

Typographic notations

z-tree terms are marked in SMALLCAPS

z-tree menu items are marked in ->

The text you type is in *italics*

Terms and notations of z-tree

Experiment = Set of procedures aimed at controlled empirical investigation of a particular question/problem/hypothesis. Conducted in one or more sessions.

Session = Events that occur in the time span between the arrival of the subjects and the moment they have received payment. A set of corresponding sessions constitutes one experiment.

Treatment = Part of a session conducted with the same subjects and under the same conditions. Outcome stored in a single z-tree file.

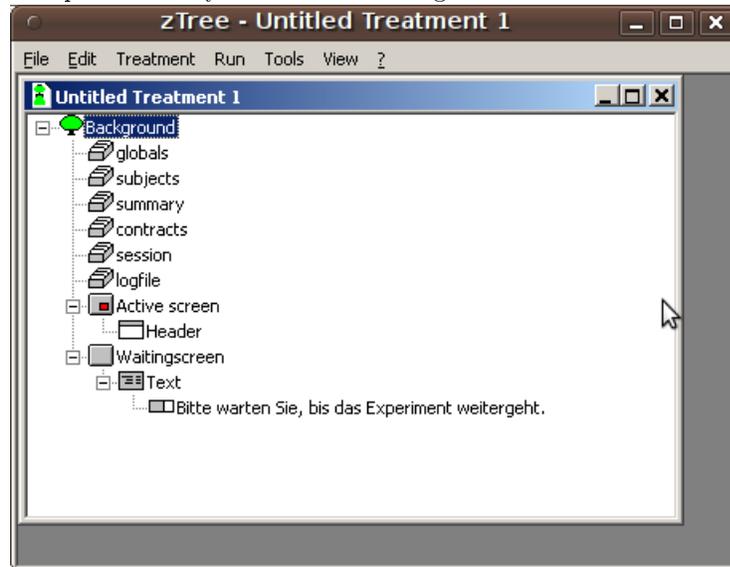
Stage = Logical part of a treatment consisting of one or more actions of the players and/or Nature. Stages are built in a stage tree of a treatment, and consist of Active screen and Waiting screen.

Active screen = Layout of information provided to the subject in several boxes arranged on the computer screen. Boxes are inserted by 1) selecting Active screen, and 2) choosing Treatment->New box. They may be Standard, Container, Contract, Contract list, Message and many others. In these boxes, you also may put New items, New Buttons and other things. All these things are contained in the Treatment menu: selecting items from that menu and submenus, you compose the appearance of your Active screen, pretty much as children build a house in a kindergarden (!). You fill the Waiting screen in the same way: by default this is just an empty space you may optionally fill with some messages.

Programming z-tree by means of a simple language is needed for most relatively advanced treatments; in most cases this is done through New Program menu item. Before moving to that, let build a simple z-tree treatment for the Public Goods game with two players and one period.

A simple Public Goods game

1. Open z-tree - you see the following screen



2. Set up the general parameters of your treatment. To do so, select BACKGROUND, in the menu, choose Treatment->Info.... You will see the following table.

