The Online Recruitment System ORSEE - A Guide for the Organization of Experiments in Economics[*]

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Abstract

We discuss several issues of organizing economic laboratory experiments like subject pool, recruitment, scheduling and show how we solved them with the help of the Online Recruitment System for Economic Experiments (ORSEE).[1] This paper may serve as a manual for the system. A test system has been installed in order to visually support the reader while reading the manual.[2]

Contents

1   Introduction

Laboratory experimentation has been a growing field in economics for the last decades.[3] But the more experiments have been conducted in economics, the more the issue of an appropriate methodology and organization has been arisen.

At the moment, there are the following items which are commonly agreed to be symptomatic for economic experiments (compared to human subject experiments in psychology and other social sciences)[4]:

- Subjects are payed for their participation.

- Payment should reflect subjects' performance in the experiment, i.e. the strategy space should translate to the payoff space.[5]

- Subjects should be volunteers motivated by the experimenters' payment.

- Subjects should not be deceived.

However, there is a wide variety in the procedures of maintaining a subject pool and organizing experiments. This paper deals with the topic of the organization of economic experiments, and how this work can be supported and standardized by the use of the Online Recruitment System for Economic Experiments (ORSEE).

The specific aims of ORSEE are:

- to simplify the organization of economic laboratory experiments

- to standardize the procedures of experiment organization

- to depersonalize the experimenter-subject interaction

- to allow the conduction of simple internet experiments

- to provide information and statistics about the subject pool[6]

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[3]For an introduction into experimental methodology and an overview on history and topics of experimental economics see Davis & Holt (1993), Friedman & Sunder (1994) and Kagel & Roth (1995).

[4]For a discussion of differences between economics and psychology and in economic and psychological methodology see Camerer (1996), Hertwig & Ortmann (2001) (with Open Peer Commentary), Rabin (1998), Rabin (2002), Zwick, Erev & Budescu (1999).

[5]See Harrison (1989).

[6]Out of the 11 points which should be included in the experimental procedures section of every experimental paper sent to *Econometrica* (see Palfrey & Porter (1991)), ORSEE directly provides information about 4 of them: subject pool and recruiting procedures, number of subjects per session, experience of subjects and the when and where of the experiment.

In the following, we point out the principles which guided the design of the system, based indeed on experimental methodological reasoning. However, this work is not about how to *conduct* an economic experiment. Where the organization of experiments is guided by methodological reasoning, this is discussed.

ORSEE has been implemented and is online in Jena, Germany since March 2003. Currently, it is used at three institutions.[7] In order to support the reader while going through the manual a test system has been installed.[8]

The following section discusses some methodological issues regarding the organization of experiments and recruitment of subjects. Section 3 gives a brief overview of the recruitment system and short examples of how laboratory and internet experiments can be conducted in ORSEE. Section 4 and 5 discuss the Subject and Experimenter Area of ORSEE in full detail. The Appendix contains a technical manual for installation and configuration of the system as well as some practical tips and tricks.

Before starting, some terms used throughout this manual should be defined: A 'session' is defined as processing an experiment at a certain time at a certain location. An 'experimenter' is a person who conducts and/or administrates an experiment. A 'subject' is a person who is recruited to participate in an experiment.

2 Methodological Issues

2.1 Subject Pool

The subject pool is the most precious resource for experimental economists. Standard economic theory suggests that there are no differences in economic decision making between old and young or female and male people. But as standard theory has proven to make wrong predictions in many economic situations, this is not the final truth, as well.[9]

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[8]`http://experiment.mpiew-jena.mpg.de:9999` resp. `http://experiment.mpiew-jena.mpg.de:9999/admin` using the login 'test' and the password 'test'.

[9]Ball & Cech (1996) provide an overview over subject pool effects on results in experimental economics. They found no evidence for subject pool differences when using student populations from different universities, no to little evidence for students vs. professionals as experimental subjects, mixed evidence when testing for effects of gender or psychological attributes, but evidence for culture, experimental experience and economic education. Overall, they conclude, subject pool differences in economic situations depend on the design and nature of the economic setting studied, ranging from anonymous markets with many agents to distribution games where fairness considerations might be involved.

However, most researchers in experimental economics are using undergraduate student subjects in their studies, because they are cheap due to low opportunity costs, are easy to recruit, have mostly little knowledge in the topic being tested experimentally, and show steep learning curves. One conclusion drawn from the education effect seems to be that most experimenters try to avoid using doctoral students as subjects.

The fact that registration for experiments and sessions is possible over email and the internet only restricts the subject pool to people who have access to these technologies. Since most experimenters use students as subjects, and in most countries universities provide email and internet to their students, we consider this as a minor drawback of the system. To avoid that always the same subjects with often and immediate access to their email register for experiments ORSEE provides the important feature to invite a random draw from the subject pool, or to exclude subjects who have participated at certain other experiments.

In addition, ORSEE collects important data when subjects register with the database. The subjects' history of participation at experiments is saved. The experimenter can then invite subjects due to specific characteristics, i.e. field of study or gender.

2.2 Recruitment process

ORSEE is designed to organize experiments with *paid volunteers*.[10] However, the payment is still in the experimenters hand. As well, ORSEE does not allow for classroom experiments (where subjects don't register before the experiment) and does not collect information about subjects' participation at certain uni-

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[10]Psychologists, who care more about the representativeness of subject pool than experimental economists, often use undergraduate subject pools (USP's), which require all students in an introductory psychology course to participate. Some studies found that volunteers are not representative for the student overall population, which is explained by the self-selection of volunteers (Dixon 1978, Jackson, Procidano & Cohen 1989, Jung 1969, Rosenthal & Rosnow 1975). Eckel & Grossman (2000) tested for differences in behavior between volunteers (who turn up at a particular time and location, motivated by promises of financial reward) and pseudo-volunteers (recruited from a class in which the experiment was to be conducted immediately, but where students could leave if they wanted) in dictator experiments. They found that pseudo-volunteers were more generous, and that for them religious and altruistic preferences had a greater impact on gift-giving. However, other studies suggest that paying the volunteering subjects might increase their representativeness (Rush, Phillips & Panek 1978, Wagner & Schubert 1976). Recently, Camerer & Hogarth (1999) surveyed 74 studies comparing experiments with and without monetary incentives. They concluded that providing monetary incentives matters for tasks where performance responds to effort and effort responds to incentives. For a detailed discussion of the necessity of paying experimental subjects see Binmore (1994), Harrison (1989), and Smith & Walker (1993).

versity courses.[11]

ORSEE was designed to keep personal experimenter-subject interaction in the organization process as minimal as possible by the use of a depersonalized database system, generic emails and web sites, and institutional email addresses for communication.[12] Addresses and email templates can be edited in ORSEE. Psychological studies show that a description and even the name of an experiment can have an impact on subjects' voluntary self selection to experiments (Jackson et al. 1989, Senn & Desmarais 2001, Saunders, Fisher, Hewitt & Clayton 1985, Silverman & Margulis 1973). To avoid this bias in ORSEE, the type of experiments conducted at an institution should be only described once (at a publicly accessible 'Experiment Rules' page), and invitation emails are based on generic templates. Regarding the experiment name, ORSEE distinguishes between two types: the internal, meaningful name to identify the experiment in the experimenter area (i.e. 'Five Person Circular Ultimatum Game'), and a public name used for communication with subjects via emails and website (i.e. 'Exp416'). Both can be chosen freely.

