

# Study on the Influence of Different Music Rhythms towards Stepper Users

許示佐、李維靈

E-mail: 9806461@mail.dyu.edu.tw

## ABSTRACT

With regard to the current exercise behavior, many exercisers like to listen to music while exercising. A lot of gymnasiums also include different music rhythms into the planning of stepper courses to extend the exercising time of exercisers and improve their coordination. However, the music type and rhythm are played randomly for the exercisers to listen, namely the exercisers are passive listeners; different music rhythms or different fitness equipment would not be the factors that influence the music types. Therefore, this study regards stepper as the experimental exercising equipment and attempts to discuss under different "music rhythms", whether the ratings of perceived exertion, feeling scale, heartbeat rate, and stepping frequency of exercisers would be influenced and differed when the exercisers are exercising on the stepper. This study uses the design of subject experiment and 18 subjects (with six males and twelve females) have been selected. Music rhythms are used as the experimental targets, and there are four different situations in total. Also, there are four different kinds of music rhythms, including non-music, slow music rhythm, music rhythm with normal speed, and fast music rhythm. The physical and psychological changes of subjects under different music rhythms are observed. The result shows the following findings: In the music rhythm with normal speed situation, the subjects have better physical and psychological states when exercising. And, most of the subjects indicate that the music rhythms will influence their exercise behaviors, namely the faster the rhythm, the more the stepping times. The heartbeat rates of subjects would not have changes because of the change of music rhythms. Time change is the main factor that influences the heartbeat rates of subjects, but not the music rhythm.

Keywords : Music rhythm, ratings of perceived exertion, feeling scale, heartbeat rate, stepping frequency

## Table of Contents

中文摘要 . . . . .	iii	英文摘要 . . . . .	iv
致謝辭 . . . . .	vi	內容目錄 . . . . .	vii
目錄 . . . . .	ix	圖目錄 . . . . .	xi
緒論 . . . . .	1	第一節研究背景與動機.. . . . .	1
. . . . .	3	第二節研究目的 . . . . .	3
. . . . .	3	第三節研究範圍 . . . . .	3
. . . . .	3	第四節名詞釋義 . . . . .	3
. . . . .	3	第二章文獻回顧 . . . . .	5
. . . . .	5	第一節音樂對生理、心裡相關文獻之探討 . . . . .	5
. . . . .	5	第二節音樂節奏與運動相關文獻之探討 . . . . .	10
. . . . .	5	第三節運動自覺與運動感覺相關文獻之探討 . . . . .	16
研究方法 . . . . .	23	第一節研究設計 . . . . .	23
. . . . .	23	第二節研究流程 . . . . .	23
. . . . .	23	第三節研究對象 . . . . .	24
. . . . .	23	第四節研究設計 . . . . .	24
. . . . .	24	第五節實驗前準備 . . . . .	24
. . . . .	24	第六節資料處理與分析 . . . . .	28
. . . . .	30	第四章結果與討論 . . . . .	31
. . . . .	30	第一節描述性統計 . . . . .	31
第二節音樂節奏對運動自覺影響之分析... . . . .	50	第二節音樂節奏對運動自覺影響之分析... . . . .	50
第三節音樂節奏對運動感覺影響之分析.. . . .	54	第三節音樂節奏對運動感覺影響之分析.. . . .	54
第四節音樂節奏對心跳率影響之分析.. . . .	58	第四節音樂節奏對心跳率影響之分析.. . . .	58
第五節音樂節奏對踏步頻率影響之分析... . . . .	62	第五節音樂節奏對踏步頻率影響之分析... . . . .	62
第六節討論,,, . . . . .	65	第六節討論,,, . . . . .	65
. . . . .	65	第五章結論與建議 . . . . .	70
. . . . .	70	第一節結論 . . . . .	70
. . . . .	70	第二節研究建議 . . . . .	70
. . . . .	75	參考文獻 . . . . .	75
. . . . .	77	附錄A 受測者同意書 . . . . .	77
. . . . .	86	附錄B Hit Fm 年度百首歌曲彙整表.. . . . .	86
. . . . .	87	附錄C 受測者健康調查表 . . . . .	87

