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The Perception of Musical Phrasing in Correlation to Movements in Sports Routines

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Abstract: Musical phrasing is an important element in generating expression, demonstrating the direction of music structure, giving a sense of melodic contour and so forth. Like other musical elements such as articulation, dynamics, harmony, meter, rhythm and tempo, musical phrasing also features greatly in the choreography of dance and of sports that involve a routine. As phrasing indicates the start and the end of a unit or sub-unit in a melodic structure, this indirectly correlates to a movement or series of movements in a routine or dance. This study looks into the perception of musical phrasing in movements in a Tai Chi routine from a musical perspective. A competition routine in which choreography and music were evaluated to have the most congruence was chosen. From the video recording, the initiation of musical phrases was recorded and compared with the phrasing of movements in the routine. While many musical elements are congruent with the movements, the result indicates that the Tai Chi practitioner's perception of musical phrasing as applied to the choreography is rather different from the perception of a musician.

Key words: Phrasing · Congruence · Music · Sports routine · Tai Chi · Movement

INTRODUCTION

Research into the perception of phrasing amongst musicians is not a new subject in the field of music psychology, performance, language, speech and so forth. Both language and music share a basic property that involves a hierarchical structure consisting of information at different levels, thus making both domains exemplars of complex auditory information [1]. Similar to musical phrasing, which is formed or shaped by other units such as tempo, dynamics, melodic structure, etc., language in the context of speech is also organized and constructed from small units, phonemes, into more complex units, words and thence into phrases and sentences. Another domain that deals with phrasing is the movement generated in dance choreography, which includes steps, elements and routines. As music and dance are closely related, there is no doubt that both subjects influence each other and contribute structural variances. For example, the structure in a musical phrase can affect the movement in a choreography, thus the interaction between the two subjects contributes to the logic and sense of the performance. Beyond dance, this could similarly apply in those sports which use music as accompaniment to a choreographed routine. This paper analyses a Tai Chi competition routine to music selected by the athlete. A musician's perception of the use of music in this Tai Chi routine will be discussed.

Music and Sports: Research in music and sports is burgeoning and the two subjects have led to many different studies. One significant study is how music provides ergogenic effects to enhance the performance of sport activities [2]. This concerns the psychological aspects of how music affects stamina and emotion in sportsmen, normally for sports involving repetitive actions or movements [3-6]. Musical style used in sports activities and preferences of music amongst athletes are most commonly studied when relating music and sports. This can be referred to Gfeller's research (1988) on the music preferences of young adults in aerobics [7] and McGuinness's (2009) analysis on music genre in skating competition [8]. From a more sociological perspective, in *We are the Champions* McLeod (2011) addressed the

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complex paradoxical relationship between the two subjects in contemporary social practice, giving much emphasis on the function of popular music and sports events [9]. Looking into the functions of music to enhance the ergogenic effects on sportsmen, music is commonly used either as a background accompaniment to add sonic ambience or as a symbolic character to portray identity, such as the playing of anthems at a sports event.

On the other hand, there exists another category of sports that involve a choreographed routine or choreography, where the use of music is nonetheless more complex since the integration of both domains contributes to the entire performance. In this category, music is either used to synchronize a routine or simply as background accompaniment to generate a kind of sonic ambience. However, regulations in many different sports events imply that routines should be 'matched' or 'harmonized' with the music. For example, in rhythmic gymnastics, penalties are made for 'absence of harmony in the character of each movement sequence and the music […]' or 'absence of unity between different musical themes' (code of points 2009-2012:63); in figure skating, 'Clothing, may however, reflect the character of the music chosen' (Special Olympics Winter Sports Rules); and in Tai chi competition, it is stated that 'the competitor may choose a piece of music on his own to match the choreography' (Rules of International Wushu Tao Lu Competition, 2005). In these sports, creativity in choreography and synchronization with the selected music are equally important as the display of acrobatic skills and techniques. Nonetheless, the use of music in these routine-based sports also functions to monitor the duration of each competitor's participation and the length of overall event. This kind of sports routine is similar to dance in that both consist of choreography and the involvement of music.

The issue of congruence between a routine and music was discussed long ago. Despite the preference of an individual athlete or dancer, the visualization of the routine is important as a means of performance, particularly for the judges and public audiences. It was found that congruence is evidently perceived between movement and sound [10, 11]. However, in the field of dance, there was also a growing trend in the 20th century for music to be used merely as a sonic background, traceable to John Cage and Merce Cunningham [12].

