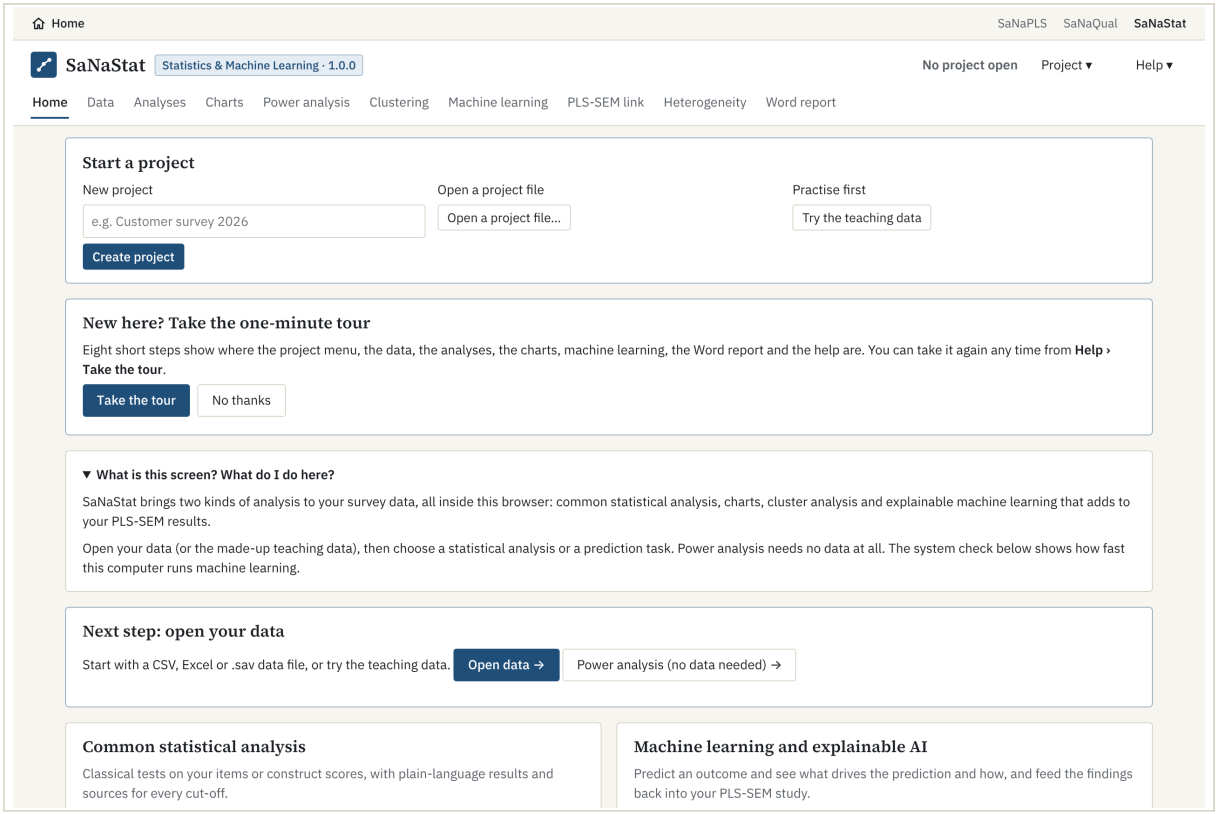
SANASOFT · USER MANUAL

SaNaStat

Getting started: a short tour of the program

Version 1.0.0 · October 2026



Worked example: the built-in teaching data, 240 made-up respondents

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SaNaSoft · 2026

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About this guide

This guide takes you once through SaNaStat, the statistics and machine learning program of the SaNaSoft suite: you start a project, open data, check it, build a scale score, run a test, plan a sample size, collect the results in a Word report and keep your work safe. It takes about half an hour. All screenshots and numbers come from a real run of SaNaStat 1.0.0 with the built-in teaching data, so you can follow along and obtain the same results.

New in SaNaStat 1.0.0

SaNaML is now called **SaNaStat**, at the address /stat/ (old links lead there). Projects saved in your browser stay, and project files are now saved as .sanastat; older .sanaml files still open. The methods and results are those of SaNaML 0.15.0, which added:

Split file, weight cases and restructuring on the Data screen; the Scheffé, Šidák, LSD, Dunnett and Student–Newman–Keuls post hoc tests; stepwise selection in linear regression; further statistics and stem-and-leaf plots; layered cross-tables with the Mantel–Haenszel test; saved factor scores; and a new Agreement screen (Cohen's kappa and the intraclass correlation). The Common Statistical Tests manual shows each of them step by step.

Three manuals then teach the analyses in depth, each with its own practice data (Table 1). They open from the SaNaStat start page and from the **Help ▾** menu.

Table 1

The SaNaStat manuals

Manual	What it teaches
Common Statistical Tests	Data checking and preparation, descriptives and charts, t-tests, ANOVA, repeated measures, chi-square, correlation and regression (including ordinal and multinomial), reliability and factor analysis, mediation and moderation, multiple imputation, power analysis, and a short machine learning check
Marketing Analytics	Survey scales, campaign tests, what drives spend, predicting churn, customer segments
HR Analytics	Responsible people analytics, engagement scales, pay equity, training evaluation, attrition, employee types

What you need

- A computer with an up-to-date browser (Google Chrome, Microsoft Edge, Mozilla Firefox or Safari). SaNaStat runs inside the browser: your data are read on your own computer and are not uploaded.

- Nothing else. This guide uses the teaching data that are built into SaNaStat. **They are made up**: 240 respondents of a technology-adoption survey, with no real person in them.

How to read the instructions

Bold coloured text such as **Open data →** is a button, box or menu item on the screen: click or choose exactly this. Numbered steps are carried out in order. *Italics* show text exactly as it appears in the results.

Feedback on this guide is welcome at sabraz@seu.ac.lk.

1. Start a project

Open SaNaStat at the address of your installation (for the program on your own computer: double-click SaNaStat.exe; it opens http://localhost:4310/). On the SaNaStat start page click **Open SaNaStat →** (in the SaNaSoft suite, choose SaNaStat on the start page). SaNaStat opens on its Home screen (Figure 1).

