Mixed methods research Part 2: Designing an online experimental survey from prior qualitative research and using one-way ANOVA in SPSS for data analysis

Denitsa Dineva, Cardiff University

Abstract

This dataset article explains the second stage of a mixed methods research design set within an overall quantitative piece of research. It provides a step-by-step guide on designing, collecting, and analysing quantitative data based on prior qualitative research via the methods of experimental survey design and one-way Analysis of Variance (ANOVA). Experimental design is a common research method that seeks to provide a scientific explanation for the impact of one (independent) variable on another (dependent) variable. ANOVA, in turn, uncovers whether there are any statistical differences between the means of three or more independent groups on the dependent variable. This dataset article contains data collected from an online experiment assessing the impact of six brand conflict management strategies (independent variable) on consumer attitudes and Corporate Social Responsibility (CSR) perceptions (dependent variables).

Student Guide

1. Introduction

Quantitative research involves the collection of numerical data to understand social phenomena such as people's beliefs, experiences, attitudes, behaviours, and interactions in a generalisable way. In other words, quantitative research methods focus on quantifying the collection and analysis of data to generate conclusions that can be subsequently applied to other contexts and situations. For example, by surveying a percentage (also known as *sample*) of undergraduate students regarding their career aspirations, the researcher can then assume that the results of the survey from this subset reasonably apply to the whole undergraduate cohort. Quantitative research, however, can sometimes fail to tell us about how people may actually act or respond in real-life settings. In turn, mixed methods research combines qualitative research techniques with quantitative ones in order to provide a thorough understanding of a specific social phenomenon.

Among the most common approaches to conducting mixed methods research is a sequential exploratory design whereby the quantitative research stage is informed by a qualitative research stage that precedes it (Figure 1) (Edmonds and Kennedy, 2016).

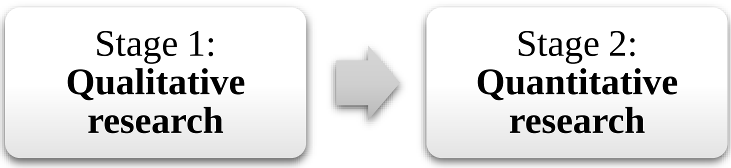


Figure 1. Sequential exploratory design

This article explores the quantitative stage of mixed methods research with a particular focus on designing a *one-factor experiment* that draws from qualitative research insights and using *one-way Analysis of Variance (ANOVA)* to analyse the data. This article dataset is taken from Dineva et al.'s (2020) research paper into consumer attitudes and perceptions towards brand conflict management on social media. The research paper uses qualitative data insights to inform quantitative research regarding the impact of different brand conflict management strategies on consumer attitudes and perceptions.

2. What is experimental research?

The purpose of experimental research is to establish the effect that a factor (known as an *independent variable*) has on another (known as a *dependent variable*). In this dataset, the authors examine the effect of brand conflict management strategies (independent variable) on consumer attitudes and Corporate Social Responsibility (CSR) perceptions (dependent variables). Experiments thus aim to carry out research in a controlled and objective fashion, so that precision is maximised, and specific conclusions can be drawn regarding research questions (Munck and Verkuilen, 2005). Experimental design has two distinguishing features from more conventional surveys: (i) the researcher manipulates (i.e., creates, alters) the independent variable of interest, and (ii) the respondents are randomly assigned to different groups (Charness et al., 2012).

Experiments have two other important design elements, and thus it is possible to distinguish between a variety of experimental designs. For example, experiments can be differentiated based on how many independent variables are manipulated: *one-factor* (one independent variable), *two-factor* (two independent variables) or *three-factor* (three independent variables) experiment. Experimental designs can also be *between-subjects*, meaning that different respondents are assigned to different manipulation groups, while *within-subjects* designs involve the researcher assigning participants the same manipulation groups (Erlebacher, 1977). For instance, if the researcher wants to understand the effect of three different marketing strategies on purchase behaviours, in a between-subjects design this would entail one group of respondents being shown Strategy A, a different group Strategy B, another group Strategy C, while in a within-subjects experiment all groups will be shown all three strategies.

3. What is (one-way) ANOVA?

ANOVA is a common method for analysing quantitative experimental data. This is because ANOVA tells the researcher if there are any statistical differences between the mean scores of a dependent variable across three or more groups (independent variables). ANOVA compares the variance (i.e., variability in scores) between the different groups of an independent variable(/s) with the variability within each of the groups. An F ratio is calculated, which represents the variance between the groups divided by the variance within the groups. A large F ratio indicates that there is more variability between the groups (caused by the independent variable) than there is within each group (Pallant, 2011). When the F test is significant this indicates that the null hypothesis, which states that the population means are equal, can be rejected.

