Objective

- Evaluate the use of SARA-T for SAw measurement
- All 3 levels of SAw positively correlated
- Better SAw should result in better performance
- SARA-T should not distract from primary task

Method

- 100 non-expert subjects
- Simulated approach air traffic control task
- Objective: Guide incoming aircraft while complying with safety regulations (see Figure 2)
  - 3 scenarios, 30 minutes each
  - 14 SAw questionnaires per scenario

Results

- Mean response times of all SAw-levels positively correlated (see Table 1)
- Significant correlations with performance in the main task
- Repeated measurement ANOVA showed no significant effect of the questionnaires on performance (F < 1)

Discussion

- Results support use of SARA-T for real time measurement of SAw
- Especially Level 1 SAw (Perception) explains variance in performance
- SARA-T is non-intrusive
- In the future, SARA-T could help to guide adaptive human centered automation by operator’s SAw during actual situation

Table 1

<table>
<thead>
<tr>
<th>L1 Projection</th>
<th>L2 Comprehension</th>
<th>L3 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 Projection</td>
<td>0.57***</td>
<td>.59***</td>
</tr>
<tr>
<td>L2 Comprehension</td>
<td>0.67***</td>
<td>- .28**</td>
</tr>
</tbody>
</table>

Annotations. Asterisks indicate levels of significance (* p < .050, ** p < .010, *** p < .001). Spearman-Rho-Correlations were used due to non normality of the variables.

Figure 1. Schematic flowchart of SARA-T’s procedure. Correct answers for questionnaires are gathered through log file analyses (circle). Operator’s responses are validated immediately after completing a questionnaire.

Figure 2. Conventional approach procedure at Düsseldorf airport, Germany. Incoming aircraft (1) reaches Downwind (2) via STARS. Subjects were instructed to turn (3) all aircraft onto the Centerline (4) while complying with safety regulations. Aircraft reached the airport (EDDL) after passing point FAF (5).

References
