

Role of Lyrics and Music in the Retrieval of Dance Sequences among Dancers

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ABSTRACT

Dance is an elegant type of performance art with aesthetic and metaphorical meanings. It increases one's cognitive ability while also fostering physical capabilities such as balance, control, and coordination of bodily motions. The research's main goal is to investigate the role of lyrics and music in dancers' recovery of dance sequences. It would help us better understand the cognitive processes that a dancer employs to learn a dance routine. The study focused on dancers between the ages of 18 and 25. The influence of lyrical and non-lyrical music on retrieval of the dance sequence was investigated using a quasi-experimental research approach. Two videos exhibiting dance moves were employed as the study's tool. The first video included lyrical music, while the second featured non-lyrical or instrumental music, although both videos featured the same dance choreography. The videos were provided to two groups, each of which had three trials to watch the video, memorize the instructions, and replicate it correctly according to the music. The participants' responses were recorded in order to see which group fared better in the task. The study's findings revealed that when it comes to retrieving dancing sequences, there is no substantial difference between lyrical and non-lyrical music. Some dancers were better at synchronizing their motions to the beat, while others were better at it with melody.

Keywords: *Dance, Lyrical, Non-Lyrical, Retrieval, Learning*

Dance is a performing art form that consists of sequential movements. It is a graceful art form that contains aesthetic and symbolic values and is acknowledged as an art form with psychological benefits by performers and observers within different cultures. One of the most basic motives of dance is the expression and communication of emotions. Dance has a magical power to heal both the body and the soul. Researchers have provided the miraculous benefits of dance in terms of physical and mental health. It is highly effective in boosting emotional and social well-being. It improves one's cardiovascular health, helps in maintaining strength and balance in the body, boosts cognitive performance, and helps in managing emotions. Another important function of dance is to enhance cognitive ability, as reproducing dance sequences accurately requires one to have a good

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attention span in order to memorize steps, moves, sequences, beats, rhythms, etc., which exercises the brain and turns out to be effective in increasing memory.

It fosters physical skills and helps people gain balance, control, and coordination of their body movements. Dance soothes a person's mind and body and also helps in reducing stress levels by enhancing cognitive abilities, thus boosting the overall health of a person. It also helps a person to cultivate communication skills by uniting people through songs, tunes, music, lyrics, and specific compositions. This helps people to develop listening and social skills and enhances their creativity. Dance provides a platform for people to express their feelings, thoughts, emotions, and imaginations freely. As a result, a person's vision and their creative connection to the world improve. Music and dance are great and effective ways to improve one's creativity and imagination power. This eventually provides a great platform for people to connect with various cultures by understanding the prevalent cultural concepts, changes, variations, and differences in cultures.

Dance helps with improving mobility and flexibility. While dancing, dancers imply specific focus on the movements, which requires the dancers to get their mind and body coordinated to follow the moves according to the rhythm played, catch the beats according to the tempo of the song, and synchronize the moves in dance. A study conducted by Hamacher et al. (2015) has shown that synchronizing cognitive and motor activity requires effective cognitive skills like indulging in dual-tasking by implying accurate focus on the rhythm, grasping moves and coordinating the moves.

Statement of the problem

The basic motive is to study the role of lyrics and music in the retrieval of dance sequences among dancers. It would aid us in comprehending the underlying cognitive processes and a person's ability to relate, understand, retain, remember, reproduce, and communicate the essence to others. The basic criteria for the study is to understand the mechanisms and logistics behind one's personal preference, convenience, automatic connectivity, and different strategies associated with learning and memorizing dance sequences.

The significance of the study

Dance and music are two cultural elements that have an impact on cognition as well as physical, psychological, social, and spiritual well-being. The difference in the music played may have some effects on dance if the cognitive processes involved in memorizing dance moves vary due to the change in music. Researchers have previously tried to uncover the cognitive processes of individuals, mostly by analyzing the academic skills or practical abilities of the participants. Trying to understand the retrieval process through art would allow us to analyze the basic underlying cognitive factors in a creative way. Learning processes are easily influenced by the cues received from incoming information. The cues that come along with the vital information play an important role in grabbing the attention of a person. The learning process thus gets shaped in accordance with those cues. The brain works differently in accumulating information of different natures. Learning of any particular dance sequence requires our brain to grasp and adapt certain cognitive cues in order to relate, accumulate, understand, and further reproduce incoming information, which eventually forms a dance sequence. Cognitive processes and mechanisms through which dancers relate to sounds, words, patterns, music, movements, etc. differ from person to person. The memory of each person related to kinesthetic activities differs according to the specific cues and relatable factors that the person gets adapted to. Each and every person differs in capacity, capability, talent, and also the ways in which they relate to the logistics

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of a particular phenomenon. Studying the effects of varying music styles on learning dance sequences would provide us a platform to understand the difference in individuals' perceptions and how well they can relate to a particular genre of music. It also helps us to understand how people are able to appropriately connect and accurately communicate the received information to others.