To perform an ANOVA, you need one categorical independent variable with three or more distinct categories (e.g., six brand conflict management strategies) and one continuous dependent variable (e.g., CSR perceptions). For ANOVA to be performed, there are certain assumptions that need to be met first including normality (i.e., normal distribution), homogeneity of variance (i.e., using Levene's test checks whether the variance in scores is the same for each of the studied groups) and independence (i.e., no relationship exists between the observations in each group or between the groups themselves). These are discussed in detail by Pallant (2011, p.226) and if not met, the researcher must consider performing a non-parametric test; in this case, an alternative to one-way ANOVA would be the Kruskal-Wallis H Test that serves the same function as a one-way ANOVA, but unlike it does not assume that the data are normally distributed.

There are different ANOVAs (e.g., two-way ANOVA, factorial ANOVA) that are used in different situations, but this article discusses one-way ANOVA, which is the most simplistic form of ANOVA. One-way ANOVA is used when the researcher has one independent variable, as indicated in the 'one-way' part of the title, with three or more groups and only one dependent variable. It is important to note that a significant F test performed as part of one-way ANOVA tells the researcher that the null hypothesis can be rejected, but it does not show the researcher which of the groups differ, for which post-hoc tests need to be conducted. Tukey's honest significant difference (HSD) is a common post-hoc test used to assess the significance of differences between pairs of group means and is often performed in conjunction with one-way ANOVAs.

4. Illustrative example

This dataset referred to here is taken from Dineva et al. (2020) who recorded and compared respondent attitudes and CSR perceptions (two dependent variables) after being shown six different brand conflict management strategies (one independent variable). Please note that in the original article, the authors manipulated two independent variables (the conflict and the strategy) and used a two-way ANOVA for data analysis. For the purpose of this article, the dataset has been simplified to contain one independent variable (brand conflict management strategy) and uses a one-way ANOVA correspondingly to analyse the data. In this example, you will be shown how an experiment may be designed from qualitative data insights, how to collect data and the outputs of data analysis to expect.

4.1. Design the experiment

When designing an experiment, which resembles a conventional survey at a first glance, but has some distinguishing features discussed earlier, certain steps must be followed by the researcher. First, the researcher must include a participant information sheet in the beginning, which informs potential respondents about the aims of the study and the necessary requirements for their participation (e.g., reward, timing, risks, personal data, ethics). This is typically followed by a consent form where participants decide whether or not to agree that the researcher can use their personal and non-personal data. The participant information sheet and consent form are designed according to pre-defined institutional standards and universities provide templates that students can adapt to their study.

Second, it is good practice to ask any opening questions that will help the researcher determine whether the individuals who access their experimental survey are eligible to participate. For example, in this dataset, the researchers asked participants to confirm whether they like any non-profit organisations on social media and how often they visit social media sites. This helped the researchers determine whether their participants are suited to their study's goals. For instance, if respondents do not visit social media sites or like non-profit organisations, then they may not provide useful or relevant responses to the research.

The third part of a typical experimental survey is the manipulations, which are also referred to as independent variables. Importantly, in this dataset, the researchers designed their independent variables from qualitative research insights whereby six brand conflict management strategies were uncovered on social media via the qualitative method of netnography. These six strategies were then standardised before included in the experiment and each was shown to a different group of participants. The standardisation process involved the strategies using same format and style, punctuation, emojis and tone of voice (for more information see Dineva et al., 2020), and represented the manipulations of this research, which as discussed earlier represent a key feature of experimental design. Different participants were then assigned to different strategies and no group of participants saw more than one brand conflict management strategy (i.e., between-subjects experimental design).

Fourth, once the participants have been shown the independent variable (manipulations), the researcher can ask about dependent variables – in this case, strategy attitudes and CSR perceptions. Dependent variables are usually measured using scales: a type of composite measure that comprises several items that have a logical or empirical structure among them. These are used in order to improve precision and reliability and are invariably taken from past research studies. For example, Dineva et al. (2020) measured strategy attitudes using the following scale: 'In my opinion…The brand is a socially responsible organisation/The brand is concerned to improve the well-being of others/The brand follows high ethical standards', and strategy attitude using 'My attitude towards the strategy is…Good/Pleasant/Favourable/Positive'. The final part of an experimental survey is the inclusion of relevant to the research demographic questions such as gender, age, and income among others.

