

HOW TO INSTALL THE BOX TASK ON A WINDOWS 7/8/10 PC, TABLET OR LAPTOP

Tutorial March 2017

Step 1 - Installation

Make sure that you are working on a Windows system on which you have administrator rights. If possible, login as administrator.

Make a new folder `C:\BoxTask`

Open the `BOXTASK.ZIP` file and extract all files to this folder `C:\BoxTask`

In the subfolder 'boxtask setup' that is in this folder (so `C:\BoxTask\boxtask setup`), right click on `setup.exe` and select 'Run as administrator'.

This will start the installation process of the Box Task program. The setup program will ask you where the program should be installed. It is the easiest if you install the program in the `C:\BoxTask` folder for this as well, then you have everything in one place.

During installation you may or may not get two types of warnings:

- some OCX or DLL files may already be on your system in a newer version; it is recommended that you keep your existing file; the installation software will ask you "Do you want to keep this file?"; select 'Yes'

In the end you will get the message that the Box Task was installed successfully (despite these warnings)

After that, go the 'ico' folder in `C:\BoxTask\BoxTask`, select all icons (CTRL+A) and delete them all (you may get a warning that you need administrator rights, if so, press OK)

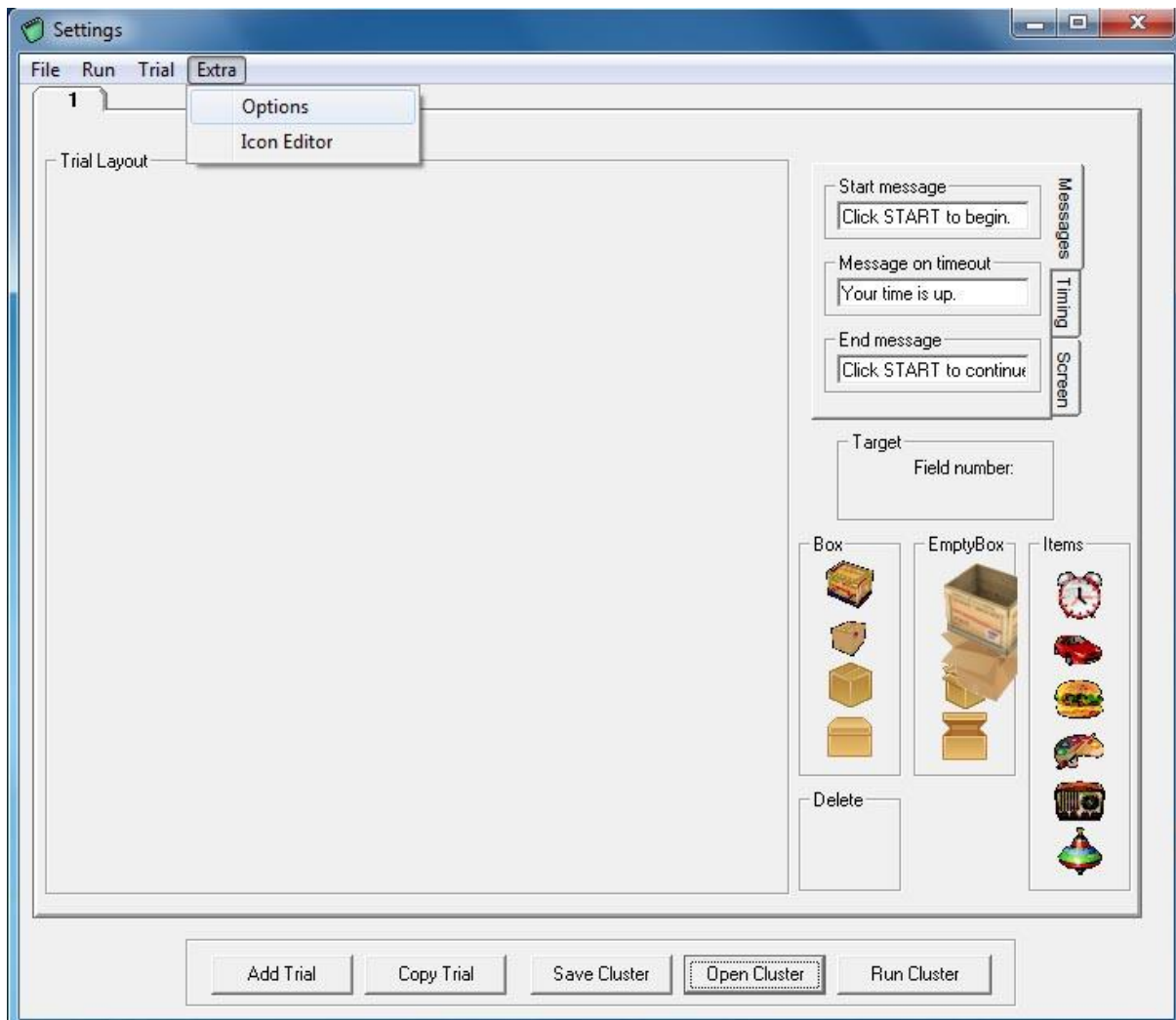
Then go to `C:\BoxTask\ICONS 64x64`; select all (CTRL+A) and copy them all to the folder `C:\BoxTask\BoxTask\ico` that you just emptied