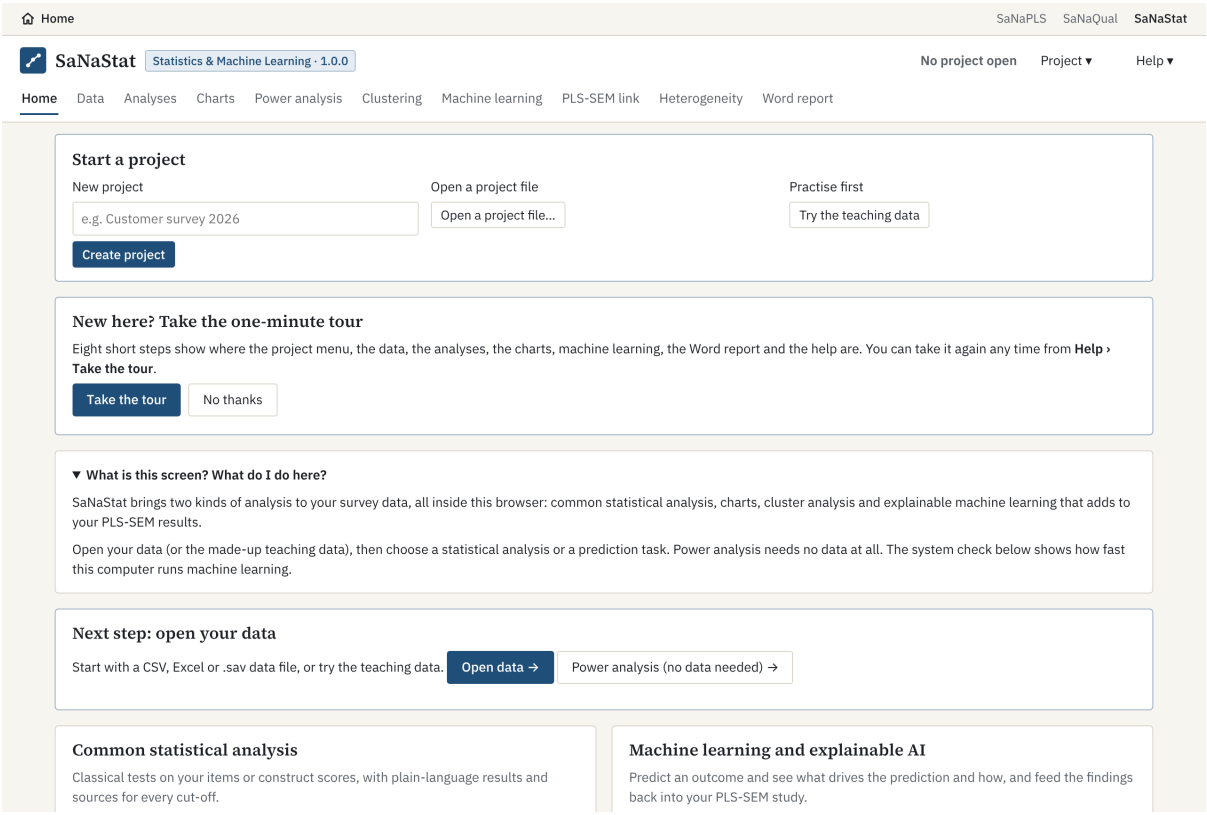


Figure 1. *The Home screen of a new browser: start a project, open a project file, practise with the teaching data, or take the tour.*

The header shows the version ("Statistics & Machine Learning · 1.0.0"), the project (*No project open*), the **Project ▾** and **Help ▾** menus and, below them, the screens: **Home**, **Data**, **Analyses**, **Charts**, **Power analysis**, **Clustering**, **Machine learning** and **Word report** (in the SaNaSoft suite also **PLS-SEM link** and **Heterogeneity**). The thin bar at the very top has a **Home** link to the SaNaSoft start page (in the stand-alone edition, the SaNaStat start page) and, in the suite, links to the other programs; the same **Home** link is at the bottom left of every screen. Going to the start page does not lose anything: your project is saved first, and when you come back in the same browser tab SaNaStat opens the screen you were on. Clicking the SaNaStat name or logo opens the SaNaStat Home screen.

In a new browser, Home offers *New here? Take the one-minute tour*: eight short steps that point at the project menu, the data, the analyses, the charts, machine learning, the Word report and the help. Click **Take the tour**, or **No thanks** to follow this guide instead; the tour stays available under **Help ▾** › **Take the tour**.

Concept: a project

A **project** holds one dataset and everything you make from it: the variable types, construct scores, analyses and the Word report. SaNaStat saves it in this browser as you work; there is no Save button. A project file (.sanastat) is a backup copy you can keep, e-mail or open on another computer.

1. Under **Start a project**, type a name in **New project**, here **My first study** (Figure 2).
2. Click **Create project**. SaNaStat opens the Data screen.



Figure 2. *Starting a project: name it, then create it.*

2. Open your data

The Data screen (Figure 3) reads a CSV, Excel (.xlsx) or .sav/.zsav file with one row per respondent and one column per question, with the column names in the first row. Click **Choose a file...** for your own data. For this tour, click **Try the teaching data**.

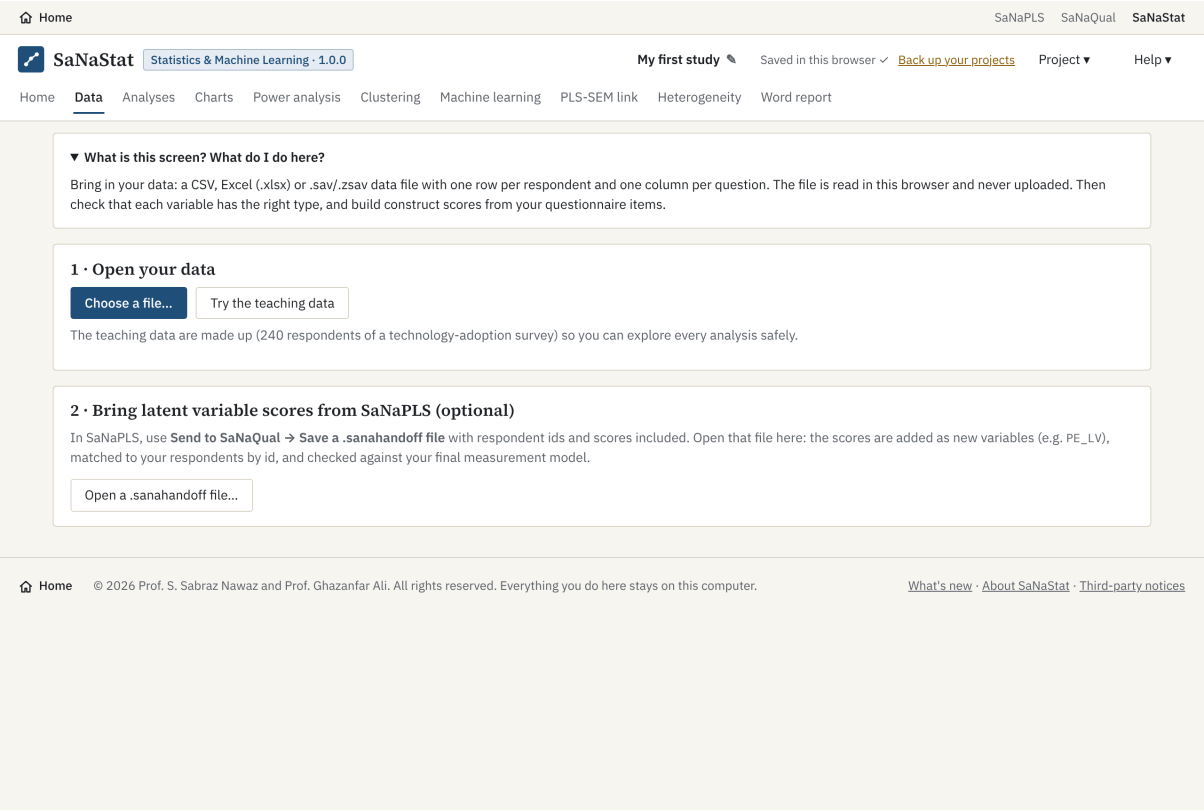


Figure 3. *The Data screen before any data are open.*

SaNaStat reports *240 respondents, 20 variables*. The header now shows the project name, *Saved in this browser* ✓ and the number of results in the Word report (Figure 4). Click the project name (with the pencil) to rename the project.

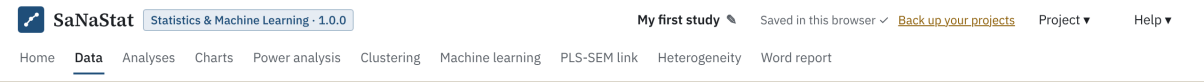


Figure 4. *The header with an open project: its name, the save status and the Project menu.*

Check the variable types

SaNaStat guesses for each variable whether it is a **Scale** (numbers you can average: ratings, scores, age) or **Categorical** (groups or answers without a meaningful average: gender, education, yes/no). Look through the list under **2 · Check the variable types** and change any guess that is wrong (Figure 5). In the teaching data, Gender (Female, Male) and Education (Diploma, Bachelor, Postgraduate) are categorical; the questionnaire items such as PE1 to PE4 are scales; ID is set to ID.