Taking into consideration Tai Chi philosophy, which deals not only in the many forms of routine, but also significantly into the principles of breathing and relaxing, the question may arise whether congruence between music and movement should be applied in a routine. Despite conventional Tai chi, which focuses on many aspects of internal *qi* generation and stances in slow practice, it was observed that more acrobatic movements, often with a faster pacing, are exhibited in a competition routine, demonstrating more a performance style than a practice. Therefore, synchronization of a routine and music thus contributes to the effectiveness of the overall performance.

While many aspects in music may contribute to the congruence of movement, such as rhythm, tempo, dynamics, articulation and so forth, there is no doubt that musical phrasing is an important element, since it applies similarly to dance or to movement in a routine. Analogous to music, phrasing provides important functions to generate directions and tension and to form an overall structure. This study focuses on the perception of synchronization between movement and music, which is analysed and compared from a musical perspective. Another purpose is to identify how the Tai Chi athlete perceives musical phrasing in association with the choreographed routine.

Musical phrasing and Body Movements: In past decade there has been extensive research on body gestures in music performance [13-18]. While most of these studies focus on instrumentalists, there is research which deals with gesture or physical movement in dance [10, 19-21] and sports choreography [22] that has much association with the music. The physical movements of musicians directly and indirectly impact greatly on visualization of the audience during a performance.

Despite musical analysis being focused on instrumentalists to understand an individual interpretation of certain music, studies in musical phrasing also appear in much interdisciplinary research regarding the effect of listeners' perception of musical structure, or perception in the visualization of the physical movement of performers [18, 23]. This shows that visual stimuli have a great impact on audience perception of a performance. In relating to physical movement, it was found that participants can visually extract underlying patterns of phrasing in music even without hearing the sound [24]. Variance in physical movement can also affect visual perception even with the same aural stimuli [23]. In the same paper, Juchniewicz also found that individual elements of music such as phrasing, *rubato* and dynamics were affected by the presence of physical movement. Repeated movement patterns seems to connected closely to the phrasing of the music performed and these movements may serve to

enhance the listeners' perception of the musical phrasing [25]. It was also found that intensity is related to the performer's phrasing; it increases towards the end of a phrase and decreases at a phrase boundary with the introduction of new material [21]. However, these findings are closely tied to the body movement of the instrumentalists who produce the music and sound. As body movement greatly affects the interpretation of music and the perceptions of listeners or audiences, this also leads us to wonder about other related subjects that deal with music, such as dance and sports routines.

MATERIALS AND METHODS

The researchers chose for this study a professional Tai Chi athlete of international repute who was a gold medalist for consecutive years from 2006 – 2012. After reviewing selected videos, the athlete was chosen due to her interpretation of music which displayed most congruence with the routine. Many Tai Chi athletes use music as a background accompaniment for their routine; if not entirely as a background accompaniment, only a minor section of the movement synchronized with the music. The chosen athlete was trained in *wushu* at a very young age and later took up Tai Chi, which led her to the international competition arena. The participant was informed about the study and the procedure and purposes were explained. A sword routine of 3:55 minutes was chosen from her recent competition routine and the performance was recorded. The performance took place in a hall and the music was played using the built-in PA system. Three performances were recorded and the best performance was selected for this analysis. The music used in the routine is entitled Si Xiang Qu... (missing home), an orchestral work using a Chinese folk song theme, originally written by Ma Si Cong. According to the athlete, the music track was edited to suit the choreography and the duration of the routine. The music is written with a four-bar phrase theme in a calm moderate tempo and it was varied throughout with different accompaniment patterns. There are two main transitions in the theme, which is rather free in rhythm, with the *guzheng* playing different arpeggios creating a quiet and suspended ambience.

With the athlete's assistance, the phrases of movement from the routine were marked, mainly focusing on the initiation of a movement, ranging from a longer section combining a few forms to shorter phrasing for each movement. We were informed by the athlete that the short pause in each movement or the beginning of a step could be regarded as a phrase movement. On the other hand, the musical phrasing was marked according to the clear thematic structure of the music. The interpretation and perception of the athlete were identified through the analysis of both duration of the movements and musical phrases. The analysis also aimed to identify possible reasons for any movements generated against the musical phrasing.

