Data Science Department
Survey Methodology

Team 6

SURVEY METHODOLOGY

Phase 4: Reliability and Validity “SPSS Tests”

ABSTRACT

Reliability and validity are fundamental concepts in research. Reliability pertains to measurement consistency, while validity concerns the accuracy of capturing the intended construct.

Introduction for Validity

Validity refers to the accuracy of a measurement in capturing the intended construct. Total validity assesses the overall strength of a measurement instrument by considering various aspects of validity, such as content validity.

Content validity

It assesses whether a measure adequately represents the content domain of the construct it intends to measure. It ensures that the items or questions in the measure are relevant, representative, and comprehensive. Content validity is established through expert judgment and review, ensuring that the measure captures the breadth and depth of the construct accurately using “Pearson Correlation Coefficient”.

Correlations

		Action	Adventure	Comedy	Drama	Romance	Horror	Sci-fi or Fantancy	Musical	Family	Ranking Movies Genres
Action	Pearson Correlation	1	.317*	.070	-.019	-.341*	.413**	.022	-.227	-.020	.413**
	Sig. (2-tailed)		.041	.660	.904	.027	.007	.890	.148	.901	.007
	N	42	42	42	42	42	42	42	42	42	42
Adventure	Pearson Correlation	.317*	1	-.103	-.056	-.265	.308*	.321*	.033	.033	.425**
	Sig. (2-tailed)	.041		.517	.727	.090	.047	.038	.836	.834	.005
	N	42	42	42	42	42	42	42	42	42	42
Comedy	Pearson Correlation	.070	-.103	1	.276	.356*	-.222	.255	.111	.136	.538**
	Sig. (2-tailed)	.660	.517		.077	.021	.157	.104	.484	.389	<.001
	N	42	42	42	42	42	42	42	42	42	42
Drama	Pearson Correlation	-.019	-.056	.276	1	.497**	-.067	.353*	-.358*	.022	.462**
	Sig. (2-tailed)	.904	.727	.077		<.001	.674	.022	.020	.892	.002
	N	42	42	42	42	42	42	42	42	42	42
Romance	Pearson Correlation	-.341*	-.265	.356*	.497**	1	-.295	.190	-.088	-.057	.269
	Sig. (2-tailed)	.027	.090	.021	<.001		.058	.227	.581	.719	.085
	N	42	42	42	42	42	42	42	42	42	42
Horror	Pearson Correlation	.413**	.308*	-.222	-.067	-.295	1	.015	-.351*	-.316*	.215
	Sig. (2-tailed)	.007	.047	.157	.674	.058		.923	.023	.042	.172
	N	42	42	42	42	42	42	42	42	42	42
Sci-fi or Fantancy	Pearson Correlation	.022	.321*	.255	.353*	.190	.015	1	.114	.076	.660**
	Sig. (2-tailed)	.890	.038	.104	.022	.227	.923		.473	.630	<.001
	N	42	42	42	42	42	42	42	42	42	42
Musical	Pearson Correlation	-.227	.033	.111	-.358*	-.088	-.351*	.114	1	.438**	.148
	Sig. (2-tailed)	.148	.836	.484	.020	.581	.023	.473		.004	.350
	N	42	42	42	42	42	42	42	42	42	42
Family	Pearson Correlation	-.020	.033	.136	.022	-.057	-.316*	.076	.438**	1	.335*
	Sig. (2-tailed)	.901	.834	.389	.892	.719	.042	.630	.004		.030
	N	42	42	42	42	42	42	42	42	42	42
Ranking Movies Genres	Pearson Correlation	.413**	.425**	.538**	.462**	.269	.215	.660**	.148	.335*	1
	Sig. (2-tailed)	.007	.005	<.001	.002	.085	.172	<.001	.350	.030	
	N	42	42	42	42	42	42	42	42	42	42

*. Correlation is significant at the 0.05 level (2-tailed).