2.3 No-shows

Every experimenter has to deal with the problem of no-shows or late-shows. To avoid this, most institutions use the mean of over-recruitment, i.e. they invite more subjects than actually needed for the specific experimental session. The number of reserve participants is determined by experience.

ORSEE uses the same approach. The participant statistics section provides a monthly statistic of no-shows. For every session the experimenter can determine the number of reserve participants to be invited. All subjects are treated equally, there is no distinction between subjects invited for the session and subjects invited as reserve. At the laboratory's door, we use the simple rule of first come, first serve. The subjects coming latest, but still in time, as well as the participating subjects receive a show-up fee intended to cover their opportunity costs to show up. The amount of this fee may vary between countries. After each session the experimenter has to fill in the show-up and participation data.

To motivate subjects to show-up, a reputation system is implemented in ORSEE, which provides a statistic of no-shows to subjects and experimenters.

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[11]For a recruitment system allowing for this see for instance 'E-Recruit' (http://e-recruit.sourceforge.net).

[12]To our knowledge, there are only two studies testing for experimenter-subjects effects in the recruitment procedure. Coutts & Schneider (1975) find no overall effects of experimenter's sex and subject's sex, but that male volunteers were more likely to show up when recruited by a male experimenter, while Senn & Desmarais (2001) note that both sexes are more likely to sign up for a sex research study when recruited by a male.

This should be accompanied by a rule, which excludes subjects who did not show up a certain number of times from further participation. This rule might be set by the laboratory staff and announced at the public 'Rules page'.[13]

2.4 Multiple Experimenters and Laboratory Booking

Most of the experimental studies in economics are joint papers between two or more authors, and laboratories are regularly used by more than one experimenter. To comply with these facts, ORSEE allows for multiple experimenters. Each experimenter receives his own login, password, and certain privileges (i.e. sending emails, editing experiments). The experiments, she is involved in, are listed at a special page.

The dates and times of sessions have to be coordinated to prevent clashes. After an experimenter has created the session, it immediately appears in ORSEE's internal calendar. If the time of the session clashes with another, the experimenter gets a feedback. The internal experiment calendar is sent out to the experimenter pool once a week by email. Thus, the rule for allocating laboratory space in ORSEE is 'first come, first serve'. However, by maintaining a second, system-external calendar publicly accessible by experimenters one may use another rule.

To facilitate collaboration and learning between experimenters, ORSEE allows to share knowledge via linking of papers and uploads of instructions and programs. In this way, an experimenter can profit from the experience of others in the team.

2.5 Moral issues and privacy

In Europe there are many laws dealing with the privacy of personal data, and in the U.S. university human subject committees regulate the use of students in experiments. Unlike psychologists, economic experimentalists have agreed to not deceive their subjects in any way (see Hertwig & Ortmann (2001)). For the organization of experiments this means that subjects should be invited without false promises. The public part of ORSEE includes a 'Rules' page where the laboratory should announce how experiments are conducted at their institution.

In our view, no deception means also that subjects should know about the data collected in the recruitment database and in the experiment and what it is used for. By using individualized URLs ORSEE ensures that subject-subject anonymity in the participant database is purely in the hand of the participants themselves. For laboratory experiments, ORSEE is exclusively a

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[13]In Jena we use the rule '3 no-shows and you are out (of the subject-pool)'.

recruitment system, meaning that there is no direct connection between the data collected during the registration process and the decision data recorded in the experiment.[14]

At the end, the experimenter herself is in charge of subjects' privacy. To announce the privacy policy of the institution, ORSEE provides a publicly accessible 'Privacy statement' page. In the general registration procedure subjects have to accept both the experiment rules and the privacy policy.[15]

2.6 Administration and Organization

Regarding the *organization* of laboratory experiments, the objection should be to control the process and the subject pool data as much as possible. However, when privacy or other moral issues are involved, this is not always possible (see previous section).

The experimenter can edit the complete participant data by hand, including creation and deletion of new participants. She can observe the whole recruitment process and the number of participants assigned, invited, registered, showed up, and participated for each experiment and session. A monthly statistic is provided by email to the group and is immediately accessible in the experimenter area of ORSEE.

However, although each experimenter can organize own experiments herself, the system cannot solve all tasks that are needed to administer the subject pool. An administrator responsible for the subject pool and recruitment system is needed, who does tasks like searching for doubletons in participant data or controlling that experimenters fill in all participation data.

2.7 Internet experiments and surveys

ORSEE provides two major functions: the organization of laboratory experiments and the organization and conduction of simple, controlled internet experiments. Internet experiments have some advantages over laboratory experiments, because they are closer to the field, i.e. they have higher participation rates at lower (opportunity) costs, a more diverse subject pool, and can have a longer duration. However, this comes at the cost of losing control over subjects and environment, and brings some problems with the immediate payment.

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[14]For internet experiments in ORSEE the experimenter can download recruitment data and participant data only in two separate files. However, to allow for delayed payoffs which have to be calculated from the decisions and assigned to specific participants, an ID code allows to connect both data sets.

[15]In Jena, we additionally require subjects to sign the experiment rules (which include insurance clauses) at their first experiment participation. This serves as an informed consent.

Greiner, Jacobsen & Schmidt (2002) provide an overview and discuss some techniques to increase control and maintain payment in internet experiments.

The online survey function of ORSEE uses some of these techniques to allow for the conduction of simple internet experiments, where payment is not immediate, and subject decisions are not interdependent. The use of the strategy method (i.e. letting subjects decide in sequential form games for all possible decisions of their opponent, see Selten (1967)) facilitates the conduction of more complex games with this feature.

3   System Overview

In this section, we first provide a list with the features of the Online Recruitment System for Economic Experiments. Then we shortly describe the basic system design and show how laboratory experiments are organized and internet experiments are conducted in ORSEE.

3.1   Features

3.1.1   General Features

- multiple laboratory/subject pool/experimenters support

- attribute query selection (i.e. select female participants, select participants who have not participated in experiment X)

- random recruitment of subjects out of subject pool

- public and internal experiment calendar

- reputation system (number of no-shows)

- automated mailing for registration process

- subjects are informed by automated emails about the sessions they registered for

- subjects are able to manage their own account (without password, using an individualized URL)

- overview about registration state

- experimenters are informed about session's state by automated emails

- calendar and session's participants lists in printable format (pdf)

- build-in module for designing and conducting complete online surveys

- regular emails with experiment calendar and subject pool statistics to experimenters

- multiple language support

- open source

3.1.2 Technical Features

- *MySQL* database (data is completely separated from the application)

- HTML based application implemented in *MetaHTML*[16]

- recommended system: Red Hat Linux 7.3 and later on i386/i686 processors, other unixes work as well

- further requirements: *sendmail* for automated mailing, *webalizer* for access statistics, *cron* for regular jobs, *latex* for pdf-output

3.2 License

The Online Recruitment System for Economic Experiments is available under a special open source license called 'Citeware'. Specifically, the source code may be copied, modified and distributed under terms complying with the Open Source Definition of the Free Software Foundation. However, the use of derivative products is restricted in a way that any academic report, publication, or other academic disclosure of results obtained with the use of this software will acknowledge the software's use by an appropriate citation of this paper.