RESULT AND DISCUSSION

The result of the analysis is presented in Table 1. In matching the structure of the music and the routine, the entire routine could be divided into five main sections. Although this result focuses on the phrasing of both movement and music, we also take account of other musical details, such as dynamics and articulation, which the athlete synchronized to her movements. Therefore, sections that are found to be incongruent to the phrasing of the music may be synchronized in other aspects. From the overall analysis, the phrasing of movements showed much congruence with the musical phrasing at the ending sections of music. The musical phrasing perfectly synchronized with movement at the ending sections may be due to some significances in direction derived from the dynamics and momentum of the music. The loudness and *crescendo* generated at the initiation of each phrasing reaching a climax must be an obvious signal to the athlete to develop the technique of *fa jin* (.. lexplosive energy, for example, a punch or a kick). The cymbal crash and timpani also contribute to this which assists the interpretation of the athletes in synchronizing a movement with the phrasing. In the interview, the athlete explained that she always prefers music which has loud points that can highlight the technique of *fa jin*, where a punch or a kick can be emphasized by a specific sound.

However, incongruence between musical phrasing and movement was found more towards the second and third sections of the routine. Incongruence means that movements or steps by and large begin in the middle of a phrase, or at the end of a phrase, with or without any relevance; or movement pauses or ends in the middle of a musical phrase. As this was considered one of the most congruent routines in terms of movement and music, we examine from a musical perspective possible reasons for athletes to have such incongruence between movement and music. A few occurrences were found where movements were initiated within or near the end of a phrase, for example, pausing in movement but performing

Table 1 Duration of Phrasing for movement and music in a Tai Chi routine

Section of Routine	Initiation of the movement phrasing	Notes on musical phrasing and movement phrasing	Initiation of musical phrase
0.00 -1:01	Preparation	Music begins	0:09
	0:15	Movement starts according to the last note of theme	0.17
	0:23	Congruence	0:23
	0:28	Congruence	0.28
		Congruence	0:34
	0.39	Congruence	0.40
	0.48	Sudden turn at 0:48, according to the note of melody, end of preceding phrase	0.45
	0:51	Congruence	0:51
	0.57	Congruence	0.57
1:01- 1:27	1:01	Several movements generated at the end of previous music phrasing which is a ritardando (gradually slower)	
	1:04		1:06
	1:07	Turn starts earlier then the *guzheng* two-notes entry	1:09
	1:11	Initiation of *guzheng* running passage from 1:12-1:26	1:12
	1:18	Pu Bu form – raising up from a bending position	
1:27-2:15	1:27	Congruence	1:27
	1:33	Congruence	1:33
	1:38	Movement starts at the end of preceding phrase; congruence with the counter-lines occurred within the phrase of the theme	1:40
	1:42		1:45
	1:49		1:52
	1:54		1:58
	2:03	Congruence	2:04
	2:08	Movement starts at the end of preceding phrase	2:10
2:15-3:00	2:15	Music transition in one bar phrase, movement either starts after or before the initiation of musical phrase	2:16
	2:18		2:19
	2:25		2:22
	2:29	Long harp running arpeggio phrase accompanying balancing form, movement starts after the musical phrase	2:27
	2:41	Climax 1 - congruence	2:41
	2:44	Steps synchronize with the counter-melody	2:46
	2:47	Movement follows the pitch of the theme	2:50
	2:52		2:55
3:00-3:41	3:00	Climax 2 - congruence	3:00
	3.07	Congruence	3:07
	3:10	Movement starts from preceding phrase but end in congruence at the end of phrase	3:12
	3:16	Congruence	3:16
	3:22	Climax 3 - congruence	3:22
	3:26	Climax 4 - congruence	3:26
	3:32	Climax 5 - congruence	3:32
	3:36	Congruence	3:36
	3:41	Congruence	3:41

Note: Grey highlight indicates incongruence between musical phrase and phrasing of the movements

a sudden turn at 0:48[1], the beginning of a step at 1:18 and the circle of turns beginning at 2:52, all occur within a phrase. Although not synchronized with the music, the repetition of the athlete's movements in different sections may reveal possible reasons for such interpretation. In many sections, the initiation of the movement may be based on certain notes or pitch of the theme. In fact, the theme that occurs four times in the overall music nevertheless provides a kind of familiarity where the athletes may rely on a particular pitch to make a movement. For instance, the first few notes of the phrase may have acted as a cue for the athlete to prepare the 180 degree turn and later synchronize the abrupt turn at 0:48 with the last note/pitch of the phrase. From a musical