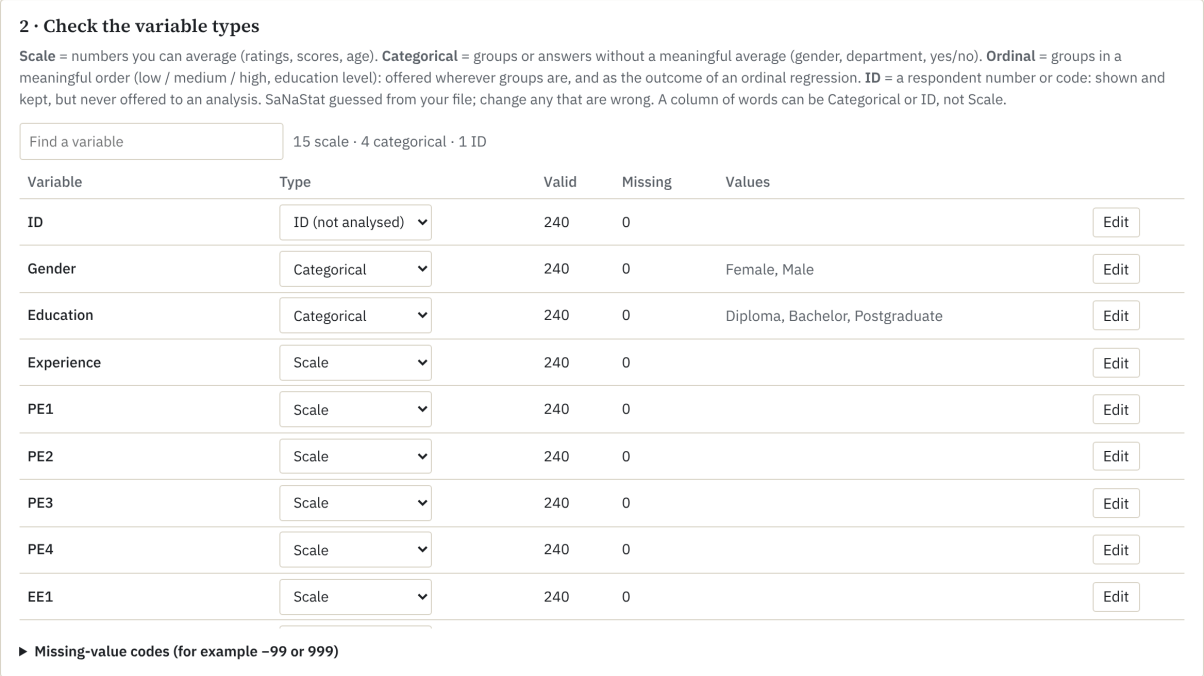


Figure 5. *Variable types, with the number of valid and missing values.*

Two more types are offered. **Ordinal** is for groups in a meaningful order (low, medium, high); **ID** is for a respondent number or code, which is shown and kept but never offered to an analysis. For the teaching data SaNaStat finds *15 scale · 4 categorical · 1 ID*.

The same list does more:

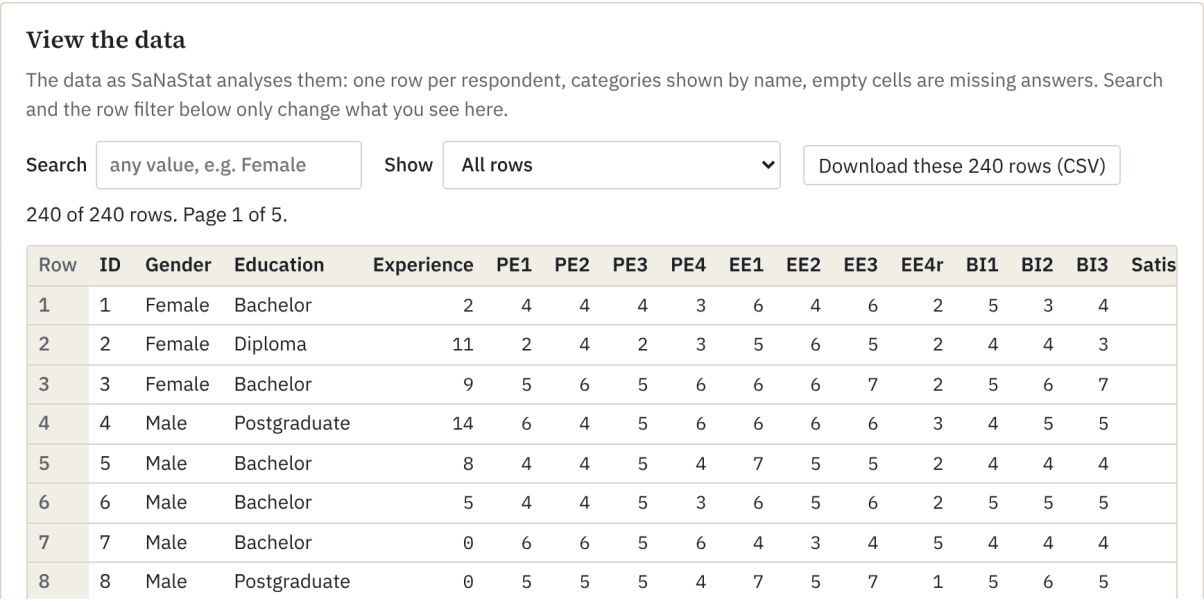
- **Edit** next to a variable opens the variable editor: rename it, give it a label (what the question asked), change its type, name or merge its categories, or delete it.
- **Missing-value codes (for example −99 or 999)** shows where codes such as −99 occur and, with **Set as missing**, makes them missing values, so they are not analysed as real answers.

Prepare and view the data

Further down, the Data screen has these optional steps:

- **4 · Compute and recode variables (optional)**: your own formula (with **What can a formula contain?** listing what you can type), an "if ... then ... else" rule, a recode table, ranks and z-scores, groups from a scale, a 0/1 indicator, merged categories, a mean or sum across items, and **Reverse-code several items at once**.
- **7 · Select cases (optional)**: analyse only some respondents, for example only women. Every analysis, chart and model then uses only them until you remove the filter.
- **8 · Split file and weight cases (optional)**: repeat the analyses for each group of a categorical variable, one group at a time, or let a row with a count stand for several respondents.

- **9 · Restructure the data (optional)**: turn repeated columns into rows (wide to long), rows into columns (long to wide), or transpose a small table; Undo brings the old shape back.
- **View the data (rows and values) →** under **1 · Open your data** shows the data as SaNaStat analyses them, one row per respondent (Figure 6). Search it, or show only the rows with missing answers.



View the data

The data as SaNaStat analyses them: one row per respondent, categories shown by name, empty cells are missing answers. Search and the row filter below only change what you see here.

Search any value, e.g. Female Show All rows Download these 240 rows (CSV)

240 of 240 rows. Page 1 of 5.

