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Ori Weisel
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Friedrich Schiller University Jena
Carl-Zeiss-Str. 3
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www.uni-jena.de

Max Planck Institute of Economics
Kahlaische Str. 10
D-07745 Jena
www.econ.mpg.de

A flexible z-Tree implementation of the Social Value Orientation Slider Measure (Murphy et al. 2011)* — Manual —

Paolo Crosetto[♯], Ori Weisel[♯], and Fabian Winter[♯,†]

[♯]Max Planck Institute of Economics, Kahlaische Strasse 10, 07743 Jena, Germany
[†]Corresponding Author: winter@econ.mpg.de

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Abstract

This manual describes a z-Tree (Fischbacher, 2007) implementation of the paper-based Social Vaule Orientation (SVO) Slider Measure by Murphy et al. (2011). Using the paper-based version instead of the slider-based version (as implemented on the SVO-Website) avoids server-traffic related delays we experienced in the latter implementation.

JEL-Classification: C91, D03, D64
Keywords: z-Tree, Social Value Orientation

This manual describes an implementation of the SVO Slider Measure (Murphy et al., 2011, SVOSM here after) in z-Tree, the de-facto industrial standard of experimental economics research. SVOSM is designed to measure social preferences on a continuous scale. We refer to the corresponding publication for further details. The z-Tree implementation is attached to this pdf-file, and you can simply double-click **here**  to open the file.

Murphy et al. (2011) present two different versions of the SVOSM: a quasi-continuous web-based measure using sliders, and a discrete paper-based version capturing the important features of the web-based version, but (to some researchers) easier to administer. After implementing a slider-based version with real-time display of the slider's position in z-Tree, we experienced *serious* time delays, causing the server to freeze for up to several minutes. Whether this was due to traffic on the network or to excessive read-and-write activities on the hard drive could not finally be settled, but slightly increased performance after switching to a solid state drive points towards the latter cause. This finally led us to implement a point-and-click version of the SVOSM, heavily reducing network traffic as well as hard drive issues.

Our implementation of the SVOSM provides all the features of the paper-based version of the SVOSM, except for interior decisions (i.e., choices which are in between the discrete values on the

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scale).[1] Moreover, we generalized our implementation by allowing for different matching protocols of the decision makers, different languages, and different scaling, ordering and subsets of the items. Table 1 gives an overview of the important parameters of the implementation.

The z-Tree implementation of the SVOSM was designed as a stand-alone treatment which is easy to integrate in existing z-Tree treatments. It was created in z-Tree 3.36 and can be used as any other treatment.

1 Parameters

This section describes parameters of the z-Tree treatment which can easily be changed by the experimenter to match specific needs. Standard parameters, e.g. number of subjects, are treated in the conventional ways of z-Tree. It is not necessary nor recommended to change the number of rounds or groups. To change treatment specific parameters, open the globals program "////INSERT PARAMETERS HERE ////" (see Figure 1) and change the respective values described below.

