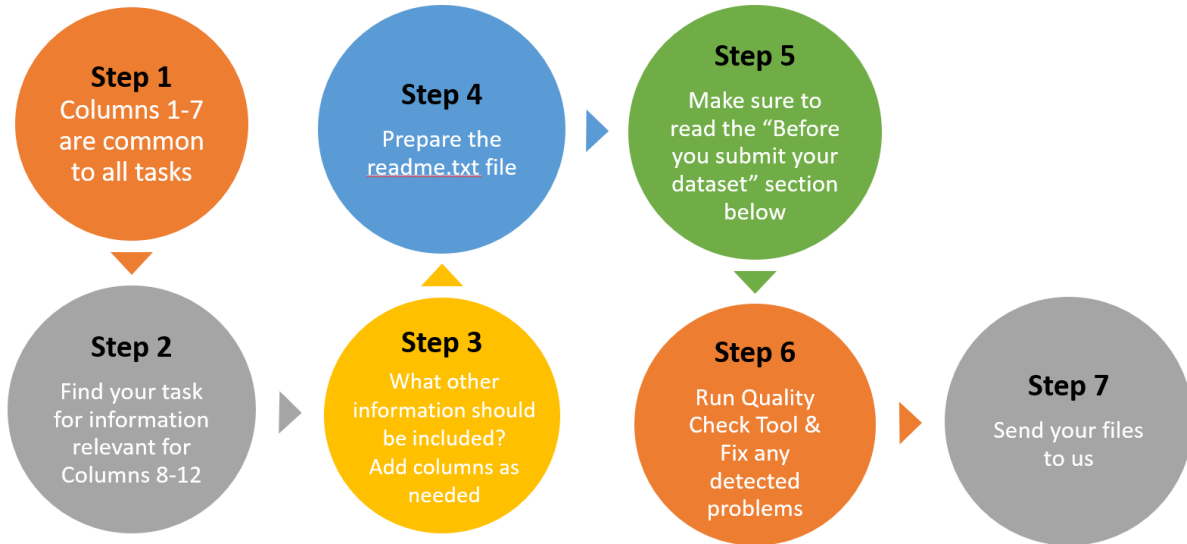


Format of the data

Datasets should be submitted in .csv format, where each column presents a different variable. The details of the structure and format are presented below. There are a number of basic steps such as compiling information common to all tasks, adding information specific to each task, preparing a codebook (i.e., a readme) file for others to use, running quality checks, and finally sending your files to us. These steps are outlined in the diagram below.



STEP 1

The following required columns are common to all procedures:

*Column 1: **Species:*** Species tested; e.g. human, rat, pigeon, mice, etc.

*Column 2: **Subj_idx:*** The subject index (must be in ascending/alphabetical order; can be alpha-numeric; e.g. 1, M01, N-012 etc)

*Column 3: **Session:*** Session number

*Column 4: **Block:*** Block Number. Blocks here are defined as a set of trials divided by distinct events such as a break, which might or might not correlate with conditions. The conditions should be indicated in an independent column; see Step 3. If there are no blocks, use "1" throughout.

*Column 5: **Trial:*** Trial number

*Column 6: **Stim:*** Stimulus type (numeric or string format). This could be Auditory, Visual, Audiovisual, etc.

*Column 7: **Procedure:*** TP (for Temporal Production), TR (for Temporal Reproduction), TE (for Temporal Estimation), PI (for Peak Interval Procedure), TB (for Temporal Bisection) TG (for Temporal Generalization), TA (for Tapping), DRL (for Differential Reinforcement of Low Rates of

Responding Procedure) or OTHER (for any other type of procedure not listed here; please make sure to define the procedure in as much detail as possible in the associated codebook file). Make sure there are no spaces before or after the abbreviations (e.g. “_TR” or “_TR_” instead of “_TR_” could cause the quality check to issue an error). If you are contributing data under the “OTHER” category, we will assign a standard acronym for that procedure before adding your related contribution to the database. When multiple procedures are employed in the same experiment, all the procedures should be reported as separate .csv files with common identifying information (e.g. Subj_idx). Please contact us for further details if you are planning to report multiple procedures within a single dataset.