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Introduction for Reliability

Reliability, in the context of research and measurement, refers to the consistency, stability, and dependability of a measurement instrument or scale. It is the extent to which a measurement tool consistently measures what it is intended to measure and produces consistent results over time or across different conditions.

Reliability is crucial in research because if a measure or scale is unreliable, it introduces random error and reduces the accuracy and precision of the measurements. In other words, unreliable measures can produce inconsistent or erratic results, making it difficult to draw meaningful conclusions or make reliable predictions based on the data.

There are different types of reliability tests that researchers always consider, so we have chosen two of the most important reliability test methods to calculate them using **``SPSS Statistics``:**

1. **Test-Retest Reliability**
2. **Internal Consistency Reliability**

SPSS (Statistical Package for the Social Sciences): is a software program widely used for statistical analysis and data management. It provides a comprehensive set of tools and functions for researchers, social scientists, and data analysts to analyze data, generate reports, and conduct statistical tests.

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1. **Test-Retest Reliability:** This refers to the consistency of measurements when the same test or measure is administered to the same individuals at two different points in time. It assesses the stability of the measurement over time.

First: we identified our variables, and we used FOUR Features to calculate the reliability of our data.

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Student_ID	Numeric	14	0	Student ID	None	None	15	Center	Nominal	Input
2	Student_Age	Numeric	2	0	Student Age	None	None	13	Center	Scale	Input
3	R11	Numeric	8	0	Action	{1, Least Fav...	None	9	Center	Ordinal	Input
4	R12	Numeric	8	0	Adventure	{1, Least Fav...	None	9	Center	Ordinal	Input
5	R13	Numeric	8	0	Comedy	{1, Least Fav...	None	9	Center	Ordinal	Input
6	R14	Numeric	8	0	Drama	{1, Least Fav...	None	9	Center	Ordinal	Input
7	R15	Numeric	8	0	Romance	{1, Least Fav...	None	9	Center	Ordinal	Input
8	R16	Numeric	8	0	Horror	{1, Least Fav...	None	9	Center	Ordinal	Input
9	R17	Numeric	8	0	Sci-fi or Fantancy	{1, Least Fav...	None	9	Center	Ordinal	Input
10	R18	Numeric	8	0	Musical	{1, Least Fav...	None	9	Center	Ordinal	Input
11	R19	Numeric	8	0	Family	{1, Least Fav...	None	9	Center	Ordinal	Input
12	R1	Numeric	8	0	Ranking Movies Genres	None	None	8	Center	Ordinal	Input
13	R21	Numeric	8	0	Cast	{1, Least Fav...	None	6	Center	Ordinal	Input
14	R22	Numeric	8	0	Genre	{1, Least Fav...	None	6	Center	Ordinal	Input
15	R23	Numeric	8	0	Director	{1, Least Fav...	None	6	Center	Ordinal	Input
16	R24	Numeric	8	0	Studio	{1, Least Fav...	None	6	Center	Ordinal	Input
17	R25	Numeric	8	0	Reviews	{1, Least Fav...	None	6	Center	Ordinal	Input
18	R26	Numeric	8	0	Quality of Story	{1, Least Fav...	None	6	Center	Ordinal	Input
19	R2	Numeric	8	0	Ranking the Factors Deciding Movies	None	None	8	Center	Ordinal	Input
20	Reasearching_Movies_Before_Watching	Numeric	8	0	Do you research movies before watching them?	{0, No}...	None	20	Center	Ordinal	Input
21	Where_You_Watch_Movies	Numeric	8	0	Where do you usually watch movies?	{1, Home}...	None	14	Right	Ordinal	Input
22	TOTAL	Numeric	40	0	Total	None	None	8	Center	Ordinal	Input

Second: After identifying the variables we went to the data view interface to assign the individuals responses to make the analysis for our chosen features to calculate the reliability.