The objectives of the current study

1. The objective of the study is to understand the difference in the retrieval of dance sequences due to the variation in the music.
2. Another objective of the study is to understand the difference in the learning of dance sequences over three trials among the two groups of participants.
3. The study would also focus in understanding the difference in learning and retrieval process of dance sequences among individual.

REVIEW OF LITERATURE

Music and movement

Mitchell, R., and Gallaher, M. (2001) investigated the capacity to discern a match between a piece of music and a dance designed to express it in a survey of 942 university students. The study included three pieces of music and three dances. Sequential selection, sequential judgment, simultaneous judgment, and isolated presentation were the four circumstances used to present these. In each circumstance, participants were asked to determine an adequate match between the music and the dance. The participants were asked about their decision-making process in each situation after they had made their option. The participants were able to make a connection between the music and the dance pattern. As a result, the findings revealed that participants were capable of detecting a match between music and dance.

Leow et al. (2014) investigated the effect of different auditory signals on the capacity to synchronize one's movements to the auditory rhythm, which varied in beat salience and musical character. They demonstrated that high-groove music was superior to low-groove music in synchronizing gait and eliciting longer and faster steps in a behavioral experiment, and that low-groove music was particularly detrimental to gait in weak beat-perceivers, indicating that both beat salience and beat perception skills are important mediators in movement cueing.

Blasing B. E. (2015) explored how visual familiarity with the observed movement and accompanying music affects the segmentation of dance phrases in dancers of various ability levels and non-dancers. Dancers and non-dancers in one experiment were given a video of a dancer performing a rehearsed dance phrase and were asked to specify segment borders by pressing keys. The findings imply that dance expertise reduces the number of perceived segment boundaries in an observed dance phrase, and that dance expertise modulates the effects of visual familiarity and music on movement and segmentation. In a second experiment, motor experience was included as a factor, based on actual data that visual and motor skill alter action perception in different ways. After participants learned to dance the phrase, fewer segment boundaries were defined in the intermediate trials, and music reduced the number of segment barriers before learning. The findings revealed that specialized motor experience of dance movement altered perception and anticipation, as well as extended segmentation, but that this was not comparable to professional dance skill.

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Aviv V. and Marinberg N. (2019) created choreographic sequences that were either melodic or rhythmic in nature, and these dance sequences were taught to professional dancers in pilot research. As a result, certain dancers were able to better match their motions to beat, while others were able to do so with melody.

Dance and cognition

Kimura K. and Hozumi N. (2012) investigated the sorts of aerobic dancing programmes that have a good influence on cognition in elderly persons. The investigation was conducted using a randomized controlled trial approach. The researchers used two 40-minute aerobic dance programmes to examine the effects of acute aerobic dance exercise on cognitive performance. Thirty-four older volunteers, ranging in age from 65 to 75, were randomly allocated to one of two training groups: free (N = 17) or combined (N = 17). The freestyle and combination style movement patterns were used. In order to equalize the workout intensity, both dancing routines were controlled. To examine executive cognitive ability immediately before and after the 40-minute dance exercise, a task-switching reaction time test was used to measure response time and correct rates. As a result, the findings imply that dancers use auditory and temporal stimuli (music, a beat, or sounds) to prompt movement to a rhythm. Importantly, programmes that use the exact same movements as dance but are not performed in a sequential order have no cognitive effects. In a mixed style dancing workout with a dual-task nature, the executive cognitive network was enabled.

Music listening can improve episodic memory and regulate prefrontal cortex (PFC) activity during memory encoding in older individuals, according to Ferreri L. et al. (2014). Upbeat music improved source-memory performance and reduced dorsolateral PFC activity bilaterally as compared to a silent background, showing that music can aid memory encoding in older individuals by modifying prefrontal activity in a non-demanding manner.