Row	ID	Gender	Education	Experience	PE1	PE2	PE3	PE4	EE1	EE2	EE3	EE4r	BI1	BI2	BI3	Satis
1	1	Female	Bachelor	2	4	4	4	3	6	4	6	2	5	3	4	
2	2	Female	Diploma	11	2	4	2	3	5	6	5	2	4	4	3	
3	3	Female	Bachelor	9	5	6	5	6	6	6	7	2	5	6	7	
4	4	Male	Postgraduate	14	6	4	5	6	6	6	6	3	4	5	5	
5	5	Male	Bachelor	8	4	4	5	4	7	5	5	2	4	4	4	
6	6	Male	Bachelor	5	4	4	5	3	6	5	6	2	5	5	5	
7	7	Male	Bachelor	0	6	6	5	6	4	3	4	5	4	4	4	
8	8	Male	Postgraduate	0	5	5	5	4	7	5	7	1	5	6	5	

Figure 6. *View the data: one row per respondent, with search and a row filter.*

Tip: check the quality of survey data

Before you analyse a survey, click **Check data quality →** on the Data screen. It looks for careless responding (for example the same answer to every item), outliers and missing data, and suggests which respondents to exclude. The Common Statistical Tests manual (chapter 3) explains every index.

3. Build a scale score

A construct (scale) score is the average of the items that measure one idea. In the teaching data, EE1 to EE4r measure effort expectancy; EE4r was asked the other way round and must be reverse-coded.

1. Under **3 · Build construct scores (optional)**, type **EE** in **Name of the construct**.
2. Type **EE** in **Quick pick: items starting with** and press Tab: EE1, EE2, EE3 and EE4r are ticked.
3. Tick **R** next to **EE4r** to reverse-code it. On the 1 to 7 scale given by **Lowest answer** and **Highest answer**, a reversed 2 becomes 6.

SaNaStat checks at once that the items hang together (Figure 7): Cronbach's α = .85 on 240 complete responses, McDonald's ω = .85, and every corrected item–total correlation lies between .67 and .71, well above the warning level of .30.

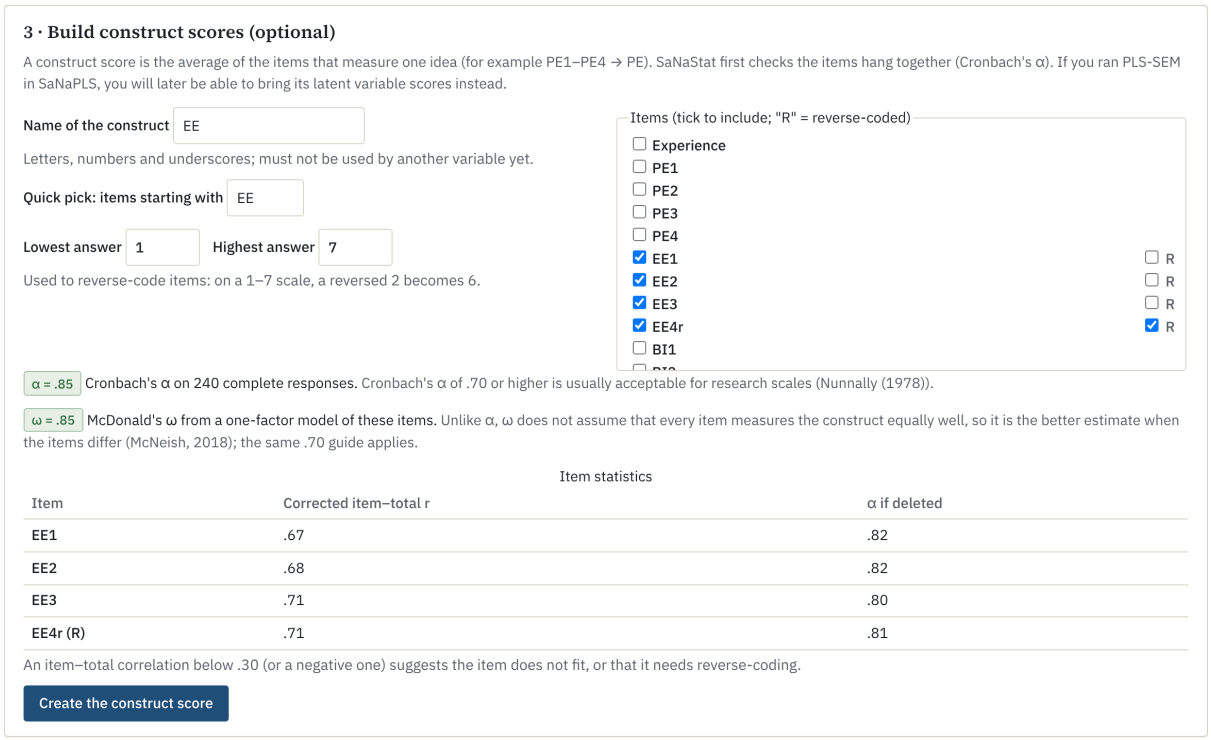


Figure 7. *Building the EE score: items, reverse coding, Cronbach's α, McDonald's ω and item statistics.*

1. Click **Create the construct score**. EE is now a variable like any other.

Cut-off values: reliability

A Cronbach's α (or McDonald's ω) of .70 or higher is usually acceptable for research scales (Nunnally, 1978). An item with a corrected item–total correlation below .30, or a negative one, does not fit the scale or needs reverse-coding.

4. Run an analysis

Click **Analyses**. The list on the left shows every analysis with a short description, in four groups:

- **Common statistics**: descriptive statistics, t-tests, ANOVA (one-way, repeated measures, factorial, ANCOVA and MANOVA), chi-square, Fisher's exact and McNemar tests, and correlation and regression;
- **Measurement and models**: factor analysis and reliability (exploratory and confirmatory), mediation and moderation, and missing data handled by multiple imputation;
- **HR and people analytics**: survival analysis, adverse impact and pay gaps;
- **Marketing analytics**: A/B tests, RFM and customer value, market basket and conjoint analysis.

If you are not sure which test you need, **Help me choose** at the top of the list opens the test selection guide: it asks two questions and suggests a test, with **Open it →** to go there (Figure 8).