4.2. Distribute the survey and prepare data for analysis

Some of the main platforms on which experimental surveys can be designed on include Qualtrics, SurveyMonkey, Typeform, and Google Forms with Qualtrics being the most advance, while the remaining are free and with more simplified usability. Once the experiment has been designed, distributed to generate a representative sample, and data have been collected, the researcher must then prepare the collected data for analysis. This involves cleaning the dataset by removing unnecessary data entry points such as respondent IDs, completion time and device type that are collected automatically and are not essential for data analysis or for answering the research questions. The researcher must also ensure that there are no missing data by, for example, running Frequencies on SPSS to find out what percentage of values is missing for each of the variables of interest.

Next, where the researcher has used any multi-item scales, as discussed earlier, these will appear in the dataset as individual variables that need to be converted into a single variable to be able to perform the ANOVA. This can be done by calculating the mean of the items comprising each scale for each scale. In this dataset there are two dependent variables: strategy attitude comprising of four items (STRATEGY_ATTITUDE_1, STRATEGY_ATTITUDE_2, STRATEGY_ATTITUDE_3, STRATEGY_ATTITUDE_4) and CSR perceptions comprising of three items (CSR_1, CSR_2, CSR_3).

4.3. Conduct one-way ANOVA and report results

The output from performing one-way ANOVA should be as follows.

Oneway

Descriptives

StrategyAttitudeMean DV

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Control	90	2.5167	1.00266	.10569	2.3067	2.7267	1.00	5.00
Educating	89	2.3090	1.01622	.10772	2.0949	2.5231	1.00	5.00
Mobilising	83	2.0873	.97173	.10666	1.8752	2.2995	1.00	5.00
Bolstering	91	2.1621	.98979	.10376	1.9560	2.3682	1.00	4.75
Pacifying	84	1.7202	.73366	.08005	1.5610	1.8795	1.00	3.25
Censoring	88	2.5170	1.11404	.11876	2.2810	2.7531	1.00	5.00
Total	525	2.2248	1.01301	.04421	2.1379	2.3116	1.00	5.00

ANOVA

StrategyAttitudeMean DV

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39.124	5	7.825	8.145	<.001
Within Groups	498.604	519	.961		
Total	537.728	524			

The first Descriptives table provides some very useful descriptive statistics, including the mean, standard deviation and 95% confidence intervals for the dependent variable (Strategy Attitude) for each separate independent variable group (Control, Educating, Mobilising, Bolstering, Pacifying, Censoring), as well as when all groups are combined (Total). It also tells the researcher how many participants were assigned to each strategy (N). This table is useful when you need to describe your data.

The next table that shows the output of the ANOVA analysis and whether there is a statistically significant difference between the group means (in this case, between the different brand conflict management strategies). The F value is 8.15 and the researcher can see that the significance value is < .001, which is below the threshold of .05 and can, therefore, conclude that there is a statistically significant difference between the respondents' attitudes towards different brand conflict management strategies. While this is useful, at this stage it is not clear which of the specific strategies differed. This information can be found in the Multiple Comparisons table, as shown below, which contains the results of the Tukey HSD post hoc test.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: StrategyAttitudeMean DV
Tukey HSD

(I) StrategyType IV	(J) StrategyType IV	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Control	Educating	.20768	.14652	.716	-.2114	.6268
	Mobilising	.42932*	.14916	.048	.0027	.8560
	Bolstering	.35458	.14571	.147	-.0622	.7714
	Pacifying	.79643*	.14870	<.001	.3711	1.2218
	Censoring	-.00038	.14694	1.000	-.4207	.4199
Educating	Control	-.20768	.14652	.716	-.6268	.2114
	Mobilising	.22164	.14956	.676	-.2062	.6494
	Bolstering	.14690	.14612	.916	-.2711	.5649
	Pacifying	.58875*	.14910	.001	.1623	1.0152
	Censoring	-.20806	.14735	.720	-.6295	.2134
Mobilising	Control	-.42932*	.14916	.048	-.8560	-.0027
	Educating	-.22164	.14956	.676	-.6494	.2062
	Bolstering	-.07474	.14877	.996	-.5003	.3508
	Pacifying	.36711	.15170	.151	-.0668	.8010
	Censoring	-.42970*	.14997	.049	-.8587	-.0007
Bolstering	Control	-.35458	.14571	.147	-.7714	.0622
	Educating	-.14690	.14612	.916	-.5649	.2711
	Mobilising	.07474	.14877	.996	-.3508	.5003
	Pacifying	.44185*	.14830	.036	.0176	.8661
	Censoring	-.35496	.14654	.150	-.7741	.0642
Pacifying	Control	-.79643*	.14870	<.001	-1.2218	-.3711
	Educating	-.58875*	.14910	.001	-1.0152	-.1623
	Mobilising	-.36711	.15170	.151	-.8010	.0668
	Bolstering	-.44185*	.14830	.036	-.8661	-.0176
	Censoring	-.79681*	.14951	<.001	-1.2245	-.3691
Censoring	Control	.00038	.14694	1.000	-.4199	.4207
	Educating	.20806	.14735	.720	-.2134	.6295
	Mobilising	.42970*	.14997	.049	.0007	.8587
	Bolstering	.35496	.14654	.150	-.0642	.7741
	Pacifying	.79681*	.14951	<.001	.3691	1.2245

*. The mean difference is significant at the 0.05 level.