3.3 Basic system design

The system consists essentially of two views: the experimenters' view on the one hand and the subjects' view on the other hand. Experimenters create experiments which may consist of several sessions and invite subjects. Invited subjects may connect themselves with one of the experiments' sessions in order to participate.

We distinguish between 5 different independent states (flags) of a participant with regards to a certain experiment:

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[16]See http://www.metahtml.org.

1. *Assigned*: The participant is allowed to register for a session of this experiment.

2. *Invited*: The participant got an invitation email from the system.

3. *Registered*: The participant is registered for a certain session of a laboratory experiment.

4. *Showed-up*: The participant was at the right location at the right time.

5. *Participated*: The participant really played the game.

There are four states of a specific session:

1. *Not complete*: There are not enough participants.

2. *About complete*: There are as much participants as explicitly needed for the experiment, but not enough reserve participants.

3. *Complete*: The number of required participants plus the reserve is reached.

4. *Finished*: All data was filled in for the session. The participation data will be used for the reputation system.

There are three states for online-surveys :

1. *Waiting*: The survey has not started yet.

2. *Running*: (Invited) participants can fill in the questionnaire.

3. *Finished*: The time for the survey run out. Participation is not possible anymore.

3.4 Conducting a Laboratory Experiment

In this section we will briefly describe the procedure of organizing a laboratory experiment with ORSEE. The next section shows how simple online experiments are conducted in ORSEE.[17]

When organizing a laboratory experiment, the experimenter first has to log in in the adminstration area and to register the experiment she wants to conduct. She fills in the internal and public name of the experiment, a description, the type of experiment and her name and email address. Then she registers

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[17] A complete and fully detailed manual how to organize laboratory and internet experiments is given in section 5.1 and 5.2, respectively.

each of the planned sessions with date and time, laboratory, experiment duration, number of participants needed and over-recruited, the time of registration and when the reminder should be sent to registered participants. Next, she assigns subjects registered in the database to her experiment. When doing so, she can use different queries including experience, number of no-shows, field of study and profession, a random sub-sample and so on. Once participants are assigned, she sends an invitation e-mail which lists the sessions' dates and times and includes a link to the subjects' individualized registration page. Following this link the subject can choose one date out of the sessions available. When registering for a session, a confirmation e-mail is sent out to the subject.

When the registration period expires, the system checks the state of registration for the experiment. For each session, the experimenter gets an email informing him about the number of subjects registered, and having attached a pdf-file containing the list of the names of participants. In case of too few registrations the experimenter may now extend the registration period, or cancel the session at the very end. At the time when the session reminder email should be sent out, it is sent only when there are enough participants to conduct the experiment.

When everything is o.k., the experimenter conducts her experimental session in the laboratory. She fills in the show-up and participation data for all participants. When all data is filled in, she marks the session as finished, and its data will be included in the calculation of reputation score for the participants. When all sessions are done, the experimenter marks the experiment as finished, and it will be listed in the "old experiments" section.

3.5   Conducting an Online Survey

A special experiment type implemented in ORSEE is an 'Online Survey'. After creation of the experiment, the experimenter fills in a special properties page stating the start and stop time of the survey, the browser window size, and a short description of the experiment (to mention required technology to participate and so on). The experimenter can restrict the participation to invited subjects from the known subject pool or can allow for free registration, specifying whether unknown participants have to fill in a personal data form.

An online survey may consist of an introductory page, an instruction page, the personal data form, a number of questions, and an ending page. Each part is freely configurable in ORSEE. Questions are of a certain type, have certain predefined answering options and are organized in items. ORSEE supports 'text lines' and 'text fields', 'select fields' for numbers and text, 'checkboxes'

and 'radio buttons'. The latter two can be presented as matrices. Questions and items can be given an numbered or random order.

After having created and configured all pages and questions, the survey is ready to start. Invited subjects can follow a link in their invitation email to participate, and if free participation is enabled, the experiment is listed in the 'Internet Experiments' section of the public area. From the time specified as the start time of the survey subjects are allowed to fill in the questionnaire. While the survey is running, the experimenter can observe the participation rate and some simple average statistics of answers.

When the survey time runs out, no subject is allowed to start the survey anymore. The experimenter may extend the time or end the survey by marking it as finished. Participant and decision data may be downloaded separately as spreadsheet files in excel format.

4   The Subject Area

The subject area of the system consists of different pages, which are described below.[18] They are available in different languages, depending on the number of languages installed (see section 5.6.2 on page 44). The default language for the subject area might be set in the main configuration file (see section B on page 50).

4.1   Rules

This page displays the experiment rules set by the experimenters. These can include rules for laboratory experiments, internet experiments, video experiments, or online surveys. The rules should contain some sentences about the reputation system used, and the experimenters' policy of handling no-show-ups and late-comers. They should also contain information about the normal procedure of an experiment, if there are payments or not and so on.

4.2   Privacy Policy

To deal with legal requirements and to provide trust to the potential participants one should add here the policy of the institution regarding the data in the recruitment system and the data collected in experiments, too.

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[18]You find the Subject Area of a test system at
`http://experiment.mpiew-jena.mpg.de:9999`.

4.3 General Registration

Before the registration participants have to choose their own subgroup. The page will only show up if different subgroups are defined. Subgroups are useful because they provide a means to administrate different populations, for instance mailing lists for internet experiments only or laboratory subjects in different cities. Moreover, one can write a different registration page at another institution's web page, and people registering on this page being assigned to a certain subgroup (see also section 5.6.2 on page 44).

However, after having selected their subgroup, people see the rules for experiments and the privacy policy. They have to accept both by clicking on the acceptance button before coming to the registration page (Figure 1).

On the registration page people can enter their data. Only the email address, the last name, and the first name are required. A text shown above the form should inform potential participants that providing additional information about themselves can lead to more invitations. The data asked for includes gender, phone number, begin of study, field of study, and profession (depending on subgroup).

Figure 1: General registration.

After submitting the registration form by clicking the button, the data is checked for doubletons with already registered participants and will be inserted only in a temporary table. The candidates are informed that they got an email to the account given to confirm their registration. This is done to avoid nonsense registrations.

In their confirmation email the participants receive a link to click on. This

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brings them to a page which inform them about the successful confirmation of their registration. Now the data will be inserted in the regular participant table.