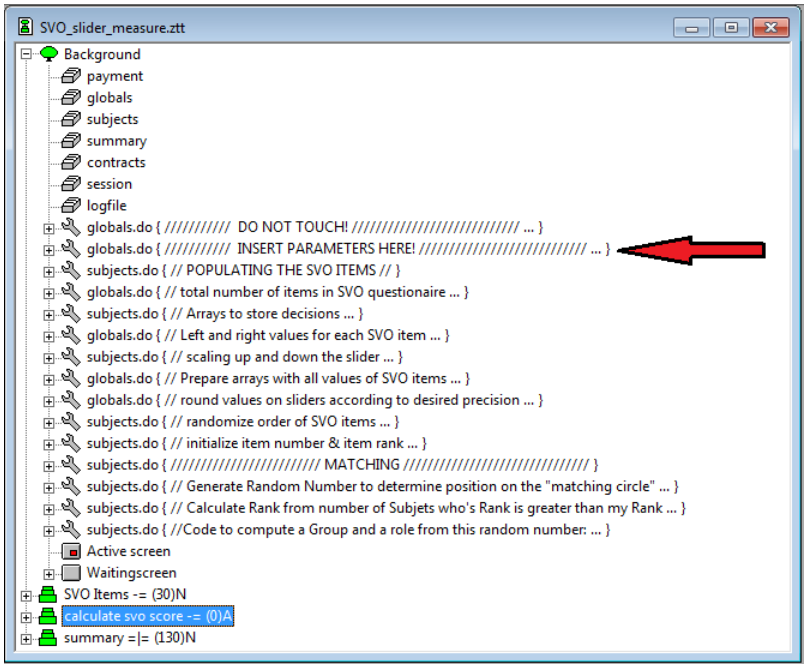

Figure 1: Screenshot of the program indicating where to change setup parameters

[1] Interior decisions in the paper-based version are possible in principle, but rarely used in practice (personal communication with R. Murphy).

1.1 language

Sets the language in which the SVOSM is displayed to the decision maker. Implemented languages are English, German, and Italian.

1.2 select_items

Allows you to choose whether only the six primary items or all fifteen items (six primary and nine secondary) are displayed. Using only the secondary items is not possible.

1.3 items_in_random_order

Determines whether items are displayed in the order presented in the paper-based SVOSM as in the original publication, or in random order. If the `RANDOM` option is chosen, the order is randomized separately for each subject.

1.4 matching

Determines the matching procedure of the measure. This is the major difference to the original publication. Murphy et al. (2011) chose a `RING` matching, such that A gives to B, B gives to C, C gives to D and D gives to A (see left side of Figure 2). Here, every subject is a sender and a receiver at the same time, though not from and to the same person. The `RING` matching works with any number of Subjects *greater than 1.*

In the `RANDOM_DICTATOR` matching (right side of Figure 2), subjects A,B,C,D are matched in groups of 2 (say (A; B) and (C;D)). Every subject submits his/her choices in the SVOSM. Later, one member of each group (say A and C) is randomly selected to be the sender, and the other (B and D, respectively) is the receiver. In this case, B receives from A and D receives from C. The choices by B and D are recorded but not implemented. `RANDOM_DICTATOR` matching thus limits the interaction to two subjects, where only one choice is finally implemented. This may reduce chains of reciprocity, where A might give to B because she expects to be compensated by D. The `RANDOM_DICTATOR` matching works with any number of Subjects that is a *multiple of 2.*

The `RANDOM_DICTATOR` matching is an implementation of the strategy method, and decisions are only implemented with probability 1/2. It has been argued that such decision making may be perceived as "colder", and thus may lead to more strategic (Brandts and Charness, 2000) or normative choices (Rauhut and Winter, 2010).

1.5 scale

The scale of the circle underlying the SVOSM can be changed. The default is `scale = 1`, which results in a circle of diameter 100, as in the original publication. Inputs greater than 1 scale the circle up (e.g. a 2 results in a circle of diameter 200 with 100,100 in the center), inputs smaller than 1 scale the circle down (e.g. a 0.5 results in a circle of diameter 50 with 25,25 in the center). Scaling may be useful if you want to present the decisions in real monetary values and cannot afford to pay 100 €/$/CHF/*cdot*.