## REFERENCES

一、中文部分 方進隆(1997), 提升體適能的策略與展望, 教師體適能手冊, 9-21。 方銘健(1997), 藝術、音樂情感與意義, 台北:全音。 王順正, 林正常(1996), 登階測驗評估最大攝氧量的效度概化, 體育學報, 20, 351-362。 艾明(2007), 音樂探索-論音樂的內在節拍擊點速度, 音樂探索, 3, 104-105。 何志培(2003), 用音樂抒解壓力, 諮商與輔導, 206, 54-55。 吳文法(1995), 攝氧能力與運動強度對橄欖球運動員無氧動力及感覺狀態影響之研究, 中華體育學刊, 9(2), 104-114。 呂昌明, 林旭龍, 黃奕清, 李明憲, 王淑芬(2001), 身體活動自我報告量表之效度及信度的研究-以TriTrac-R3D 三度空間 加速器為效標, 衛生教育學報, 15, 99-114。 宋惠娟(2006), 音樂治療

在失智症老人躁動行為處置的運用, 護理雜誌, 53(5), 58-62。李玉如(2001), 音樂治療對安養機構老人睡眠品質與情緒狀態成效之探討。台北護理學院護理研究所未出版之碩士論文。李立(2006), 音樂心理調適的心理效能、機理及形式研究, 河南師範大學學報(哲學社會科學版), 33(5), 238-240。李靖, 王旭東(2006), 音樂對運動訓練及運動性疲勞影響研究述評, 南京體育學院體育學刊, 13(5), 57-60。李麗花, 賴惠玲, 蕭正光, 鍾信心(2005), 音樂對社區老人憂鬱之成效探討, 慈濟護理雜誌, 4(2), 27-36。林正常(1995), 運動生理學實驗指引, 師大書苑, 台北市。林如瀚, 陳志展(2007), 從音樂治療觀點探討音樂對運動的影響, 中華體育季刊, 21(3), 20-26。林啟賢(1998), 心智練習在運動技能上應用的探討, 中華體育, 47, 116-124。林勝儀(1998), 音樂之友社, 新訂標準音樂辭典, 美樂出版社。金信庸(1993), 節奏在音樂創作中之運用, 臺東師院學報, 5, 279-298。姜慧嵐(2000), 台灣健康體適能俱樂部產業之研究, 私立中國文化大學運動教練研究所未出版之碩士論文。孫娟(2006), 功能性音樂在體育運動中的地位與作用, 遼寧師範大學學報社會科學版, 29(4)。徐麗麗(1997), 音樂與治療, 安寧療護, 4, 29-31。張孝慈(2007), 健康台北季刊, 12月出版, 76-78。莊靜如(2003), 你上健身房運動嗎, 健康世界期刊, 209, 96-98。陳志展, 林如瀚, 宋智航, (2007), 音樂介入不同運動訓練階段之應用, 運動教練科學, 9, 53-59。陳挺豪(2004), 健身中心運動原則及器材使用之概念探討, 淡江體育期刊, 7, 83-91。陳龍弘, 盧俊宏, 楊明磊(2005), 音樂於運動心理的應用, 輔導季刊, 41(1), 58-64。黃耀宗(2006), 運動跟著感覺走—運動自覺量表在運動訓練及測驗上的應用, 中華體育季刊, 12(2), 47-52。溫富雄(1999), 不同目標取向和自覺能力對中強度踏車運動之知覺 身體疲勞程度、情緒反應及運動表現之影響, 國立體育學院運動科學未出版之碩士論文。溫富雄、季力康(1998), 知覺和客觀的中強度運動對正、負情緒影響的比較, 國立體育學院論叢, 7(1), 125-135。劉焜輝(1994), 音樂治療的理論與實施, 諮商與輔導, 104, 21-25。盧蒙(2006), 試論正確的運動感覺與提高演奏能力的關係, 樂府新聲瀋陽音樂學院學報, 24(3), 97-99。盧俊宏(1994), 運動心理學。台北市, 師大書苑。賴惠玲(2000), 身體活動伴隨快板音樂減輕憂鬱症, 護理雜誌, 1(1), 86-92。賴惠玲(2002), 音樂治療概觀, 護理雜誌, 49(2), 80-84。