	Student_ID	Student_Age	R11	R12	R13	R14	R15	R16	R17	R18	R19	R1	R21	R22	R23	R24	R25	R26	R2	Reasearching_Movies_Before_Watching
1	20221451429	20	2	2	4	5	5	3	5	2	4	32	5	4	2	3	4	5	23	2
2	20221451429	20	2	2	5	5	5	3	5	2	3	32	4	4	3	4	5	5	25	2
3	20221509866	20	5	5	5	5	3	3	4	2	3	35	5	4	3	4	5	5	26	2
4	20221509866	20	5	4	5	4	3	3	3	2	3	32	5	4	3	4	5	4	25	2
5	20221445288	20	4	5	3	3	4	5	3	1	3	31	5	3	1	1	5	4	19	2
6	20221445288	20	4	5	3	3	4	5	3	2	3	32	4	4	2	2	4	5	21	2
7	20221451449	20	1	4	2	1	2	1	3	5	4	23	4	2	1	1	5	5	18	2
8	20221451449	20	4	4	2	2	2	1	1	5	4	25	4	4	1	1	5	5	20	2
9	20221462492	20	5	4	4	5	3	5	5	2	2	35	5	5	4	4	4	5	27	1
10	20221462492	20	5	4	4	5	3	5	5	2	2	35	5	4	3	3	4	5	24	1
11	20221320560	20	1	2	4	3	4	1	3	3	4	25	4	3	1	3	4	4	19	1
12	20221320560	20	1	3	5	4	5	1	3	3	2	27	5	4	3	3	4	5	24	1
13	20221379966	20	5	5	3	4	4	3	5	3	4	36	5	5	4	3	4	5	26	2
14	20221379966	20	5	5	3	4	4	3	5	3	4	36	5	5	4	3	4	5	26	2
15	20221461977	19	2	3	2	2	3	4	1	1	1	19	3	3	1	1	2	3	13	2
16	20221461977	19	2	4	3	3	4	5	1	1	1	24	3	4	1	1	3	5	17	2
17	20221469438	20	5	4	5	2	1	5	3	3	2	0	4	5	2	1	4	5	21	1
18	20221469438	20	5	4	5	2	1	5	4	3	2	31	4	5	2	1	4	5	21	1
19	20221452375	20	3	5	3	3	3	4	5	3	5	34	5	5	5	3	3	5	26	1
20	20221452375	20	3	5	3	3	3	4	5	4	5	34	5	5	5	3	3	5	26	1
21	20221385544	20	3	4	2	3	2	3	5	2	2	26	4	5	3	2	5	5	24	1
22	20221385544	20	3	5	2	3	2	3	5	2	2	27	4	5	3	2	3	5	22	1
23	6	20	2	2	2	3	4	1	2	4	3	23	4	3	4	3	3	5	22	0
24	6	20	4	4	3	3	4	2	4	4	3	31	1	4	1	1	1	5	13	0
25	20221060922	19	3	4	1	5	1	4	1	1	3	23	4	5	3	3	4	5	24	1
26	20221060922	19	4	4	1	5	1	3	4	1	4	27	4	5	3	2	4	5	23	1
27	20221452894	20	5	3	5	4	4	1	2	2	4	30	5	5	1	3	3	5	22	2
28	20221452894	20	5	3	5	3	3	1	3	2	5	30	5	5	2	2	4	5	23	2

And as we can see here that these columns are identifying our questions where they are:

1- Ranking of the movie genres.

Where this question is identified by R11 to R19 and their total in R1.

Second: Please rank Movies Genres

1 = Least Favorite *
5 = Most Favorite

	1	2	3	4	5
Action	○	○	○	○	○
Adventure	○	○	○	○	○
Comedy	○	○	○	○	○
Drama	○	○	○	○	○
Romance	○	○	○	○	○
Horror	○	○	○	○	○
Sci-fi or Fantasy	○	○	○	○	○
Musical	○	○	○	○	○
Family	○	○	○	○	○

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2- Ranking factors deciding movies.

Where this question is identified by R21 to R26 and their total in R2.

