Can Women’s Affective Responses to Exercise Change as a Function of Training?

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“Exercise is a best buy, but a tough sell”

I SHOULD GET MORE EXERCISE!

FROM NOW ON I'M GOING TO WEAR ANKLE WEIGHTS!

Ekkekakis, Parfitt, & Petruzzello, 2011
A hard/heavy intensity is too much: The physiological, affective,

Exercise does not feel the same when you are overweight: the impact of self-selected and imposed intensity on affect and exertion

P Ekkkekakis and E Lind

Department of Health and Human Performance, Iowa State University, IA, USA
Core Affect

Valence: The Feeling Scale (Hardy & Rejeski, 1989)

- Please choose the number that best describes how you feel right now.

<table>
<thead>
<tr>
<th>-5</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>+4</th>
<th>+5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Bad</td>
<td>Bad</td>
<td>Fairly Bad</td>
<td>Neutral</td>
<td>Fairly Good</td>
<td>Good</td>
<td>Very Good</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Arousal: The Felt Arousal Scale (Svebak & Murgatroyd, 1985)

- Please indicate how “worked up” you feel right now:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Arousal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High Arousal</td>
</tr>
</tbody>
</table>
Affective Valence (Feeling Scale)

Ekkekakis et al., 2011; Russell & Barrett, 1999
Ekkekakis et al., 2011; Russell & Barrett, 1999
Should we frame exercise recommendations in a way that helps to maximize pleasure?

Williams, Dunsiger, Jennings & Marcus, 2012
BRIEF REPORT

Recommending Self-Paced Exercise among Overweight and Obese Adults: a Randomized Pilot Study

David M. Williams, Ph.D. • Shira Dunsiger, Ph.D. • Robert Miranda Jr., Ph.D. • Chad J. Gwaltney, Ph.D. • Jessica A. Emerson, Sc.M. • Peter M. Monti, Ph.D. • Alfred F. Parisi, M.D.

Panel A: Minutes of Walking per Week

ACSM recommended minimum

Week

Median Min/Week

Self-Paced
Prescribed
Leisure Time Physical Activity and Mortality
A Detailed Pooled Analysis of the Dose-Response Relationship

Hannah Arem, MHS, PhD1; Steven C. Moore, PhD1; Alpa Patel, PhD2; Patricia Hartge, ScD1; Amy Berrington de Gonzalez, DPhil1; Kala Visvanathan, MBBS, MPH3; Peter T. Campbell, PhD2; Michal Freedman, JD, PhD1; Elisabete Weiderpass, MD, MSc, PhD4,5,6,7; Hong Chen, PhD1; MD, PhD4,5,6,7; Kathy Digital, MD, PhD4,5,6,7; and Min Lee, MBBS, ScD9; Charles E. Matthews1

[+] Author Affiliations

CONCLUSIONS AND RELEVANCE Among people reporting any activity, there was an inverse dose-response relationship between proportion of vigorous activity and mortality. Our findings suggest that vigorous activities should be endorsed in clinical and public health activity guidelines to maximize the population benefits of physical activity.
Current Knowledge Gap:

• Can affective response to exercise change (improve) as a function of training time?
• Or is it a fixed-phenomenon?
Method: Study Design & Procedures

- Project GEM - Parent RCT (PI: Bryan RO1 CA179963)
  - Supervised exercise 4 days/week for 16 weeks

- Affect data collected 4 times over 16 weeks
  - Week 0, Week 4, Week 8, Week 16

- 4 exercise training conditions
  - TX 1: Short (20 min) @ low intensity (55% HRR)
  - TX 2: Long (40 min) @ low intensity (55% HRR)
  - TX 3: Short (20 min) @ high intensity (75% HRR)
  - TX 4: Long (40 min) @ high intensity (75% HRR)

- Within each exercise bout, affect collected every 10 minutes (3 – 5 times depending on condition)
  - Min 0, min 10, min 20, min 30, min 40
Aims of the present investigation

1. Determine whether affective response (valence) changes as a function of training time.
   ➢ Specifically, does affective valence become more positive over time?

2. Determine the extent to which volume of exercise training (intensity and duration) explains changes in affective response (valence) over time.
Method: Participants

• $N = 233$ (current)

• **Inclusion criteria**
  • Female
  • 30 – 45 years old
  • Sedentary (defined as < 60 minutes per week of cardiorespiratory exercise with no changes for the past 6-months)

• **Age range:** 30 – 45 years old
  • $M = 37.05$, $SD = 4.74$

• **BMI range:** 17.8 – 40.4 kg/m$^2$
  • $M = 29.21$ kg/m$^2$, $SD = 5.50$

• **Ethnicity:** 70% white
Average Affective Valence Score (FS) Change Across Weeks
Average Affective Valence Score (FS) Change Across Weeks & Training Groups
Average Affective Valence Score (FS) Change Between Intensity Groups Across Weeks
## Rating of Perceived Exertion Scale (RPE; Borg, 1998)

<table>
<thead>
<tr>
<th></th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>No exertion</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Light</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Somewhat hard</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Hard (heavy)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Very hard</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Maximal exertion</td>
<td></td>
</tr>
</tbody>
</table>
Average RPE Change Across Weeks & Training Groups

- Training group 1 (Short/Low)
- Training group 2 (Long/Low)
- Training group 3 (Short/High)
- Training group 4 (Long/High)
Average RPE Change Between Intensity Groups Across Weeks

RPE Scale

Baseline | Week 4 | Week 8 | Week 16
---|---|---|---
Low Intensity | | | |
High Intensity | | | |
Main Takeaways

• Core affective responses (valence and arousal) do not appear to change across time as a function of training
  • Even though RPE does differ across groups in a logical way

• Core affective response to exercise may be a fixed-phenomenon, individual difference variable
  • There is variability in the way people’s affect changes over time, we don’t know what’s causing it
Implications & Future Directions

• Implications:
  • Higher intensity exercise *might not* be evil…
    • Rather than eliminate intensity recommendations – might consider teaching skills for managing unpleasant feeling state during exercise (e.g., acceptance, mindfulness, distress tolerance, values focus; see Stevens & Bryan, 2015)
    • Discomfort is just a feeling – “observe your edge”

• Future directions:
  • Explore using a better metric for exercise volume
  • Explore other ways of improving affect over time
    • e.g., exercise setting and context matter (Stevens, Smith, & Bryan, 2015)
  • Increase external validity
    • Test with activities other than treadmill (ideally self selected)
Thank you!

- NHI/NCI (PI: Bryan RO1 CA179963)
- CU CHANGE Lab at CU Boulder
- IMAGE Lab at CU Anschutz Medical Campus

Questions?

Comments?