

**Analysis Report**

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SAMPLE REPORT - Rafael Data Analysis Portfolio

### **Attention Check and Manipulation Checks**

From the total of 108 individuals on the Camera group, 91 passed the attention check. In the Speaker group, 91 from 105 individuals did the same. The final sample size, excluding respondents who have not qualified was 182 individuals.

The first manipulation check tested if respondents on the humour group perceived the interactions differently than the non-humour group. The table below shows the mean scores for each condition.

#### *Group Statistics*

	Presence of Humor	N	Mean	Std. Deviation	Std. Error Mean
I perceive the conversation between the smart home device and it's user as... - Humorous	With Humor	125	4.616	1.570	.140
	No Humor	57	3.456	1.582	.210
I perceive the conversation between the smart home device and it's user as... - Funny	With Humor	125	4.408	1.647	.147
	No Humor	57	3.404	1.591	.211
I perceive the conversation between the smart home device and it's user as... - Amusing	With Humor	125	4.568	1.573	.141
	No Humor	57	3.877	1.722	.228
I perceive the conversation between the smart home device and it's user as... - Serious	With Humor	125	4.240	1.775	.159
	No Humor	57	3.105	1.385	.183

Respondents of the Humor group have found the interactions more Humorous, Funny and Amusing than the ones on the non-Humor group. All these differences were tested using T-tests and were significant ( $p < 0.01$ ). The table below shows these results.

### Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
I perceive the conversation between the smart home device and it's user as... - Humorous	Equal variances assumed	4.612	180	.000	1.160	.251
I perceive the conversation between the smart home device and it's user as... - Funny	Equal variances assumed	3.857	180	.000	1.004	.260
I perceive the conversation between the smart home device and it's user as... - Amusing	Equal variances assumed	2.667	180	.008	.691	.259
I perceive the conversation between the smart home device and it's user as... - Serious	Equal variances assumed	4.268	180	.000	1.135	.266

A second test was performed to see if the perception of the conversation as benevolent or sarcastic was different between groups subject to different types of humor. The Aggressive humor group perceived the content as more sarcastic, but the difference was not significant at the standard 5% significance level,  $t(123) = -1.705$ ,  $p = 0.091$ .

### Group Statistics

	Type of Humor	N	Mean	Std. Deviation	Std. Error Mean
I perceive the conversation between the smart home device and it's user as...	Affiliative	58	3.830	1.340	.176
	Aggressive	67	4.250	1.439	.176

### Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
I perceive the conversation between the smart home device and it's user as...	Equal variances assumed	-1.705	123	.091	-.426	.250

A third test checked if respondents of the Camera group perceived the device's objective as security (higher end of the scale) to a higher extent than the Speaker group, which was expected to perceive it as for 'entertainment' (lower end of the scale). A one-sample T-test was applied on both groups to test if the mean scores are significantly different than 4, which is the mid-point of the scale.

#### *One-Sample Statistics*

	N	Mean	Std. Deviation	Std. Error Mean
CheckFunction_Camera	91	5.835	1.454	.152
CheckFunction_Speaker	91	2.329	1.106	.115

The results were significant for the Camera group,  $t(90) = 12.032$ ,  $p < 0.001$  and the Speaker group,  $t(90) = -14.406$ ,  $p < 0.001$ , indicating that the check was successful.

### **3x2 Factorial ANOVA**

The analysis proceeded with the test of the influence of Device Type and Type of Humor on three dependent variables: Social Presence, Human-Like Trust and System-Like Trust. Two different models were tested for each DV: one testing the effect of the groups and a second adding four different covariates.

Before running the models, the distribution of the variables was checked using skewness and kurtosis, which were all within the -1.5 and +1.5 range, thus indicating no substantial depart from normality.

#### *Descriptive Statistics*

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Social Presence	183	4.510	1.236	-.851	.180	1.387	.357
Human-Like Trust	183	4.934	1.072	-.582	.180	1.033	.357
System-Like trust	183	4.826	1.060	-.335	.180	.852	.357
Valid N (listwise)	183						

The first two models tested the effect of the variables on Social Presence (table below). Variances were equal between groups according to Levene's tests ( $p > 0.05$ ).