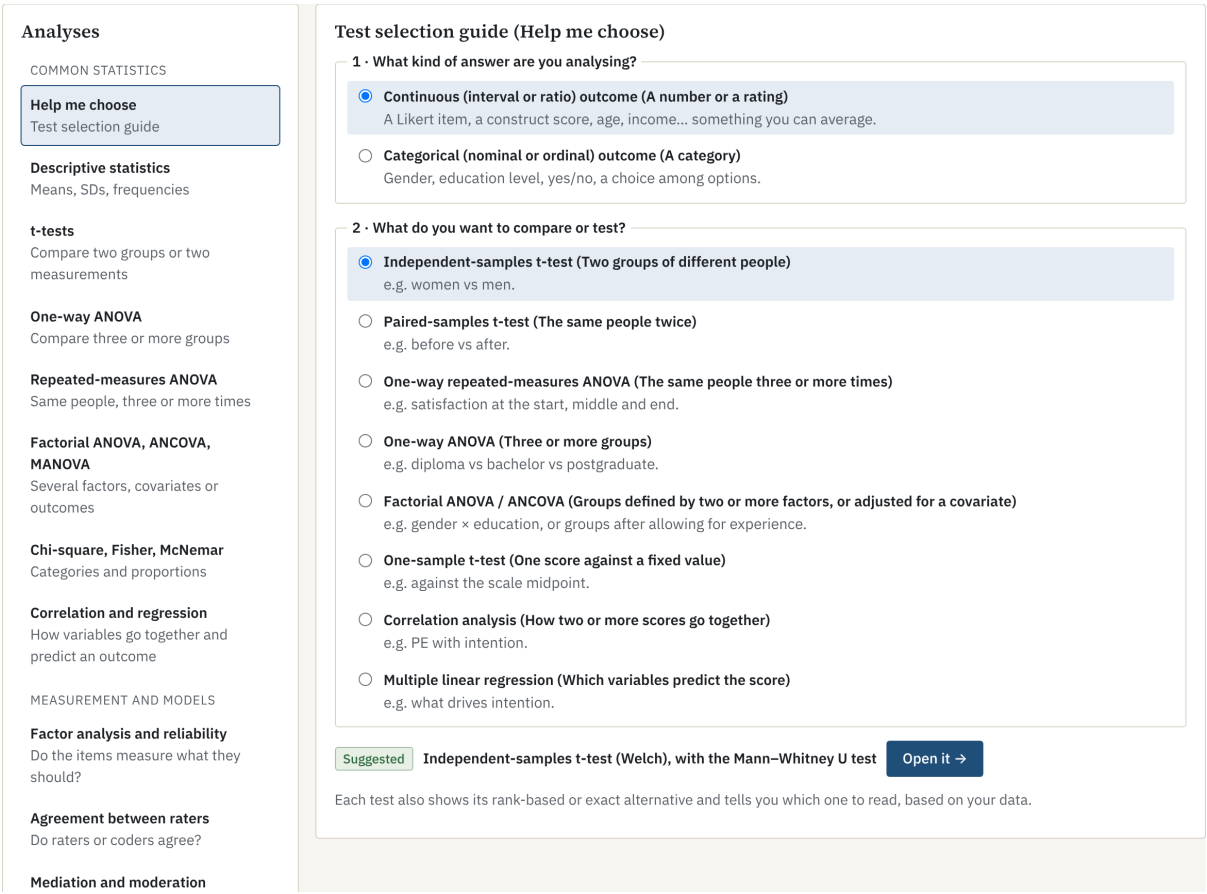


Figure 8. *The top of the Analyses screen: the grouped list of analyses and the test selection guide.*

Do women and men differ in effort expectancy?

1. Choose **t-tests** (*Compare two groups or two measurements*).

2. Keep **Independent-samples t-test (Two groups of different people)**, choose **EE** under **Score to compare** and **Gender** under **Groups**.

The result appears at once (Figure 9). Every result has the same parts (Figure 10):

- *What it means*: the finding in one or two plain sentences;
- the checks, each marked OK, Note, Check or Info, with the rule of thumb it uses and its source;
- the tables (here group descriptives, both t-tests, effect sizes, the rank-based alternative and Levene's test), each with **Copy table** (to paste into Word or Excel), **Copy as picture**, **PNG** and **CSV**; charts offer **Copy picture**, **PNG** and **SVG**;
- *How to report it (APA style)*: a sentence ready for your text, with **Copy this sentence**, **All tables (Excel)** and **Add to Word report**;
- the references.

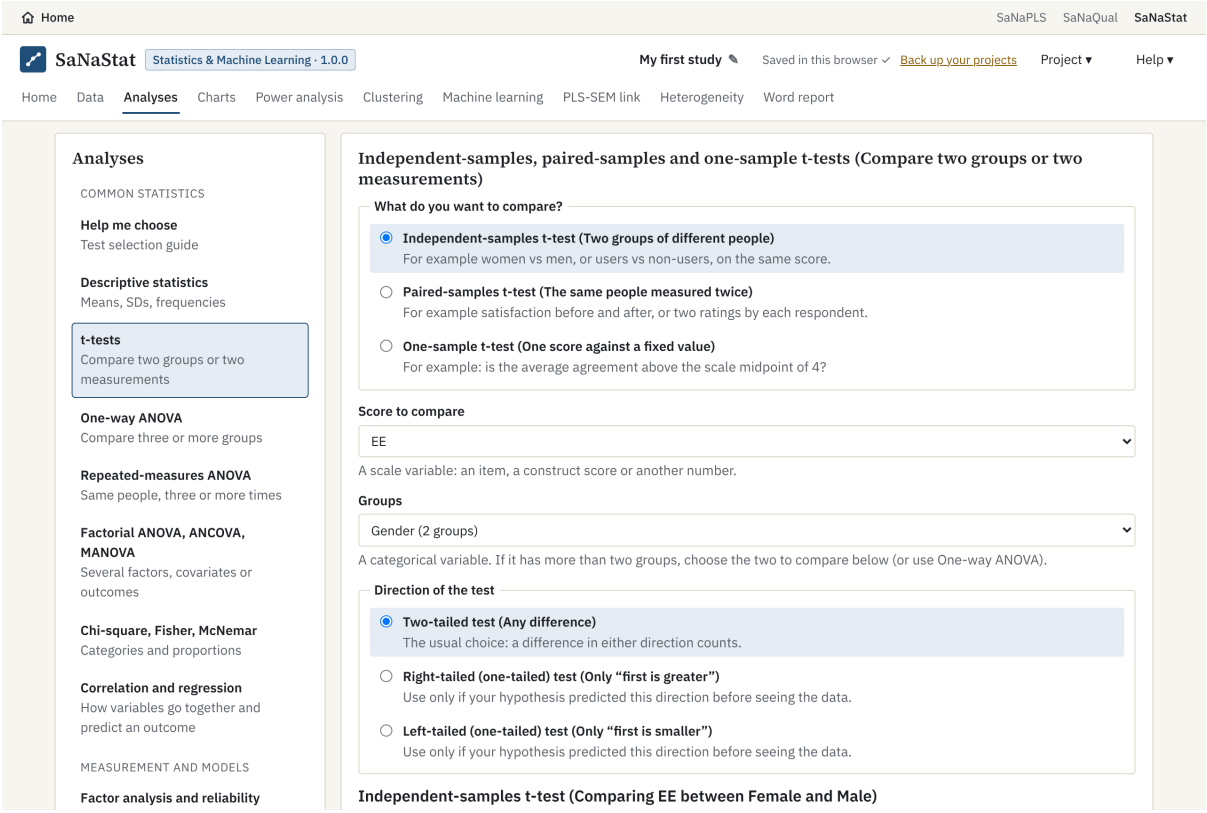


Figure 9. *An analysis: the settings at the top, the result below.*

Independent-samples t-test (Comparing EE between Female and Male)

What it means: Female and Male do not differ significantly on EE (difference 0.00; d = 0.00, negligible).

Info **Which t-test.** Welch's t-test is reported first because it is accurate whether or not the variances are equal.
Rule: Compare two means with Welch's t-test by default; it stays accurate when the variances differ (Delacre et al. (2017)).

OK **Equal variances.** Levene's test does not suggest unequal variances; Student's and Welch's tests agree closely.
Rule: Levene's test p < .05 suggests unequal variances: rely on Welch's test and Games–Howell comparisons (Levene (1960); Games & Howell (1976)).

OK **Normality.** Every group has 30 or more cases, so the test of means is robust to non-normal data. Shapiro–Wilk: Female W = .979, p = .066; Male W = .966, p = .003. With this many cases the Shapiro–Wilk test flags even small, harmless departures; look at the Q–Q plot.
Rule: With about 30 or more cases per group, t-tests and ANOVA tolerate non-normal data; with fewer, prefer the rank-based test if the data are clearly skewed (Lumley et al. (2002)).

Info **Effect size.** |d| = 0.00 is negligible. The sign of d follows the order of the groups: d = 0.00 means that the two groups scored about the same.
Rule: Cohen's d: about 0.2 small, 0.5 medium, 0.8 large (Cohen (1988)).

