conduct mathematical scrutiny of the survey data. This analytical approach furnishes a scientific underpinning for the thesis proposition.

Experiment Content

(1) The control group underwent conventional teaching methods devoid of specialized instruction in music theory and music sense training.
(2) The experimental group, centred around piano accompaniment music, commenced by acquainting themselves with musical compositions. Subsequently, they divided the compositions into several 8-beat segments, with each segment serving as a unit for learning corresponding technical actions. All actions were learned in conjunction with piano accompaniment music. Teaching methodologies employed for the experimental group encompassed explanation, video imitation, image training, and music instruction.

Emphasis was placed on fostering students' interest in music, elucidating its integral role in sports dance learning. Attention was directed towards utilizing movement rhythm to engage students' interest in music, while selecting familiar music with distinct rhythm for accompaniment purposes (Sugiharto et al., 2022).

Results

Analysis of the Influence of Music Training on the Teaching Effect of Artistic Expression of Sports Dancers

(1) Grouping and testing of research objects in the early stage of teaching.

To ensure the experimental accuracy, both groups' basic demographics and sports dance music quality were assessed and measured prior to the experiment (refer to Table 1). Each group comprised 6 participants, with comparable age distributions (P=0.612). The mean age for the experimental group was 19.1 ± 0.613, while for the control group, it was 20.6 ± 0.317. T-test results indicated no significant disparity in height between the experimental and control groups (P=0.866), with mean heights of 173.2 ± 2.612 and 172.2 ± 1.353, respectively. Similarly, there was no notable difference in body weight between the two groups (P=0.871), with mean weights of 65.4 ± 3.216 for the control group and 67.3 ± 4.613 for the experimental group, indicating comparable basic demographics between the two groups (P>0.05).

Table 1

Basic Statistics of Students in the Experimental Group and the Control Group (N=12)

Group	Number of people	Age	Stature	Weight
Experimental Group	6	19. 1±0. 613	173. 3±2. 613	65. 4±3. 216
Control Group	6	20. 6±0. 317	172. 3±1.353	67. 3±4. 613
P		P =0. 613	P=0. 867	P=0. 872

Prior to the experiment, there were no notable differences in measuring the rhythmic acuity of sports dance music between the experimental and control groups (P>0.05). Subsequently, students' musical rhythm was evaluated, wherein the metronome rhythm was adjusted to 132 beats per minute in line with research requirements, corresponding to the standard sports dance music rhythm of 10 seconds, encompassing 20 to 22 beats. The measurement protocol stipulated that the time taken by students to listen to the rhythm of 4×8 beats from the music should be recorded. Students were instructed to clap their hands to the rhythm played by the metronome, emphasizing heavier claps on the fourth and eighth beats while simultaneously stepping with their heels.

Analysis revealed that the average response time of students in the experimental and control groups to the metronome rhythm was 15.112s ± 0.358 and 14.324s ± 0.483, respectively. T-test results indicated a non-significant difference (P=0.275>0.05), indicating comparable rhythmic perception between the two groups. Thus, it can be inferred that the rhythmic acuity of students in both the control and experimental groups is largely consistent (Ušpurienė & Sadzevičiūtė, 2022).

Prior to the experiment, both the control and experimental groups received pre-instruction on the 4×8 beat technique for a duration of 2 hours, followed by an evaluation. Two experts from Shenyang Institute of Physical Education, with extensive experience in sports dance instruction, conducted a technical assessment on the action proficiency of the student cohorts. The average scores attained by students in the control and experimental groups in the 4×8 clap technique test before the experiment were 71.4 ± 2.257 and 72.2 ± 2.862, respectively (refer to Table 2). Subsequent T-test analysis yielded a result of P=0.793>0.05, indicating the absence of significant discrepancy in sports skill performance between the two groups of students prior to the experiment (Dai et al., 2022).

Table 2

Basic situation of Sports Dance Technology of Students in the Experimental Group and the Control Group Before the Experiment (N=12)

Group	Number of people	Average	Standard Deviation	T	P
Experimental Group	6	71 .4	2. 257	0. 315	0. 793
Control Group	6	72.2	2. 862		

(2) Selection and implementation of single-factor indicators in the teaching process

The investigation revealed that employing interpretative, video simulation, image training, and music teaching

methodologies within the experimental group significantly enhances the performance of sports dance athletes in collegiate sports settings. Table 3 presents statistical outcomes, encompassing sample size (N), mean of dependent variable (artistic expression), standard deviation (Std) of the experimental and control groups, standard error (Std Error), 95% confidence interval, as well as the minimum and maximum values.

