The impact of Technostress on Sustainable Employability and the moderating role of Age.

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The impact of Technostress on Sustainable Employability and the moderating role of Age
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Prof. Dr. Tinka van Vuuren, Prof. Dr. Maria Peeters, Serena Paz Diaz & Ben van Veen MSc.

- Tinka van Vuuren holds a special chair at the Open University of the Netherlands. She works as well as senior adviser at APG/Loyalis.
- Maria Peeters is a Full Professor at TU/e. She is also an Associate Professor at Utrecht University.
- Serena Pareja Diaz is HR-advisor at Huuskes b.v. and former student of Saxion Applied University.
- Ben van Veen is senior lecturer/researcher at Saxion Applied University.
Research question

‘Does technostress influence the sustainable employability of workers, and if so, is this influence moderated by the age of the workers?’
Techno-stress and absenteeism (TNO/CBS, 2018)

- 60% of employees use PC or smartphone (almost) all day
- 28% of employees often or always experience information overload
- These two groups indicate that they are absent twice as often due to work pressure or work stress compared to employees who do not experience information overload or do not use IT at work
Technostress
Stress caused by technology

Five components of Technostress
(Tarafder, Tu, Ragu-Nathan & Ragu-Nathan, 2007)

- Techno- overload
- Techno- invasion
- Techno- complexity
- Techno- uncertainty
- Techno- insecurity
Consequences of Technostress

• Psychological responses to stressors: including fatigue, exhaustion
• Attitudes and behavior as decreased levels of job satisfaction and lowered commitment to the organization, performance and productivity.
• (Ayyagari et al., 2011; Jena, 2015;
• Owusu-ansah, Azasoo & Adu, 2016;
• Ragu-Nathan et al., 2008; Tarafdar et al., 2010;
• Tarafdar et al., 2007, 2011).
Sustainable employability

Extent to which employees are able and willing to carry out their current and future work (Van Vuuren, 2012: Ybema, Van Vuuren & Van Dam, 2017)
Job-demands resources model
(Bakker & Demerouti, 2007)
The more job insecurity, the less sustainable employability
(Van Vuuren & Smulders, 2018)
Sample

• The data for this research has been collected from a Dutch organization active in the technical sector.
• All employees (N = 239) of this organization are invited with the permission of the works council to complete a questionnaire online.
• A total of 158 respondents returned the questionnaire (response 66.1%).
Sample

- Of these 158 respondents, 22% were female and 78% male respectively of the response.
- The majority (73%) had an MBO education
- 16% were between 21 to 30 years, 24% between 31 to 40, 40.5% between 41 to 50, 24% 51 years and older
- This distribution is representative for the total workforce.
Measures (1)

Technostress

- 5 Technostress scales were measured on a 5-point (Daeleman, 2011; Tarafder, Tu, Ragu-Nathan & Ragu-Nathan, 2007)
- Examples of items are for:
  1. Techno-overload: "This technology forces me to work much faster"
  2. Techno-invasion: "I spend less time with my family because of this technology"
  3. Techno-complexity: "I don't know enough about this technology to perform my work properly"
  4. Techno-uncertainty is: “There are always new developments in technology that we use in our organization”
  5. Techno-insecurity: "I feel a constant threat to my job security because of new technologies”
- The lowest Cronbachs α is .75.
Work ability

Work ability is measured by the Work Ability Index (WAI) (Tuomi, Ilmarinen, Jahkola, & et al., 1997).

- It consists of the following items:
  - Current work ability compared to the lifetime best comprises the work ability score that is often used as a separate indicator of work ability and has been described above (0–10 points).
  - Work ability in relation to the demands of the job (2–10 points).
  - Number of current diseases diagnosed by a physician (1–7 points).
  - Estimated work impairment due to diseases (1–6 points).
  - Sick leave during the past year (1–5 points).
  - Own prognosis of work ability two years from now (1, 4 or 7 points).
  - Mental resources (1–4 points).

- WAI is calculated by summing the points of the seven items, hence the score ranges from 7 to 49 points. The index is divided into: poor (7–27 points), moderate (28–36 points), good (37–43 points), and excellent (44–49 points) (Tuomi et al. 2006).

