# Appendix A: Literature review of virtual streamer livestreaming

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| --- | --- | --- | --- |
| **Author(s) (Year)** | **Research subject** | **Contents** | **Method** |
| Gao et al. (2023) | Virtual Streamer | Virtual streamer characteristics (i.e., likability, animacy, responsiveness) →purchase intention | Questionnaire survey |
| Hu & Ma (2023) | Virtual Streamer | Sensory language →purchase intention | Questionnaire survey |
| Ma et al. (2024) | Virtual Streamer | Presenter design (high vs low realistic) →purchase intention | Experiment |
| Wang et al. (2024) | Virtual Streamer | Integrity →purchase intention | Questionnaire survey & Experiment |
| Zhou et al. (2024) | Virtual Streamer | Emotional richness→visit intention | Questionnaire survey |
| **The current study** | Virtual Streamer | Language naturalness (i.e., text and voice) →user engagement | Econometric model |

# Appendix C: Correlation metric and descriptive statistics results

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| User engagement | 1\* |  |  |  |  |  |  |  |  |  |  |  |
| Text naturalness | -0.166\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |
| Voice naturalness | 0.175\*\*\* | -0.264\*\*\* | 1 |  |  |  |  |  |  |  |  |  |
| Appearance | 0.249\*\*\* | -0.406\*\*\* | 0.208\*\*\* | 1 |  |  |  |  |  |  |  |  |
| Followers | 0.134\*\*\* | 0.107\*\* | -0.195\*\*\* | -0.142\*\*\* | 1 |  |  |  |  |  |  |  |
| Merchant rating | -0.058 | -0.117\*\* | 0.109\*\* | 0.099\* | -0.415\*\*\* | 1 |  |  |  |  |  |  |
| Service rating | 0.013 | 0.091\* | -0.015 | -0.06 | 0.313\*\*\* | 0.067 | 1 |  |  |  |  |  |
| Duration | 0.009 | -0.035 | 0.123\*\* | 0.007 | -0.323\*\*\* | 0.074 | -0.270\*\*\* | 1 |  |  |  |  |
| Product quantity | 0.184\*\*\* | -0.158\*\*\* | 0.145\*\*\* | 0.091\* | 0.422\*\*\* | -0.203\*\*\* | 0.046 | 0.01 | 1 |  |  |  |
| Weekend | 0.079 | -0.106\*\* | 0.324\*\*\* | 0.373\*\*\* | -0.125\*\* | 0.068 | 0.049 | 0.073 | 0.132\*\*\* | 1 |  |  |
| Subtitles | -0.092\* | 0.237\*\*\* | -0.151\*\*\* | -0.352\*\*\* | 0.082 | -0.011 | 0.049 | 0.003 | -0.033 | -0.220\*\*\* | 1 |  |
| Background music | -0.01 | 0.127\*\* | -0.053 | -0.133\*\*\* | -0.033 | 0.046 | 0.01 | 0.033 | -0.079 | -0.090\* | 0.402\*\*\* | 1 |

Notes: \*\*\* represents p < 0.01; \*\* represents p < 0.05; \* represents p < 0.10. Sample size – 394.

# Appendix D: The results of heterogeneous effects

**Table** **D.1** **The results of different types of price**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low price** | **Low price** | **High price** | **High price** |
| Text naturalness | -1.182 | -3.380\*\* | -1.615\*\* | -2.040\*\*\* |
| Voice naturalness | -0.047 | -1.662\* | 1.434\*\* | -0.725 |
| Appearance |  | 0.105 |  | -0.135 |
| Text naturalness\* Appearance |  | 3.609\* |  | 2.346\* |
| Voice naturalness\* Appearance |  | 1.807\* |  | 2.643\*\*\* |
| Controls | Included | Included | Included | Included |
| Constant | 6.941\*\* | 6.471\*\* | -3.737\* | -6.386\*\*\* |
| Observations | 184 | 184 | 210 | 210 |

Note: \*\*\* represents *p* < 0.01; \*\* represents *p* < 0.05; \* represents *p* < 0.10

**Table D.2 The results of different types of the brand**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Niche brand** | **Niche brand** | **Famous brand** | **Famous brand** |
| Text naturalness | -2.303\*\* | -3.477\*\* | -0.593 | -1.174 |
| Voice naturalness | 2.013\*\*\* | -2.225\*\* | -0.860 | 0.032 |
| Appearance |  | -1.340 |  | 1.514\*\* |
| Text naturalness\* Appearance |  | 3.594\* |  | 1.345 |
| Voice naturalness\* Appearance |  | 4.268\*\*\* |  | -0.848 |
| Controls | Included | Included | Included | Included |
| Constant | 6.677\*\*\* | 6.693\*\* | -5.510\* | -2.421 |
| Observations | 196 | 196 | 198 | 198 |

Note: \*\*\* represents *p* < 0.01; \*\* represents *p* < 0.05; \* represents *p* < 0.10

**Table D.3 The results of different genders**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Female voice** | **Female voice** | **Male voice** | **Male voice** |
| Text naturalness | -1.204\* | -1.844\*\* | -1.733 | -4.722\*\*\* |
| Voice naturalness | 1.096\* | -0.595 | 0.267 | -4.089\*\*\* |
| Appearance |  | 0.544 |  | -1.508 |
| Text naturalness\* Appearance |  | 2.095\* |  | 4.845\*\* |
| Voice naturalness\* Appearance |  | 2.059\*\* |  | 4.849\*\*\* |
| Controls | Included | Included | Included | Included |
| Constant | 5.368\*\* | 5.595\*\* | -5.200\* | -5.675\*\* |
| Observations | 332 | 332 | 62 | 62 |

Note: \*\*\* represents *p* < 0.01; \*\* represents *p* < 0.05; \* represents *p* < 0.10

**Table D.4 The results of different types of product**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Search products** | **Search products** | **Experience products** | **Experience products** |
| Text naturalness | -0.017 | -3.584\*\* | -1.945\*\* | -2.661\*\* |
| Voice naturalness | 0.053 | -2.977\*\* | 1.247\* | -1.049 |
| Appearance |  | -0.004 |  | -0.183 |
| Text naturalness\* Appearance |  | 3.847\* |  | 2.670\* |
| Voice naturalness\* Appearance |  | 2.389 |  | 2.785\*\*\* |
| Controls | Included | Included | Included | Included |
| Constant | 5.065\* | 6.266\* | 4.568\* | 4.884\* |
| Observations | 106 | 106 | 288 | 288 |

Note: \*\*\* represents *p* < 0.01; \*\* represents *p* < 0.05; \* represents *p* < 0.10