This table shows which groups differed from each other. It can be seen from the table that the statistically significant differences lie between Control and Mobilising (p=.048), Control and Pacifying (p<.001), Educating and Pacifying (p=.001), Mobilising and Censoring (p=.049), Bolstering and Pacifying (p=.036), Censoring and Pacifying (p<.001).

These findings can be reported in the following manner where the means (M) that are presented are obtained from the Descriptives table.

There was a statistically significant difference between groups as determined by one-way ANOVA ($F_{(5,519)} = 8.15$, p<.001). A Tukey post hoc test revealed that Pacifying (M=1.72; SD=.73) generated significantly more favourable attitudes compared with the Control (M=2.52; SD=1.00), Censoring (M=2.52, SD=1.11) Educating (M=2.31; SD=1.02) and Bolstering (M=2.16; SD=.99) strategies. In addition, Mobilising (M=2.09; SD=.97) generated more positive attitudes compared with Censoring and Control. No other significant differences were found between the groups. These findings suggest that consumers prefer the use of pacifying and mobilising brand conflict management strategies when uncivil consumer interactions take place on social media.

5. Review

This dataset article demonstrated how qualitative research insights into real brand practice (conflict management strategies) can be used to inform the design of an experimental survey. You should know:

- How qualitative data can be utilised in experimental manipulations.
- The main elements that characterise an experiment: manipulation of independent variables and randomisation.
- The different types of experiments e.g., one-factor, two-factor, three-factor; between-subjects versus within-subjects design.

- The difference between independent and dependent variables.

This article also explained how ANOVAs can be utilised to analyse experimental data, specifically focusing on a one-way ANOVA. To perform a one-way ANOVA, you should know:

- The variables you need for one-way ANOVA and when to use it.
- What Tukey HSD does and how it is used to further interpret the outputs from one-way ANOVA.
- How to interpret and report the output of one-way ANOVAs.

To find out more about how this quantitative research is preceded by a qualitative research stage, refer to dataset article: *"Mixed methods research Part 1: Collecting and analysing social media textual data using netnography and thematic analysis".*

6. Your Turn

Identify a research problem that experimental design can help you understand better. What would your independent and dependent variables?

What type of experimental design do you think would be suitable to your research question: between- or within-subjects design?

How will you ensure that potential respondents are eligible to participate in your study?

References

Charness, G., Gneezy, U., & Kuhn, M. A. (2012). Experimental methods: Between-subject and within-subject design. *Journal of Economic Behavior & Organization*, *81*(1), 1-8. Doi: 10.1016/j.jebo.2011.08.009

Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. *Handbook of Mixed Methods in Social and Behavioral Research*, *209*(240), 209-240.

Dineva, D., Breitsohl, J., Garrod, B., & Megicks, P. (2020). Consumer responses to conflict-management strategies on non-profit social media fan pages. *Journal of Interactive Marketing*, *52*, 118-136. Doi: 10.1016/j.intmar.2020.05.002

Edmonds, W. A., & Kennedy, T. D. (2016). *An applied guide to research designs: Quantitative, qualitative, and mixed methods*. Sage Publications. Doi: 10.4135/9781071802779.n18

Erlebacher, A. (1977). Design and analysis of experiments contrasting the within-and between-subjects manipulation of the independent variable. *Psychological Bulletin*, *84*(2), 212. Doi: 10.1037/0033-2909.84.2.212

Munck, G. L., & Verkuilen, J. (2005). Research designs. *Encyclopedia of Social Measurement*, *3*, 385-395.

Pallant, J. (2011). Survival manual. *A step by step guide to data analysis using SPSS*, 4th Edition.

Further reading

Bacile, T. J., Wolter, J. S., Allen, A. M., & Xu, P. (2018). The effects of online incivility and consumer-to-consumer interactional justice on complainants, observers, and service providers during social media service recovery. *Journal of Interactive Marketing*, *44*, 60-81. Doi: 10.1016/j.intmar.2018.04.002

Coleman, R. (2018). *Designing experiments for the social sciences: How to plan, create, and execute research using experiments*. SAGE publications.

Coolican, H. (2017). *Research methods and statistics in psychology*. Psychology Press.