4.4 Invitation and Registration for Experiments

There are mainly two links included in the invitation emails the subjects receive. One leads to the participant data editing page. Here a form similar to the registration form is presented to the user, and she can change her data or delete her account. Internally the account is not deleted. If she tries later to register again with the system, the system knows her and an experimenter can reactivate her account by hand.

The second link in the invitation mail leads to the participant's experiment registration page (Figure 2). This page consists of three parts:

- a list of future sessions of all experiments the participant has been invited for, yet has not participated or registered so far and for which the registration period has not expired (see section 5.1.2 on page 22)

- a list of the future experiment sessions the participant has already registered for

- a list of former sessions a participant was registered for, including a summary of *finished* sessions (see section 5.1.7 on page 29)

While the two latter ones only have an informational character, the first list contains small *register* buttons on the right side. If a user clicks on one of these buttons, she registers for the corresponding session. A text above the page should tell the participants about the binding character of the registration. At the same time an email is sent out to the participant's email address to inform him again about the successful registration, again containing the date, time and location of the session.

4.5 Calendar

The calendar contains an overview of all experiments and their sessions (Figure 3). The information about a session contains the public name of the experiment (see section 5.1.2 on page 22), the time, date and location of the session and the status of the session. The latter is denoted as *free places* if the registration time has not expired and there are free places left, and as *completed* otherwise. That means, that sessions which are not full already but whose registration period has expired are marked as complete at the *subject* area.

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Figure 2: Experiment registration page.

Figure 3: Experiment calendar in Subject Area.

4.6 FAQ

Subjects regularly have questions about details of the registration procedure and other features. To avoid answering all the questions several times, there is

a page containing 'Frequently asked questions'. They are multilingual as well and administrable through the experimenter section.

5 The Experimenter Area

The experimenter area is accessible via the subdirectory */admin*.[19] If you are not logged in yet, you are asked to enter your username and password. Note, that case matters. After logging in you enter the main screen of the experimenter area (Figure 4). From there you can jump to the different functions described below. Your current location is marked at the navigation area on the left side. In the following we will explain the main function of the system by providing a tutorial concerning the organization of a normal laboratory experiment.

Figure 4: Experiment overview in experimenter area.

5.1 Laboratory Experiments

5.1.1 Registration of the Experiment

To register a new experiment choose *Create new* from the experiment's part at the navigation bar or from the experiment overview page. You carefully have

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[19]You find the Experimenter Area of a test system at `http://experiment.mpiew-jena.mpg.de:9999/admin`. You may use the username 'test' and the password 'test' to log in.

to fill in the fields which are explained below (see Figure 5).

Figure 5: Creation of a new experiment.

Name: State the *internal* name of the experiment. This name will only be used at the internal pages and is therefore not accessible by possible participants. Take a meaningful name so that you can later quickly find and identify your experiment.

Public name: In this field the publicly used name of the experiment has to be given. You should choose a generic, abstract name, which nevertheless allows for non-ambiguous identification, like *Experiment 24.*

Description: Describe your experiment in short sentences. Together with uploaded instructions this can help other experimenters to benefit from your knowledge. In addition, it allows to determine experiments on which subjects should not have participated when registering for your experiment. The description will not be shown in the subject area.

Type: There are three types of experiments which can be administered by the system: laboratory and internet experiments and online-surveys. For laboratory experiments, the system manages only the recruitment process. This is done for internet experiments as well, which can be either conducted external or programmed and controlled using the Virtual Laboratory environment (Greiner et al. 2002). Online-surveys are questionnaires which can be created using the online-surveys toolbox integrated in the system. No programming skills are required in order to conduct a survey. See section 5.2 for details.

Experimenter: Type in the user names of the experimenters involved in the experiment. If you use the login-names as listed when you click *show login names*, the experiment will appear in the *My Experiments* list of the related experimenters.

Experimenter's email: Fill in the email-address of the experimenter. All messages of the system regarding this experiment will be sent to this address. If you want the messages sent to more than one address, fill them in as well, separated by commas (no spaces).

E-mail sender address: This address will be the sender of all emails from the system to the assigned/invited/registered participants of this experiment. That means, that this is the address they will reply to if they have questions or comments. You can specify only one email address.

Experiment finished?: When setting up the experiment you leave this Box unchecked, of course.

Hide in participants statistics?: If you don't want that this experiment is considered when calculating no-show-up numbers for participants statistics, then check this box. This is useful when you add data of old experiments which you conducted before you started with ORSEE and its recruitment system.

Hide in public calendar?: Normally, all laboratory experiment sessions will be listed in the public calendar. But sometimes you don't want to show the sessions date to the public, i.e. when you invite two definite subgroups at the same time. If you check this box, the sessions of this experiment will be hidden.

Link to Paper: When finished with the paper, you can provide the full URL to allow other experimenters to download the paper.

After filling in the fields as described above, click on add. The page returns with the message *Changes saved*. If you now click on Experiments – Overview, you will see your just created experiment listed under *Experiments without dedicated sessions*. You can access this experiment for further settings by clicking on its name.

For laboratory experiments the experiment's page consists of three parts: first, the basic data as entered above is listed. By clicking on *Edit basic data* you jump to a form similar to the one you used to create the experiment, where you can make changes. If you click on *Upload instructions*, you can exactly do this: upload instructions. This can be useful for your colleagues as well as for you (just imagine, you are in the lab and forgot your instructions ...).

The second part lists the sessions of the experiment with some additional information. The last part is dedicated to the subjects of your experiment: here you can administer their assignment and their invitation.

5.1.2 Registration of Sessions

To register a session click on the *Create new* link in the sessions part of your experiment's page. You see a new form containing the following fields (see Figure 6):

Figure 6: Creation of a new session.

Date, Time and Laboratory: Fill in exactly what you think you should fill in.

Duration of experiment: This value has to be given as hh:mm and is used twice in the system: firstly, it will be checked whether this session overlaps with another session in the same laboratory. It is possible to ignore the warning message, but you should of course only do so, if you plan to hold two sessions at the same time. Secondly, this time will be shown in the public calendar as the maximum time the session will last.

Session reminder: Choose the number of hours before the session starts, where you want to be sent out a reminder email to the registered participants. This time should of course be later (i.e. a lower number) than the time stated

in the field *Registration end.* If the session is not full at the time the reminder email is supposed to be sent, the system will only sent a warning message to the experimenter, and the reminder email can be send from the session's subject registration list page. Therefore one can handle the case that the experimenter has to cancel a session due to not enough registrations.

Needed participants: State the number of participants you exactly need to carry out the experiment.

Reserve participants: To handle the case of no-show-ups, one should of course invite more people than actually needed.

Registration end: Choose the number of hours before the start of the session, when you want the registration period to end, i.e., after the time you are stating here participants are no longer able to register for the session. Of course, you can also extend this time at a later stage.

Remarks: This is only a small notepaper for you.

Session finished?: Leave this box unchecked when setting up a session.

