Take Heart: Older Adults’ Heart Rate Variability Predicts Negativity Avoidance
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Background

**Positivity Effect (PE):** Older adults’ preference for positive and avoidance of negative information. Considered to be an emotion regulation mechanism [1].

Successful emotion regulation depends on autonomic nervous system (ANS) functionality. The heart is innervated by the ANS and can provide information on ANS functionality [2].

Heart Rate Variability (HRV): Variability of heartbeat intervals. Considered a measure of ANS functionality.

HRV at rest is associated with emotion regulation [3] and inhibitory control [4].

Questions:

1. If the PE is an emotion regulation mechanism and HRV is an index of emotion regulation capabilities, could older adults’ HRV predict the PE?

2. If HRV is also related to inhibition, would the HRV-PE relationship be stronger for negativity avoidance rather than positivity preference?

3. Does the HRV-PE relationship change under high load?

Method

Participants: 63 young (M = 18.8) and 62 older (M = 71.6)

HRV at rest: Participants asked to sit back and relax for 10 minutes. HRV calculated for final five minutes

Task: Picture viewing and eye tracking

- **Single task:**
  - Fixation count and duration recorded
  - Happy Neutral & Angry Neutral face pairs (32 pairs/task)

- **Dual task:**
  - Fixation count and duration recorded
  - Happy Neutral & Angry Neutral face pairs (32 pairs/task)

Results

1. Positivity effect

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<thead>
<tr>
<th>Single task</th>
<th>Dual task</th>
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<tbody>
<tr>
<td>Happy</td>
<td>0.02</td>
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<tr>
<td>Angry</td>
<td>-0.02</td>
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<td>Heart Rate Variability</td>
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| HRV at rest | Associated with emotion regulation [3] and inhibitory control [4].

2. HRV and preference for emotional faces

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Discussion

1. Older adults’ PE manifested primarily as negativity avoidance

- A positivity preference was found under single task, which disappeared under dual task conditions

2. High resting HRV was associated with higher negativity avoidance only in older adults

- No associations were found between HRV and preference for positive faces. This supports findings suggesting that HRV is also related to inhibition (i.e., avoiding negativity)
- No associations found in young adults

3. Older adults’ negativity avoidance and the HRV-negativity avoidance relationship were not affected by task demands

- The secondary task was easy (~2% errors) and did not change older adults’ negativity avoidance

Conclusions

Older adults’ PE is dependent on the functionality of the ANS, as measured by resting HRV levels

Improving HRV (diet and exercise) could increase older adults’ emotion regulation capabilities

References


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