Efficacy of a Motivational Video on Heart Rate, RPE, and Total Work Performed During Stationary Cycling

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Purpose

- The purpose of this study was to compare the effects of watching a motivational video (Tour de France (MV)) versus a calming video (Bob Ross painting (PV)) while cycling.
Background Information

- Physical activity
  - primary recommendations in prevention against CVD, obesity, and premature death (5)
  - ACSM PA recommendations to maintain a healthy lifestyle (6)
  - Participation rates declining last 50 years (1)
Background Information

❖ Decline due to (2):
  ➢ Lack of motivation/boredom during PA
  ➢ Time
  ➢ Financial cost
  ➢ Pain
  ➢ How to start
Studies to boost PA participation (2,3,4,7-15):

- Preferred exercising with both or at least one stimulus (audio or visual) compared to none at all
- Cycling versus running
- RPE
Background Information

- Increased video-based technology → reevaluate
- Psychophysiological Effect of Peer Motivation (3,4)
- Easily accessible for all populations
Hypothesis

- It was hypothesized that the motivational test would have increased exercise heart rates, total mileage, and lower ratings of perceived exertion compared to the same exercise test during the non-motivational video.
Participants

- Four males and six females
  - Ages 18-50
  - University of Lynchburg population
  - No varsity athletes
  - Recreationally active
  - Auditory and visual capabilities
Research Design

- Randomized within-subjects design
- Independent variable:
  - type of video
- Dependent variables:
  - Heart Rate
  - RPE
  - Total Mileage
Methods - Session 1

- Informed Consent & PAR-Q
- Familiarization Period:
  - Borg Scale
  - Intensities during test
- Measurements:
  - Age
  - Sex
  - Ht
  - Wt
  - % BF
Methods - Exercise Test PV

- Non-Motivational Video
  - Warm-up 2 min defined intensity RPE 10
  - Cycle at moderate intensity for 20 min while watching Bob Ross Mystic Mountains
  - Cool-down 2 min at light intensity
  - HR & RPE recorded at:
    - Minute 1 of warm-up
    - Minutes 5, 10, 15, 20
    - Minute 1 of cool-down
  - Distance cycled recorded at completion of 2 min cool-down
Methods - Exercise test MV

- Motivational Video
  - Same procedure
  - Tour de France 2018-Best Moments
Instrumentation

<table>
<thead>
<tr>
<th>Rating</th>
<th>Descriptor</th>
</tr>
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<tbody>
<tr>
<td>6</td>
<td>No exertion at all</td>
</tr>
<tr>
<td>7</td>
<td>Extremely light</td>
</tr>
<tr>
<td>8</td>
<td>Very light</td>
</tr>
<tr>
<td>9</td>
<td>Light</td>
</tr>
<tr>
<td>10</td>
<td>Somewhat hard</td>
</tr>
<tr>
<td>11</td>
<td>Hard (heavy)</td>
</tr>
<tr>
<td>12</td>
<td>Very Hard</td>
</tr>
<tr>
<td>13</td>
<td>Extremely hard</td>
</tr>
</tbody>
</table>
Instrumentation
Statistical Analysis

- SPSS (IBM Technologies, version 26, Armonk, NY)
- Paired Samples t-test
- 2x6 Factorial ANOVA
- Demographics
<table>
<thead>
<tr>
<th>Variables</th>
<th>$n$</th>
<th>%</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>$M$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$SD$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Range$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>21.5</td>
<td>0.7</td>
<td>21 – 23</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.756</td>
<td>0.076</td>
<td>1.65 – 1.94</td>
</tr>
<tr>
<td>Body mass (kg)</td>
<td>76.24</td>
<td>11.92</td>
<td>61.3 – 95.4</td>
</tr>
<tr>
<td>Body fat (%)</td>
<td>22.31</td>
<td>6.28</td>
<td>8.0 – 29.8</td>
</tr>
</tbody>
</table>
Table 2 Paired sample *t*-test results for heart rate averaged across exercise, RPE averaged across exercise and distance covered