Erlebacher, A. (1977). Design and analysis of experiments contrasting the within-and between-subjects manipulation of the independent variable. *Psychological Bulletin*, *84*(2), 212. Doi: 10.1037/0033-2909.84.2.212

Pallant, J. (2011). Survival manual. *A step by step guide to data analysis using SPSS*, *4*th Edition.

Tabachnick, B. G., & Fidell, L. S. (2007). *Experimental designs using ANOVA* (Vol. 724). Belmont, CA: Thomson/Brooks/Cole.

How-to Guide

Introduction

In this guide, you will learn how to conduct a One-way Analysis of Variance in IBM® SPSS® Statistics software (SPSS) using a practical example to illustrate the process. You will find a link to the example dataset, and you are encouraged to replicate this example. Additional practice examples are suggested at the end of this guide.

Contents

1. One-Way Analysis of Variance (ANOVA)

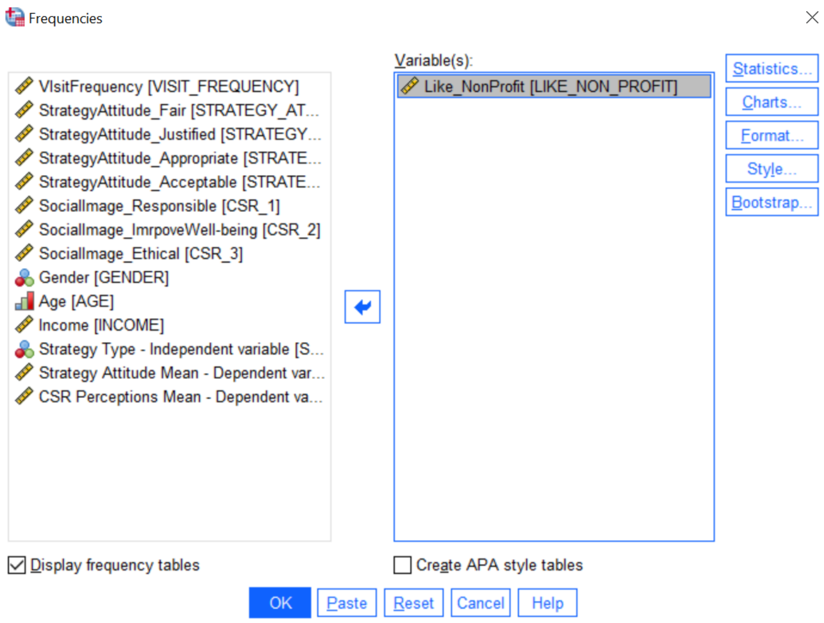
The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent groups on one dependent variable.

2. An example in SPSS

The dataset consists of a .sav file and requires the installation of, and access to, SPSS. This SPSS dataset is taken from Dineva et al. (2020) who recorded and compared respondent attitudes and CSR perceptions after being shown six different brand conflict management strategies. Please note that in the original article, the authors manipulated two independent variables (the conflict and the strategy) and used a two-way ANOVA for data analysis. For the purpose of this article, the dataset has been simplified to contain one independent variable (brand conflict management strategy) and uses a one-way ANOVA correspondingly to analyse the data.

2.1.Preparing data for analysis

The researcher must ensure that there are no missing data by, for example, running Frequencies on SPSS to find out what percentage of values is missing for each of the variables of interest. This can be done by clicking on Analyze -> Descriptive Statistics -> Frequencies -> Choosing a variable from the list -> OK.



For demonstration, the variable from the dataset labelled Like_NonProfit was chosen and the output from performing the Frequencies function is shown below confirming that there are no missing values in the dataset for this variable. This also confirms that all respondents ‘like’ non-profit organisations, which confirms their suitability to participate in the study.