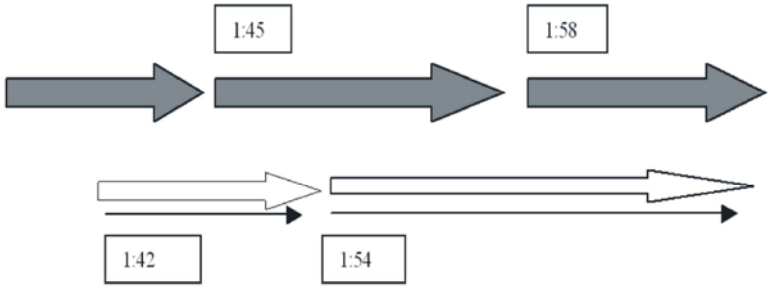

Fig. 1: Phrasing indicates the movement synchronizing with the counter-line of the Music

Phrasing of the main theme
Phrasing of Counter-line
Phrasing of the movements

perspective, the abruptness of the turn contrarily emphasizes the resolution of the phrase. The same applies to the introduction of the routine, where the 'starting' position of raising both hands begins at the end of the last note of the phrase.

Another case of incongruence was found in the transition section of the music, where the more tranquil, less active music section accompanied a series of movements. This occurs at 2:18 to 2:29 when the theme comes to a standstill as emphasis is given to the slow moving harmony leading to the next section. However, this was choreographed with a series of steps and turns that lack of relevance to the music, though structurally it was understood as the movement ended with a stance synchronized with a *guzheng* arpeggio accompanied by the strings tremolo. Perhaps the slow progression of harmony in this section could be replaced with a balancing stance with fewer steps or movements.

A similar case occurs at the phrase where the *guzheng* plays an octave arpeggio phrase at 1:07-1:26. While the long arpeggio phrase starts at 1:15, rising from a bent position 'flat stance' (*pu bu*..) to perform a series of steps starts at 1:18. The short pauses during the steps with sword turning also contribute to the incongruence of the running arpeggios in the music. The same applies to the second transition before the music leads to the recapitulation of the theme, which is one of the climaxes. The demonstration of balancing and straightening the left leg at 90 degrees while simultaneously bending up and down using the right leg, did not match the harp phrase running in fast arpeggios. Not only did the initiation of this movement begin before the arpeggio phrase, the musical phrase along with the tempo which became gradually faster in *accelerando* was also not shown in the slow balancing movement of the form.

Another point worthy of discussion is that the ambiguity of movement moves against the main theme phrasing but in congruence with the counter melody, which is the subsidiary melodic fragment juxtaposed with the main theme (Figure 1). The result of this is that, in the first few viewings, the routine or movements of a particular form seem to start within a phrase of the main theme and movements continue across phrasings. However, with a closer analysis, these movements are initiated with the phrasing of the counter melody which also serves as a kind of improvisation to the main theme. The counter-melody, whether in a long or short fragments, often occurs within or across the main theme. Ambiguity occurs since the initiation of the main movements of a particular form is synchronized with the phrasing of the counter-melody rather than with the main theme. Interestingly, while there is contradiction in terms of phrase structure between the music and movement, to certain extent congruence still occur between the two subjects.

From the overall analysis, the incongruence between the two subjects also led us to understand the athlete's perception of the details in this music. Synchronizing according to certain notes/pitch of the theme may or may not be the initial intention of the athlete. For a routine with music accompaniment that has to be completed in a strict duration, it is of no surprise that some musical elements function as a cue for the athlete to perform certain forms, or as preparation for a particular movement. In discussion and interview with the athlete, it was explained that her intention was to synchronize each form and movement as closely as possible to the music.

However, it is agreed that not all movements are able to fit perfectly to the existing music, so compromise between some sections of the routine and the music is

unavoidable. We were also informed that another limitation in the process of editing music is that bridging of sections may not be perfectly done. This results in the smoothness connecting two intended phrases or sections in the music being interrupted; for example, at 3:00, the preceding phrase is slightly shortened, which is apparent from a musical perspective.