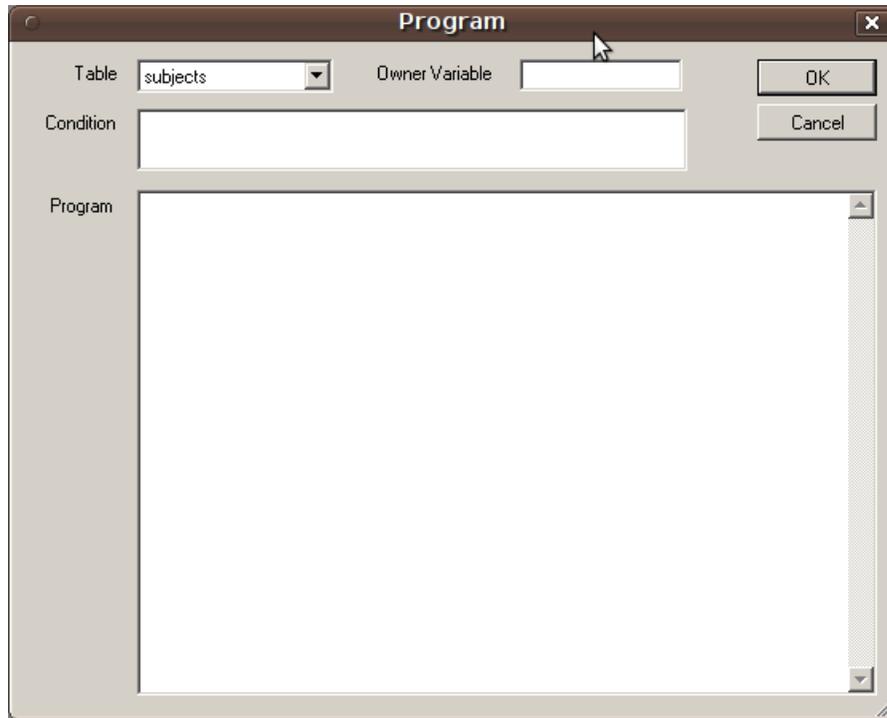
General Parameters	
Number of subjects	24
Number of groups	6
# practice periods	0
# paying periods	10
Exch. rate [Fr./ECU]	.07
Lump sum payment [ECU]	0
Show up fee [Fr.]	10

Buttons: OK, Cancel, Bankruptcy rules...

In the above example, there are 24 subjects grouped into 6 groups of 4 players, the game is to be repeated for 10 periods without practice, and the payments are given in the bottom part. At first, we want a simpler treatment with 2 subjects in 1 group, played for 1 period - these inputs can easily be modified.

3. Start adding programming items by selecting the menu item just above the top incompleted item. At first instance, this is the last item of the BACKGROUND menu, just before ACTIVE SCREEN. (To delete any item, select it and press Ctrl+X).

Click the last item in this menu, select Treatment->New program, and click it. You get



Complete the program window with subjects table in the top screen, inserting the following two lines:

EfficiencyFactor = 1.6;

Endowment = 20;

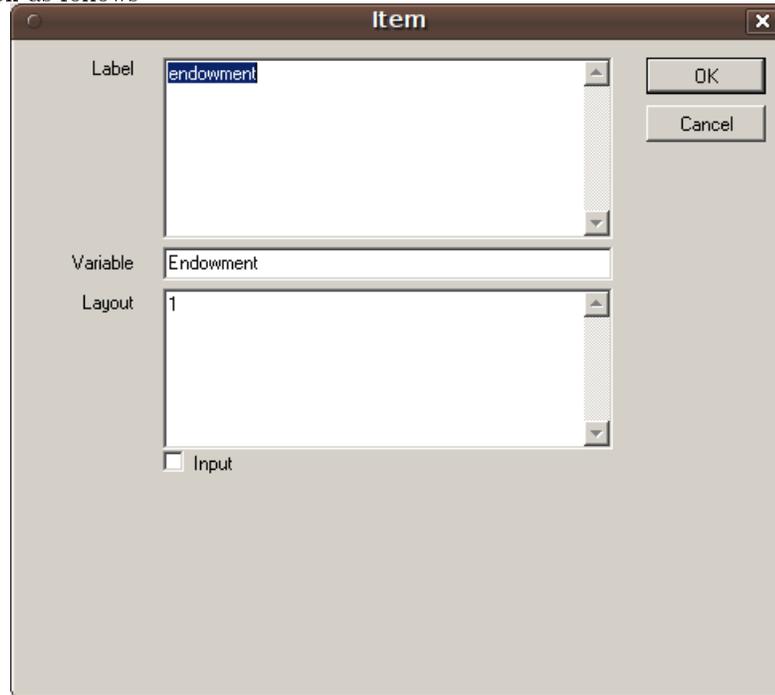
ending each line with semicolon (;) - this tells z-tree the command is completed.

4. Set up new stage: Select BACKGROUND, then Treatment->New Stage. Name it *contributions*, press OK. It will appear at the bottom of the tree, as a green pyramid. In this stage, you will program choices of your subjects. To do so, you need to tell z-tree which information should your subjects see and what should they do.