Table 3

Descriptive Statistics of One-Way ANOVA (N=12)

	Artistic Expressiveness							
					95% Confidence Interval of the Mean			
	N	Mean Value	Standard Deviation	Standard Error	Lower Limit	Superior Limit	Minimum	Maximum
Control Group	6	72.834	1.7225	0.7033	71.027	74.642	70.0	75.0
Experimental Group	6	81.501	1.0487	0.4283	80.398	82.602	80.0	83.0
Total	12	77.168	4.7257	1.3643	74.165	80.168	70.0	83.0

Table 4 displays the outcomes of the homogeneity of variance test. With a significance value (sig) of 0.447, indicating P>0.05, it is evidenced that there exists no significant variance disparity between the experimental and control groups at the α=0.05 threshold level, thus affirming homogeneity of variance.

Table 4

Results of Variance Homogeneity test (N=12)

Artistic Expressiveness			
Levene Statistic	**Df1**	**Df2**	**Conspicuousness**
0.630	1	10	0.447

Table 5 presents the outcomes of the analysis of variance (ANOVA). It includes the sum of squares, mean square, F value, and probability (P value, sig) for both inter-group and intra-group deviations. Given P<0.05, it indicates a significant difference at the α=0.05 level between the experimental and control groups.

Table 5

Statistical Table of One-Way ANOVA (N=12)

	Artistic Expressiveness				
	Sum of Squares	**Df**	**Mean Square**	**F**	**Conspicuousness**
Intergroup	225.334	1	225.334	110.821	0.000
Within Group	20.334	10	2.034		
Total	245.668	11			

Comparison and Analysis of Research Objects in the Later Stage of Teaching

Test and analysis of the experimental group before and after teaching

Following the teaching experiment, the average response time of students in the experimental group to the metronome rhythm decreased from 15.112 ± 0.358 seconds to 13.112 ± 0.219 seconds. Upon conducting a T-test, the resulting P value was found to be 0.001, indicating statistical significance (P<0.05). This suggests a significant improvement in measured scores among students in the experimental group after the teaching experiment, signifying enhanced proficiency in musical rhythm perception.

Furthermore, the technical evaluation scores for sports dance among students in the experimental group decreased from 71.5 ± 2.256 to 81.5 ± 1.048 following the teaching experiment. T-test analysis yielded a P value of 0.001, also indicating statistical significance (P<0.05). This signifies a substantial improvement in technical evaluation scores among students in the experimental group subsequent to the teaching experiment.

Test and analysis of control group before and after teaching

The average response time of students in the control group to the metronome rhythm before and after the teaching experiment was recorded as 14.342 ± 0.483 seconds and 13.324 ± 0.565 seconds, respectively. The resultant outcome of the T-test yielded a P value of 0.132, indicating no

statistical significance (P>0.05). This suggests that, under the guidance of traditional sports dance teaching methods, students in the control group did not demonstrate effective improvement in their musical rhythm perception. Subsequent to the teaching experiment, the sports dance skills evaluation scores for students in the control group were 72.1 ± 2.861 and 72.8 ± 1.722, respectively. The T-test result indicated a P value of 0.146, signifying no statistical significance (P>0.05). This indicates that students in the control group did not exhibit significant enhancement in their performance in sports dance technology evaluation following the teaching experiment.

Test and analysis of experimental group and control group

Following the experiment, the average reaction time of students in the experimental group and the control group to the metronome rhythm was 13.112 ± 0.219 and 13.3241 ± 0.565, respectively. The T-test result yielded a P value of 0.016, indicating statistical significance (P<0.05). This suggests that after the experiment, the measurement outcomes of students in the experimental group exhibited significant improvement compared to those in the control group, underscoring the significant impact of music training on the rhythmic sense and beat of sports dancers. Moreover, after the experiment, the average scores of students in the experimental group and the control group were 81.5 ± 1.048 and 72.8 ± 1.722, respectively. The T-test result yielded a P value of 0.021, also indicating statistical significance (P<0.05). This suggests that the motor skills performance in the experimental group significantly improved compared to the control group after the experiment.

