Evidence of Electrocardiograph (ECG) to Examine the Feelings of Exciting, Relaxing, or Boring when Watching Sports

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10:30-10:55 AM, Ballroom D3 **(including questions)**

Previous studies have suggested that watching sports can provide entertainment value (Gau & James, 2013; Zillman, Bryant, & Sapolsky, 1989) from the attributes of a sporting event such as the dramatic process during the game, the unpredictable outcome of the event, and the beauty and spirit in the athletes' performance. This may help the audience divert from daily routines and enjoy the relaxation (Gau & James, 2013). However, a feeling of relaxation may not be always the case; sometimes an emotion of excitement might be aroused, which is likely to influence sleep if watching a game just before the time to go to bed. While a feeling of relaxing may help sleep better, a feeling of exciting may cause a sleep problem. The physiological signals of ECG are a useful measure to help examine the feelings of relaxing or exciting. The autonomic nervous system (ANS) plays a critical role in recognition of emotion (Kreibig, 2010; Levenson, 2014). A relaxation response may be explained by enhanced cardiac parasympathetic tone, which can be indicated by the increased amplitude of the high-frequency (HF) component of heart rate variability (Sakakibara, Takeuchi, & Hayano, 1994). By contrast, the exciting feeling of watching experiences might increase heart rate (Harrison, Carroll, Burns, Corkill, Harrison, Ring, & Drayson, 2000), which can be indicated by the increased amplitude of the low-frequency (LF) component of heart rate variability. As for a tendency to feel bored, this might occur when a person is not interested in a game. In this situation, watching a short five-minute basketball highlight may not provoke changes of ECG in comparison with the ECG data of resting. This study attempts to examine these three different watching experiences by using the evidence of ECG. The second major purpose of this study is to explore possible factors that would influence the physiological signals of ECG in watching experiences.

In total, 24 college students were recruited to participate in this research with 8 females and 16 males. Full highlights of the 2013 Finals Game 6 by Miami Heat versus San Antonio Spurs (five minutes and 18 seconds) openly accessed in the YouTube (Dawk Ins, August 10, 2015) was used as a treatment. Heart Rate Variability Monitor (8Z11) made by Wegene Technology Corporation ("Wegene" Handheld ECG Monitor) with a medical device license from Ministry of Health and Welfare in Taiwan was used to collect the data. Before watching the highlights, participants' ECG data at their resting situation were collected for five minutes. After watching the highlights, participants answered a questionnaire about their watching experiences and an overall level of involvement with basketball. The scale of watching experiences had six dimensions: entertainment, escape, education, aesthetics, self-esteem and sociability with three items in each dimension. The scale measuring an overall level of involvement with basketball had three items asking whether participants played and watched basketball frequently and whether they were familiar with this sport. All items used a five-point Likert scale from 1=disagree, 2=somewhat disagree, 3=neutral, 4=somewhat agree, to 5=agree. Participants were also interviewed with a semi-structured interview outline, which included questions about participants' sleeping quality last night, any working or studying pressure recently, then about whether participants could recognize the game, the teams, the players and some details related to the game, about participants' emotions along viewing the game, and their general basketball participation in daily lives.

Based on the analyses of the interviews, five participants were categorized as the exciting and nervous group. They reported in the interviews they felt aroused, excited or even nervous when watching the highlights with the evidence of physiological signals in terms of increased LF and decreased HF. However, only one participant in this exciting group was highly involved with basketball whereas the other four participants in this group self-reported pretty low basketball involvement mean scores between 1.33 and 2.33 in their daily lives. For the group with seven participants who reported themselves as basketball experts in the interviews and also self-reported high scores of involvement with basketball in the survey, seemingly contrary to intuition, their physiological signals maintained the same

tendency to cardiac sympathetic or parasympathetic tone (six participants) or changed from sympathetic to parasympathetic tone (one participant) in the comparison between resting ECG and recorded ECG in watching the basketball highlights, indicating their emotions might keep similar or relaxed. According to their interviews, this is probably because they are familiar with the game or simply enjoy recalling some memories without too much intense excitement. The third group had five participants not interested in the highlights with low basketball involvement. Comparing to the resting ECG, the physiological signals of this group in watching the highlights showed similar or relaxed emotions with one exception, who said that he was sleepy at rest and then waked up when watching the game although he was not interested in the game. So, this participant showed increased ratios of LF to HF from the resting to watching scenarios. The fourth group with seven participants showed interest in the highlights that either appreciated performance, enjoyed the atmosphere, or paid attention to understand what was going on in the game. They might somewhat get excited or relaxed from watching the game. In general, the self-reported watching experiences seemed related to heart rate (HR) with correlation -0.55 (p=.007) indicating the higher experiences the lower HR. This might mean experiences in watching sports would be relaxed for most people. This study concluded that evidence of ECG could help examine deeply the feelings of exciting, relaxing, or boring when watching sports. Additional interviews further provided insights to explain possible reasons behind the feelings.

Dawk Ins (August 10, 2015). Ray Allen Full Highlights 2013 Finals Game 6 vs Spurs - LEGENDARY 3-Pointer To Save Miami! From https://youtu.be/4J6mWg9dfO8.

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