- Cronbach’s alpha is .76.
Measures (3)

**Employability**
- *Employability* consists of 3 items. All items were measured on a 5-point Likert-scale.
- The items represent perceived labour market position (3 items: Veld, Semeijn & Van Vuuren, 2016)
- Cronbach’s alpha of this scale is .67.

**Vitality**
- *Vitality* is measured by the “vigor” scale, which is part of a self-report questionnaire “the Utrecht Work Engagement Scale” (UWES), developed by Schaufeli and Bakker (2003).
- Vigor is assessed by three items that refer to high levels of energy and resilience, the willingness to invest effort, not being easily fatigued, and persistence in the face of difficulties. These items were measured on a 7-point Likert-scale. Cronbach’s alpha is 0.86.

**Age**
## Results (1)

Table 1: Means, Standard Deviations, and Correlations \( (N = 158) \)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>α</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td>42.46</td>
<td>10.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Work ability</td>
<td>7 -49</td>
<td>40.99</td>
<td>5.78</td>
<td>.76</td>
<td>-.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Employability</td>
<td>1 -5</td>
<td>3.16</td>
<td>.86</td>
<td>.67</td>
<td>-3.79**</td>
<td>0.11</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>4. Vitality</td>
<td>0 -6</td>
<td>4.5</td>
<td>1.25</td>
<td>.86</td>
<td>-.08</td>
<td>.484**</td>
<td>.226**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Techno-overload</td>
<td>1 -5</td>
<td>2.86</td>
<td>.87</td>
<td>.90</td>
<td>.228**</td>
<td>-3.68**</td>
<td>-1.61*</td>
<td>-2.64**</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Techno-invasion</td>
<td>1 -5</td>
<td>1.97</td>
<td>.88</td>
<td>.88</td>
<td>.09</td>
<td>-.176*</td>
<td>.02</td>
<td>-.308**</td>
<td>.521**</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Techno-complexity</td>
<td>1 -5</td>
<td>2.18</td>
<td>.67</td>
<td>.81</td>
<td>.428**</td>
<td>-.312**</td>
<td>-.254**</td>
<td>-.14</td>
<td>.485**</td>
<td>.386**</td>
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<tr>
<td>8. Techno-uncertainty</td>
<td>1 -5</td>
<td>1.79</td>
<td>.64</td>
<td>.86</td>
<td>.09</td>
<td>-.198*</td>
<td>-.161*</td>
<td>-.185*</td>
<td>.419**</td>
<td>.486**</td>
<td>.619**</td>
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<td>9. Techno-insecurity</td>
<td>1 -5</td>
<td>3.33</td>
<td>.73</td>
<td>.81</td>
<td>.05</td>
<td>-.15</td>
<td>-.06</td>
<td>.10</td>
<td>.213**</td>
<td>.256**</td>
<td>.160*</td>
<td>.14</td>
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</table>
Results (2)

Table 2. Hierarchical regression models to predict work ability standardized β coefficients and R²

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>β</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.014</td>
<td>.017</td>
<td>.003</td>
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<tr>
<td>Techno-overload</td>
<td>-.302**</td>
<td>-.294**</td>
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<tr>
<td>Techno-invasion</td>
<td>.062</td>
<td>.015</td>
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</tr>
<tr>
<td>Techno-complexity</td>
<td>-.207</td>
<td>-.204</td>
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<tr>
<td>Techno-uncertainty</td>
<td>-</td>
<td>.036</td>
<td>.047</td>
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<tr>
<td>Techno-insecurity</td>
<td>-.078</td>
<td>-.087</td>
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<tr>
<td>Age x Techno-overload</td>
<td>-.078</td>
<td>-.087</td>
<td></td>
</tr>
<tr>
<td>Age x Techno-invasion</td>
<td>.197*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age x Techno-complexity</td>
<td>.031</td>
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<tr>
<td>Age x Techno-uncertainty</td>
<td>-.093</td>
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<td>Age x Techno-insecurity</td>
<td>.042</td>
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<tr>
<td>Adjusted R²</td>
<td>.012</td>
<td>.13</td>
<td>.14</td>
</tr>
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</table>
### Table 3. Hierarchical regression models to predict employability standardized β coefficients and $R^2$