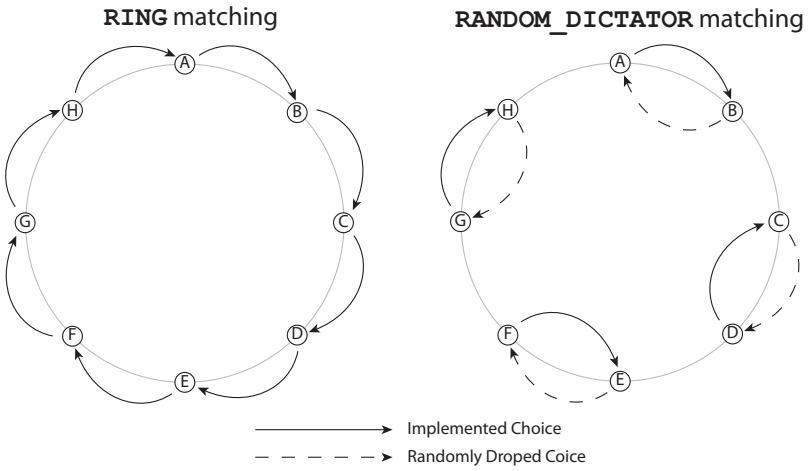

Figure 2: Different matching protocols

1.6 precision

Determine the precision of the displayed values. This option is more or less hard-coded, since z-Tree does not allow for conditional layout of decimals. `INTEGERS` displays values as integers, which is desired for larger numbers, e.g. a circle of diameter 100. For a circle with small diameter, two decimals should be more appropriate (choose option `TWO_DIGITS_AFTER_POINT`).

1.7 debug

Displays some debugging information, including a kill-button. Useful for testing the treatment.

2 Output

The z-Tree treatment writes all the relevant output in the subjects-table and calculates the important measures straight away. This makes it possible to readily use the result in the experiment (e.g. for matching purposes) and makes the subsequent data analysis more convenient, since all important measures are already in the data set. There are more variables in the subjects table than we discuss here, but most of them are explained in Table 2. Some of the output variables are only important under specific parameters, e.g. `avg_dist_to_equality` is only calculated if also the secondary items are used. The rightmost column of table 2 indicates if and when the variables are used.

2.1 Profit

The `Profit`-variable is built-in in z-Tree, and is automatically written to the `TotalProfit`-variable in the session table. Thus, you can use the profits earned in the SVOSM also in later treatments, if there are any. To determine the profits, one of the sliders is randomly selected and the corresponding

earnings are written to the `Profit`-variable. If `RING` matching is used, `Profit` contains the sum of the amount received as a receiver and the amount kept as a sender. When the `RANDOM_DICTATOR` option is chosen, `Profit` depends on the subjects role: If she was chosen to be a sender, `Profit` returns the amount kept, and if she was chosen to be a receiver, it returns the amount sent to her by the sender.

2.2 svo_angle

The `svo_angle` is the core measure of the SVOSM. It is calculated from the primary items as

$$\arctan\left(\frac{\texttt{mean\_to\_self} - 50 * \texttt{scale}}{\texttt{mean\_to\_other} - 50 * \texttt{scale}}\right).$$

See Murphy et al. (2011) for a detailed discussion. The `svo_angle` is stored in the subjects table *and* in the session table. Storing values in the session table is necessary if some of the SVOSM information is required in other treatments later in the session.

2.3 svo_type

The `svo_type` assigns labels to specific value ranges of the `svo_angle`. These labels are more or less arbitrary and should only be used if really necessary. In all other cases, the continuous form of the measure is preferable. The following values are used: 1 = Altruist, 2 = Prosocial, 3 = Individualist, 4 = Competitive. Thresholds are taken from the original publication. The `svo_type` is stored in the subjects table *and* in the session table.

2.4 inequality_aversion_score

The `inequality_aversion_score` is calculated from the secondary items and is only computed if they are used. It is designed to distinguish between the motives of efficiency maximization and material equality. It is calculated as

$$\frac{\texttt{avg\_dist\_to\_equality}}{(\texttt{avg\_dist\_to\_equality+avg\_dist\_to\_joint})}$$

if the subject is classified as being "prosocial" (see subsection 2.4 above). In all other cases it is set to -99. The `inequality_aversion_score` is stored in the subjects table *and* in the session table.

3 Disclaimer

We tested the treatment carefully, both on our own and with "real" subjects. However, the authors disclaim all warranties, express or implied, regarding the Software, including any implied warranties of satisfactory quality, merchantability or fitness for a particular purpose. The authors shall have no liability whatsoever to the User of the Software for any direct, indirect, special or consequential loss and/or expense (including loss of profit) suffered by the User and arising out of a malfunctioning of the Software.