By clicking on the *Add* button the session will be registered. You get back the same form with the message changes saved. If there is a overlap with another session in this laboratory, a warning message will be shown, too.

Your session will now be listed in the session part of the experiment's main page. The *Edit* link leads to the same form as described above to change the settings you just entered. Below the sessions' date and time you see the words *Registered subjects* and three numbers. The first number shows the number of subjects already registered for the session, the first number in brackets the required number of participants for the experiment itself, and the second number in brackets the required number of reserve participants. If the number of registered subjects is lower than the number of required participants, the color will be red, if it exceeds the second, it will change to orange, and if it finally is equal to the sum of both the latter numbers, it will be green.

If you click on the words *Registered Subjects*, a list of the subjects registered for this session will be shown, which is empty. You should now register all your other sessions before turning to the last part of the experiment's main page.

At the experiment overview page your experiment is now listed in the section *Experiments with dedicated sessions.*

5.1.3 Assigning Participants

The third part of your experiment's main page contains a list of participant states as described above (see section 3.3 on page 12), i.e. you get informed about how much participants are assigned to your experiments, how much invitations you sent out, how much subjects have registered for sessions, showed up and participated. At time, there should only be zeros.

The selection process of participants will be done when you assign participants to the experiment. To do this, choose *Assign Subjects* from the options part. You get a human readable form to perform a query into the database (see Figure 7). The default is to select all possible subjects not yet assigned to your experiment. By activating the different clauses (by checking the small box next to the number) and filling them in you can define your selection. To find the right selection, just try to formulate an intact sentence by choosing its different parts from this menu (i.e. "Select all ... where gender is 'female' ... and where field of studies is 'economics' ... and without subjects who have participated at one of the following experiments: 'Dictator Game','Ultimatum Game' ... , but at maximum 100 subjects").

Figure 7: Assigning participants.

At the current state, the following query modules are implemented in ORSEE:

- freetext for last name, first name and email address

- number of no-shows

- gender

- begin of study

- field of study

- participation at former experiments

- assignment to other experiments

- random subset of certain size

These modules allow the experimenter to restrict the subject pool to his needs. Particularly the possibility of a random draw ensures that not always the same subjects with immediate access to the internet register for the experiments.

After your selection, click on *Search and Show*. You get the list of all participants satisfying your selection clause to check your query. You can simply assign all of the listed people by clicking on the appropriate button, or assign only selected participants by checking them and clicking on the button *Assign only marked participants*. After submitting your choice, you get a feedback message on how many participants were assigned and will return again to the assignment form. After making your participant assignments you can see their number at the described list in the last part of the experiment's main page.

5.1.4 Inviting Participants

After having registered sessions and assigned participants, you probably want to inform them about being selected for participation. The recruitment system includes the feature to send out automated messages to your aimed participants. To do this, click on *Send invitations* on your experiments' page in the bottom participant part.

You see the following three fields to fill in (cf. Figure 8):

Subject: As you might have guessed, in this field you have to fill in the subject of the invitation mail. The default is taken from the currently active language file (see section 5.6.4 on page 45 for more details on languages).

Send invitations

Subject: Experiment

Body of message:
You can use the following variables:
Id: <experimentmail::participant_id>
Firstname: <experimentmail::fname>
Lastname <experimentmail::lname>
E-Mail-Address: <experimentmail::email>
Phone number: <experimentmail::phone_number>
Begin of studies: <experimentmail::begin_of_studies>
Main field of studies: <experimentmail::studies>

Important! List of sessions: <experimentmail::sessionlist>
Important! Link to experiments registration webpage: <experimentmail::link>

To rebuild the default invitation mail, clear the message body window below and click on save.

Hallo <experimentmail::fname> <experimentmail::lname>!

Hiermit möchten wir Sie zu einem neuen Experiment einladen.
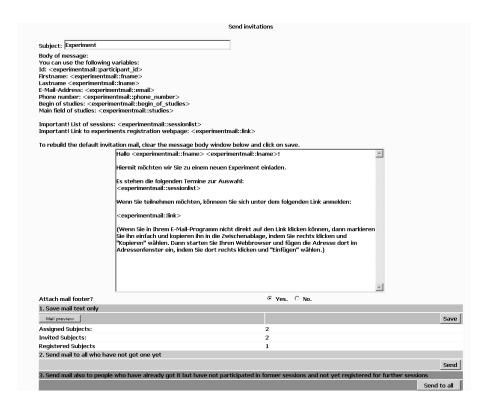
Es stehen die folgenden Termine zur Auswahl:
<experimentmail::sessionlist>

Wenn Sie teilnehmen möchten, könneen Sie sich unter dem folgenden Link anmelden:

<experimentmail::link>

(Wenn Sie in Ihrem E-Mail-Programm nicht direkt auf den Link klicken können, dann markieren Sie ihn einfach und kopieren ihn in die Zwischenablage, indem Sie rechts klicken und "Kopieren" wählen. Dann starten Sie Ihren Webbrowser und fügen die Adresse dort im Adressenfenster ein, indem Sie dort rechts klicken und "Einfügen" wählen.)

Attach mail footer?   ○ Yes.   ○ No.

1. Save mail text only

| Mail preview | | Save |

Assigned Subjects: 2
Invited Subjects: 2
Registered Subjects   1

2. Send mail to all who have not got one yet

| | Send |

3. Send mail also to people who have already got it but have not participated in former sessions and not yet registered for further sessions

| | Send to all |

Figure 8: Sending invitation emails.

Mail text: In this field you can insert the body of the invitation message. If you come to this page the first time, the standard text as defined in the mail files in the subject standard language will be included. If you change the text it will be saved and presented if you come again. To rebuild the original default text just clean the whole text window and click on save.

You might use variables in the text. The most important ones are the list of available sessions and the link to the registration page. The other variables including first and last name are means to personalize emails. Be careful when including them and use exactly the same letters as described above the text field. Check the variables in the mail preview.

Mail footer: Normally, there is a standard mail footer defined in the mail files, which contains information about your institution and a link to edit or delete the participant's data. If you activate the inclusion of the footer, it will be included in the email using the public standard language.

Underneath the described fields you see some options. The one with the fewest consequences is the *Save* button, it just saves the mail text and subject.

By clicking on *Mail preview* the texts will be saved, too, and you will be taken to a page containing a good approximation of the resulting email. Being back to the mail page and having checked all and everything, there are two ways to send out emails. First, you can send them only to the people who have not got one before, what should be the normal case. Second, you can mail the message to a greater audience including the subjects who have already got an email, but have not registered for a session of the experiment so far. When sending out a mail for the first time, both options will lead to the same result.

However, you should always check the mail text via the preview before sending out the email for a nonempty session list. If there is no session with registration period that ends in the future, then the list will be empty and a quite meaningless email would result. Remember, that most people at the internet including your participants don't like to much unsubstantial emails in their in-box.

The time needed for sending the emails depends heavily on the number of emails to send out. So it might be that you have to wait a while. Please don't stop this process by pressing the stop-button of your browser or do other funny games, because this can lead to unexpected results. When ready with all the work, you will be redirected to the invitation page and a message appears saying something about the sent emails and the time needed. After getting your email, the participants can register for a session as described above in section 4.4 on page 17.