Please make sure that the column names do not include spaces either in their beginning or their end. (e.g. Writing “Session” or “Session” instead of “Session” will issue an error during quality check; see **Quality Check** section below). Lastly, please note that all column names are case-sensitive (e.g. using “block” instead of “Block” might give an error during quality check)

Example table

Species	Subj_idx	Session	Block	Trial	Stim	Procedure
Human	1	1	1	1	Auditory	TR
Human	1	1	1	2	Auditory	TR
Human	1	1	2	1	Auditory	TR
Human	1	1	2	2	Auditory	TR
Human	2	1	1	1	Auditory	TR
...
Human	1	2	1	1	Auditory	TR
Human	1	2	1	2	Auditory	TR
Human	1	2	2	1	Auditory	TR
Human	1	2	2	2	Auditory	TR

STEP 2

Temporal Production (TP):

Column 8: Duration_Set: Target durations used in the corresponding session/block in numeric format (in seconds and separated by semicolon)

Column 9: Target_Duration: Target duration used in the corresponding trial (in seconds)

Column 10: Response: Produced duration in numeric format (in seconds)

Stim	Procedure	Duration_Set	Target_Duration	Response
...	TP	.5;1;2;4	1	1.3
...	TP	.5;1;2;4	4	3.83
...	TP	...	...	...

Temporal Reproduction (TR):

Column 8: Duration_Set: Target durations used in the corresponding session/block in numeric format (in seconds and separated by semicolon)

Column 9: Target_Duration: Target duration used in the corresponding trial (in seconds)

Column 10: Response: Reproduced duration in numeric format (in seconds)

Stim	Procedure	Duration_Set	Target_Duration	Response
...	TR	2	2	1.91
...	TR	2	2	2.143
...	TR	...	...	...

Temporal Estimation (TE):

Column 8: Duration_Set: Target durations used in the corresponding session/block in numeric format (in seconds and separated by semicolon)

Column 9: Target_Duration: Target duration used in the corresponding trial (in seconds)

Column 10: Response: Produced/Reproduced duration in numeric format (in seconds)

...	Procedure	Duration_Set	Target_Duration	Response
...	TE	4;5;6;7;8	4	4.57
...	TE	4;5;6;7;8	8	8.09
...	TE	...	...	...

Peak Interval Procedure (PI):

Column 8: Duration_Set: Target durations used in the corresponding session/block in numeric format (in seconds and separated by semicolon)

Column 9: Target_duration: Target duration used in the corresponding trial (in seconds)

Column 10: Response_Onset: Onset times of responses (separated by semicolon; in seconds)

Column 11: Response_Offset: Offset times of responses (separated by semicolon; in seconds).

If only onsets are recorded insert "N/A" in this column

...	Procedure	Duration_Set	Target_Duration	Response_Onset	Response_Offset
...	PI	15;30	15	14;14.6;15.2;15.7	14.1;14.8;15.4;15.9
...	PI	15;30	15	14.7;15;15.8	14.8;15.1;16
...	PI	...	...	...

In Experiments where participants were asked to bracket the target interval by pressing the key, each response column should have a single value.

One can also include the FI trials in the data by adding another column to the right of Response_Offset where peak interval trials can be marked as "PI" and fixed interval trials can be marked as "FI".

For Peak Interval Procedure, we also encourage the submission of a time.event dataset as a supplement.

Temporal Bisection (TB):

Column 8: Duration_Set (including the reference durations or the standard duration) in numeric format separated by a semicolon (in seconds). This should include the entire set of durations used in the corresponding session/block.

Column 9: Test_Duration: Test duration in the corresponding trial in numeric format (in seconds)

Column 10: Response: Short Long Judgments (S for Short; L for Long - string format, capital letters)

Column 11: Reference_Intervals: Reference Intervals separated by a semicolon (in seconds)

...	Procedure	Duration_Set	Test_Duration	Response	Reference_Intervals
...	TB	1;1.2;1.4;1.6;1.8;2;2.2	1.4	S	1;2.2
...	TB	1;1.2;1.4;1.6;1.8;2;2.2	2.2	L	1;2.2
...	TB	...	...	...