In the folder `C:\BoxTask` delete the file `SOUND.WAV`

After that, go to `C:\BoxTask\BoxTask` and select the program file `BoxTask.exe` (the .exe may not be visible), right click on this file and select Send to --> Desktop (create shortcut)

Run the program by clicking this shortcut

You should see the following screen:

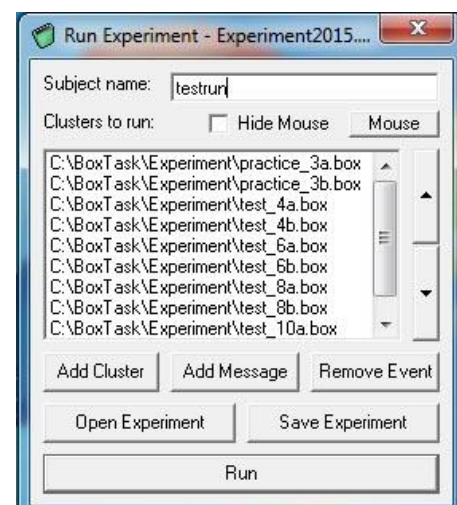


The first time you run the program, you have to go to *Extra* → *Options* and set Icon Size to 1000.

Step 2 – Run experiment

After the program has started, click Experiment in its top menu and then Run Experiment. After that, open the file `Experiment2016.bex` in the folder `C:\BoxTask\Experiment`.

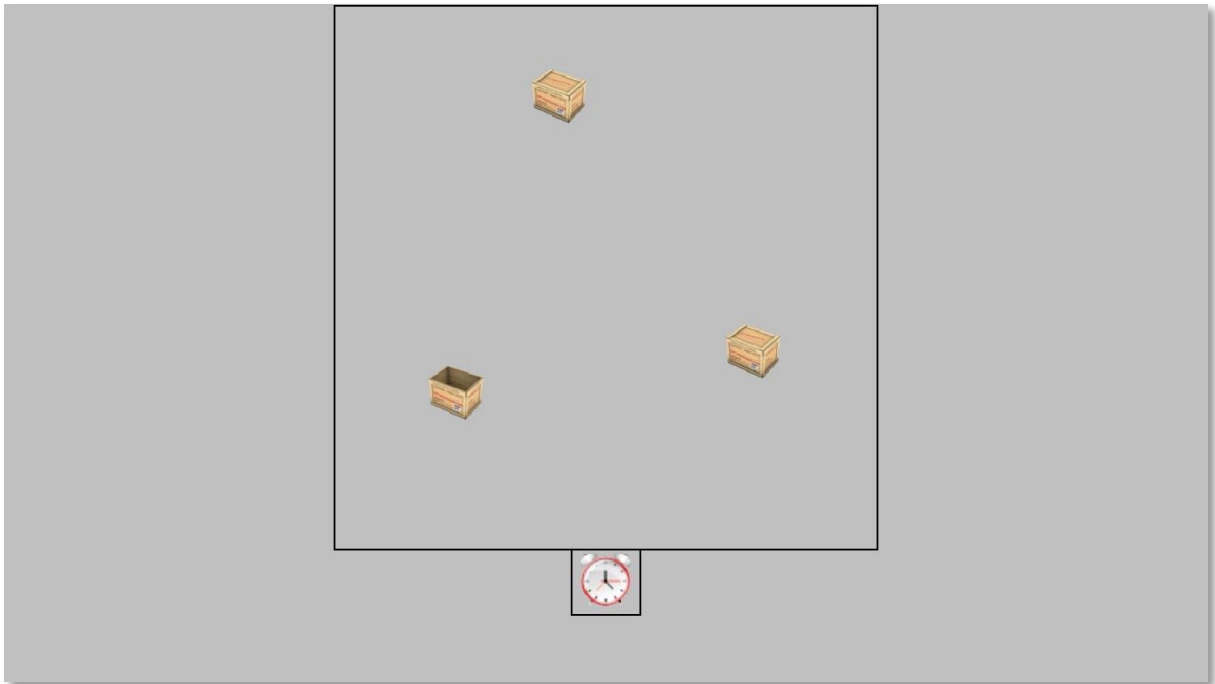
You will see that the individual trial files (called 'Clusters' in the program, with extension `.box`) will be loaded into the program (2 trials of the same working memory load; practice trials with 3 boxes and then the actual test with 4, 6, 8 and 10 boxes).