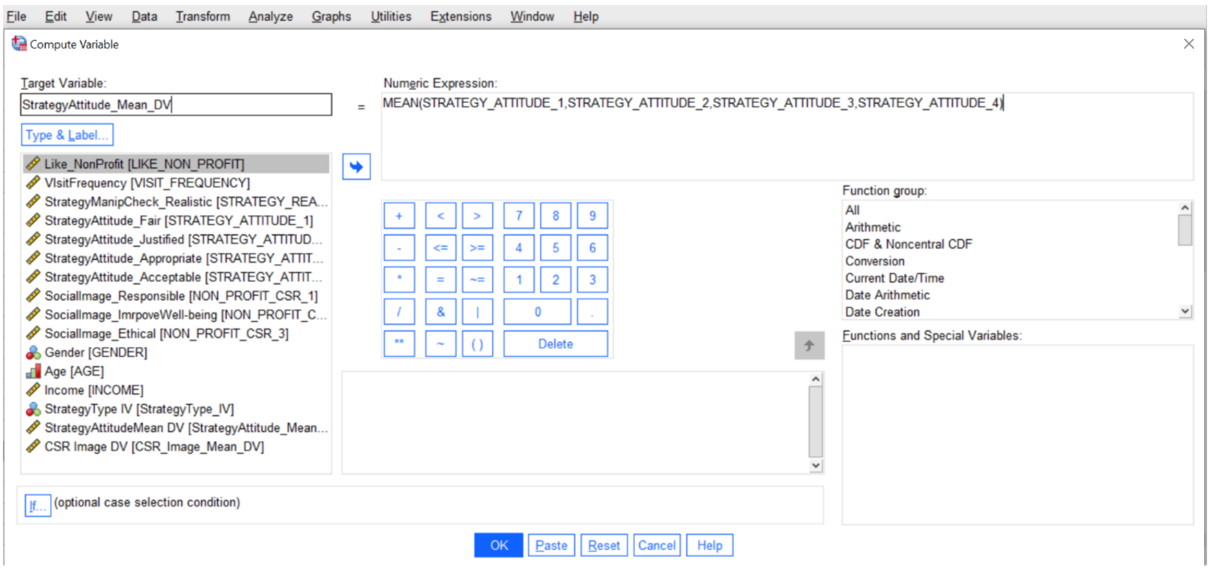
Frequencies

Statistics

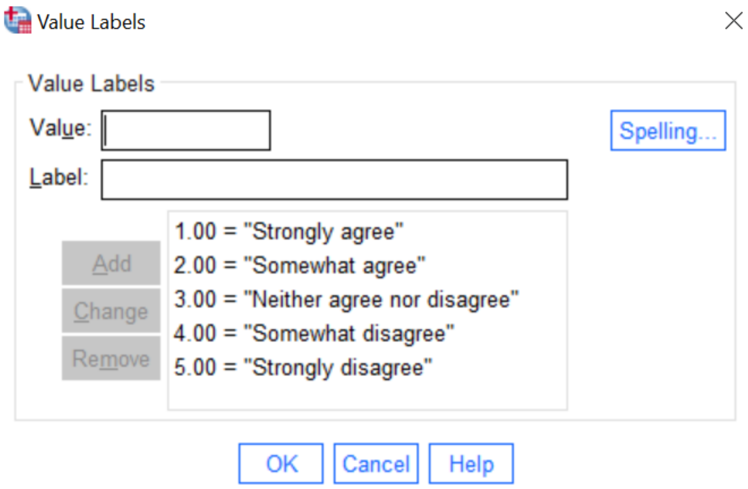
Like_NonProfit

N	Valid	525
	Missing	0

Next, where the researcher has used any multi-item scales, these will appear in the dataset as individual variables that need to be converted into a single variable to be able to perform the ANOVA. This can be done by calculating the mean of the items comprising each scale and for each scale using the Compute Variable function on SPSS. In the Compute Variable window, first enter the name of the new variable to be created in the 'Target Variable' box. It is important to remember that SPSS does not accept spaces in the variable names. In the 'Numeric Expression' box, enter the function 'MEAN()'. Within the brackets of the mean function, enter all of the variables to be averaged relating to the same scale, separating each one with a comma. Ensure the variables are entered exactly as they appear in the SPSS datasheet.



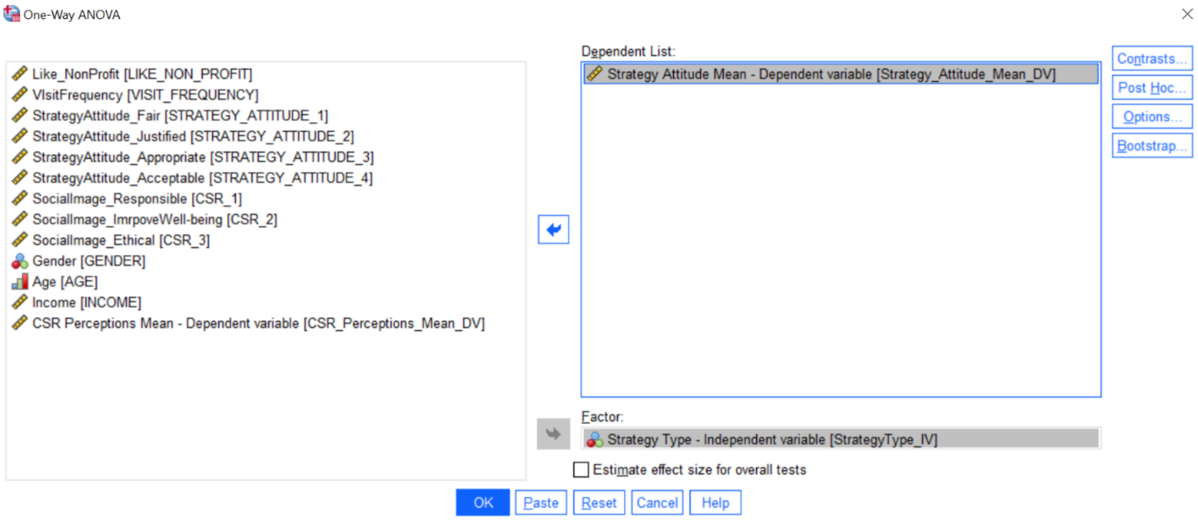
Once completed, you will see a new variable in your dataset, and you will need to manually input how this was assessed in your survey by clicking on ‘Values’ and assigning a Value and Label. In this case, the authors used a 5-point descending Likert scale (1=Strongly agree, 2=Somewhat agree, 3=Neither agree nor disagree, 4=Somewhat disagree, 5=Strongly disagree).