Temporal Generalization (TG):

Column 8: Duration_Set (including the standard duration) in numeric format separated by a semicolon. This should include the entire set of durations used in the corresponding session/block. (in seconds)

Column 9: Test_Duration: Test duration in the corresponding trial in numeric format (in seconds)

Column 10: Response: Same Different Judgments (S for Same; D for Different - string format, capital letters)

Column 11: Standard: Standard Interval (in seconds)

...	Procedure	Duration_Set	Test_Duration	Response	Standard
...	TG	1;1.2;1.4;1.6;1.8;2;2.2	1.8	S	1.6
...	TG	1;1.2;1.4;1.6;1.8;2;2.2	1.4	D	1.6
...	TG	...	...	...

Please make sure to indicate the standard duration in a separate column.

Tapping (TA):

Column 8: Entrainment: The number of entrainment intervals in the corresponding trial (insert NA if self-paced. Separate multiple values with a semicolon). The entrainment times per trial may be added as an additional column.

Column 9: Target: Target inter-tap interval (in seconds; insert NA if self-paced)

Column 10: Response: Inter-tap intervals in that trial starting with the synchronous taps (in seconds; separated by semicolon)

...	Procedure	Entrainment	Target	Response
...	TA	10	.43	.38;.4;.39;.43;.4; ...
...	TA	10	.43	.43;.42;.36;.47;.4.1; ...
...	TA	10;12	.47	...

Differential reinforcement of low rates of responding (DRL):

Column 8: **Target:** The minimum inter-response time required to receive a reward (in seconds)

Column 9: **IRT:** Inter-Response time for the corresponding response (in seconds)

...	Procedure	Target	IRT
...	DRL	15	13.74
...	DRL	15	16.11
...	DRL	...	...

STEP 3

If applicable, contributors can add new columns to the dataset as needed:

Optional Columns:

- Response Time (in seconds) as the time between the stimulus offset and categorization response (e.g., Temporal Bisection & Temporal Generalization)
- Condition (e.g., Feedback/NoFeedback)
- If the dataset has training data in it, you can append the training data prior to testing and indicate in a new column which portion of the data is "Training" vs. "Testing"
- Confidence Ratings (details of the scale used should be indicated in the codebook.txt)
- Any other factor that is needed to fully describe your dataset

To the degree possible, missing trials should be indicated with a blank cell (in their actual order in the dataset). The same applies to the excluded trials; the exclusion status can be indicated by adding another column. The criteria used to exclude the trials should be indicated in the codebook.txt.

We encourage that all participants/subjects are included in the dataset (even though you might have excluded them according to some exclusion criteria). We encourage researchers to also indicate which participants were excluded from the original analysis in the codebook.txt as well as the criteria used to exclude those cases.

STEP 4

Content of the Accompanying codebook.txt file

Each dataset should be accompanied by a codebook.txt file in order to provide details regarding the corresponding experiment. This file can be as detailed as the contributors would like but should certainly include the following information:

- *Contributor(s):* Full name and email of contributor(s).

- *Citation*: If the paper has been published, the citation should be provided in APA format. Contributors should also indicate to which experiment of a study the dataset belongs to. If the paper has not been published, this should be indicated in this section.
- *Stimulus*: The stimulus types or classes used should be described. How this information matches the indices used in the dataset should be made clear here (e.g., what does “1” under condition corresponds to if a numeric format was used to indicate different conditions)
- *Manipulations*: Contributors should describe all the manipulations used or state if there were no manipulations.
- *Feedback*: Contributors should indicate if there was any feedback and the type of feedback used. This information should ideally also be listed in the dataset submitted.