#### *Tests of Between-Subjects Effects*

Dependent Variable: Social Presence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
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Corrected Model	6.575 <sup>a</sup>	5	1.315	.855	.513	.024
Intercept	3649.817	1	3649.817	2373.779	.000	.931
DeviceType	2.834	1	2.834	1.843	.176	.010
HumorType	2.670	2	1.335	.868	.422	.010
DeviceType *	.802	2	.401	.261	.771	.003
HumorType						
Error	270.610	176	1.538			
Total	3969.438	182				
Corrected Total	277.184	181				

a. R Squared = .024 (Adjusted R Squared = -.004)

#### Tests of Between-Subjects Effects

Dependent Variable: Social Presence

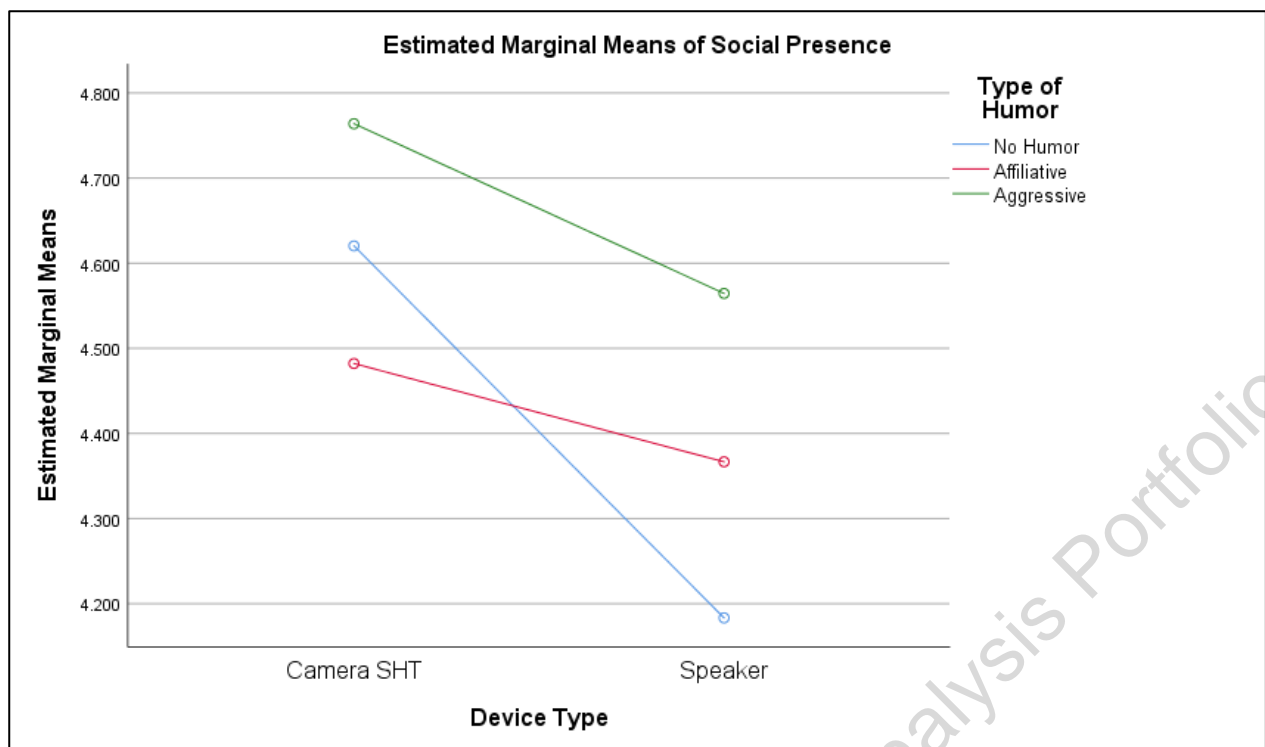
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	155.703 <sup>a</sup>	9	17.300	24.495	.000	.562
Intercept	41.882	1	41.882	59.298	.000	.256
Perceived_Enjoyment	13.060	1	13.060	18.491	.000	.097
Perceived_Similarity	9.823	1	9.823	13.908	.000	.075
Usage_Intention	.943	1	.943	1.335	.249	.008
Person_Relevance	.006	1	.006	.009	.927	.000
DeviceType	.343	1	.343	.486	.487	.003
HumorType	1.173	2	.586	.830	.438	.010
DeviceType *	.200	2	.100	.142	.868	.002
HumorType						
Error	121.482	172	.706			
Total	3969.438	182				
Corrected Total	277.184	181				

a. R Squared = .562 (Adjusted R Squared = .539)