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>β</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.379***</td>
<td>-.346***</td>
<td>-.329***</td>
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<tr>
<td>Techno-overload</td>
<td>-.095</td>
<td>-.115</td>
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<tr>
<td>Techno-invasion</td>
<td>.204*</td>
<td>.189*</td>
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</tr>
<tr>
<td>Techno-complexity</td>
<td>-.029</td>
<td>.055</td>
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<tr>
<td>Techno-uncertainty</td>
<td>-.165</td>
<td>-.229*</td>
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<td>Techno-insecurity</td>
<td>-.046</td>
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<tr>
<td>Age x Techno-overload</td>
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<td></td>
<td>.080</td>
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<tr>
<td>Age x Techno-invasion</td>
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<td>.032</td>
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<tr>
<td>Age x Techno-complexity</td>
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<td></td>
<td>-.240*</td>
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<td>Age x Techno-uncertainty</td>
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<td>Age x Techno-insecurity</td>
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<tr>
<td>Adjusted $R^2$</td>
<td>.14</td>
<td>.16</td>
<td>.17</td>
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</tbody>
</table>
Results (4)

Interaction between age and technostress

[Graph showing the interaction between age and technostress]
Table 4. Hierarchical regression models to predict vitality standardized $\beta$ coefficients and $R^2$

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\beta$</th>
<th>$\beta$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.082</td>
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<td>-.043</td>
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<td>Techno-overload</td>
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<td>-.151</td>
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</tr>
<tr>
<td>Techno-invasion</td>
<td>-.229*</td>
<td>-.258*</td>
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<tr>
<td>Techno-complexity</td>
<td>.087</td>
<td>.089</td>
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</tr>
<tr>
<td>Techno-uncertainty</td>
<td>-.060</td>
<td>-.065</td>
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</tr>
<tr>
<td>Techno-insecurity</td>
<td>-.012</td>
<td>-.004</td>
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</tr>
<tr>
<td>Age x Techno-overload</td>
<td>.122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age x Techno-invasion</td>
<td></td>
<td>.076</td>
<td></td>
</tr>
<tr>
<td>Age x Techno-complexity</td>
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<td>-.038</td>
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<tr>
<td>Age x Techno-uncertainty</td>
<td></td>
<td>-.081</td>
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</tr>
<tr>
<td>Age x Techno-insecurity</td>
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<td>.024</td>
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</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.00</td>
<td>.078</td>
<td>.070</td>
</tr>
</tbody>
</table>
Conclusions

• The three indicators of sustainable employability are differently related to the five components of techno-stress:
  – Workability is related to techno-overload.
  – Vitality is related to techno-invasion
  – Employability is positively and negatively related to technostress

• Age is related to employability (not to vitality and workability)
• Age is related to techno-overload and techno-complexity
• Age hardly influences the relationship between technostress and sustainable employability.
Answer to research question:

• Does technostress influence the sustainable employability of workers, and if so, is this influence moderated by the age of the workers?’

• Yes, techno-overload goes together with less workability and techno-invasion with less vitality. Techno-uncertainty goes together with less employability, but techno-invasion goes together with more employability.

• Age hardly influences this relationship.

• Extra: Age relates to employability
  Age relates to techno-overload and techno-complexity
Practical implications

• Sustainable employability seems not much at risk as a consequence of technostress in this company.

• Almost no negative consequences of technostress for sustainable employability. And sometimes even positive consequences: the less time spend with their families because of technology (techno-invasion), the better their employability.

• An older age can help to deal with technostress: the work ability of younger workers suffers more than of older workers of spending less time with their families because of technology (techno-invasion).

• But also a younger age helps: the employability of older workers is less than of younger workers if they experience that they do not know enough about technology to perform their work properly (techno-complexity).
Thank you for your attention!

Prof. dr. Tinka van Vuuren

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