Additional fields (if and when applicable):

- *Subject demographics*: Average age, SD of age, age groupings, clinical categories
- *Type of the response device used*: For human research keyboard, mouse, response box, eye tracker (e.g., gaze). For animal research lever, nose poke, etc.
- *Experiment setting*: Lab vs. online
- *Training*: Contributors should indicate the amount of training given to the subjects prior to actual testing
- The primary aim of the experiment
- Main result of the study
- Special instructions: For instance how subvocal counting or chronometric strategies were suppressed in humans studies
- Link to material and/or codes
- Date of Data collection (if possible time of data collection)
- Location of data collection including the country and language of instruction
- If a given subject completed different tasks
- Any other important information about the dataset that contributors see relevant

Basic dataset information

The basic datasheet information should be filled out for each dataset, which will be added to the master spreadsheet titled “Timing_Database_Information.csv”. We will make this file available online at the Open Science Framework (OSF) website. The OSF (<https://osf.io/>) is “... a tool that promotes open, centralized workflows by enabling capture of different aspects and products of the research lifecycle, including developing a research idea, designing a study, storing and analyzing collected data, and writing and publishing reports or papers.” (Foster & Deardorff, 2017, p. 203). See “Step 7” below for further details.

Naming the files

The files should be named “**dataset**_method_FirstAuthorLastName_year.csv” and “**codebook**_method_FirstAuthorLastName_year.txt”. (e.g. dataset_TR_Karsilar_2016.csv and codebook_TR_Karsilar_2016). The year should be indicated in four digits to indicate the year of

the corresponding publication or preprint. Contributors should use “unpub” instead of the year if the work has not been published yet (e.g. dataset_TB_Balci_unpub.csv). If multiple datasets from the same year are submitted, the conventional “a.b.c...” suffix should be added following the year. (e.g. dataset_TB_Duyan_2020a.csv and dataset_TB_Duyan_2020b.csv; along with the complementary codebook_TB_Duyan_2020a.txt and codebook_TB_Duyan_2020a.txt). If an unpublished dataset is later published, please let us know so that we can update the information on the database.

Lastly, in the “Spreadsheet_template.xlsx”, enter all the necessary information. The value in the “Name_in_database” section of the spreadsheet should match the name of the dataset file exactly. Do not include the suffix “.csv” when reporting dataset names in this spreadsheet. (e.g. for the first example above, the Name_in_database section of the spreadsheet would show “dataset_TR_Karsilar_2016”)

Please do not change the order of the components of the file names and make sure to place all underscores (_) at their appropriate location as described and exemplified in this section.

STEP 5

Before you submit your dataset

- Please take a look at the examples or templates provided for your task that you are about to upload.
- Please double-check every detail of your submission.
- Please make sure that all the files open properly and it is free of any unintended formatting issues.
- Please name the required columns exactly as listed above (e.g., Subj_idx instead of “Participant” or “Subject”)
- Please make sure that all durations are in *seconds*.
- Please do not change the order of the required columns.
- Please do not omit rows or columns or leave any cell empty.
- Please make sure that there are no special characters in your dataset.
- Please make sure to write the codebook file via a text editor (instead of Word). This will ensure that nonsensical characters are not inserted during “save as” txt.
- Please make sure that the number of subjects, sessions, blocks, trials, minimum and maximum number of trials per subject, number of tasks by conditions in the dataset and information spreadsheet (Spreadsheet_template.xlsx) match. In case the number of sessions, blocks and/or trials differ between subjects please indicate it in the Notes section of the excel sheet.
- Please use “period” and not “comma” as a decimal place separator.
- Please do not use semicolons (“;”) for anything other than to separate items within columns, as exemplified above. Please do not enter spaces before or after the semicolon for such use cases (see table examples above).