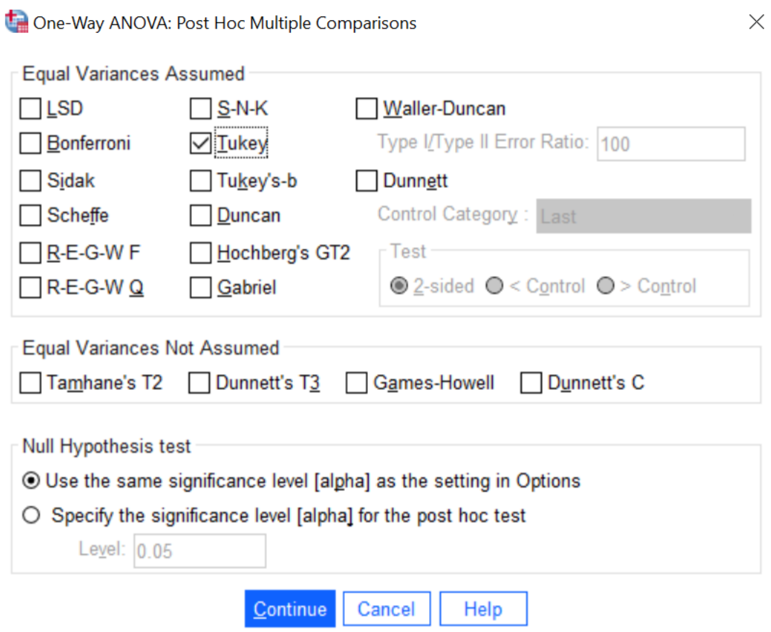
You need to repeat the process for the second dependent variable: CSR perceptions.

2.2.The SPSS procedure for one-way ANOVA

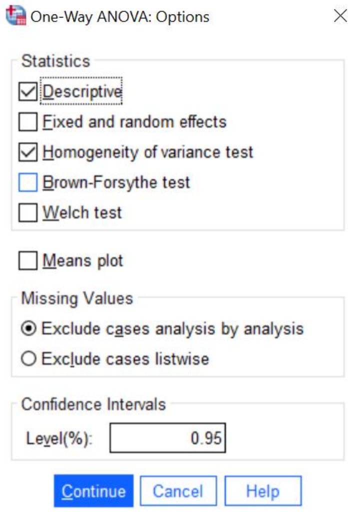
To perform the one-way ANOVA, Click Analyze > Compare Means > One-Way ANOVA on the top menu and you will be presented with the One-Way ANOVA box. Then, transfer the new dependent variable created, Strategy Attitude Mean, into the Dependent List, and the independent variable, Strategy Type, into the Factor using the appropriate Right arrow buttons or by dragging and dropping the variables.



Click on the Post hoc button. Tick the Tukey checkbox as shown below and then Continue. The Tukey HSD post hoc test is generally the preferred test for conducting post hoc tests on a one-way ANOVA. The test only allows for a pairwise comparison of means and tells the researcher exactly where the significant differences between two groups lie. An alternative that you could use to Tukey HSD is Scheffe, which compares all possible simple and complex pairs of means, has a narrower confidence interval, and is more suited to large datasets, because of its lower statistical power.



Then, click on the Options button. Tick the Descriptive checkbox in the –Statistics– area. You could also tick ‘Homogeneity of variance test’, which will tell you whether your data meets one of the main assumptions for ANOVA by reporting the Levene statistic.



Once done, press OK and the output from the analysis should be as follows. First, you will see the Descriptives table, which contains the number of participants in each group of the independent variable, the means, and standard deviations. These are useful for descriptive purposes when reporting the results from the one-way ANOVA.

