Visualisation Project – COSC3000 2024 S1

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* CA4 (“Ellie”) was excluded to ensure correct replication of thesis results.

**REPLICATION OF THESIS GRAPHS:**

* Replaced original boxplots with normal error bars to reduce visual complexity and increase readability.
* Used different data point markers to separate ‘before’ and ‘after’ training data points.
* Added horizontal lines to increase visual identification of data points in relation to y-axis.
* Used blue markers and error bars to visually differentiate the statistically significant differences.
  + First tried green but the colour difference was not obvious and may not cater to colour-impaired viewers (see Appendix 1).

On the left is a heavily annotated visualisation that makes it explicitly clear what the graph markings represent; however, the trade-off is that it’s harder to focus on the data due to its noisy appearance. On the right is a clean version that relies on the inference skill of the viewer such as the difference being inferred from the y-axis and data point positioning. Finally at the bottom left, the colour legend has been included back in as the representation of a blue marking is not a universal standard and may not be clear to viewers. The bottom left is an example of the Untrained Dyad results which do not have any statistically significant results.

**A graph of a graph showing the same number of people

Description automatically generated with medium confidence**

**A graph with numbers and lines

Description automatically generated with medium confidence**

**A graph with black and white lines

Description automatically generated**

**A graph with blue and black lines

Description automatically generated**

**DEMONSTRATING INDIVIDUAL SESSION DATA:**

* Changed from error bar graph to boxplot to increase area of comparison between the average score and individual session data points.
* Different colours were used to differentiate ‘Before’ and ‘After’ training plots.
  + Instead of using a different marker in the box to replace the mean line, as otherwise it would be harder to differentiate between the mean point and individual session data points.
* Colour-blind consideration: used yellow and red to symbolise before and after; used blue to symbolise statistical significance.
  + A black border was added around ‘Before’ training yellow session data points to help the small points standout against the white background.
* Lines were not used to connect individual session data points as there is no meaningful sequence to demonstrate.
* I considered using black background (see Appendix 2 for an example)
  + It would reduce glare and eyestrain on laptop screens and provide higher contrast.
  + However, this format is not widely used in scientific journals and may fail to cater to viewers with contrast sensitivity, laptops with poorer screen quality (fails to render black background accurately) and laptop compatibility.

A graph with purple and yellow dots

Description automatically generated

A graph of different colored lines

Description automatically generated with medium confidence

**CHANGING COGNITIVE AND SOCIAL WEIGHTINGS:**

Functional play was changed from 2 to 3 as it demonstrated that the CA understands and exemplifies a play object’s intended use. Constructive remains lower as it does not necessarily suggest the CA is using it for socially accepted play usages. Symbolic play was moved up to 4 as it suggests the CA also understands intangible play concepts involving the object.

|  |  |  |
| --- | --- | --- |
| Cognitive | | |
| Sub-Category | Previous Weight | New Weight |
| Non-play | -1 | -1 |
| Stereotype | 0 | 0 |
| Exploratory | 1 | 1 |
| Functional | 2 | 3 |
| Constructive | 2 | 2 |
| Symbolic | 3 | 4 |
| Rule-governed | 5 | 5 |

Negative social interactions were demoted to -2 as this response is seen to be less socially accepted than no interaction. No interaction was also demoted to -1 as it’s not a stereotypical social response in play settings. Passive-low can be seen as the minimum threshold for socially acceptable responses. Unilateral has been increased to 4 and above active-low as it the thesis design suggests that while the CA is initiating, the peer is responding negatively which requires significantly higher social capacity to handle.

|  |  |  |
| --- | --- | --- |
| Social | | |
| Sub-Category | Previous Weight | New Weight |
| Negative | -1 | -2 |
| No interaction | 0 | -1 |
| Passive-low | 1 | 0 |
| Passive-high | 2 | 2 |
| Unilateral | 2 | 4 |
| Active-low | 3 | 3 |
| Active-high | 5 | 5 |

Results for Indoor Play: Social Interaction with Trained Dyads (Changed Weights)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trained** | | | | |
| **CA** | **Pre** | **Post** | **Change** |  |
| CA1 | -0.42 ± 0.267 | 0.386 ± 0.15 | 0.806 | 0.013 |
| CA2 | -0.54 ± 0.054 | -0.381 ± 0.126 | 0.159 | 0.494 |
| CA3 | -0.785 ± 0.06 | -0.488 ± 0.075 | 0.296 | 0.048 |
| CA5 | -0.06 ± 0.297 | 0.992 ± 0.365 | 1.052 | 0.064 |
| all | -0.451 ± 0.168 | 0.127 ± 0.179 | 0.578 | 0.03 |

Results for Indoor Play: Cognitive Play with Trained Dyads (Changed Weights)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trained** | | | | |
| **CA** | **Pre** | **Post** | **Change** |  |
| CA1 | 0.338 ± 0.128 | 1.001 ± 0.126 | 0.663 | 0.006 |
| CA2 | 0.721 ± 0.194 | 1.005 ± 0.177 | 0.2284 | 0.406 |
| CA3 | -0.131 ± 0.114 | 0.166 ± 0.085 | 0.298 | 0.09 |
| CA5 | 2.158 ± 0.148 | 2.09 ± 0.171 | -0.068 | 0.79 |
| all | 0.771 ± 0.146 | 1.066 ± 0.14 | 0.294 | 0.62 |

**A graph of a graph showing the same number of people

Description automatically generated with medium confidence**

A graph of different weights

Description automatically generated

A graph of a graph with numbers

Description automatically generated with medium confidence

**A graph with numbers and lines

Description automatically generated with medium confidence**

**APPENDIX:**

APPENDIX 1: Green markers to symbolise statistical significance.

**A graph with green and black lines

Description automatically generated**

APPENDIX 2: Black background graph

A graph with colorful dots and lines

Description automatically generated