No significant main effects of Device Type ( $F(1, 176) = 1.843, p = .176$ ) or Humor Type ( $F(2, 176) = .868, p = .422$ ) were found. The interaction effect between Device Type and Humor Type was also non-significant ( $F(2, 176) = .261, p = .771$ ).

The second model, incorporating covariates such as Perceived Enjoyment and Perceived Similarity, demonstrated a significant corrected model with a substantial effect size (R Squared = .562). Notably, Perceived Enjoyment emerged as a significant predictor of Social Presence ( $F(1, 172) = 18.491, p = .000$ ), as well as Perceived Similarity. Humor Type and Device Type still showed non-significant effects.

The graph below shows the mean scores of Social Presence for different levels of Device Type and humor Type.



The second pair of models tested the influence on Human-Like Trust. Groups showed equal variances on these models too ( $p > 0.05$ ).

#### Tests of Between-Subjects Effects

Dependent Variable: Human-Like Trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11.503 <sup>a</sup>	5	2.301	2.056	.073	.055
Intercept	4393.300	1	4393.300	3927.052	.000	.957
DeviceType	8.410	1	8.410	7.517	.007	.041
HumorType	3.184	2	1.592	1.423	.244	.016
DeviceType * HumorType	.167	2	.084	.075	.928	.001
Error	196.896	176	1.119			
Total	4631.519	182				
Corrected Total	208.399	181				

a. R Squared = ,055 (Adjusted R Squared = ,028)

#### Tests of Between-Subjects Effects

Dependent Variable: Human-Like Trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	104.581 <sup>a</sup>	9	11.620	19.252	.000	.502

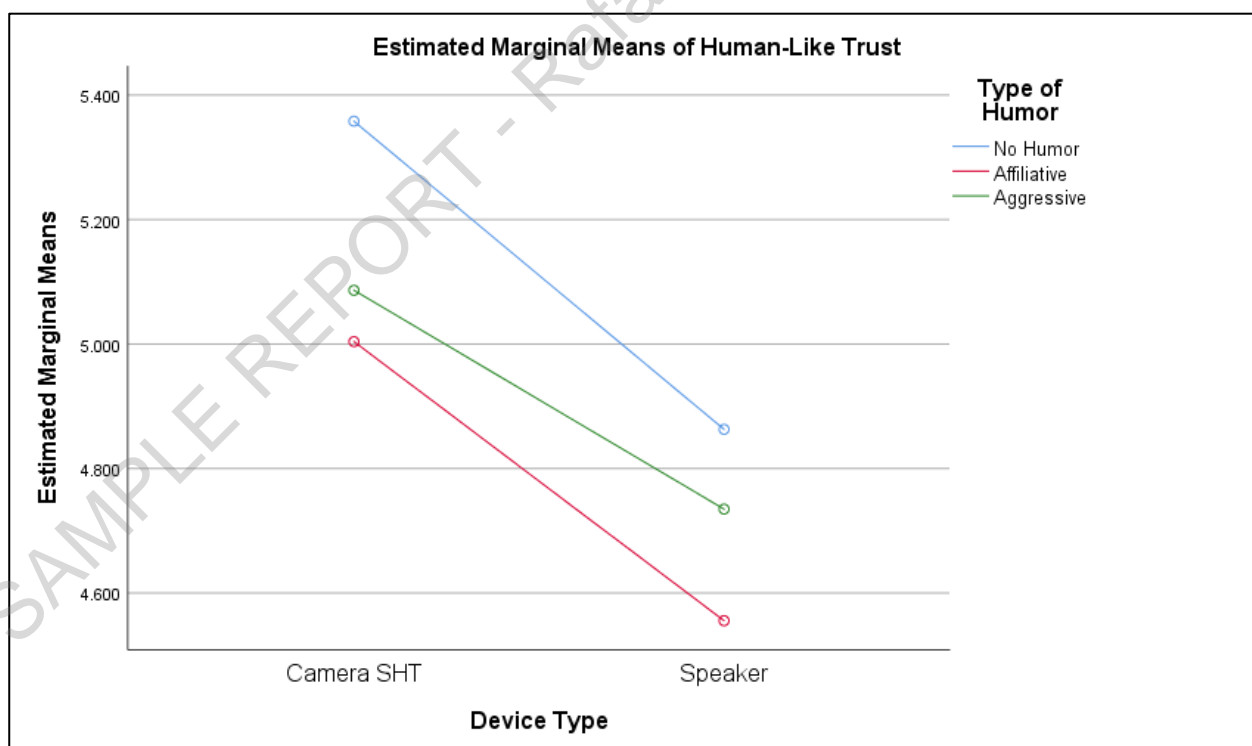
Intercept	106.138	1	106.138	175.844	.000	.506
Perceived_Enjoyment	13.761	1	13.761	22.798	.000	.117
Perceived_Similarity	1.747	1	1.747	2.894	.091	.017
Usage_Intention	.027	1	.027	.045	.833	.000
Person_Relevance	.538	1	.538	.891	.347	.005
DeviceType	4.046	1	4.046	6.704	.010	.038
HumorType	2.151	2	1.076	1.782	.171	.020
DeviceType *	.137	2	.068	.113	.893	.001
HumorType						
Error	103.818	172	.604			
Total	4631.519	182				
Corrected Total	208.399	181				