- Please separate multiple responses to a single trial by semicolons within the “Response” column. For an example of such a use, see *Peak Interval* and *Tapping* procedures; this scheme also applies to other procedures with multiple responses for a given trial.
- *Adding multiple responses in a single column in Excel*: If the multiple responses for a single trial are in different columns in your csv file, you can merge them into a single column using the '&' function in Excel. To separate the data points with semicolons within a single column, add ';' between the referenced cells. For example, if you want to merge the columns J2, K2 and L2, type in '=J2&"&K2&"&L2' and apply this function to the entire column. You can use this simple technique for all columns that may require concatenation, such as the Duration_Set, Reference_Intervals, Response_Offset or Response columns.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	Species	Subj_idx	Session	Block	Trial	Stimulus	Procedure	Entrainme	Target	Response_1	Response_2	Response_3	Response	TargetType	
2	Human	115	1	1	1	Auditory	TA		32	0.5	0.45899	0.50643	1092260875	=J2&"&K2&"&L2	random IRI
3	Human	115	1	1	2	Auditory	TA		32	0.4	0.36425	0.4035	0.41158	0.36425;0.4035;0.41158	random IRI
4	Human	115	1	1	3	Auditory	TA		32	0.6	0.54614	0.61746	0.72012	0.54614;0.61746;0.72012	random IRI
5	Human	115	1	1	4	Auditory	TA		32	0.8	0.66482	0.80741	0.83477	0.66482;0.80741;0.83477	random IRI
6	Human	115	1	1	5	Auditory	TA		32	0.6	0.57767	1171177842	0.60111	0.57767;1171177842;0.60111	random IRI
7	Human	115	1	1	6	Auditory	TA		32	0.4	0.4429	0.32428	0.4075	0.4429;0.32428;0.4075	random IRI
8	Human	115	1	1	1	Auditory	TA		32	0.6	0.56951	0.60926	0.6171	0.56951;0.60926;0.6171	fixed IRI
9	Human	115	1	1	2	Auditory	TA		32	0.6	0.53793	0.6091	0.56159	0.53793;0.6091;0.56159	fixed IRI
10	Human	115	1	1	3	Auditory	TA		32	0.6	0.61692	0.54586	0.6091	0.61692;0.54586;0.6091	fixed IRI
11	Human	115	1	1	4	Auditory	TA		32	0.6	0.62489	0.6169	0.63294	0.62489;0.6169;0.63294	fixed IRI

STEP 6

Data quality check

We have written simple scripts in Matlab and Python to help with initial data quality checks. These files are named TD_quality_check.m and TD_quality_check.py, respectively and are available on the OSF page (<https://osf.io/vrwjz/>), under Instructions for Contributors → Quality Check Info and Scripts. Please run one of these files before sending your contributions (this is a REQUIREMENT for submission). To run the files:

Edit the “Spreadsheet_template.xlsx” document to include the information about your dataset(s).

Please make sure that you have appropriately renamed your files such that they include the prefix “dataset_” and “codebook_” (see **Naming the files** section above for details)

Place one of the TD_quality_check files (Matlab: TD_quality_check.m; Python: TD_quality_check.py), all files you're sending, and the Spreadsheet_template.xlsx document (don't rename this file) in a new folder.

Run the quality_check file. If there are any errors or warnings, update the files until you have addressed all issues.

Please note that the quality checking scripts only look for and warn about:

- 1- Incorrectly stated column names and/or missing columns.
- 2- Inconsistencies/Errors in file names as well as the expected number of files.
- 3- Incorrectly loading/corrupt data.
- 4- Inconsistencies between information in the Spreadsheet_template.xlsx file and the submitted .csv files (e.g. in terms of sample sizes, maximum and minimum trials per subject, name of study etc.)

Thus, we highly recommend that the researchers check the submission such that no inconsistencies are present in the data. Please check the “Contribution Templates” folder under “Instructions for Contributors” on OSF for examples of each type of procedure.

STEP 7

Where to send files

To contribute, send an email to TimingDatabase@gmail.com with:

- All dataset files (in .csv format)
- All codebook files (in .txt format)
- A single csv file with information about the dataset(s) you’re contributing. Please use the template provided called “Spreadsheet_template.xlsx”. This information will be added to the master spreadsheet “Database_Information.csv”, which will be available on the OSF page of the database.
- A confirmation (within the email) that you have run one of the data quality checks and they return no errors.

Your files will undergo additional basic quality checks and then be uploaded to the database (<https://osf.io/vrwjz/>). You can check the website for examples of datasets and codebook files that follow the directions and fulfill the requirements listed above.

NOTE: Contributors are welcome to share additional ideas for analyses that can be conducted with the completed database.