Another point that the athlete emphasised is the need to have a style of music with grandeur even though in a slow tempo. Accented, loud thumps or hits should be provided within the selected music for climaxes and also for the *fa jin* effect (attack) movements. As mentioned above, this was evidently achieved in this routine at five positions, since the five *fa jin* effects were perfectly congruent with the music that featured cymbals and timpani. The five positions, each contributing to the climax of both music and routine, also indirectly accentuated the phrasing of the music and together with the movements provided a perfect audio-visual synchronization. The climaxes and the use of cymbals with the timpani also enhanced the dynamic level, which may indirectly contribute to the understanding of phrasing by the athlete.

However, this is not the case with many of the videos we have reviewed, as the *fa jin* effects are not accentuated by any significant point in the music. This raises the question of the principle of Tai Chi practice which is concerned with *qi* flow, blood circulation and breathing. If these factors, closely associated with internal body control, are taken into consideration, it may not be feasible to have perfect synchronization to manipulate or restrict movements [26]. The reason is that these entities require a much more natural flow and spontaneity. Therefore, the preference of having music as a background sonic accompaniment was still optional for many Tai Chi athletes. Although concerns and discussion occurred whether a Tai Chi routine should be restricted by a particular music, or whether music should only be used as a background accompaniment, the congruence between music and movement no doubt could be easily detected by viewers, particularly those with musical background. An appropriate music that matches the routine is thus important, as is evident in Mitchell and Gallaher's research (2001) that people can recognize a match between music and dance although they are temporally separated [11]. In a different context, as applied to the gestures of instrumentalists, this parallels King's statement that 'physical movement regularly appeared to convey information about the tempo and phrasing of the music' [27]. As much research identified the correlation and function for congruence between movement and music, the use of music only as background accompaniment in these sports routine may reduce the quality of the overall performance. In addition, sports routines in the competition arena only allow a limited length of time for each contestant. This means that principles or practices of breathing, meditation or *qi* which are quite impossible to restrict to synchronization with music may not be as focused as in competitive routines, which consists of faster, acrobatic movements that are well planned together with the music.

CONCLUSION

This study highlights the perception of phrasing of a Tai Chi routine from a musical perspective. Another aim of this research was to understand how the athlete perceived musical phrases in correlation with the phrases of Tai Chi movements. A routine was selected as it was evaluated to be one of the most congruent routines in terms of movement and music. From a musical perspective, the phrasing between the two subjects was most congruent in the last two climactic sections of the routine. The understanding of phrasing in these sections may be due to the assistance of the climaxes and instrumentation that directly raises the dynamic level. There are three possible explanations for most of the incongruent phrasing between the two subjects, although congruence based on other musical elements was achieved. Firstly, the athlete matches movements according to a pitch from the theme of the music. Secondly, some of the pitches from the theme are used as a cue for a movement and therefore phrasing was not highlighted for these moments. Thirdly, although congruence of phrasing was not consistently achieved at some recurring main themes, these movements were found to be congruent with the counter-lines which are juxtaposed within the theme. This means that, from the perception of the athlete, the counter-line rather than the main phrase structure may have dominated the focus of the form or movement. In future study, we should also consider different perceptions about the use of music in this routine from viewers with and without a musical background. Musicians are prone to focus more on the use of music accompaniment due to the training and knowledge they possess. On the other hand, depending on the musicality of a viewer, the problem of congruence and synchronization may not be an issue. In the field of music, together with these sports routines that encompass a great artistry and creativity, the perception

of the audience is rather subjective and the complexity increases when both subjects are performed simultaneously.