a. R Squared = ,502 (Adjusted R Squared = ,476)

The analysis of Human-Like Trust indicated a significant main effect of Device Type ( $F(1, 176) = 7.517, p = .007$ ) and non-significant effects for Humor Type and the interaction term.

In the extended model with additional covariates, the corrected model was significant with a considerable effect size (R Squared = .502). Here, Perceived Enjoyment again played a significant role ( $F(1, 172) = 22.798, p = .000$ ).

The graph below shows the mean scores of Human-Like trust for different levels of Device Type and humor Type.



The third pair of models tested the influence on System-Like Trust, also with equal variances ( $p > 0.05$ ).

*Tests of Between-Subjects Effects*

Dependent Variable: System-Like trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7.555 <sup>a</sup>	5	1.511	1.352	.245	.037
Intercept	4193.246	1	4193.246	3752.048	.000	.955
DeviceType	3.650	1	3.650	3.266	.072	.018
HumorType	3.051	2	1.525	1.365	.258	.015
DeviceType *	.629	2	.314	.281	.755	.003
HumorType						
Error	196.696	176	1.118			
Total	4439.877	182				
Corrected Total	204.250	181				

a. R Squared = .037 (Adjusted R Squared = .010)

*Tests of Between-Subjects Effects*

Dependent Variable: System-Like trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	104.350 <sup>a</sup>	9	11.594	19.962	.000	.511
Intercept	96.321	1	96.321	165.837	.000	.491
Perceived_Enjoyment	3.795	1	3.795	6.533	.011	.037
Perceived_Similarity	3.596	1	3.596	6.192	.014	.035
Usage_Intention	2.669	1	2.669	4.596	.033	.026
Person_Relevance	.537	1	.537	.924	.338	.005
DeviceType	.713	1	.713	1.227	.269	.007
HumorType	.896	2	.448	.771	.464	.009
DeviceType *	1.452	2	.726	1.250	.289	.014
HumorType						
Error	99.900	172	.581			
Total	4439.877	182				
Corrected Total	204.250	181				