<table>
<thead>
<tr>
<th></th>
<th>Non-motivational video</th>
<th>Motivational video</th>
<th>t</th>
<th>Sig. (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>RPE averaged across exercise</td>
<td>12.25</td>
<td>1.28</td>
<td>12.85</td>
<td>0.69</td>
</tr>
<tr>
<td>HR averaged across exercise</td>
<td>126.78</td>
<td>18.10</td>
<td>137.75</td>
<td>15.67</td>
</tr>
<tr>
<td>Distance (miles)</td>
<td>6.95</td>
<td>1.06</td>
<td>8.01</td>
<td>0.9</td>
</tr>
</tbody>
</table>

*p<0.05*
Table 3: 2 x 6 Factorial ANOVA for heart rate (HR) and rating of perceived exertion (RPE) across time

<table>
<thead>
<tr>
<th></th>
<th>Non-motivational video</th>
<th>Motivational video</th>
<th>F</th>
<th>Sig.</th>
<th>partial η²</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>HR (bpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>107.1</td>
<td>19.2</td>
<td>102.3</td>
<td>23.2</td>
<td></td>
</tr>
<tr>
<td>5 min</td>
<td>117.2</td>
<td>20.8</td>
<td>126.0</td>
<td>18.2</td>
<td>0.000*</td>
</tr>
<tr>
<td>10 min^\text{T}</td>
<td>125.7</td>
<td>21.5</td>
<td>133.4</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td>15 min^\text{T}</td>
<td>130.1</td>
<td>17.1</td>
<td>141.9</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>20 min^\text{T}x</td>
<td>134.1</td>
<td>14.8</td>
<td>149.7</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>Post^\text{t}</td>
<td>119.1</td>
<td>19.9</td>
<td>131.7</td>
<td>17.2</td>
<td></td>
</tr>
<tr>
<td>RPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35.19</td>
</tr>
<tr>
<td>Pre</td>
<td>9.1</td>
<td>1.4</td>
<td>8.9</td>
<td>0.7</td>
<td>0.80</td>
</tr>
<tr>
<td>5 min^*</td>
<td>11.2</td>
<td>0.9</td>
<td>11.6</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>10 min^*</td>
<td>12.2</td>
<td>1.2</td>
<td>13.0</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>15 min^</td>
<td>12.6</td>
<td>2.0</td>
<td>13.6</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>20 min^*T</td>
<td>13.0</td>
<td>1.8</td>
<td>13.8</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Post^t</td>
<td>9.7</td>
<td>1.6</td>
<td>10.2</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

* p<0.05, ^ sig. different than pre, Tsig. different than 5 min, xsig. different than 10 min, xsig. different than 20 min
Analysis

- Visual stimuli studies → mileage significantly increased in cycling or running tests from control to visual stimuli (3, 8, 11)
- Current study → mileage significantly increased from PV to MV
Controlled Factors

❖ Covering dashboard
❖ Noise-cancelling headphones
❖ Youtube Premium
Limitations

- Sleeping habits
- Caffeine intake
- Medication
- Screen viewing
Recommendations

❖ Larger population size
❖ Diversity in ages
❖ Video Activity
❖ Special Populations
Final Thoughts

❖ Purpose

❖ Results

❖ Motivational videos enhance subjects’ performances with less perceived effort
Application

❖ Results from this study:

➢ Increase exercise volume for a general population
➢ Benefit individuals seeking to implement PA who lack motivation
➢ Contribute knowledge to the exercise physiology community
References

2. Casilio KM. Effects of watching television while exercising. The College at Brockport; State University of New York. Psychology Master’s Theses. 2012.
13. Lind E. The role of an audio-visual attentional stimulus in influencing affective responses during graded cycling exercise. Iowa State University, Digital Repository; Graduate Theses and Dissertations. 2008.