**Appendix E: Outcome of the statistical tests**

1. **Frequency table of statements crossed with participants occupation**

Table E.1: Occurrences of statements x occupation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Occupation | | | |
| Statement | Role: | Cooperative | | Wholesaler | |
| # | % | # | % |
| 1. The simulated scenario is similar to a trade scenario in real life | *Yes* | 7 | 70.0 | 7 | 87.5 |
| *No* | 3 | 30.0 | 1 | 12.5 |
| 1. The data presented in the simulation is similar as data in reality | *Yes* | 10 | 100.0 | 8 | 100.0 |
| *No* | 0 | 0 | 0 | 0 |
| 1. The options in the trade model work similar as in reality | *Yes* | 10 | 100.0 | 4 | 50.0 |
| *No* | 0 | 0 | 4 | 50.0 |
| 1. All trade options used in reality are present in the gaming simulation | *Yes* | 10 | 100.0 | 5 | 62.5 |
| *No* | 0 | 0 | 3 | 37.5 |
| 1. All decision parameters used in reality are present in the gaming simulation | *Yes* | 5 | 55.6 | 4 | 57.1 |
| *No* | 4 | 44.4 | 3 | 42.9 |
| 1. The representation of the data is sufficient for a realistic role fulfilment | *Yes* | 10 | 100.0 | 6 | 85.7 |
| *No* | 0 | 0 | 1 | 14.3 |
| 1. The trade model in the simulation is sufficiently realistic for the role fulfilment | *Yes* | 8 | 80.0 | 8 | 100.0 |
| *No* | 2 | 20.0 | 0 | 0 |
| 1. Information can be used in the same way as the information in reality | *Yes* | 9 | 100.0 | 6 | 75.0 |
| *No* | 0 | 0 | 2 | 25.0 |
| 1. The information for the role of cooperative was complete | *Yes* | 10 | 100.0 | 2 | 25.0 |
| *No* | 0 | 0 | 6 | 75.0 |
| 1. The information for the role of wholesaler was complete | *Yes* | 10 | 100.0 | 8 | 100.0 |
| *No* | 0 | 0 | 0 | 0 |
| 1. The experience in the simulation session felt like a normal working environment | *Yes* | 5 | 50.0 | 5 | 62.5 |
| *No* | 5 | 50.0 | 3 | 37.5 |
| 1. The biddings appeared to be realistic | *Yes* | 10 | 100.0 | 8 | 100.0 |
| *No* | 0 | 0 | 0 | 0 |
| 1. The simulation contains the necessary functionalities to perform trade tasks in the gaming simulation | *Yes* | 4 | 40.0 | 8 | 100.0 |
| *No* | 6 | 60.0 | 0 | 0 |
| 1. This simulation can be a precursor for a digital trading platform | *Yes* | 6 | 60.0 | 4 | 50.0 |
| *No* | 4 | 40.0 | 4 | 50.0 |
| 1. This simulation can be used to train employees | *Yes* | 4 | 100.0 | 8 | 100.0 |
| *No* | 0 | 0 | 0 | 0 |
| 1. The instruction round matched the simulated scenarios | *Yes* | 9 | 90.0 | 5 | 62.5 |
| *No* | 1 | 10.0 | 3 | 37.5 |
| 1. The online instruction round supported the participants' understanding of the simulation | *Yes* | 6 | 100.0 | 8 | 100.0 |
| *No* | 0 | 0 | 0 | 0 |

1. **Results of the Fisher’s Exact test**

The results of the Fisher’s Exact test are presented with a one and two sided significance for occupation x statement and role x statement. Significant outcomes are marked with an asterisk.

Table E.2: Statistical analysis of the relation between occupation and statement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fisher's Exact test (cooperative/wholesaler) | Occupation | | | Role | |
| Statement | sign. 2-sided | sign. 1-sided | sign. 2-sided | | sign. 1-sided |
| 1. The simulated scenario is similar to a trade scenario in real life | 0.588 | 0.382 | 1.000 | | 0.712 |
| 1. The options in the trade model work similar as in reality | 0.023 | 0.023\* | 1.000 | | 0.712 |
| 1. All trade options used in reality are present in the gaming simulation | 0.069 | 0.069\*\* | 1.000 | | 0.500 |
| 1. All decision parameters used in reality are present in the gaming simulation | 1.000 | 0.581 | 1.000 | | 0.601 |
| 1. The representation of the data is sufficient for a realistic role fulfilment | 0.412 | 0.412 | 1.000 | | 0.529 |
| 1. The trade model in the simulation is sufficiently realistic for the role fulfilment | 0.477 | 0.294 | 1.000 | | 0.765 |
| 1. Information can be used in the same way as the information in reality | 0.206 | 0.206 | 0.206 | | 0.206 |
| 1. The information for the role of cooperative was complete | 0.002 | 0.002\* | 0.620 | | 0.310 |
| 1. The experience in the simulation session felt like a normal working environment | 0.664 | 0.480 | 1.000 | | 0.681 |
| 1. The simulation contains the necessary functionalities to perform trade tasks in the gaming simulation | 0.013 | 0.011\* | 1.000 | | 0.690 |
| 1. This simulation can be precursor for a digital trading platform | 1.000 | 0.520 | 0.637 | | 0.319 |
| 1. The instruction round matched the simulated scenarios | 0.275 | 0.206 | 0.576 | | 0.288 |

\* significant at 95% confidence interval, \*\* significant at 90% confidence interval

1. **Standardized and adjusted residuals for each statement x occupation**

There are no residuals calculated for the statements 2, 10, 12, 15 and 17, because the outcome was unanimous. The statements 3, 4, 9 and 13 are marked with an asterisk to indicate a significant outcome, which means that the possibility of confounding in the residuals is present.