Group descriptives

Group	n	Mean	SD	Median	Skewness	Shapiro–Wilk W	p (normality)
Female	118	5.29	0.90	5.25	−0.35	.979	.066
Male	122	5.29	0.96	5.50	−0.55	.966	.003

Shapiro–Wilk test of normality per group (Shapiro & Wilk, 1965): p < α suggests the scores are not normally distributed.

Copy table | Copy as picture | PNG | CSV

t-tests (two-sided)

Test	t	df	p	Mean difference	95% CI
Welch's t (recommended)	0.03	237.82	.977	0.00	[−0.23, 0.24]
Student's t (equal variances)	0.03	238	.977	0.00	[−0.23, 0.24]

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Effect size

Measure	Value	95% CI	Size
Cohen's d	0.00	[−0.25, 0.26]	negligible
Hedges' g	0.00	[−0.25, 0.26]	negligible

CIs of d and g are 95% intervals from the noncentral t distribution (Steiger & Fouladi, 1997); Hedges' g corrects d for small-sample bias (Hedges, 1981). The CI of the rank-biserial r uses Fisher's z (Ben-Shachar et al., 2020).

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Rank-based alternative

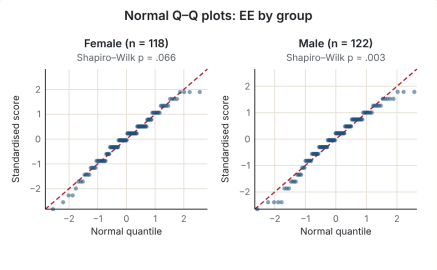
Test	U	z	p	Rank-biserial r	95% CI	Method
Mann–Whitney U	7083.0	−0.21	.831	−.02	[−.16, .13]	normal approximation

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Equal variances

Test	F	df	p
Levene (mean)	0.49	1, 238	.487
Brown–Forsythe (median)	0.40	1, 238	.527

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Normal Q–Q plots: EE by group. Each point is one respondent's standardised score against the value expected under a normal distribution; the dashed line marks a perfect fit. A bend at one end means skew, an S-shape heavy or light tails; Likert-type scores form steps, which is expected. (Wilk & Gnanadesikan, 1968)

Copy picture | PNG | SVG

How to report it (APA style): An independent-samples Welch's t-test showed that EE did not differ significantly between Female (M = 5.29, SD = 0.90) and Male (M = 5.29, SD = 0.96), t(237.82) = 0.03, p = .977, d = 0.00, 95% CI [−0.25, 0.26], Hedges' g = 0.00, 95% CI [−0.25, 0.26].

Copy this sentence | All tables (Excel) | Add to Word report

▸ References

Figure 10. *The parts of a result: what it means, the checks with their rules, and the tables.*

In the teaching data, women (M = 5.29, SD = 0.90, n = 118) and men (M = 5.29, SD = 0.96, n = 122) do not differ: Welch's t(237.82) = 0.03, p = .977, d = 0.00, 95% CI [−0.25, 0.26]. A non-significant result is a result too, and the confidence interval of d shows how large a difference could still be hidden: up to about a quarter of a standard deviation either way.

How to report it

"An independent-samples Welch's t-test showed that EE did not differ significantly between Female (M = 5.29, SD = 0.90) and Male (M = 5.29, SD = 0.96), t(237.82) = 0.03, p = .977, d = 0.00, 95% CI [−0.25, 0.26], Hedges' g = 0.00, 95% CI [−0.25, 0.26]."

Click **Add to Word report** under the sentence. The result is marked *In the Word report*.

5. Plan a sample size

Click **Power analysis**. It needs no data. It opens on a multiple regression with four predictors and a medium effect ($f^2 = 0.15$): with $\alpha = .05$ and power .80, a study needs N = 85 (achieved power .803) (Figure 11). Choose another analysis or goal to plan your own study; the Common Statistical Tests manual (chapter 15) explains every option. Click **Add to Word report** to keep the plan with your results.

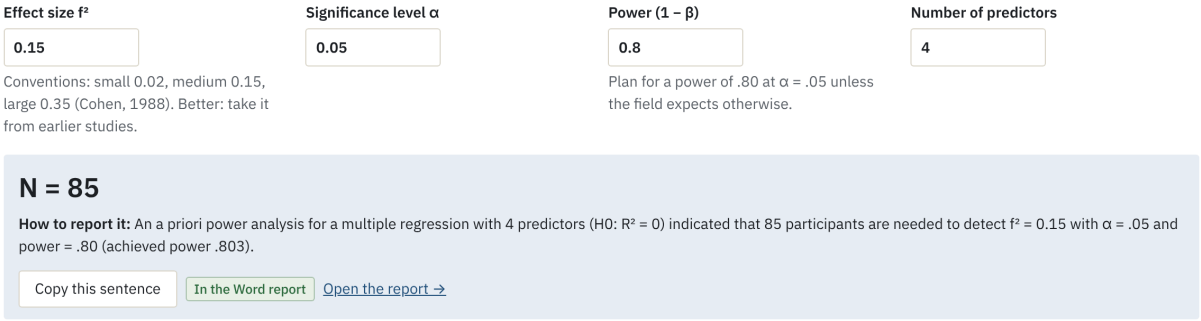


Figure 11. *A power analysis: the numbers of the design and the sample size needed.*

6. Download the Word report

Click **Word report** in the menu; it shows how many results it holds, here *Word report (2)*. The screen, *Word report (2 results)*, lists the results you added, with their finding (Figure 12). Untick a result to leave it out, use the arrows to change the order and **Remove** to drop one; **Parts of this result** chooses what goes in for that result alone.