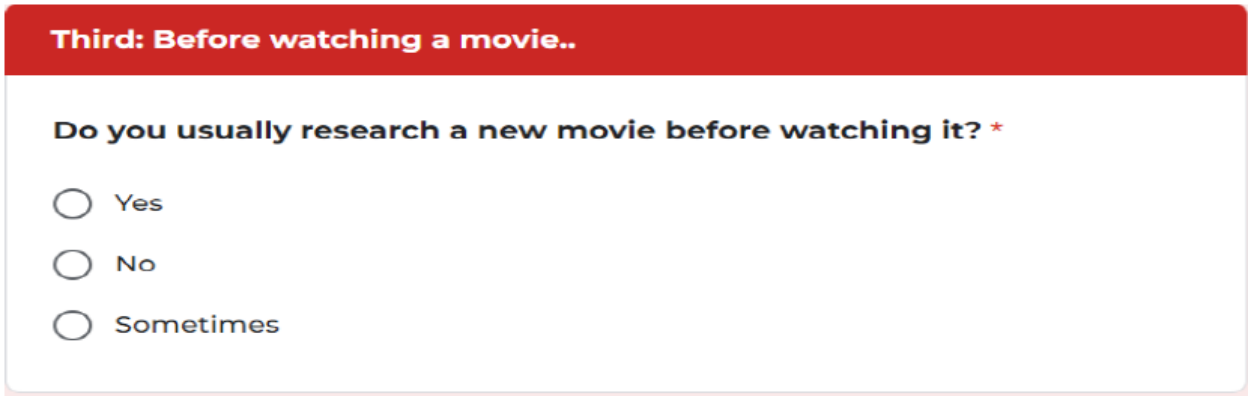
Fourth: Please rank the factors that you consider when deciding to see a movie.

1 = Least Important *
5 = Most Important

	1	2	3	4	5
Cast	○	○	○	○	○
Genre	○	○	○	○	○
Director	○	○	○	○	○
Studio	○	○	○	○	○
Reviews	○	○	○	○	○
Quality of Story	○	○	○	○	○

3- Do you research movies before watching them?

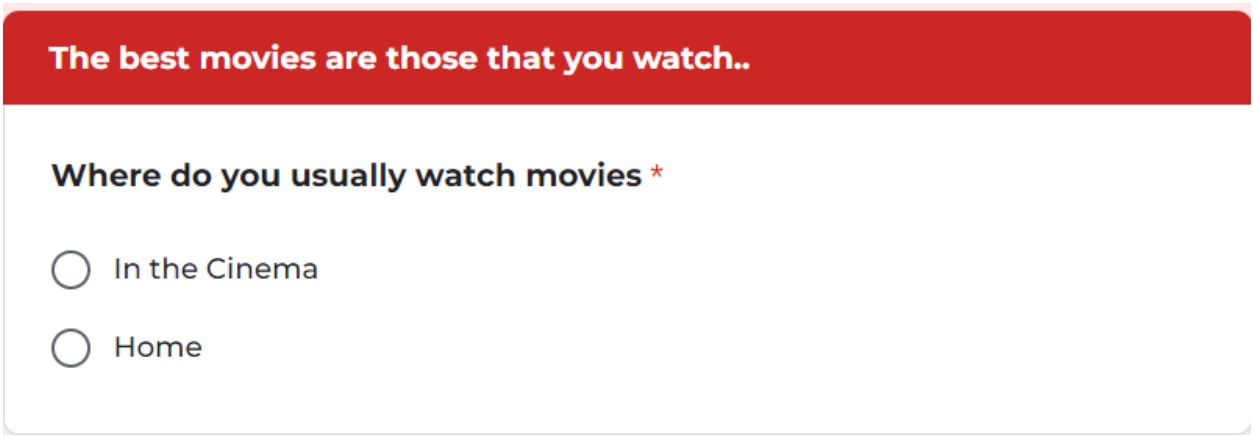
Where this question is identified by Researching_Movies_Before_Watching



4- Where do you usually watch movies?