Table E.3: Residual analyses of the statements x occupation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Occupation | | | |
| Statement | Residual: | Cooperative | | Wholesaler | |
|  |  | Yes | No | Yes | No |
| 1. The simulated scenario is similar to a trade scenario in real life | *Standardized* | -0.3 | 0.5 | 0.3 | -0.6 |
| *Adjusted* | -0.9 | 0.9 | 0.9 | -0.9 |
| 1. The options in the trade model work similar as in reality | *Standardized* | 0.8 | -1.5 | -0.9 | 1.7 |
| *Adjusted\** | 2.5 | -2.5 | -2.5 | 2.5 |
| 1. All trade options used in reality are present in the gaming simulation | *Standardized* | 0.6 | -1.3 | -0.6 | 1.4 |
| *Adjusted\** | 2.1 | -2.1 | -2.1 | 2.1 |
| 1. All decision parameters used in reality are present in the gaming simulation | *Standardized* | 0 | 0 | 0 | 0 |
| *Adjusted* | -0.1 | 0.1 | 0.1 | -0.1 |
| 1. The representation of the data is sufficient for a realistic role fulfilment | *Standardized* | 0.2 | -0.8 | -0.2 | 0.9 |
| *Adjusted* | 1.2 | -1.2 | -1.2 | 1.2 |
| 1. The trade model in the simulation is sufficiently realistic for the role fulfilment | *Standardized* | -0.3 | 0.8 | 0.3 | -0.9 |
| *Adjusted* | -1.3 | 1.3 | 1.3 | -1.3 |
| 1. Information can be used in the same way as the information in reality | *Standardized* | 0.4 | -1.0 | -0.4 | 1.1 |
| *Adjusted* | 1.6 | -1.6 | -1.6 | 1.6 |
| 1. The information for the role of cooperative was complete | *Standardized* | 1.3 | -1.8 | -1.4 | 2.0 |
| *Adjusted\** | 3.4 | -3.4 | -3.4 | 3.4 |
| 1. The experience in the simulation session felt like a normal working environment | *Standardized* | -0.2 | 0.3 | 0.3 | -0.3 |
| *Adjusted* | -0.5 | 0.5 | 0.5 | -0.5 |
| 1. The simulation contains the necessary functionalities to perform trade tasks in the gaming simulation | *Standardized* | -1.0 | 1.5 | 1.2 | -1.6 |
| *Adjusted\** | -2.7 | 2.7 | 2.7 | -2.7 |
| 1. This simulation can be a precursor for a digital trading platform | *Standardized* | 0.2 | -0.2 | -0.2 | 0.2 |
| *Adjusted* | 0.4 | -0.4 | -0.4 | 0.4 |
| 1. The instruction round matched the simulated scenarios | *Standardized* | 0.4 | -0.8 | -0.5 | 0.9 |
| *Adjusted* | 1.4 | -1.4 | -1.4 | 1.4 |

1. **Association between Occupation and perceived reduction/abstraction**

Statistical estimations showed a strong association (Cramers’ V) of 59.8% for statement 3, 79.1% for statement 9 and 63.2% for statement 13 with a 99% probability, and an association of 50% for statement 4 with 95% probability. The uncertainty coefficient indicated that knowing a participant’s occupation reduces error in predicting the response to each statement of 36.4% for statement 3, 27.5% for statement 4 , 58.4% for statement 9 and 39.7% for statement 13, all at a 99% confidence interval.

Table E.4: Association and conditional independence between occupation and statement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Cramer's V | | Uncertainty coefficient | | |
| Statement | value | p-value | | value | p-value |
| 1. The options in the trade model work similar as in reality | 0.598 | 0.011 | | 0.364 | 0.005 |
| 1. All trade options used in reality are present in the gaming simulation | 0.500 | 0.034 | | 0.275 | 0.018 |
| 1. The information for the role of cooperative was complete | 0.791 | 0.001 | | 0.584 | 0.000 |
| 1. The simulation contains the necessary functionalities to perform trade tasks in the gaming simulation | 0.632 | 0.007 | | 0.397 | 0.002 |

1. **Test for conditional independence**

Table E.5: Testing for absence or presence of confounding variables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tests of conditional independence: | Cochran's | | Mantel-Haenszel | |
| Statement | Chi² | p-value | Chi² | p-value |
| 1. The simulated scenario is similar to a trade scenario in real life | 0.788 | 0.375 | 0.095 | 0.758 |
| 1. The options in the trade model work similar as in reality | 6.429 | 0.011 | 3.647 | 0.056 |
| 1. All trade options used in reality are present in the gaming simulation | 4.500 | 0.034 | 2.083 | 0.149 |
| 1. All decision parameters used in reality are present in the gaming simulation | 0.004 | 0.949 | 0.185 | 0.667 |
| 1. The representation data is sufficient for a realistic role fulfilment | 1.518 | 0.218 | 0.032 | 0.858 |
| 1. The trade model in the simulation is sufficiently realistic for the role fulfilment | 1.800 | 0.180 | 0.325 | 0.568 |
| 1. Information can be used in the same way as the information in reality | 2.550 | 0.110 | 0.669 | 0.414 |
| 1. The information for the role of cooperative was complete | 11.250 | 0.001 | 7.677 | 0.006 |
| 1. The experience in the simulation session felt like a normal working environment | 0.281 | 0.596 | 0.003 | 0.959 |
| 1. The simulation contains the necessary functionalities to perform trade tasks in the gaming simulation | 7.200 | 0.007 | 4.489 | 0.034 |
| 1. This simulation can be a precursor for a digital trading platform | 0.180 | 0.671 | 0.003 | 0.959 |
| 1. The trial session matched the simulated scenarios | 1.945 | 0.163 | 0.641 | 0.423 |