5.1.5 Control of the Registration Process

Some of you might not be satisfied by the convenience an internet based registration process provides or might simply not trust the potential participants. In that case, you have the option to monitor the registration process and to change everything by hand.

As already mentioned above, a summary statistics about the registration process is given in the bottom part of your experiment's page which is focused on the whole experiment. In the center part of the page one statistic is given for each session separately. By clicking on the links behind the participant states you reach a page with a list of the corresponding participants. Clicking the *Registered subjects* link in the session area is almost the same as clicking on it in the participants area, with the difference that you only get the participants regis-

tered for the corresponding session. At all participant lists you can download a printable version (pdf, created via latex) of the list by clicking on *Print version.*

Assigned (invited) subjects: To keep the page as short as possible the emerging list contains only those assigned (invited) subjects who have not yet registered for a session. You can register some or all or none of them for a certain session by hand. To do this, you have to check the boxes at the right (you can also use the *Check all/Uncheck all* buttons) and to choose the session in the list at the bottom. By clicking on the *Change* button you (try to) register them for the session. Before writing to the database a check is performed if the number of the new participants together with the already registered subjects exceeds the capacity (participants needed + reserve) of the session. If not, everything is fine, but if that is the case an error message appears and you have to deselect some of your choices. However, to allow for flexibility, you can overrule the check by deselecting the small checkbox at the bottom of the table (Yes, the one denoted *Check for free places in session*). The registered subjects will not appear again in this table, from now on you can administer by using the following options.

Registered and showed up subjects and subjects participated: In principle, the tables you get for this three options are similar, except, that for each option only the appropriate subjects are shown and in the list for the subjects participated you cannot change the show-up status. (Subjects participated always showed up.) In the table itself you get the necessary information to handle the session: names, email addresses, phone numbers, and participation history.
You can move subjects within the experiment from one session to another by changing their session field and clicking on the change button. To de-register participants (in case they cannot come) move them to a session called *No Session*.

5.1.6 Just before the Session

When setting up the session you had to specify two time points: the registration end and the session reminder time. When the registration phase runs out, the system checks if there are enough participants. An email will be sent out to the addresses specified in the experiment's 'experimenter's address' field, containing the relevant numbers for your session and an attached pdf-file, which contains

a list of all registered participants.

If the session is complete, i.e. there are enough participants, the system will send out a reminder message to all participants at the time specified in the session's options.

Sessions		
8 Sessions registered		
06/12/2003 14:00 Registered Subjects: 13 (12,3) [Help]	Goethe-Galerie Session finished	Edit
06/12/2003 16:00 Registered Subjects: 15 (12,3) [Help]	Goethe-Galerie Session finished	Edit
06/13/2003 10:00 Registered Subjects: 26 (24,4) [Help]	Goethe-Galerie Session finished	Edit
06/13/2003 12:30 Registered Subjects: 28 (24,4) [Help]	Goethe-Galerie Session finished	Edit
06/18/2003 10:00 Registered Subjects: 28 (24,4) [Help]	Goethe-Galerie Session finished	Edit
06/18/2003 12:00 Registered Subjects: 28 (24,4) [Help]	Goethe-Galerie Session finished	Edit
06/18/2003 14:00 Registered Subjects: 28 (24,4) [Help]	Goethe-Galerie Session finished	Edit
06/18/2003 16:00 Registered Subjects: 28 (24,4) [Help]	Goethe-Galerie Session finished	Edit
Options:		
Create new		

Participants	
Assigned Subjects: [Help]	406
Invited Subjects: [Help]	380
Registered Subjects: [Help]	194
Shown-up subjects: [Help]	183
Participated: [Help]	167
Options:	
Assign subjects	Delete assigned subjects
Send invitations	

Figure 9: Session overview and experiment statistics.

5.1.7 Finishing a Session

At the end, there should be enough participants in every session. If you have a internet connection from the laboratory to your experiment recruitment server, you can do the following steps just in time when the participants arrive at their location, if not, do it later. But do it, to give the whole system a little amount of — meaning and consistency.

To keep track who participated where and so on, you click the *Registered subjects* link of your session and fill in the two right columns. For showed-up subjects (the persons who get a show-up fee from you) mark the *shown-up* box, and for persons really participating mark the *participated* box. At the end click change to save the results.

If you have checked the list and all seems to be o.k., go to the *Edit* page of the session and check the *Session finished?* box. From now on, this session will be included in the calculation of the subject's participation history.

5.1.8 Ending the Experiment

If you have run all sessions and finished them in the database, go to the *Edit* page of your experiment and check the box *Experiment finished?*. The experiment will be moved from the *Current Experiments* list to the one containing *Old Experiments*.

5.2 Online Surveys

5.2.1 Overview

ORSEE treats Online Surveys as experiments with special properties. Sessions don't exist. Instead, a survey consists of several questions. Each question can have a certain type, which are described below. For some question types, there exists a set of answer options which have to be created.

Every question is organized in items, which can be seen as the repetition of the same question and type as several sub-questions. In the survey every question is presented on a unique page, can be filled in and submitted. Then a check will be done on required fields to be filled in, and if there are missing fields, the page with the question will be presented again. If everything is ok, the next question will be presented. The data collected will be saved on the very end.

However, we use various techniques to ensure that every participant can fill in a questionnaire only once. But for free registration, none of these techniques is secure, while it is almost guaranteed for surveys with participation restricted to registered and invited users due to a known and verified subject pool.

If you allow free registration, it is highly recommended to provide some economic incentives, for example to collect participant data and condition the payoff to a lottery winner on correct filled in personal data. Greiner et al. (2002) deal with this topic in more detail.

Every survey is presented in the following order:

- introduction (if enabled)

- personal data form (if enabled and at the beginning)

- instructions (if enabled)

- questions (in chosen order)

- personal data form (if enabled and at the end)

- final page (if enabled)

5.2.2 Online Survey Properties

When you have created a new experiment of the type 'Online Survey', the experiment's main page looks different than the one for laboratory experiments. Instead of the session's part of the page, you have now two new sections there: 'Properties' and 'Questions'. By clicking on 'Edit Online Survey Properties' you come to a page where you can fill in specific characteristics of the online survey you want to conduct (see Figure 10).

Figure 10: Editing Online Survey Properties.

Start/Stop Date and Time: The online survey will be accessible by the participants only for a certain period of time. Here you have to specify the exact time from when participants are allowed to fill in the questionnaire and the exact time from when this is not allowed anymore. Please note that when you enter a start time in the past, the survey will be accessible immediately, even if you haven't specified questions. Thus, choose a time in the future.

Please note also that you should not change the questions, answer options, or items after the first participant has filled in the first question.

Style: It is possible to conduct online surveys in a different layout style than the default style of your recruitment system. Here you can choose the style, i.e. the combination of layout, colors and graphics.