二、英文部分 Berger B., & Owen, D. R. (1988). Stress reduction and mood enhancement in four exercise modes: swimming body conditioning hatha yoga and fencing. *Research Quarterly for Exercise and Sport*, 59 (2), 148-159. Bernardi, P. C., & Sleight, P. (2006). Cardiovascular, cerebrovascular, and respiratory changes induced by different types of music in musicians and non-musicians: The importance of silence. *Heart*, 92 (4), 445-52. Borg, G. (1970) Perceived exertion as an indicator of somatic stress. *Scandinavian journal of Rehabilitation Medicine*, 2 (2), 92-98. Boutcher, S. H., & Trenske, M. (1990). The effects of sensory deprivation and music on perceived exertion and affect during exercise. *Journal of Sport and Exercise Psychology*, 12, 442-447. Cabanac, M. (1986). Performance and perception at various combinations of treadmill speed and slope. *Physiology and Behavior*, 38, 839-843. Chen, M. J., Xitao, F., & Moe, S. T. (2002). Criterion-related validity of the Borg ratings of perceived exertion scale in healthy individuals: a meta-analysis. *Journal of Sports Sciences*, 20(11), 873-899. Copeland, B. L., & Frank, B. D. (1991). Effects of types and intensities of background music on treadmill endurance. *The Journal of Sports Medicine And Physical Fitness*, 15, 100-103. Davis, W. B., Gfeller, K. E., & Thaut, M. H. (1999). *An introduction to music therapy: Theory and practice*, edition. Boston: McGraw Hill College. Douglas, N. W. (1985). The effect of tempo and disposition in music on perceived exertion, brain waves and mood during exercise. Unpublished master thesis, Pennsylvania State University. Evans D. (2002). The effectiveness of music as an intervention for hospital patients: a systematic review. *Journal of Advanced Nursing*, 37, 8-18. Gauvin, L., & Rejeski, W. J. (1993). The exercise-induced feeling inventory: Development and initial validation. *Journal of Sport and Exercise Psychology*, 15 (4), 403-423. Gauvin, L., & Spence, J. C. (1998). Measurement of exercise-induced changes in feeling states affect mood and emotions. *Advances in Sport and Exercise Psychology Measurement*, 26, 325-336. Gfeller, K. (1988). Musical components and styles preferred by young adults for aerobic fitness activities. *Journal of Music Therapy*, 25 (1), 28-43. Hardy, C. J., & Rejeski, W. J. (1989). Not what, but how one feels: the measurement of affect during exercise. *Journal of Sport and Exercise Psychology*, 11, 304-317. Huron, D. (2000). Perceptual and cognitive applications in music information retrieval, *International Symposium on Music Information Retrieval*, 10(1), 23-25. Jernberg, p. (1981). Using music in swimming. *Swimming Technique*, 18, 36-37. Karageorghis, C. I., & Jones, J. (2000). Effects of synchronous and asynchronous music in cycle ergometry. *Journal of Sports Sciences*, 18, 16. Karageorghis, C. I., & Terry, P. C. (1997). The psychophysical effects of music in sport and exercise: A review. *Journal of Sport Behavior*, 20, 54-68. Karageorghis, C. I., & Terry, P. C. (2001). The magic of music in movement. *Sport and Medicine Today*, 5, 38-41. Karageorghis, C. I., Jones, L., & Low, D. C. (2006). Relationship between exercise heart rate and music tempo preference. *Research Quarterly for Exercise and Sport*, 77 (2), 240-250. Karageorghis, C. I., Terry, P. C., & Drew, K. M. (1996). Effect of pretest stimulative and sedative music on grip strength. *Perceptual and Motor Skill*, 83, 1347-1353. Karageorghis, C. I., Terry, P. C., & Lane, A. M. (1999). Development and initial validation of an instrument to assess the motivational qualities of music in exercise and sport: The Brunel Music Rating Inventory. *Journal of Sport Sciences*, 17, 713-724. Kenney, E. A., Rejeski, W. J., & Messier, S. P. (1988). Managing exercise distress: The effect of broad spectrum intervention on affect, RPE, and running efficiency. *Canadian Journal of Sport Science*, 12, 97-105. Lind, E., Joens-Matre, R. R., & Ekkekakis, P. (2005). What intensity of physical activity do previously sedentary middle-aged women select? Evidence of a coherent pattern from physiological, perceptual, and affective markers. *Preventive Medicine*, 40, 407-419. Matesic, B. C., & Cromartie, F. (2002). Effects music has on lap pace, heart rate, and perceived exertion rate during a 20-minute self-paced run. *The Sport Journal*, 5(1). McCaffrey, R. & Locsin, R., C. (2004). The effect of music listening on acute confusion and delirium in elders undergoing elective hip and knee surgery. *Journal of Clinical Nursing*, 2(13), 91-96. Moyna, N. M., Robertson, R. J., Meckes, C. L., Peoples, J. A., Millich, N. B., & Thompson, P. D. (2001). Intermodal comparison of energy expenditure at exercise intensities corresponding to the perceptual preference range. *Medicine and science in sports and exercise*, 33 (8), 4-10. North, A. C., & Hargreaves, D. J. (1997). The effect of physical attractiveness on responses to pop music performers and their music. *Empirical Studies of the Arts*, 15, 75-89. Pates, J., Karageorghis, C. I., Fryer, R., & Maynard, I. (2003). Effects of asynchronous music on flow states and shooting performance among netball players. *Psychology of Sport*