M. H. Woolhouse and R. Lai (2014) investigated entertainment and person perception, and found that synchronized motions improved memory for incidental person attributes. Subjects in this study watched recordings of two pairs of laterally positioned dancers, one of whom was synchronized with the music and the other who was not. Music-dance synchrony increased the visual examination duration, according to the findings. The goal of the study was to figure out which dance moves were responsible for torso and head fixations. We wanted to know if there are any aspects of dance that are specifically meant to lead an observer's gaze towards the face, which is the primary "communicative doorway" for the transmission of intent, affect, and empathy.

METHODOLOGY

Nature of the study

The basic motive is to study the effect of lyrical and non-lyrical music on retrieval of dance sequence. It would help us to understand the underlying cognitive processes and ability of a person to relate, understand, analyze, reproduce and communicate the information to other people through dance moves. The basic criteria for the study is to understand the mechanisms and logistics behind one's personal preference, convenience, automatic connectivity, and different strategies associated with learning and memorizing dance sequences.

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Sample

The study was conducted on dancers within the age range of (15 - 25 years). Sixty trained dancers were selected for the experiment using the purposive sampling technique. The dancers were randomly divided into groups of two having 30 participants each in the group.

Inclusion criteria

- The participants selected would be trained classical dancers
- The participants selected would be the dancers who have experience of at least 5 years.

Exclusion criteria

Participants having physical impairments would be excluded from the study. Dancers trained in western dance styles would be excluded from the study.

Operational Definitions

Dependent variable is retrieval of dance sequences. There would be a difference in retrieval of dance sequence depending on the change in the type of music. Independent variable is the lyrics in the music. The presence or absence of lyrics can have a significant effect on the process of retrieval.

Research design

The quasi-experimental research design was used to study the effect of lyrical and non-lyrical music on the retrieval and learning of the dance sequences. Quasi-experimental research involves the manipulation of independent variables. These are generally used to establish causality, that is the effect of the independent variable on the dependent variable.

Tools used

The tool used for the study was two videos depicting dance moves. Both the videos are one minute long. The first video contained lyrical music and the second video would consist of non-lyrical or instrumental music. The dance choreography done in both the videos was exactly the same, only the music in both the videos are different. The scores were obtained using a standard scoring sheet which was validated by experts and it consists of the dance sequences and the scores to be given if the participants reproduce the dance sequences accurately.

Dependent variable

Retrieval of dance sequences is the Dependent Variable.

Independent variable

Lyrical and Non-Lyrical music played for the experiment is the Independent Variable.

Extraneous variable

The experiment was carried out entirely online using an internet platform (zoom). Because the experiment was conducted online, the researchers had less control over the environment in which the participants performed. To keep an eye on this, the participants were told about the specific requirements for the room they may pick to participate in the experiment in. The participants were told that the room needed to be large enough for them to dance in and that it needed to be well lit. Another crucial aspect that can influence the experiment's outcome is the participant's interest and mood. To guarantee that the participant's interest and mood do not influence the study, the subject was asked about his or her willingness to engage in the experiment, as well as whether or not the participant was in a good mood and calm. If a

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participant became exhausted throughout the experiment, she was allowed to take a break from it in order to relax and replenish. It should be large enough for the participants to dance in and adequately lit. This would allow the person to return to the experiment feeling completely rejuvenated. An external aspect that can influence the outcome is the type of dance in which the participants have been trained. When doing the experiment in an online mode, the amount of connectivity is the most significant stumbling block. The participants were told to have a good network connection so that the experiment wouldn't be hampered by a network problem. When the participant experienced network or technical challenges, the study was halted and resumed once the person's access was fully restored. When the network issue became too much of a hindrance, the conduction was halted, and the participant was asked to reschedule the conduction for a time when he or she was free and would have better connectivity. To keep that variable under control, the choreography was created in such a way that it was easy for the participants to follow, regardless of the dance genre they were trained in.

Control variable

Two dance movies with various types of music were used as the experiment's tools. The choreography performed in both tools was identical. This was done to ensure that the stimulus being shown to the participant was under control, which helped to reduce the potential of retrieval errors.

Participants who had been trained for at least 5 years were chosen for the experiment, and it was also required that they stick to their training schedules. Participants who stopped attending training after a few years after initial training sessions or who took a break from training were not included in the study. This assured that the participants' level of dancing knowledge and expertise remained adequate.