Window size: For security and handling reasons the online survey will be conducted in a separate browser window. Fill in the size the window should have. During the survey, participants are allowed to scroll in this window, but not to resize it. Remember, that the items of your questions should fit into the page, on the one hand, and that not all participants might have such a big computer screen as you, on the other hand.

Allow free registration: If this box is unchecked, only participants invited explicitly from the registered subject pool are allowed to participate in your experiment. If the box is checked, the survey will be listed in the internet experiments section of the subject area with a link to participate. You can decide to require a personal data form. Details for this will be shown on the experiment's main page if you check this box. However, invited subjects from the system's subject pool are not required to fill this in. If you want to ask your participants for special data not covered by the standard questions provided by the system's data form, just create questions for it.

If free reg.: Show in public area?: When you check this box and the experiment allows free registration, the survey will be listed under 'Current Internet Experiments' in the subject area. To be listed the end of the experiment has to be in the future. Check this box if you have filled in the descriptions below completely and if you want to announce it. Make sure that either the start of the experiment is still in the future or that you have created all your questions and tested them.

If free registration: Show personal data form?: As mentioned above, you check this box if you want not registered participants to fill in a personal data form. After checked, a new submenu will appear at the experiment's main page, where you can configure this form.

Present introduction page/instructions/final page?: In every experiment you might want to present an introduction, to provide instructions, or to say a word at the end. Check this boxes to enable these pages. After checking, you can configure them via the links in the options section of the experiment properties at the main page of the experiment.

Button text: State the text which should appear on the submit button on each page. This may be 'continue...', 'submit' etc.

Short description: Enter a short description for your online experiment, which will be shown in the list of internet experiments available for a participant. You may announce prizes to win, needed time or other things.

Long description: The text stated her will be shown at the page from which participants start the experiment window. You may enter a public description for your online experiment. By all means, you should enter technical requirements to participate, the language of the survey, and some rules of participation and payment.

After filling in the 'Online Survey Properties' form, click on 'Change' to save your data.

5.2.3   Edit introduction/instructions/final page

For each of the three pages you can enter the text to be shown. You are allowed to use HTML tags in the text box.

5.2.4   Personal Data Form

When you have checked the box for the personal data form at the survey properties page, a new section 'Personal data form in survey' will appear at the experiment's main page. When you click on 'Edit survey personal data form', you will receive a page with the following fields to fill in (cf. Figure 11):
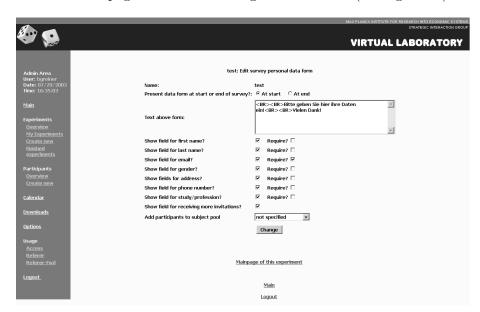

Figure 11: Personal Data Form.

Present form at start or end of survey: First, you have to specify

when the participant data form should appear in the survey. There are two philosophies: The first prefers to collect the data at the beginning, to have only serious participants and to avoid the risk that they get lost before the end. The second prefers, indeed, to show the form at the end. They argue, investing so much effort by filling in the whole questionnaire the participants fill in the data form more honestly. However, it's your choice. In the current version there is no check performed whether a particular name, email or address has already participated at the experiment to avoid double participation. Because this kind of checks may be very complicated and often depend on case to case decisions, we leave this task to you when analyzing the data.

Text above form: The text entered here will appear at the top of the personal data form page. You should note which fields are required and which not (see below).

Show field ...: You may present each part of the personal data form according to your preferences. Just check the appropriate box, and the according field will appear in the form. For each field you can state if an answer is required or not. The form will be represented as long as all required fields are filled in. There are two checks which will be conducted independent whether the required box was checked or not. First, if an email address was entered, it will be proved that it conforms with the standard email address format. Second, for the study/profession entry either a field of study or a profession are accepted, not both. Please note, that you cannot require an answer to a question if participants want to receive invitations for further experiments and that the options for this questions are limited by the chosen subject pool. Particulary, if the subject pool only allows participation at internet experiments, only this option will be shown.

Add participants to subject pool: Finally, you have to state to which subject pool participants filling in the personal data form will be assigned. Of course, this should not be your regular subject pool used for laboratory experiments. If you prefer to separate these new participants from all the others, just create a new subject pool on the 'Options' page (see section 5.6.2 for details).

5.2.5 Questions and Question Types

From the view of a participant the main part of an online survey consists of one or more questions. Every question may be of a certain type. For some question types you have to define answer options. For every question you have to create items. An item is a representation of the question with the defined type and

answer options on the question page. You may create several items for each question page.

The question types are the following:

textline: The answer field consists of a single line where the subject may enter text, numbers, and all other characters. It will be presented by the HTML form tag 'INPUT' with type 'text'. You may specify the size of the field and the maximal length of input for each item separately.

textarea: Here the subject may enter characters in a text box with a specified number of rows and columns. While the size of the box itself is limited, the size of the input text is not limited. A scroll bar appears if the text does not fit in the box. The box is presented with the HTML tag 'textbox'. For each item you can specify the number of rows and columns.

select numbers: The participant can answer the corresponding question by selecting a number out of a list of certain numbers. The used HTML tag is 'SELECT'. You are able to specify the start number, the last number and the step width for each item.

select text: To answer the question the subject has to choose one out of a list of answer options. These options have to be defined by the experimenter and are the same for all items of this question. 'SELECT' is again the HTML tag implemented.

radio: A list of options is presented with radio buttons. If a subject clicks on the radio button, it is selected. Only one of the options can be selected. If there is only one item of a radio question, the options are presented vertically with the radio button at the beginning of each option text. If there are more items a radio matrix is formed. Then at the top of the page the options are presented in one row, and for each item the radio buttons are printed horizontally. For the presentation in HTML, the 'INPUT' tag with type 'radio' is used.

checkbox: The checkbox question style is organized like the radio buttons, but here the subject may chose more than one out of the presented options. For more than one item again a matrix is formed. We use the HTML tag 'INPUT' with type 'checkbox' for display on the HTML page.

5.2.6   Create/Edit Questions

To create a question, click on 'Create new' in the questions part of the main page of the online survey. You have to state an internal name, which is only used for internet presentation and for the data import functions. The type to choose is one of the six described in the section above. In the text box enter your question (or the part of the question which belongs to all your items. After

clicking on 'Change', the question will be saved and appears in the question list of your experiment's main page (see Figure 12. You may access the options you just made by clicking on 'Edit basic data'. However, after creation of a question you are not allowed to change the questions type anymore. To change it, you have to delete the question and create a new one instead.
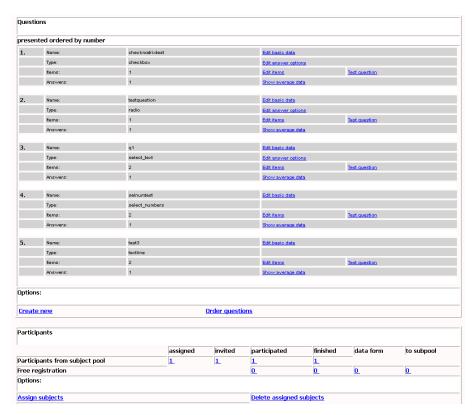

Figure 12: List of questions of an Online Survey.