5. Information in an active screen is collected in BOXES. For this experiment, we need only a simple, Standard box. To create it, select ACTIVE SCREEN, and choose Treatment->New box->Standard box... In this window you choose the layout of your screen, by setting widths, heights and positions of all frames. These must be accompanied by either % or p sign to the right of a number - otherwise the system won't recognize them, and the screen will just be blank. So far there is no need to adjust anything - press OK, and start filling this box with the information our subjects will need to see and act upon.

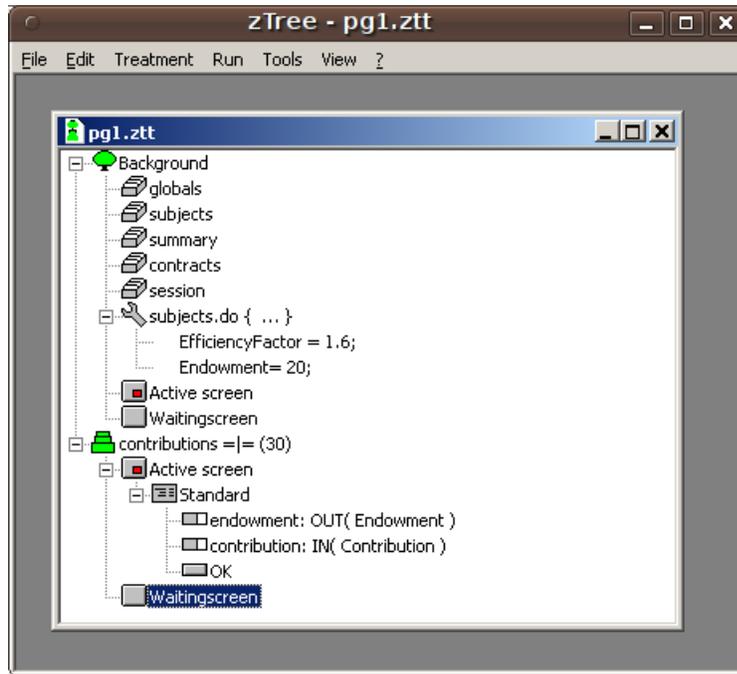
a) Select the STANDARD box you have just created, choose Treatment->New Item... It will show your endowment. LABEL it somehow (e.g. *endowment*), put VARIABLE *Endowment* (in the same case you have put it in 3) above, otherwise z-tree won't recognize it and there will be an error!), put 1 in LAYOUT (this

means that numbers will be shown in integers - multiples of 1, or 20, rather than 20.0). Do not select click INPUT - this means the item displayed will contain information rather than demand the subject to act. Your screen should look as follows



b) Now let us create the action item, or contribution. Select again ACTIVE SCREEN, go to Treatment->New Item.... LABEL this item *contribution*, use VARIABLE *Contribution* with LAYOUT 1 and click INPUT. (This click implies that Contribution is a new variable, not needed to be defined above!). In the bottom dialog, set MINIMUM to 0, MAXIMUM to *Endowment*, click OK. You may rearrange the items within the selection box simply by dragging them - make sure that contribution is below endowment

c) Terminate the stage by Ok button. Select the last item in the STANDARD box, choose Treatment->New Button..., and call it OK. Save the treatment as pg1. Your stage tree now looks as follows



6. Now it is time to calculate profits, which will be done in the second stage of the treatment. Select the first stage CONTRIBUTIONS, and add a new one (Treatment ->New stage...). Call it *profit display* - it will calculate profits. To do so, select the PROFIT stage, choose Treatment->New program, and insert in program field the following:

$$\begin{aligned} SumC &= \text{sum}(\text{same}(\text{Group}), \text{Contribution}); \\ N &= \text{count}(\text{same}(\text{Group})); \\ Profit &= \text{Endowment} - \text{Contribution} + \text{EfficiencyFactor} * \text{SumC}/N; \end{aligned}$$

These are the three variables needed to calculate profits. The first is sum of contributions, defined using pre-built variables same(Group) and pre-built function sum. The second used pre-built function count to find out how many people have contributed. The last defines variable Profit as a function of everybody's actions. Select OK - the program will be marked by a key with label subjects.do, immediately below the stage name.