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REFERENCE

1. Chiappe, P. and M.A. Schmuckler, 1997. Phrasing influences the recognition of melodies, Psychonomic Bulletin Review, 4(2): 254-259.
2. Karageorghis, C.I., D.L. Priest, L.S. Williams, R.M. Hirani, K.M. Lannon and B.J. Bates, 2010. Ergogenic and psychological effects of synchronous music during circuit-type exercise. Psychology of Sport and Exercise, 11: 551-559.
3. Karageorghis, C.I., P.C. Terry and A.M. Lane, 1999. Development and Validation of an instrument to assess the motivational qualities of music in exercise and sport: The Brunel Music Rating Inventory -2. Journal of Sports Science, 17(9): 713-24.
4. Hayakawa, Y., H. Miki, K. Takada and K. Tanaka, 2000. Effects of music on mood during bench stepping performance. Perceptual and Motor Skills, 90: 307-314.
5. Matesic, B.C. and F. Comartie, 2002. Effects music has on lap pace, heart rate and perceived exertion rate during a 20 minute self-paced run. Sport Journal, 5(Spring).
6. Salama-Younes, M., 2011. Towards a Positive Sport Psychology: A Prospective Investigation in Physical Practice, World Journal of Sport Sciences, 4(2): 106.
7. Gfeller, K., 1998. Musical Components and Styles Preferred by Young Adults for Aerobic Fitness activities. Journal of Music Therapy, 25: 28-43.
8. McGuinnes, M., 2009. Friday night and the gates are low': popular music and its relationship(s) to sport, ed. Bateman A. and Bale J., *Sporting* Sound: Relationship between sport and music, 179-192, Routledge.
9. McLeod, K., 2011. *We* Are the Champions: The Politics of Sports and Popular Music, Ashgate Publishing Limited.
10. Krumhansl, C.L. and D.L. Schenck, 1997. Can dance reflect the structural and expressive qualities of music? A perceptual experiment on Balanchine's choreography of Mozart's Divertimento No.15. Musicae Scientiae, 1(1): 63-85.
11. Mitchell, R.W. and M.C. Gallaher, 2001. Embodying Music: Matching music and dance in memory. Music Perception, 19(1): 65-85.
12. Fogelsanger, A. and K. Afanador, 2006. Parameters of perception: Vision, Audition and Twentieth-Century music and dance, Congress on Research in Dance 38th Annual Conference.
13. Cadoz, C. and M.M. Wanderley, 2000. Gesture-music. In (ed.) M.M. Wanderley and M.Battier, Trends in Gestural Control of Music, IRCAM, pp: 71-93.
14. Davidson, J. and J.S. Correia, 2002. Body movement. In (ed.)R. Parncutt and G.E. McPherson, The Science and psychology of music performance: Creative strategies for teaching and learning, Oxford University Press, pp: 237-50.
15. Dahl, S., F. Bevilacqua, R. Bresin, M. Clayton, L. Leante, I. Poggi and N. Rasamimanana, 2010. Gestures in performance. In R. Godøy & M. Leman (Eds.), Musical gestures: Sound, Movement and Meaning, 36-68. Routledge.
16. Godøy & M. Leman (eds.), Musical gestures: Sound, movement and meaning, Routledge.
17. Davidson, J.W., 2007. Qualitative insights into the use of expressive body movement in solo piano performance: A case study approach. Psychology of Music, 35(3): 381-401.
18. MacRitchie, J., B. Buck and N.J. Bailey, 2013. Inferring Musical Structure through Bodily Gesture, Musicae Scientiae, 17(1): 86-108.
19. Hagen, E.H. and G.A. Bryant, 2003. Music and dance as a coalition signalling system. Human Nature, 14(1): 21-51.
20. Seitz, J., 2005. Dalcroze, the body, movement and musicality. Psychology of Music, 33(4): 419-435.
21. Camurri, A. and T. Moeslund, 2010. Visual Gesture Recognition from motion tacking to expressive gesture, ed. Godoy, R. & Leman, M., Musical Gestures, Sound, Movement and Meaning, New York: Routledge, 25: 257.
22. Loo, F.C. and F.Y. Loo, 2012. Importance of Music Learning and Musicality in Rhythmic Gymnastics, Proceedia – Social and Behavioral Science Journal, 46: 3202-3208.

23. Junchniewicz, J., 2008. The Influence of Physical Movement on the Perception of Musical Performance, Psychology of Music, 36(4): 417-427, 425.
24. Wanderly, M. and B. Vines, 2006. Origins and Functions of Clarinettists' Ancillary Gesture, ed. Gritten, A. and King, E., Music and Gesture, Ashgate Publishing Limited.
25. Campbell, L., M. Chagnon and M.M. Wanderley, 2005. One the Use of Laban-Bartenieff Techniques to describe ancillary gesture of clarinettists. Research report. IDMIL, McGrill University.
26. Loo, F.C. and F.Y. Loo, 2013. Approaches of music accompaniment in Taichi, ed. Jaehnichen, G. & Meddegoda, C., (Music Dance) Environment, Universiti Putra Malaysia Press, pp: 245-253.
27. King, E., 2006. Supporting Gestures: Breathing in Piano Performance, ed. Gritten, A. & King, E. Music and Gesture, Surrey: Ashgate Publishing Limited, pp: 159.