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The effect of music on submaximal cycling

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CHAPTER 1

1. INTRODUCTION

1.1. HISTORICAL REVIEW

Since the dawn of mankind, music and rhythmical beats have been part of human culture. Interest in music and rhythm can be dated back to early civilizations, and for the greater part remains an evolutionary puzzle (Storr 1999). Nowadays music is prevalent in our everyday lives. Most mundane tasks such as driving and shopping are accompanied by music (North and Hargreaves 2000).

Music has a profound influence on both physical and mental development, as melody is associated with physical movement, as well as cognition and emotion (Storr 1999; Nelson 1963). We recognize our own feelings in music, and respond accordingly (Storr 1999).

Movement and motor performance are natural responses to music (Storr 1999; Szabo et al 1999). Properly established rhythm is an important part of successful performance in certain sports, for example running, skiing and running with hurdles (Nelson 1963). This is the probable reason as to why it is common practice to have background music while exercising and why many exercise programmes are designed to be synchronized with music (Copeland and Franks 1991; Nethery 2002). Music often maximizes training and performance (Mills 1996), as it brings about an added dimension. Not only does it add rhythm to a physical movement, but it stirs up a psychological element (Kennard 1983).

Music compliments exercise training for a number of physiological and psychological reasons: the beat of the music seems to pace the athlete, while the overall melody seems to enhance some sort of emotion in the athlete. Music creates a unique level of coherence of electrical activity in separate parts of the brain (Storr 1999). Listening to music is a sensory experience that has both emotional and cognitive responses (Storr 1999; Thornby

et al 1995; Nelson 1963). In a sports setting, music may help to distract the athlete, allowing the athlete to focus on something other than their exercise-induced strain (Szabo et al 1999; Szmedra and Bacharach 1998; Boutcher and Trenske 1990). Conversely, by blocking out auditory or visual cues, athletes are forced to focus on their own thoughts and other internal processes, thereby possibly allowing for amplification of their feelings of discomfort (Boutcher and Trenske 1990).

With increasing competition in sport, athletes are always searching for that "something special" that gives them a more competitive edge, by allowing them to train longer, harder and continually be motivated. If exercise can be perceived as less difficult and more enjoyable, then the inclusion of music into training programmes may result in increased exercise performance, motivation, adherence, as well as increased exercise vigour (Potteiger et al 2000; Szmendra and Bacharach 1996; Becker et al 1994).

Previous research contains contradictory findings. Some studies have measured the effects of music on aerobic exercise (Szabo et al 1999; Szmedra and Bacharach 1998; White and Potteiger 1996; Becker et al 1994; Copeland and Franks 1991), while some have focused on the effects of music on anaerobic exercise (Pujol and Langenfeld 1999; Szabo et al 1999; Nelson 1963). Others have studied varied music tempos on physiological parameters, like plasma lactate, norepinephrine and cardiovascular haemodynamics, while exercising (Potteiger et al 2000; Szmedra and Bacharach 1998; Iwanaga 1995). Although various studies have observed music in combination with treadmill running (Szmedra and Bacharach 1998; Thornby et al 1995; Copeland and Franks 1991) or on a laboratory, stationary bicycle (Potteiger 2000; Pujol and Langenfeld 1999; Szabo et al 1999; White and Potteiger 1996; Becker et al 1994; Nelson 1963), none of the studies have measured the specific affect of music on particular types of athletic activity, for example, the overall performance of cyclists on their own bicycles when exposed to music. The one exception being the study conducted by Atkinson et al (2004), although, they used subjects who were not exclusively cyclists. In their study a combination of cyclists, triathletes and runners were used. Most studies, have either examined the physiological or psychological effects of music on exercise, as separate

entities, while ignoring the overall effect of a combination of physiological and psychological variables on athletes.

Many of these above mentioned studies also utilized relatively outdated music (music that was more than 10 years old at the time that the study was conducted) (Potteiger et al 2000; Szabo et al 1999; Szmendra and Bacharach 1997; Mills 1996). Most of the athletes probably were not familiar with the music nor would they have chosen to listen to, especially while training.

In order to become accomplished, cyclists need to spend many hours on a bicycle, whether it is on the road or on an indoor trainer. This often leads to boredom and in turn lack of motivation. That is why incorporating music with training may prove to be beneficial. If cyclists perceive the training to be easier and enjoyable, cyclists probably will be able to train more proficiently. As cycling is a rhythmical activity, music can potentially aid in the timing and rhythm of the sport.

1.2. AIM OF RESEARCH

The aim of this study was to establish whether music causes changes in physiological and psychological variables during submaximal cycling. In this study it was hoped to establish whether music would have any affect on the cyclist's heart rates, change in blood lactate concentration, Borg Scale ratings and their overall perception of submaximal cycling with music.