# The Effects of Different Richness level of Nature Exposure for Health Promotion

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## 1. Introduction

- The benefits of *Green Physical Activity* for health promotion have been examined across different age groups in indoor and outdoor environments (Benfield, Rainbolt, Bell, & Donovan, 2013; Calogiuri et al., 2016; Gladwell et al., 2012; Gladwell & Rogerson, 2016; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009; Pretty, 2004). The dominant research of green physical activity focus on the investigation of different visual information, including nature or virtual videos and images presenting on a screen (Akers et al., 2012; Pretty, Peacock, Sellens, & Griffin, 2005; Schutte, Bhullar, Stilinović, & Richardson, 2017; Yeh, Stone, Churchill, Brymer, & Davids, 2016), nature scenery views from windows or placing plants indoors (Benfield, Rainbolt, Bell, & Donovan, 2013; Lohr, 2010).

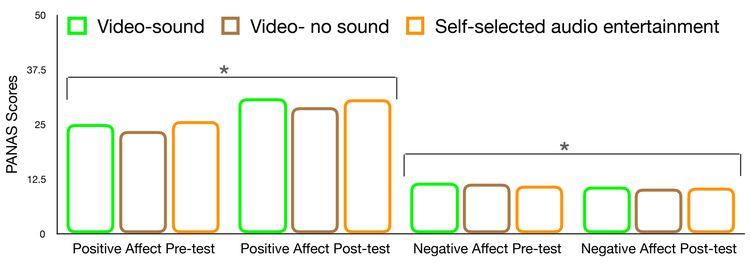
- Humans, however, explore and interact with environment through multiple sensory inputs indicating the need to expand the examination to other information sources for green physical activity. For example, nature sounds are suggested to be pleasant and beneficial for stress reduction, perceived restoration and mood recovery (Alvarsson, Wiens, & Nilsson, 2010; Annerstedt et al., 2013; Jahncke, Eriksson, & Naula, 2015; Ratcliffe, Gatersleben, & Sowden, 2013).

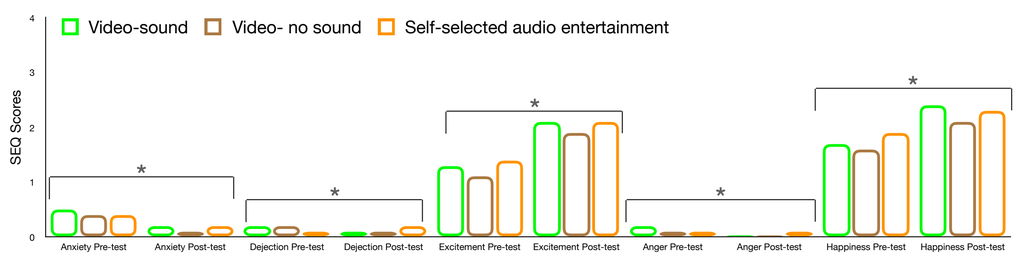
- In order to widen our understanding of green physical activity for applying in urban areas, this study examined the value of different nature information for mental benefits by manipulating the richness level of presented sources of nature information (with and without sounds) for indoor treadmill running.

## 2. Methods

- Twenty-four participants ( 29 ± 4.8 years ; 178. 4 ± 5.5 cm ; 74.8 ± 8.6 kg; 23.6 ± 3.3 kg/m$^{-2}$ ) completed three bouts of twenty-minute treadmill running with (I) a collection of ten short dynamic images with and (II) without sounds compared to their self-selected audio entertainments. The Positive and Negative Affect Scale and the Sport Emotion Questionnaire were used to assess the pre-and-post differences. A subsample of eight participants (four males and four females) were recruited for post-run interviews exploring their experience of different exercise environments.

## 3. Results




- Participants reported higher positive affects scores and lower negative affects scores after the run regardless the exercise conditions. Participants reduced the level of anxiety, angry and increased the feeling of excitement and happiness after the run regardless of exercise conditions; however, participants reported higher level of dejection only in the self-selected audio entertainment condition.

- From interview data, participants indicated distinct exercise experience when running in different environments. The rich visual-acoustic information from the ten videos created a more immersive experience when running with nature as a sense of missing information was reflected by the interviewees when running with nature video without sounds. Personal preferences of the presented information were suggested to have influences on exercisers' engagement with environment.

## 4. Conclusion

The video-sound condition might be concluded as the most beneficial treadmill running environment when compared to all the designed environments. As findings in this study suggest, when designing PA environment, the rich and diverse presented information in dynamic format might be more beneficial on PA maintenance. The consideration of personal preferences of the presented information were also an important factor designing exercise programmes or environments.

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