and Exercise, 4, 413-427. Potteiger, J. A., Schroeder, J. M., & Goff, K. L. (2000). Influence of music on ratings of perceived Exertion during 20 minutes of moderate intensity exercise. *Perceptual and Motor Skills*, 91, 848-854. Radocy, R. E., & Boyle, J. D. (2003). *Psychological foundations of musical behavior* (4th ed.). Springfield, Incoming letter: Charles C. Thomas. Reimer, B. (2005). New brain research on emotion and feeling: Dramatic implications for music education. *The International Journal of Arts Education*, 3(1), 8-36. Rejeski, W.J. (1992). Motivation for exercise behavior: A critique of theoretical directions. In G. C. Rejeski, W.J., & Kenney, E. (1987). Distracting attentional focus from fatigue: Does task complexity make a difference? *Journal of Sport Psychology*, 9, 66-73. Szabo, A., Small, A., & Leigh, M. (1999). The effects of slow - and fast - rhythm classical music on progressive cycling to voluntary physical exhaustion. *Journal Sports Med Phys Fitness*, 39 (3), 220-225 . Terry, P. C., Dinsdale, S. L., Karageorghis, C. I., & Lane, A. M. (2006). Use and perceived effectiveness of pre-competition mood regulation strategies among athletes. In M. Katsikitis (Ed.), *Psychology bridging the Tasman: Science, culture and practice – Proceedings of the 2006 Joint Conference of the Australian Psychological Society and the New Zealand Psychological Society*. 420-424. Wheeler, B. L. (1985). Relationship of personal characteristics to mood and enjoyment after hearing live and recorded music and to musical taste. *Psychology of Music*, 13, 81-92.