7. Now tell z-tree what the subjects will see at that stage. Select ACTIVE SCREEN, Treatment->New box->Standard box, again without any corrections. Insert in this box three items, in the same way as you did for the previous stage:

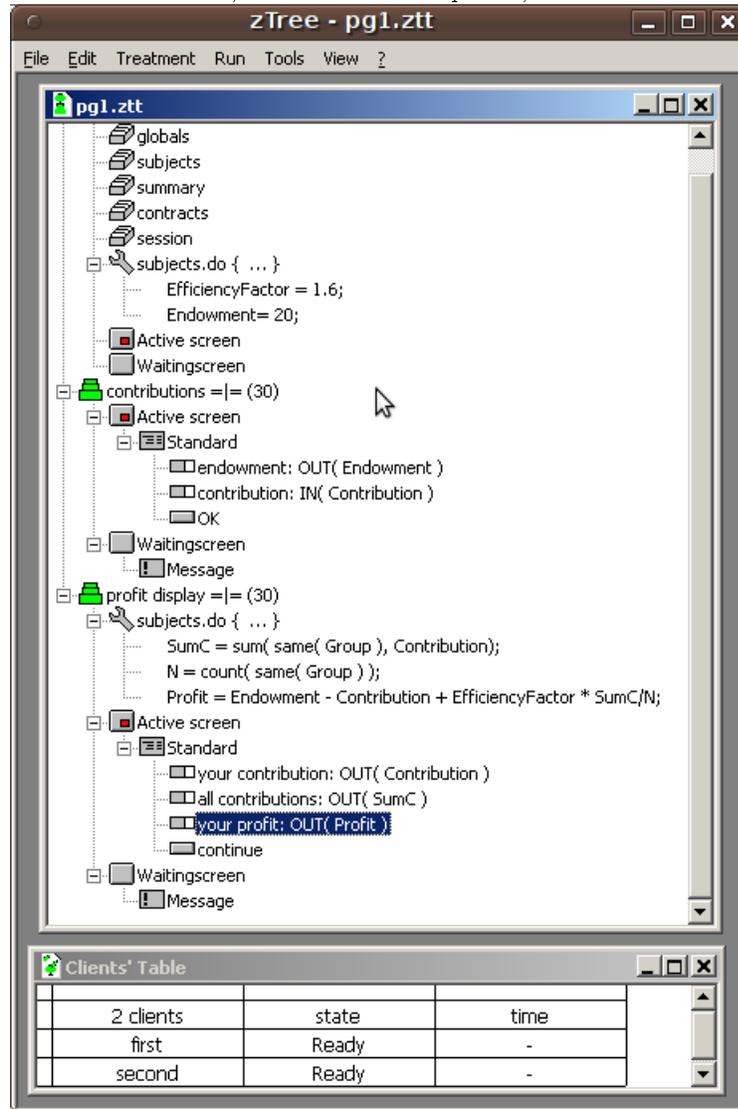
- c) *your contribution*, to recap your contribution
- d) *all contributions*, to show the sum of all contributions, SumC
- e) *your profit*, to prove what your Profit is.

f) conclude the stage by inserting a button called CONTINUE. As usual, labeling of the items and buttons is a matter of taste - all you need to take care of is that all variables are properly called and referenced. The program will alert you if you have made any mistake (unfortunately, some of the warnings

appear to be available in German only!)

7. To make your treatment even better-looking, you may add messages to Waiting screens, by selecting them and choosing Treatment->New Box->Message box.

Save the treatment, which is now completed, and looks as follows:



8. The table at the bottom is used to check whether your clients (subjects) are online. To let them be, we need to try your experiment. At first, let us do so by opening several clients in one machine. Create shortcuts to the zleaf in the same directory where your ztree.exe and zleaf.exe files are located, and label them /name first and /name second at the end of the text in the TARGET

window. Then

- a) open z-tree,
- b) open in it the treatment pg1.zzt,
- c) launch the two shortcuted leaves.

Now, if you choose Run->Clients Table in your z-tree treatment, you will see the table at the bottom, which means all your clients are online and seen by the server. Go to Run->Start treatment (or press F5) to run your treatment.