The number of trials provided to each participant was fixed at three. Fixing the number of trials prevented the individual from memorizing the moves.

Procedure

The trial was carried out on dancers with a minimum of five years of expertise. The experiment was conducted in an online fashion, with participants being shown a dance video via an internet platform (zoom) and being educated about the experiment's whole method. The participant's agreement was obtained before the experiment by explaining the experimental procedures to the participant. Following the participant's agreement, it was guaranteed that the participant's surroundings were properly set up. It was made sure that the room where the participant was to do the experiment was well-lit and that no one else was there. The person was made to feel at ease by engaging in lighthearted discussion. This allowed me to better understand the client's mood and level of interest in doing the experiment, allowing me to better control key aspects that could have influenced the experiment's outcome.

The participants were divided into two groups having 30 participants in each group. The videos were administered individually to the participants in each group and their performances were recorded. Each group was shown one particular video. The first group of participants was shown the video having the dance sequences composed in lyrical music. The second group of participants was shown the dance video composed in instrumental music. For each group the entire one-minute video was played without any pause or stop in between. Once the video goes off then the participant was asked to recall the dance moves

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seen in the video. The musical track given in the particular video was played and the participant was asked to reproduce the steps seen in the video in an accurate manner according to the music played. Similarly, three trials were given to each participant in the group and for each trial the video was played again and their performances were recorded to test the accuracy of the retrieval and learning process. After the responses were recorded, they were scored using the scoring sheet and total scores of each group were calculated.

Scoring and Data analysis

The responses of the participants were scored using the scoring sheet. Each and every dance sequence was scored in accordance with the movements, gestures, postures, and set of steps. The entire dance sequence was scored out of a hundred. The performances of each participant in a group were scored according to the set scoring criteria and certain marks were given to the participants in accordance with the accuracy of their performances. Total scores for each trial were calculated and also the sum total of all three trials was calculated to check the retrieval of the dance sequences. The difference between the third trial and the first trial was calculated to check participants learning over trials. After the scoring was completed, the data was analyzed to formulate the results.

After the scoring of the experiment was done, the result was formulated using SPSS software. A normality test was done to determine if the data is distributed normally. The test result showed that the data distribution is not normal and is a significant difference between the means of the two groups, which were determined using Mann Whitney U test.

Hypothesis

1. There would be a significant difference in learning and retrieval of dance sequences due to the variation in the music.
2. The variation in music would be correlated with the change in the learning and retrieval process.

RESULTS

Table 1.1 Descriptives statistics of age and score of participants

Variables	Mean (SD)
Age of lyrical music participants	20.63 (2.26)
Age of non-lyrical music participants	20.50 (2.62)
A score of lyrical participant	41.85 (24.62)
A score of non lyrical participant	53.53 (32.27)

Table 2.1 Normality test to check the learning effect with lyrical music

	Kolmogorov Smirnov		
	Statistics	Df	Sig.
Immediate score lyrical	.196	30	.005
Delta score lyrical	.135	30	.172

A normality test was conducted on the data collected and the Kolmogorov-Smirnov test values were considered. The results of the data indicate that the score for the immediate recall is 0.005 which means that the score is < 0.05 , and the score for the delta learning is 0.172 which means that the score is > 0.05 . Thus, the normality score indicates that the score for immediate is insignificant, which means that the data for the research is not normally distributed.

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Table 2.2 Normality test to check the learning effect with non-lyrical music

	Kolmogorov Smirnov		
	Statistics	Df	Sig.
Immediate score Non-lyrical	.196	30	.013
Delta score Non-lyrical	.209	30	.002

A normality test was conducted on the data collected and the Kolmogorov-Smirnov test values were considered. The results of the data indicate that the score for the immediate recall for the non-lyrical group is 0.013 which means that the score is < 0.05 , and the score for the delta learning is 0.002 which means that the score is < 0.05 . Thus, the normality score indicates that the score for immediate and delta learning is insignificant, which means that the data for the research is not normally distributed.

Thus, with the help of tables 1.1 and 1.2, it can be seen that the significant score for data distribution score is lower than the significant level of 0.05, hence the data is not normally distributed. So, to understand the difference in the means of the data collected Mann Whitney U test (nonparametric test) would be used.