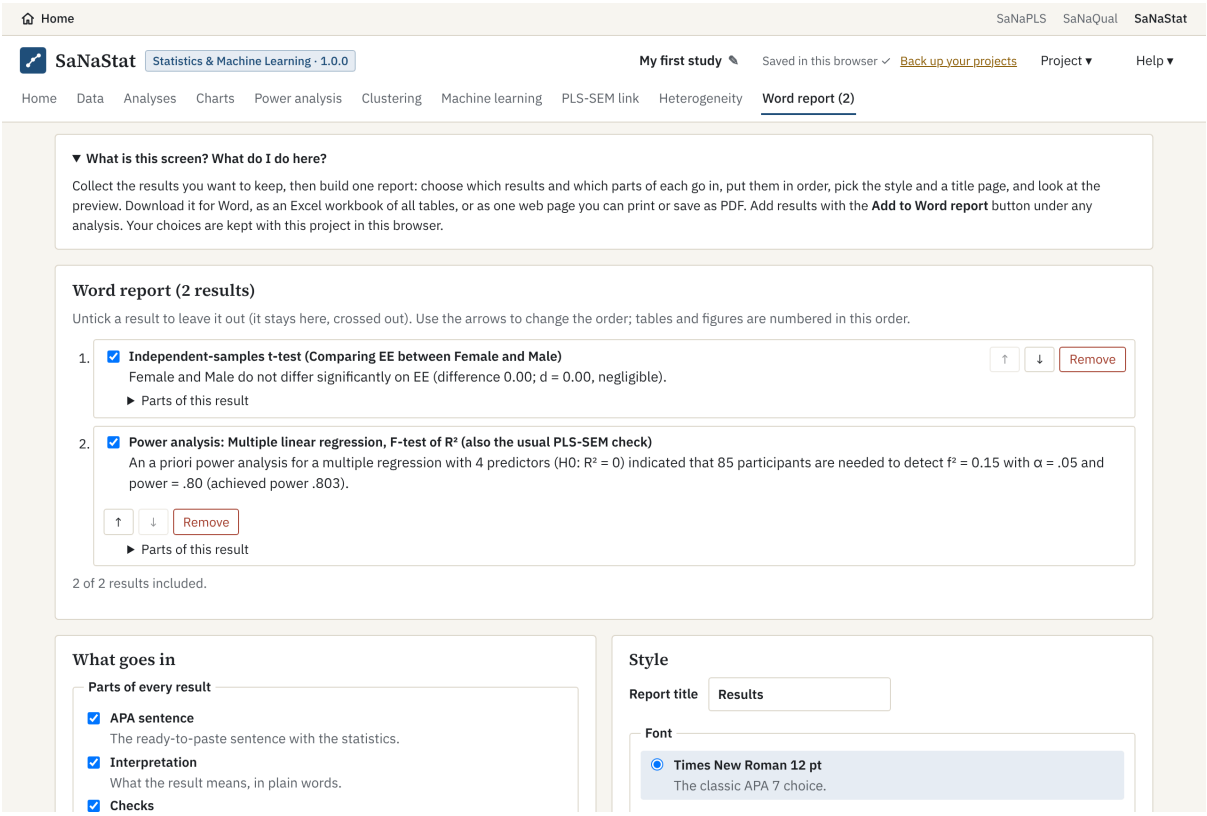


Figure 12. *The Word report: the collected results and their order, then what goes in and the style.*

Below the list you build the report:

- **What goes in**: the parts of every result (APA sentence, interpretation, checks, tables, figures, references) and, if you wish, a **Methods and reporting checklist** before or after the results;
- **Style**: the **Report title**, the font, the line spacing, the paper size and an optional **Title page**;
- **Preview and download**: **Download Word report (.docx)**, **Download all tables (Excel)** or **Download as a web page (HTML, prints as PDF)**, and **Show the preview**.

7. Keep your work safe

SaNaStat saves the project in this browser as you work. The **Project ▾** menu (Figure 13) offers:

- **New project…** and **Open a project file…** (also Ctrl+O, or drop a .sanastat file on the window);
- **My projects**, the list of all projects in this browser;
- **Export project file (backup)…**, a .sanastat file with the data, results and report;
- **Export for sharing…**, a project file for someone else: with the data, or **Without the data** (only the setups, results and Word report), and if you wish protected with a password;
- **Save to a file…** (in browsers that allow it, such as Google Chrome and Microsoft Edge), after which SaNaStat also writes the project to that file on your computer after each change;
- **Save a version…** and **Versions…**, copies of the whole project at a moment you can go back to, and **Project details…**;
- **Duplicate this project…**, to try other settings without changing the original, and **Close project**.

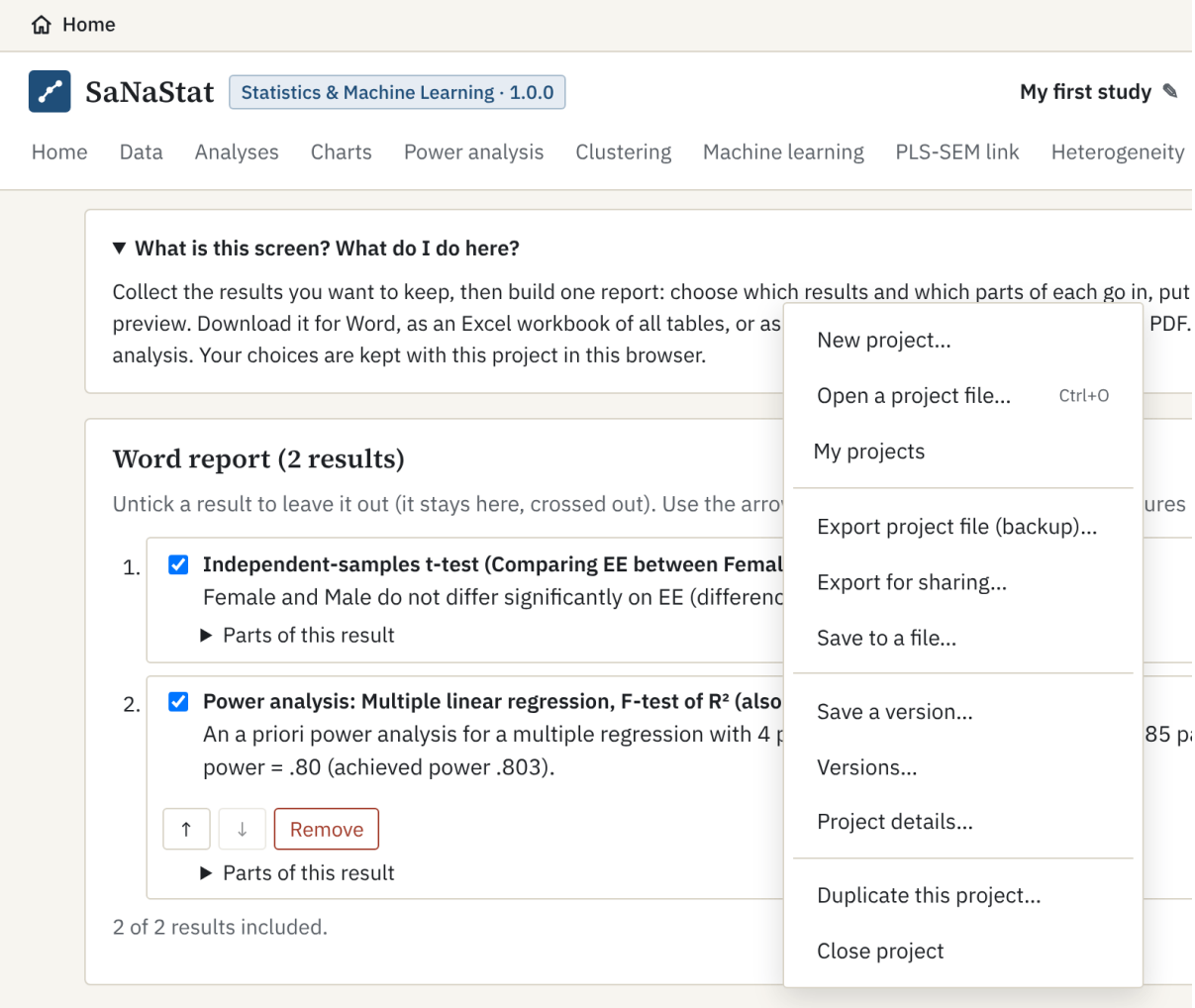


Figure 13. *The Project menu.*

My projects (Figure 14) shows each project with its data file, the number of respondents and results, when it last changed and when it was last backed up. From here you can open, rename, duplicate, see the versions of, export or delete a project; deleted projects stay under *Recently deleted* for 30 days.