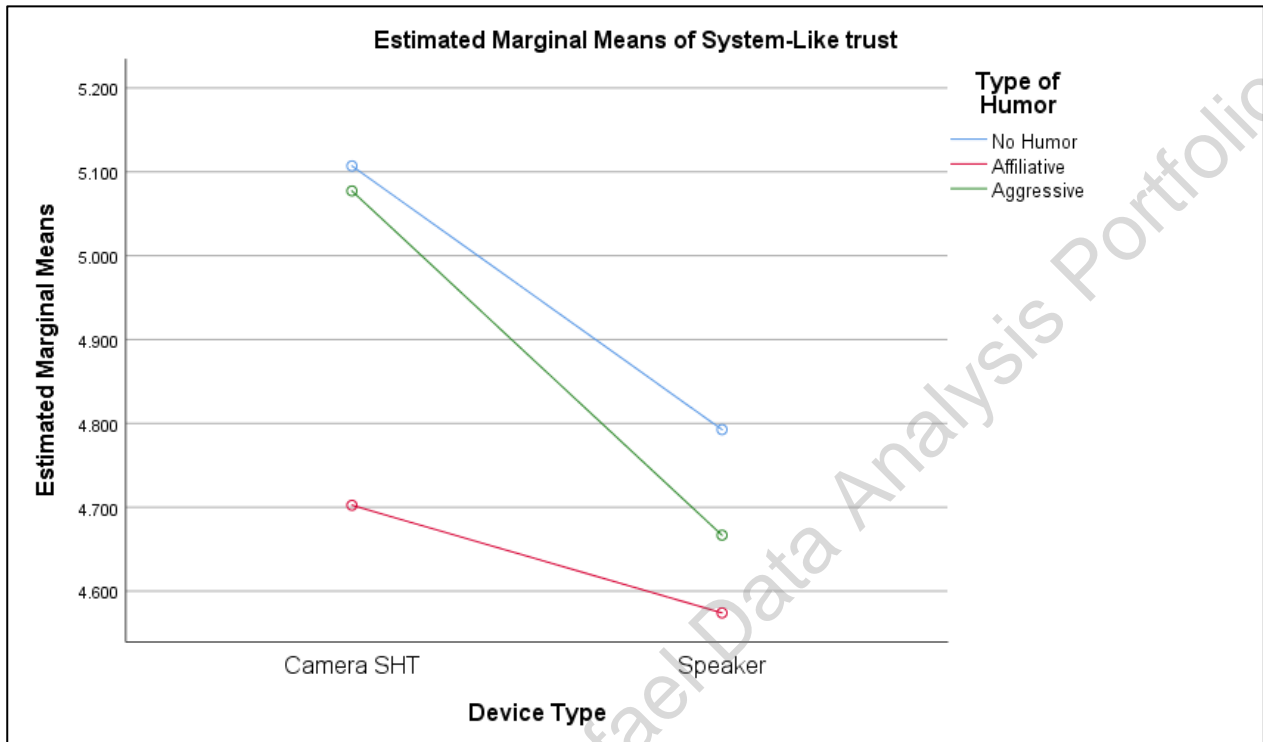
a. R Squared = .511 (Adjusted R Squared = .485)

For System-Like Trust, the initial model did not reveal any significant effects of Device Type, Humor Type, or their interaction.



The comprehensive model, including Perceived Enjoyment and other covariates, showed a significant corrected model ( $R^2 = .511$ ). Among the covariates, Perceived Enjoyment ( $F(1, 172) = 6.533$ ,  $p = .011$ ) and Perceived Similarity ( $F(1, 172) = 6.192$ ,  $p = .014$ ) were significant predictors.

The graph below shows the mean scores of System-Like trust for different levels of Device Type and humor Type.



These findings indicate the importance of perceived enjoyment and similarity in influencing Social Presence and Trust. The models suggest that these factors may play a more substantial role than the type of device or humor in shaping users' perceptions and trust towards systems. The lack of significant interaction effects suggests that the impact of device and humor types may not vary substantially across different combinations of these factors.

The same models were executed as a 2x2 factorial ANOVAs, without the differentiation of type of humor, but comparing humor vs no humor only. The results were not different from the 3x2 factorial ANOVAs reported above.

Finally, a simple one-way ANOVA was conducted testing the effect of Humor Type on the dependent variables, regardless of Device. Results were not significant ( $p > 0.05$ ).

Finally, Independent-Samples T-tests checked if device type has an effect on the DVs, regardless of humor. The results were non-significant for Social presence and System-Like Trust. For Human-Like Trust, the test was significant,  $t(180) = 2.710$ ,  $p = 0.007$ , suggesting that trust is higher for the Camera device ( $M = 4.970$ ) compared to the speaker ( $M = 4.678$ ).