If you do not use a touch screen, make sure to uncheck the Hide Mouse checkbox every time you run the experiment, otherwise you will not see a mouse cursor during testing (if this happens, press Esc)

[Using a touch screen is preferable for adults with cognitive impairments or older adults in general. Make sure the touch screen is properly calibrated, so the subject does not experience difficulties with the precision to touch a box.]

After that, you can test a participant. Provide the participant ID and click Run. The layout should like this with respect to relative icon size etc. (on a widescreen monitor)



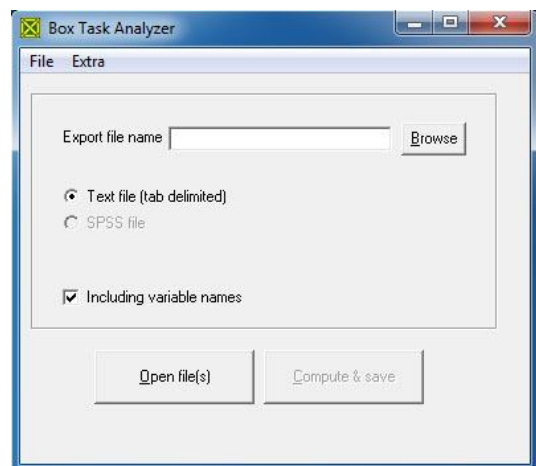
The output fil will be saved under the name of the participant ID followed by `.bof` in the `C:\BoxTask\BoxTask\Experiment` folder.

Step 3 – Analyse the data

You will need the `Box Task Analyzer 2016.exe` program for that which is in `C:\BoxTask`

Run the program by clicking it (you may get the message that the software publisher cannot be verified, this you can ignore, just uncheck the box *Always ask before opening this file* and click Run)

After that, click the *Open file(s)* button. Next, you can select all the individual output files (`.bof`) which will be aggregated into one file that you can import in SPSS, Excel or whatever.



Next, you have to enter the name of the output file (*Export file name*), click *Browse* to go the folder in which you want to store the aggregated file and give it a name. This will be a `.dat` text file that you can import in any analyses program.

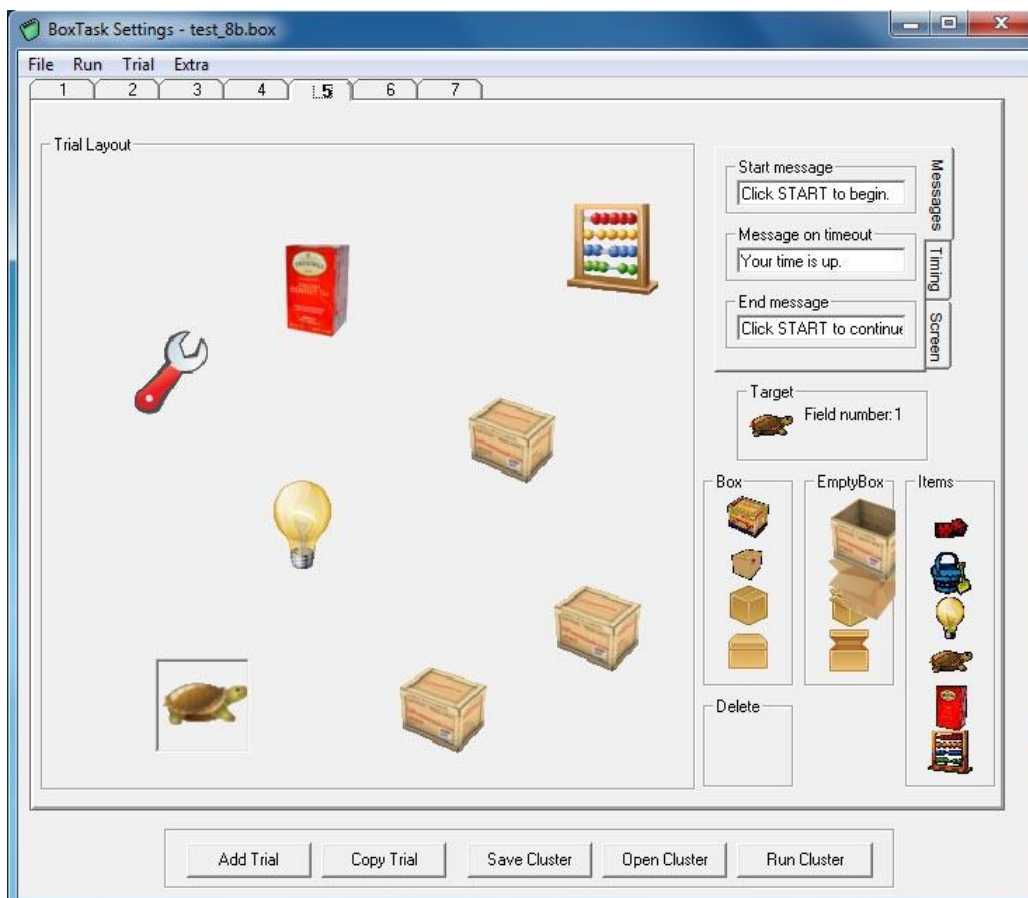
Make sure you leave the *Include variable names* checkbox checked (this will make the variable names part of the output file, which is convenient).