Discussion and Implications

Common Points of Dance and Music

Common Rhythm

The inherent connection between dance and music lies in their shared element of rhythm, constituting a natural fusion. Dance relies on music to accentuate its rhythmic essence, as human rhythmic movements inherently demand musical accompaniment. For instance, rhythmic collective activities, such as labour, often incorporate musical instruments like labour trumpets. Dance, serving as a spontaneous and rhythmic expression of emotional impulses, inherently requires the collaboration of music. However, it's essential to note that not all music can seamlessly complement dance; rather, it necessitates music characterized by distinct rhythmic qualities (Zhang et al., 2022).

Abstract and concrete presentation

Dance and music share a common characteristic: lyricism. Sound, closely linked to human emotion and spiritual life, possesses a profound emotional impact. Plato suggested that rhythm and melody could penetrate the soul, influencing auditory senses abstractly, as the feeling of music is often associated with emotion and memory. Music is commonly regarded as an "emotional shorthand" or "emotional language". Similarly, dance is also a form of lyric art, albeit expressing emotions through the rhythm and melody of bodily movements, incorporating elements like strength, pauses, rotation, relaxation, speed, hardness, and softness. Unlike music, dance engages human vision, providing specific visual imagery. Consequently, the integration of music and dance complements both auditory and visual senses (Bojner Horwitz et al., 2022).

The Role of Music in Dance

Match and help the dance express emotions, reflect personality and set off the atmosphere in the whole process Music possesses inherent characteristics that resonate deeply with individuals, often evoking personal emotional experiences in appreciators. Dancers, particularly, possess a profound connection and comprehension of the music accompanying their performances. This intimate understanding can intensify their internal emotional responses. Moreover, music has the capacity to directly influence audience emotions through dancers' external bodily movements, establishing an emotional bridge between the dance and its viewers, thereby fostering a closer bond between the audience and the performance.

Help organize music movements, and dance movements should be compared with music

Dance and music, sharing rhythm and emotional content, demand high coordination as they unfold simultaneously. Music typically precedes dance, shaping movements in sports dance through melody, rhythm, and harmony fluctuations. Music expresses emotions primarily through melody, rhythm, and harmony, stimulating hearing and association. By incorporating music's function into sports dance training, athletes can better interpret music through movement, enhancing technical performance. Music's rhythm guides action initiation, akin to language prompts in teaching but richer in cues. Movement style often mirrors music style, influencing music selection for themed actions. Melodic fluctuations convey inner feelings, integrated into actions by dancers. Adherence to music style ensures coordination between actions and music, effectively supporting dance performance (Sofron & Ţifrea, 2022).

In Conclusion, Music Primarily Manifests in Competitive Sports Dance As

Melody: Melody, comprised of sound pitch, duration, and intensity, forms the core of music composition, creating meaningful music lines. In sports dance, movements should align with the rhythmic balance and emotional

content of the melody, ensuring coordination between gymnastics, difficulty, transitions, and choreography. Melody not only dictates technical aspects but also shapes the dance's visual imagery. Soft, flowing melodies evoke gentle curves, while strong, linear melodies convey momentum, and fragmented melodies evoke intensity. When sports dance movements harmonize with music melodies, it generates a synchronized and harmonious audio-visual experience, fostering a sense of coordination and unity (Mino‐Roy et al., 2022).

Rhythm: The aesthetic value of rhythm lies in its structured order and decorative appeal achieved through repetitive patterns. It enhances visual aesthetics by introducing regular changes and local contrasts, resulting in dynamic and harmonious artistic effects. Rhythm serves as the foundation of music melody and the essence of dance dynamics and emotion. It transcends musical expression to influence movement sequences, such as the pacing and transitions in sports dance routines. The visualization of rhythm primarily occurs through movements, where rhythm guides and shapes actions. Rhythm acts as the orchestrator and conductor of movements, infusing them with vitality, while actions serve as the physical manifestation. Thus, the seamless integration of rhythm and movements constitutes the essence of sports dance aesthetics (Pastorek Gripson et al., 2022).

Harmony: Harmony refers to the resonance created by the combination of two or more musical notes. It serves two primary functions: first, it forms the basis of melody-based music, known as melodic music, where distinct tones within each chord contribute to a unified melody line. Second, harmony can take a polyphonic form, incorporating multiple simultaneous melodies. These harmonic tones often convey thoughts and emotions. Intense emotions are typically associated with high-pitched and fast-paced rhythms, accompanied by vigorous movements. The music gradually builds up, layer by layer, before abruptly stopping, evoking a sense of profound longing. As the music progresses, it deepens, leaving listeners filled with anticipation.