Table - 3.1 Comparing the two dependent variables using Mann Whitney U test

	Immediate score	Delta score
Mann-Whitney U Test	327.500	447.000
Wilcoxon W	729.500	912.000
Z	-1.815	-.044
Amp. Sig (2 tailed)	.070	.956

In the given table it is evident that the value for the Immediate score for the Mann Whitney U test is 327.500, whereas the value for the Delta score for the Mann Whitney U test is 447.000. The value for the Immediate score for Wilcoxon W is 729.500, whereas the value for the Delta score for Wilcoxon W is 912.000. The significant score for the immediate score is 0.70 and the significant score for the immediate score is 0.965. The significance score indicates that the value for the immediate and the delta score is > 0.05 , which means that the scores for the immediate recall and delta learning are insignificant. In other words, it can be said that there would be no difference in lyrical and non lyrical music concerning learning.

A normality test was conducted on the data collected and the Kolmogorov-Smirnov test values were considered. The results of the data indicate that the score for the immediate recall for the non lyrical group is 0.013 which means that the score is < 0.05 , and the score for the delta learning is 0.002 which means that the score is < 0.05 . Thus, the normality score indicates that the score for immediate and delta learning is insignificant, which means that the data for the research is not normally distributed.

Thus, the results indicate that the significant score for data distribution score is lower than the significant level of 0.05, hence the data is not normally distributed. So to understand the difference in the means of the data collected, Mann Whitney U test (nonparametric test) was used.

The value for the Immediate score for the Mann Whitney U test is 327.500, whereas the value for the Delta score for the Mann Whitney U test is 447.000. The value for the

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Immediate score for Wilcoxon W is 792.500, whereas the value for the Delta score for Wilcoxon W is 912.000. The significant score for the immediate score is 0.70 and the significant score for the immediate score is 0.965. The significance score indicates that the value for the immediate and the delta score is > 0.05 , which means that the scores for the immediate recall and delta learning are insignificant. In other words, it can be said that there would be no difference in lyrical and non lyrical music concerning learning.

DISCUSSION

Music and dance engage the brain as they enable the brain to be actively involved in cognitive processes by identifying, relating to, and recognizing sounds, words, and patterns through music. Dance helps with improving mobility and flexibility. While dancing, dancers imply a specific focus on the movements, which requires the dancers to get their mind and body coordinated to follow the moves according to the rhythm played, catch the beats according to the tempo of the song, and synchronize the moves in dance.

The purpose of this study was to gain an understanding of the effect of lyrical and non-lyrical music on the retrieval of dance sequences. The objective of the study is to understand the difference in learning and retrieval of dance sequences due to the variation in the music. There was a lot of research that shows that the music being played has certain effects on cognition and the coordination of movements concerning dance. The synchronization between music and dance facilitates better cognition. Research has been conducted to understand if there is any synchrony between music and dance choreographies. Mitchell & Gallaher (2001), researched to check if participants were able to find any match between the music played and the movement demonstrated. When the participants were given four different music pieces along with some dance movements to identify the perfect music for the given choreography, most participants ended up making some connections with particular music and the choreography. The sync between music and dance choreographies can be used as the basic criteria to identify how music can be a facilitator in providing various cues to form connections with the dance elements to aid better retrieval of dance choreography. Cognitive cues that people gather relate and process varies due to individual differences. Many people try working out their logistics to relate a dance piece and its music with respect to certain cues that they receive from the music played in a particular dance choreography. Whereas other people try to catch up with the beats and the rhythm to enhance the retrieval of dance sequences. This principle of individual differences was seen in a research conducted by Aviv and Marinberg (2019), where the purpose of the research was to identify how participants synchronize melodic-based or rhythmic-based sequences with the music. The results showed that some dancers synchronized their movements better to rhythm while others did it better with melody.

The research that evidently supports music-dance synchrony, leads to the formation of a concept that people relate to certain cues received from the choreographies which facilitates better retrieval of dance sequences. But the results of the present study gave an opposite result, which indicated that there is no significant difference between lyrical and non-lyrical music with respect to learning. In other words, the findings of this research indicate that the type of music played (whether lyrical or non-lyrical) does not have any effect on the process of retrieval and learning of dance sequences. The learning and retrieval capabilities of an individual cannot be influenced by the type of music played and it wholly depends upon individuals cognitive processes and memory.