Descriptives

Strategy Attitude Mean - Dependent variable

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Control	90	2.5167	1.00266	.10569	2.3067	2.7267	1.00	5.00
Educating	89	2.3090	1.01622	.10772	2.0949	2.5231	1.00	5.00
Mobilising	83	2.0873	.97173	.10666	1.8752	2.2995	1.00	5.00
Bolstering	91	2.1621	.98979	.10376	1.9560	2.3682	1.00	4.75
Pacifying	84	1.7202	.73366	.08005	1.5610	1.8795	1.00	3.25
Censoring	88	2.5170	1.11404	.11876	2.2810	2.7531	1.00	5.00
Total	525	2.2248	1.01301	.04421	2.1379	2.3116	1.00	5.00

Then, you will see the homogeneity of variances table, which reports the Levene’s statistic and tells us whether distributions of the outcomes in each independent group are comparable and/or equal. When the Levene's test is significant, modified procedures should be used that do not assume equality of variance. In this output, it can be seen that the *p* value is non-significant > .05, giving the researcher confidence to proceed onto interpreting the output from the one-way ANOVA.

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Strategy Attitude Mean - Dependent variable	Based on Mean	2.173	5	519	.056
	Based on Median	2.027	5	519	.073
	Based on Median and with adjusted df	2.027	5	481.935	.074
	Based on trimmed mean	2.068	5	519	.068

Next, the multiple comparisons table shows the results from Tukey HSD post-hoc and allows the researcher to determine exactly where the significant differences lie.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: StrategyAttitudeMean DV

Tukey HSD

(I) StrategyType IV	(J) StrategyType IV	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Control	Educating	.20768	.14652	.716	-.2114	.6268
	Mobilising	.42932*	.14916	.048	.0027	.8560
	Bolstering	.35458	.14571	.147	-.0622	.7714
	Pacifying	.79643*	.14870	<.001	.3711	1.2218
	Censoring	-.00038	.14694	1.000	-.4207	.4199
Educating	Control	-.20768	.14652	.716	-.6268	.2114
	Mobilising	.22164	.14956	.676	-.2062	.6494
	Bolstering	.14690	.14612	.916	-.2711	.5649
	Pacifying	.58875*	.14910	.001	.1623	1.0152
	Censoring	-.20806	.14735	.720	-.6295	.2134
Mobilising	Control	-.42932*	.14916	.048	-.8560	-.0027
	Educating	-.22164	.14956	.676	-.6494	.2062
	Bolstering	-.07474	.14877	.996	-.5003	.3508
	Pacifying	.36711	.15170	.151	-.0668	.8010
	Censoring	-.42970*	.14997	.049	-.8587	-.0007
Bolstering	Control	-.35458	.14571	.147	-.7714	.0622
	Educating	-.14690	.14612	.916	-.5649	.2711
	Mobilising	.07474	.14877	.996	-.3508	.5003
	Pacifying	.44185*	.14830	.036	.0176	.8661
	Censoring	-.35496	.14654	.150	-.7741	.0642
Pacifying	Control	-.79643*	.14870	<.001	-1.2218	-.3711
	Educating	-.58875*	.14910	.001	-1.0152	-.1623
	Mobilising	-.36711	.15170	.151	-.8010	.0668
	Bolstering	-.44185*	.14830	.036	-.8661	-.0176
	Censoring	-.79681*	.14951	<.001	-1.2245	-.3691
Censoring	Control	.00038	.14694	1.000	-.4199	.4207
	Educating	.20806	.14735	.720	-.2134	.6295
	Mobilising	.42970*	.14997	.049	.0007	.8587
	Bolstering	.35496	.14654	.150	-.0642	.7741
	Pacifying	.79681*	.14951	<.001	.3691	1.2245

*. The mean difference is significant at the 0.05 level.

3. Your turn

After downloading the dataset, perform a one-way ANOVA for the variable ‘CSR perceptions’ by following the steps outlined in this guide. How do the results for this dependent variable compare with the results reported here and why do you think this may be? For this you may want to think about what each dependent variable measures and how they differ conceptually.

Consider the descriptive statistics for each group of the independent variable. What do these tell you about the sample (e.g., favourable versus unfavourable ratings of different brand responses)? Think about your personal experience on social media and brands you may follow and why some brand responses may have more favourable ratings by the respondents than others.

Run Tukey HSD and the Scheffe test as post hoc tests – how do the results from the two compare? Remember, Tukey HSD can only perform pairwise comparisons, while Scheffe is a more conservative test. How would this influence your future choice of a post hoc test?