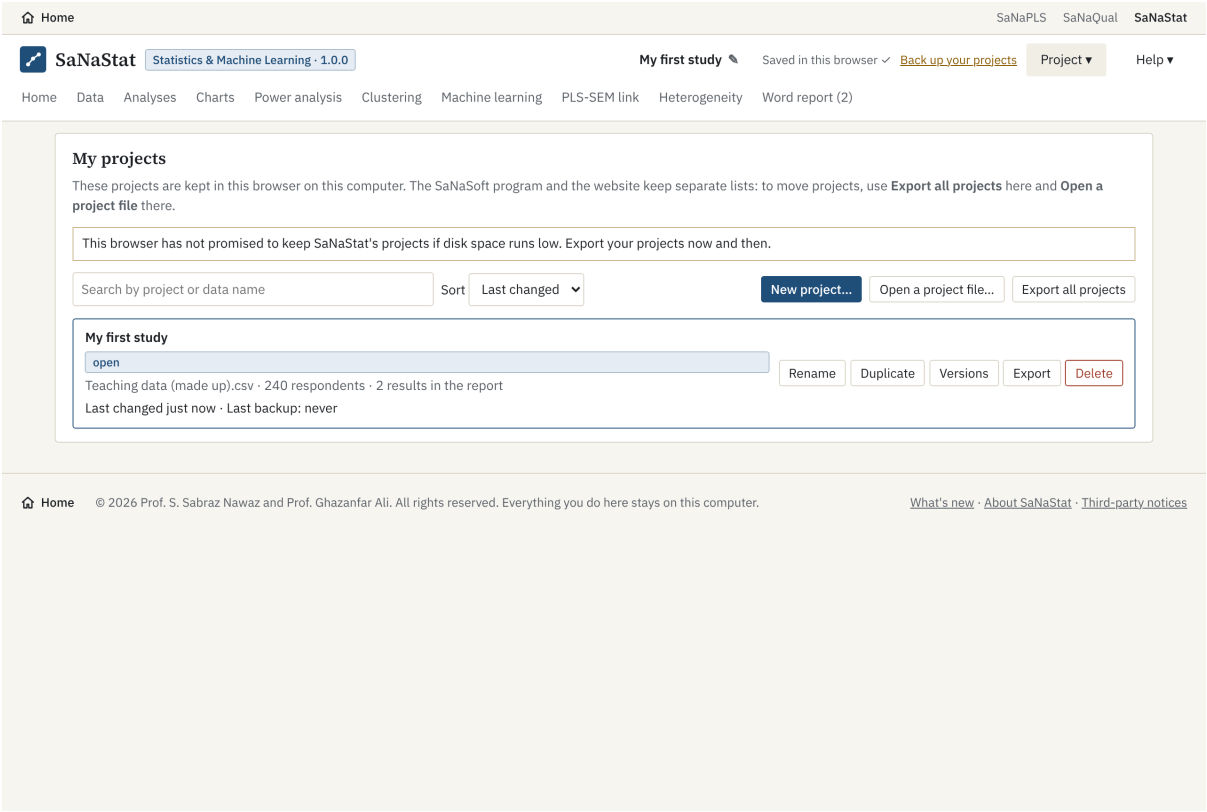


Figure 14. *My projects: every project in this browser, with its last backup.*

> **Note: the browser is not a backup**
>
> Projects live in this browser on this computer. Clearing the browser's site data deletes them, and the SaNaSoft program, the standalone program and the website each keep their own list. Export a project file after each working session, and keep it with your other research files.

8. Get help

The **Help ▾** menu (Figure 15) is always in the header. It offers:

- **User manuals (PDF)**: this guide and the three manuals of Table 1;
- **Glossary of terms**, the terms SaNaStat uses, in plain words and with a search;
- **Take the tour**, the eight-step tour of the screen;
- **Practice exercises**, short tasks on the teaching data that SaNaStat ticks off itself as you work;
- **Keyboard shortcuts** (also the ? key, when you are not typing in a box);
- **What's new**, **Send feedback** and **About SaNaStat**.

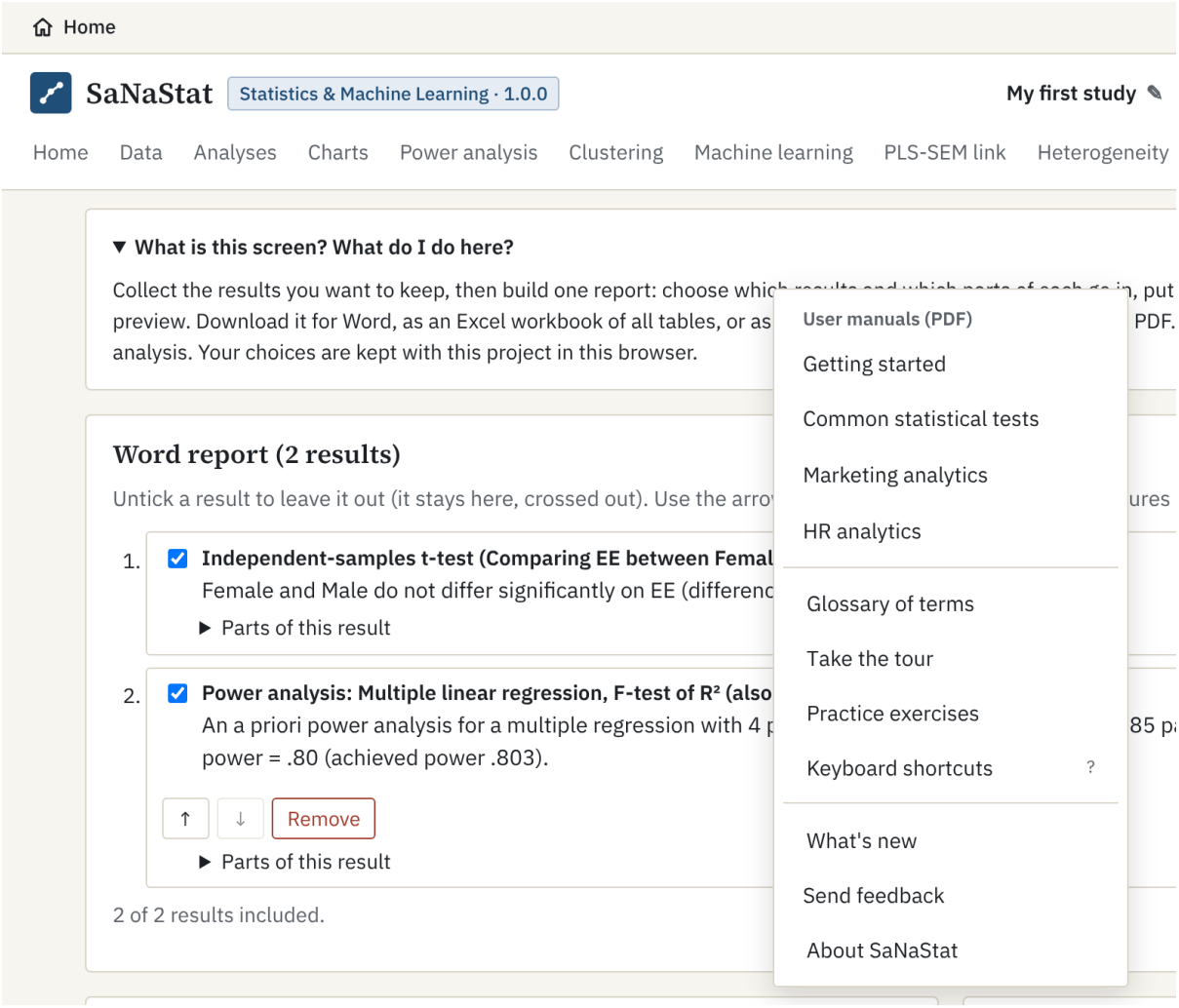


Figure 15. *The Help menu.*

9. Where to go next

- **Common Statistical Tests**: the full set of classical analyses on one practice file, from data checking to the Word report.
- **Marketing Analytics** and **HR Analytics**: the same tools applied to marketing and people questions, including the marketing and HR analyses of the **Analyses** list, machine learning with explanations and cluster analysis.
- **SaNaPower**: the separate SaNaSoft program for power analysis and sample size of F tests (multiple regression, one-way ANOVA, factorial ANOVA and ANCOVA), with its own manual.
- The practice datasets are on the start page, with a codebook; every manual says which file it uses.

References

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). McGraw-Hill.