Individuals involved in sports dance have begun to recognize the significance of music and possess a profound understanding of its technical impact on sports dance. It is widely acknowledged that the style of music dictates movement style and plays a guiding role in the technical execution of competitive sports dance. This understanding serves as a theoretical foundation for further research. However, existing literature lacks a precise definition of music style, offering only a broad conceptual understanding. Consequently, it fails to provide specific guidance on how different music styles can enhance the technical performance of competitive sports dance.

Artistic expression in sports dance encompasses athletes' ability to captivate audiences and impress judges during competitions. This ability integrates various facets of athletes' inner spirit and outward movement performance, including proficiency in movement, temperament, movement rhythm, amplitude, strength, understanding of music, basic movement proficiency, expression of movement connotation, and body posture. Influential factors on artistic expression in sports dance encompass the ability to comprehend movements, musical interpretation, technical prowess, facial expression conveyance, body shape, and physical functionality. Following the experiment, students in the experimental group exhibited significantly higher measurement scores compared to those in the control group ($P<0.05$). These results underscore the significant impact of music training on enhancing the sense of rhythm and rhythm coordination in sports dancers. Additionally, the performance of sports skills significantly improved in the experimental group compared to the control group after the experiment ($p<0.05$). Effective utilization of sports dance music rhythm, comprehensive movement execution, understanding of sports dance music, and coordinated training of music and movement sequences can notably enhance the artistic expression of sports dance athletes.

The research presents various implications, notably concerning the potential effects of rhythmic and melodic aspects of piano music on dancers' coordination and synchronization with the musical accompaniment. These elements may facilitate improved alignment of movement to the music, thereby potentially enhancing dancers' performance quality. Additionally, exposure to piano music with expressive qualities may elicit diverse emotional responses from dancers, affording them a broader spectrum of emotional expression in their choreography. This multifaceted emotional range adds depth and intricacy to their performances, thereby captivating audiences and augmenting the overall impact of their presentations.

Furthermore, the dynamic interaction between piano accompaniment and dancers has the potential to cultivate a collaborative atmosphere, fostering a sense of unity and teamwork. This collaborative engagement can facilitate seamless communication during performances, leading to enhanced cohesion and synchronicity in choreographed routines.

Conclusion and Future Directions

In order to elevate the appreciation of gymnastic artistry and enhance its appeal to both spectators and adjudicators within

competitive contexts, it becomes imperative to foster comprehensive development across various dimensions of the sport. Such dimensions encompass psychological resilience, technological proficiency, cognitive acumen, physical aptitude, among others. The performance efficacy of sports dancers is influenced by a multitude of internal factors, necessitating a concerted effort towards nurturing athletes' proficiency in movement execution, musicality, and the harmonization of movement with musical accompaniment through systematic training interventions. Incremental enhancements and refinements in athletes' capabilities are envisioned through sustained and iterative practice regimens. Sports dance, characterized by the fusion of music and corporeal expression, commands a heightened level of aesthetic appreciation, mandating attention not only to the technical precision and consistency of athletes' movements but also to the integration of choreographic design with complementary musical arrangements to amplify the intrinsic allure of sports dance. Insight garnered from research indicates that incorporation of aforementioned training modalities, coupled with Xu Lian's methodology, has yielded marked advancements in athletes' proficiency levels, thereby endowing them with a repertoire of refined performance skills.

Policy initiatives may be devised to facilitate collaborative endeavours between sports dance athletes, musicians, and artists, thereby fostering cross-disciplinary exchange and innovation. The exploration of the influence exerted by piano accompaniment music on the psychological and expressive dimensions of sports dance athletes presents a rich and fertile research terrain. Recommendations for further inquiry include empirical investigations into the specific psychological ramifications of piano accompaniment music on athletes, alongside endeavours to quantitatively assess its impact on motor performance through meticulous video analysis and evaluative metrics.

Notwithstanding the insights gained, certain limitations inherent to the study warrant consideration for future research endeavours. These encompass constraints associated with the delineation between control and experimental cohorts, suggesting avenues for exploration via alternative methodological frameworks such as survey methodologies or case studies. Furthermore, extending investigations beyond the confines of sports dance teams to include diverse cohorts such as physical education participants or dance institutions promises to enrich the scope and generalizability of findings. Additionally, expanding research endeavours across different national contexts or conducting comparative analyses with economies of similar standing could offer valuable insights into contextual nuances and comparative efficacy.

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