Subsequently, you can click the *Compute and save* button; this computes the between-search, within-search and strategy scores per trial per subject, which are subsequently stored as one aggregated file.

Advanced options

You can also use the Box Task program to make new stimulus (`.box`) files. You have to drag closed boxes into the empty square and create a layout. Next, you can select objects by right clicking on any of the 6 objects shown in the bottom right of the screen and select them from the folder. Drag one object to one of the closed boxes and click right to set this as target. Next, select Copy trial, then drag another object to another location and right click, etc.

The menu in the upper right corner can be used to change background and foreground colours, to change the timing (1 second gives the best result for the box to be opened) and set a timer if you like (if 0 is entered, no timer is visible). Also, you can alter the messages shown to the participant. If you do this when making the first display of one trial (so before selecting Copy Trial), you only have to do it once.



You can always add new icon files to the `C:\BoxTask\BoxTask\ico` folder, but these can only be 24-bit .ico files (new Windows 7/8 icons are 32-bit files, which the program cannot handle). Commercially available software such as IcoFX (<http://icofx.ro/>) can be used to convert PNG, JPG and other files (incl. 36-bit icon files) to 24-bit .ico files. An icon size of 64 x 64 gives the best results on the monitor we use (with a resolution of 1366 x 768). Also, make sure the imported graphic files are not too detailed for this resolution. You can also ask me for additional icons as I have a lot of them.

On larger screens or HD monitors, you could try whether icons with a larger resolution work, e.g. 128 x 128. But you will have to adjust the icon size under Options in the Box Task program. This will require some trial and error before you get the best results.

Individual trial files can be grouped into one experiment using the Experiment menu; just add the .box files you want to include and save them as a new experiment (this will create a .bex file).

You can also remove individual .box files from an experiment (for example, if you want to run an experiment without the 10-box trials). Removing these files from an experiment does not remove them from your PC, so you can always add them later.

In all, the Box task program uses four types of files, which are all text files you can open with any text editor such as Notepad.

- .box → this is a file that contains the information about the stimuli in one trial (i.e. consisting of multiple searches)
- .bex → this contains the filenames of the .box files that are part of one experiment
- .bof → this is the output file of a single subject, containing all raw data
- .dat → this is an aggregated, comma delimited text file that contains the between search, within search and strategy scores per trial per subject; this can be imported by SPSS, Excel etc.

For more information about the cognitive processes the Box Task measures, see one of the following papers:

Kessels, R.P.C., Hendriks, M.P.H., Schouten, J., Van Asselen, M., & Postma, A. (2004). Spatial memory deficits in patients after unilateral amygdalohippocampectomy. *Journal of the International Neuropsychological Society*, 10, 907-912.

Kessels, R.P.C., Meulenbroek, O., Fernández, G., & Olde Rikkert, M.G.M. (2010). Spatial working memory in aging and Mild Cognitive Impairment: Effects of task load and contextual cueing. *Aging, Neuropsychology, and Cognition*, 17, 556-574.

Oudman, E., Van der Stigchel, S., Wester, A., Kessels, R.P.C., & Postma, A. (2011). Intact memory for implicit contextual information in Korsakoff's amnesia. *Neuropsychologia*, 49, 2848-2855.

Van Asselen, M., Kessels, R.P.C., Neggers, S.F.W., Kappelle, L.J., Frijns, C.J.M., & Postma, A. (2006). Brain areas involved in spatial working memory. *Neuropsychologia*, 44, 1185-1194.

Van Asselen, M., Kessels, R.P.C., Wester, A., & Postma, A. (2005). Spatial working memory and contextual cueing in patients with Korsakoff amnesia. *Journal of Clinical and Experimental Neuropsychology*, 27, 645-655.

Van Geldorp, B., Konings, E.P.C., Van Tilborg, I.A.D.A., & Kessels, R.P.C. (2012). Associative working memory and subsequent episodic memory in Alzheimer's disease. *Neuroreport*, 23, 119-123.