Where this question is identified by Where_You_Watch_Movies

And the last column is the TOTAL column which identifies the total sum of the columns R1, R2, Researching_Movies_Before_Watching and Where_You_Watch_Movies



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Third: we go all the way to our last step which is calculating the reliability for our first testing method which is **Test-Retest Reliability:**

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	42	100.0
	Excluded[a]	0	.0
	Total	42	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.804	20

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Action	158.17	381.557	.434	.794
Adventure	157.57	396.885	.312	.800
Comedy	157.98	388.707	.378	.797
Drama	157.83	387.557	.454	.795
Romance	158.00	401.024	.128	.805
Horror	158.67	398.081	.143	.805
Sci-fi or Fantancy	157.69	377.585	.587	.790
Musical	159.10	409.942	-.042	.810
Family	158.60	397.515	.218	.802
Ranking Movies Genres	131.79	268.465	.853	.749
Cast	157.24	388.479	.561	.795
Genre	157.21	399.343	.260	.802
Director	158.90	377.259	.638	.789
Studio	158.98	383.097	.494	.793
Reviews	157.45	398.839	.261	.801
Quality of Story	156.62	403.607	.331	.803
Ranking the Factors Deciding Movies	139.02	309.243	.762	.763
Do you research movies before watching them?	160.12	408.742	.011	.806
Where do you usually watch movies?	160.31	407.536	.108	.805
Total	106.81	181.329	.999	.758

2. **Internal Consistency Reliability:** This measures the extent to which the items within a scale or measure are consistent and produce similar results. It is typically assessed using statistics such as **Cronbach's alpha.**

Reliability

[DataSet2]

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.814	20

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Action	158.17	381.557	.434	.794
Adventure	157.57	396.885	.312	.800
Comedy	157.98	388.707	.378	.797
Drama	157.83	387.557	.454	.795
Romance	158.00	401.024	.128	.805
Horror	158.67	398.081	.143	.805
Sci-fi or Fantancy	157.69	377.585	.587	.790
Musical	159.10	409.942	-.042	.810
Family	158.60	397.515	.218	.802
Ranking Movies Genres	131.79	268.465	.853	.749
Cast	157.24	388.479	.561	.795
Genre	157.21	399.343	.260	.802
Director	158.90	377.259	.638	.789
Studio	158.98	383.097	.494	.793
Reviews	157.45	398.839	.261	.801
Quality of Story	156.62	403.607	.331	.803
Ranking the Factors Deciding Movies	139.02	309.243	.762	.763
Do you research movies before watching them?	160.12	408.742	.011	.806
Where do you usually watch movies?	160.31	407.536	.108	.805
Total	106.81	181.329	.999	.758

Also, we have to know that we can improve this **Cronbach's Alpha** by deleting the most factor that affects our data as we see in the column **"Cronbach's Alpha if them deleted"** and here, if we removed the ``Musical`` row, Our Cronbach's alpha will improve to be **0.821**

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.821	19

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Action	153.24	489.290	.574	.809
Adventure	152.67	508.033	.457	.815
Comedy	153.05	503.348	.431	.814
Drama	152.90	495.790	.578	.810
Romance	153.00	517.400	.198	.821
Horror	153.71	515.914	.170	.822
Sci-fi or Fantancy	152.81	488.962	.663	.807
Family	153.57	518.857	.182	.821
Ranking Movies Genres	127.67	339.533	.886	.771
Cast	152.14	506.929	.655	.814
Genre	152.19	510.262	.390	.817
Director	154.00	494.900	.559	.810
Studio	153.81	503.462	.444	.814
Reviews	152.33	522.733	.190	.821
Quality of Story	151.67	519.033	.462	.819
Ranking the Factors Deciding Movies	134.00	409.500	.788	.784
Do you research movies before watching them?	155.05	532.348	-.075	.825
Where do you usually watch movies?	155.24	526.990	.190	.822
Total	102.67	235.833	.996	.795

``Thank you and hope we have made our report clear. `` 🥰 ❤️