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There were a lot of studies which evidently stated that some differences in recall and learning can be traced with respect to changes in music. But on the other hand, there is other research as well which found out that there is minimal or no effect of music on recall and learning capabilities. Research that assesses the effect of different music on the recall of dance sequences is limited, but a lot more similar research is available which assesses the effect of music on recall and learning with respect to academic or verbal aspects. One such piece of research was conducted by Lehmann & Seufert (2017) to examine the role of music in working memory. The research findings show that background music did not have any effect on recall performance, working memory capacity, or learning outcomes. The results of this study are consistent with the study conducted by Jäncke & Sandmann (2010) to examine the effect on verbal learning performance of listening to background music; its results proved that music did not have any effect on verbal learning.

The probable reasons for the results being insignificant may be due to individual differences in the attention, perception, recall, learning, and cognitive abilities of the dancers. Individual differences in cognitive abilities guide people differently to comprehend certain information. This is evident in the research conducted by Aviv & Marinberg (2019) who composed and taught choreographic sequences which were either melodic-based or rhythmic-based to check which movements help participants to synchronize better with the music. The results highlighted individual differences in making a music-dance sync as some dancers were able to synchronize their movements better to rhythm while others did it better with melody.

Differences in the dance styles of individuals would lead to differences in their perception, anticipation, and accurate recall of the movements. Visual familiarity and music of the particular form of dance affect the cognitive capacities and capabilities of each individual, which would be a crucial factor in facilitating better recall and learning over trials. In other words, the speed of processing the visual cues from the video and the ability of the individual to accurately remember, recall, and reproduce them varies according to one's cognitive capabilities. This becomes evident in the thesis of Blasing, Calvo, et.al (2012). The preferred type of music, which can facilitate better attention, recall, and learning, differs according to the individual. Another reason for the difference in the results of recall and learning over trials among the two different groups would be the lack of expertise in specific motor movements due to expertise in different forms of dance. This reason fits in with the results of research conducted by Blasing (2015), which proves that different visual and motor expertise of individuals leads to modifying perceptual actions. The difference between an individual's span of attending the steps and their accuracy in recalling and reproducing the steps leads to huge differences in the results of the study. This is a point which is proved by Bösing, Calvo et.al (2012) in their theoretical thesis, that attention is an important factor in maintaining synchrony in dance. Time taken in focusing on the moves and recalling them accurately varies according to people. The more time taken to register the steps and to recall them, the better the result will be. Emphasizing and rehearsing particular sets of steps in the video enhances the recall better. Those steps that are less rehearsed and attended tend to fade out of the short-term memory and thus are not properly retrieved. Learning and recall can follow the pattern of recency and primacy effects. The more time implied to focus on and remember a particular move, the better the chance of that move being recalled. Another reason that can be associated with recall accuracy is the level of attention one may pay to various aspects of a particular stimulus. On the other hand, more focused and divided attention is on the micro elements of the dance sequence, like the music, its timing, the beat counts, the tempo, variations in moves, the pattern of the choreography, the style of steps, micro expressions and body language etc. The best would be the recall and learning over

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trials. Proper segmentation and chunking of the visual cues help facilitate recall better. The participants chosen for the research were those who had training experience of more than 5 years in their own dance form. This led each participant to become an expert in their own dance form. Thus, the participants' expertise in a particular dance form, which was in sync with the choreographies, facilitated better recall of movements. The expertise of some participants made it easy for them to identify the steps properly and to relate to them in a better way, thus facilitating better recall. Past research by Sala & Gobet (2016) shows that there is a positive correlation between the level of expertise and the recall of random materials in different domains. Thus, proving that expertise leads to better recall.

Thus, this research did not bring out any evidence for the positive relationship between the type of music played and its effect on the recall and learning of the sequences over trials. As the results of this study disprove synchrony between the music and the dance sequence to facilitate better recall and learning, this indicates certain possibilities of varied cognitive functions among different individuals, which cannot be ignored. In this study, the exploration of sync between the type of music played and its effect on facilitating movement recall differs from other studies that have been conducted to investigate the link between music, dance, and cognition. The method of exploring the retrieval through the medium of dance is what stands out in this research in comparison to other research that explores the relationship between music and memory. The expertise of the individuals in a particular dance form affected the perception process of movements, which was reflected in the results of the study. The mode of conduction also posed certain issues in receiving accurate results. Differences in the learning and recalling aspects of the participants became the main reason that contributed to an insignificant result. Hence, it led to poor retrieval and learning.