You can use, modify and distribute this Manual and the corresponding treatment if you agree with the above points. If you use this implementation of the SVOSM, please cite the SVOSM as

Murphy et al. (2011) and make sure to follow the license agreements associated with z-Tree, in particular to cite Fischbacher (2007). Citing this manual is gratefully acknowledged.

References

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Parameter	Values	Description
language	ENGLISH	Language is English
	GERMAN	Language is German
	ITALIAN	Language is Italian
select_items	PRIMARY	only the primary items (items 1-6) are elicited.
	FULL	primary and secondary items (items 1-15) are elicited
items_in_random_order	ORDERED	items are presented according to the order in Murphy et al. (2011)
	RANDOM	items are presented in random order
matching	RING	Subject A,B,C,D are ordered on a ring-structure as in Murphy et al. (2011). In this case, A gives to B, B gives to C, C gives to D and D gives to A, which makes everyone a sender AND a receiver.
	RANDOM_DICTATOR	Subjects A,B,C,D are matched in groups of 2 (say (A; B) and (C;D). One member of each group (say A and C) is selected to be the sender, the other one as receiver. In this case, B receives from A and D receives from C.
precision	TWO_DIGITS_AFTER_POINT	values on sliders are rounded to two digits after decimal point
	INTEGERS	values on sliders are rounded to integers
scale	$(0, +\infty]$	Parameter to scale up (> 1) or down (< 1) all the numbers on a slider. Default is 1, resulting in a circle of diameter 100
debug	{1;0}	set to 1 to display some debug info; set to 0 while running actual sessions

Table 1: Parameters in the z-Tree treatment

Relevant Variables in the Subjects Table	Description	Relevant for Parameters
Subject	unique identifier for the Subject	always
Group	matching group of the Subject.	matching=RANDOM_DICTATOR
Profit	Profit of the Subject	always
input_self[i]	allocation to self in item i	always
input_other[i]	allocation to other in item i	always
random_ranks[i]	order of item i in RANDOM order	items_in_random_order = RANDOM
chosen_option[i]	chosen option on item i, counted from left to right (leftmost option = 1, rightmost option = 9)	always
mean_to_self	mean allocation to self in primary items	always
mean_to_other	mean allocation to other in primary items	always
svo_angle	svo angle calculated as $\arctan\left(\frac{\texttt{mean\_to\_self} - 50 * \texttt{scale}}{\texttt{mean\_to\_other} - 50 * \texttt{scale}}\right)$	always
svo_type	svo type, 1 = Altruist $\Leftrightarrow$ svo_angle > 57.15, 2 = Prosocial $\Leftrightarrow 57.15 \geq$ svo_angle > 22.45, 3 = Individualist $\Leftrightarrow 22.45 \geq$ svo_angle > -12.04, 4 = Competitive $\Leftrightarrow$ svo_angle ≥ -12.04	always
avg_dist_to_equality	average standardized distance of the choice to the choice which would maximize equality	select_items = FULL
avg_dist_to_altruist	average standardized distance of the choice to the choice which would maximize altruism	select_items = FULL
avg_dist_to_joint	average standardized distance of the choice to the choice which would maximize joint earnings	select_items = FULL
avg_dist_to_indiv	average standardized distance of the choice to the choice which would maximize individual gains	select_items = FULL
not_altru_indiv	Dummy taking the value 1 if avg_dist_equality, avg_dist_joint > avg_dist_altruist, avg_dist_indiv	select_items = FULL
inequality_aversion_score	Degree of inequality aversion calculated as $\frac{\texttt{avg\_dist\_to\_equality}}{(\texttt{avg\_dist\_to\_equality+avg\_dist\_to\_joint})}$ if not_altru_indiv == 1, else -99)	select_items = FULL
payed_slider	slider selected for payment as sender	always
slider_as_receiver	slider selected for payment as receiver	matching=RING
kept_of_sender	amount kept by the sender	matching=RING
received_from_sender	amount received from the sender	matching=RING
kept_as_sender	amount kept as sender	matching=RING
sent_as_sender	amount sent as sender	matching=RING"

Table 2: Relevant variables in the subjects table