Limitations

1. The results of this study can vary culturally. Preference of learning classical and cultural dance forms can differ among different cultures.
2. Duration of the study can cause boredom in the participants and can thus affect the result.
3. Level of motivation and willingness to participate in the study and to complete the study may vary among individuals, which may hamper the accuracy of the results.
4. Willingness of the participants can affect the conduction, and accuracy of the study.

Implications

This study can be implied to study the association between memory and motor functions. It helps to understand how audio-visual learning is ineffective in marking a difference in the perception, recall, retrieval and learning process. The type of music played (whether lyrical or non-lyrical) does not have any effect on the process of retrieval and learning of dance sequences. The learning and retrieval capabilities of an individual cannot be influenced by the type of music played and it wholly depends upon individuals cognitive processes and memory.

The research provides evidence that individual differences in cognitive abilities guide people differently to comprehend certain information. Learning dance moves becomes convenient with an effective use of associations. More the relatable the learning material would be, the better would be the recall of the learnt information. The research evidently shows that some dancers were able to synchronize their movements better to rhythm while others did it better with melody. The results of the experiment failed to find any significant relationship between the type of music played and the retrieval of the information, but differences in

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one's learning ability and effectiveness of association got highlighted in the study. Another reason that can be associated with recall accuracy is the level of attention one may pay to various aspects of a particular stimulus.

Scope for future research

This research can be taken ahead to explore more in the field of dance to understand and relate it to cognitive psychology in a better manner. The influence of lyrical and non-lyrical music in learning and memorizing any particular dance sequence can also be explored.

People brought up in different culture would have differences in their intellectual makeup. The cognitive abilities, learning styles and strategies etc. would be different in people across the world. The culture that they are born into would have given them a different training, exposure, learning and experiences which heavily influence their lifestyle and practices. So cross cultural research can be done to explore how lyrical and non-lyrical music would mark a difference in recalling and retrieval of dance sequences among students.

Another aspect that would yield interesting results would be to check if there is any relation between expertise and learning with respect to dance. The way an expert deal with his or her subject matter would be different from how a beginner would look into the matter. So, exploring how the level of expertise can mark a difference in building up association with the subject matter to help facilitate the retrieval and learning would be an interesting topic to dig into. Similarly, the aspect of familiarity of a particular dance form and its relationship with learning can be explored. While conducting the experiment with students trained in different dance forms gave me an insight that knowledge or training in a particular style may or may not facilitate better learning of moves of a dance sequence. Recalling the dance moves mainly depends on the level of association a person has with the choreography presented.

It is very evident that cognitive capacities of individuals get affected with their growing age. Keeping that fact in mind it would be interesting to know what difference can age make in retrieval of dance moves among students.

The way or mode through which the participant views a learning material may have significant effect in retrieval and learning process. Displaying a video material to watch and reproduce and visualizing a person dancing would create two different impacts on the learner. Research can be conducted to check whether visualizing an individual dancing to help the participant recall and reproduce the choreography and watching a video of the person makes any difference in retrieval and learning process or not.

Ethical Considerations

1. The consent of the participants should be taken before the participant participates in the study
2. Participants would be ensured that they have the freedom to leave the study anytime they feel uncomfortable
3. Emotional state of the participant would not be hampered
4. Would avoid biases and discriminative opinions make the participants uncomfortable in the study.

CONCLUSION

Music and dance engage the brain because they allow it to participate actively in cognitive processes by detecting, relating to, and recognizing sounds, words, and patterns. There have been studies that suggest that the music being played has an effect on cognitive and movement coordination in the context of dance. Many people strive to figure out how to connect a dance piece and its music to certain cues that they get from the music played in a certain dance routine. However, the findings of this study revealed the reverse, indicating that there is no substantial difference in learning between lyrical and non-lyrical music. Individual differences in the dancers' attention, perception, recall, learning, and cognitive ability may be the reason for the results being inconsequential. Individual variances in dance styles would result in differences in perception, anticipation, and accurate recollection of moves. The sort of music performed has no effect on an individual's learning and retrieval ability; it is entirely dependent on their cognitive processes and memory. Better recollection and learning would be aided by a person's ability to selectively focus on many components of a given input.

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Conflict of Interest

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