5.2.7 Ordering questions

After you have created more than one questions, you are able to order them. To do so click on 'Order Questions' in the 'Options' part at the end of the question list.

At the top of the page you see a button, which contains either 'Change to random order' or 'Change to number order'. In the random order mode, each participant is presented with a question sequence generated by a random draw at the beginning of the experiment. With this feature you may neutralize order effects in your questionnaire. In the number order mode the questions will be presented in the order as they appear on this page (and on the main page). To change this order use the up and down arrows on the right side. By clicking an

up arrow, the question will change the place with the question above, and by clicking the down arrow vice versa.

5.2.8   Create/Edit Answer Options

The online survey main page presents a list of all questions. At the right side of each question a set of options is presented. For the types 'select text', 'radio' and 'checkbox' you have the option to 'Edit answer options'. If you click on the corresponding link, you see a list of the answer options for this question (which is empty in case you have just created the question).

These answer options again may be presented in random or numbered order. You can change this with the help of the button at the top of the page. The order of the options is changeable by the arrow buttons. To change the other properties of an option click on 'Edit' on the right side of the listed option.

To create a new option, click of the 'Create new' button. On the 'Answer option edit' page you see the following fields:

Answer shown: Fill in the option text the subject should see when choosing it.

Answer data: State the exact data which should be saved in the database when the subject chooses this option. For checkboxes this entry will be ignored, because here the system will save 'y' if the checkbox is checked and nothing if it is not.

After having filled in the fields, click on 'Change' to save your settings.

5.2.9   Create/Edit Items

As mentioned above, each question consists of one or more items. If no item was defined, the page will only consist of the question text and the button to continue. This might be useful if you want to provide new instructions or a comment between questions.

If you follow the link 'Edit items' on the left side of the question in the question list, you are presented a list of the items. Like for the answer options, you may change the order mode by the button on the top and the order itself by the arrow buttons. The properties of existing items are accessible via the 'Edit' links, and to create a new item use the 'Create new' button.

The item's properties page differs with the type of the question. For all type of questions the following fields are presented:

Name: State the internal name for the item. This name will be used to identify the column in the data table when importing the result data of your experiment.

Text before: This text will appear at the left side of the item in the page. You may use HTML tags, as well as for the next field.

Text after: This text will appear at the right side of the item.

The rest of the fields and their meaning differ between the question types. We will discuss them for each type separately.

textline: First you have to state the size of the input line in characters, and the size of the text which can be filled in at maximum. In the field 'default' you may enter the text which should be already filled in in the textline when it appears at the user's screen. When you check the 'Require?' checkbox, the item will be presented again and again until there is some text filled in. That means also the default is taken as a text filled in. Thus the default has not to be changed by the subject, while an empty field has to.

textarea: In the 'Width' field state the number of columns (in characters) of the presented text box, and in 'Height' the number of rows. 'Default' and 'Require?' have the same meaning as for the 'textline' item: the default is the text which is already filled in, and if an answer to this item is required, then there must be some text filled in when continuing the survey.

select numbers: In the 'Start' field specify the number where the list of numbers should start, in the 'End' field where the list of numbers should end. The 'Steps' field has to filled in with the increment in which the numbers are presented from 'Start' to 'End', i.e. the difference between one number and the next one. Click on 'Change' after you have filled in the items, and then continue with the other properties (this will update the 'default' selection list).

As 'Default' select one number of the list or choose the empty option (no default). If a number is chosen, than the list in the question's survey page will only contain the numbers with no empty field and the chosen default number preselected. If you not choose a default number, the list will contain an empty field which is also preselected.

The 'Require?' options has different meanings whether there is a default number or not. If the first case is true, checking the 'Require?' forces participants to change from the preselected number to a different one. The experiment continues only in case this is done. If the second case is true and the 'Required?' box is checked, then participants must choose one number out of the list and cannot leave the page with the empty option selected.

select text: For the 'select text' question type you have to define answer options. As a 'Default' you may select one of these options or none. The empty option will only appear in the question page of the survey if no default is chosen, otherwise it will be hidden. The 'Required?' box works analogous to

the 'select numbers' type: when it is checked and there is a default text chosen, a change is required, when there is no default, a selection of one of the answer options is required. Thus, you may create your own not empty default options (like 'Choose from the list ...') as an answer option selected as 'Default' and required to change.

radio: The 'radio' question type also requires answer options. As 'Default' you may select one of these options or none. If none is selected, no radio button will be checked when presenting the page, otherwise the default button will be checked. Note, that the nature of radio button is that when one is checked, it can only be changed to another one, but subjects cannot uncheck them at all anymore. Thus, the enabled 'Required?' option is always fulfilled if there is a default answer option. However, if there is no default chosen, the 'Required?' option will force the participant to check one of the buttons.

Checkbox: As for 'select text' and 'radio' questions you have to define answer option for 'checkbox' type questions. Although a checkbox question allows the selection of more than one option by clicking on the appropriate box, so far only one answer option can be chosen as 'Default' to be already checked when the participant enters the question. Checkboxes can be unselected every time. The 'Require?' option forces the participant of the survey to check at least one of the checkboxes of this item.

5.2.10   Test Questions

On the right side of each question in the question list you find a link called 'Test Question'. If you click on it, a new window in the size of the experiment window as given in the survey properties appears with the question presented in the same way as in the survey. With the help of this function you can test your layout, the answer options and question styles as well as the specified requirements for answering the question.

5.2.11   Invite Participants

Similar to laboratory experiments you may assign subjects from your subject pool to the online survey and invite them by email. To do so browse to the participant part at the end of the online survey's main page. Choose the 'Assign Participants' function to connect participants with your experiment in the same way like for laboratory experiments. Use the 'Invite participants' link to send out invitation emails. Note, that the default text for the invitation email differs to the one used for laboratory experiments, and that the link presented in the mail will guide participants to their individualized internet experiment page,

but not to the laboratory experiment page.

5.2.12 Monitoring the online survey

When subjects started to participate at your survey you can monitor this on the online surveys main page in the participant section. The statistics for the different states a participant may be in are presented separately for participants from your subject pool and when allowed for participants who used the free registration.

If there are already answers in the database you may see some simple descriptive statistics for each question when you click on the link 'Show Average Data' at the right side of each question in the question list.

5.2.13 Changes during the survey time

We urge you seriously not to change your question and survey design when the survey is already online, although the system permits you to do that. When you delete questions or items, the data already collected for these will be lost. Note that every change at the survey may have cause a change in participants behavior, meaning that you cannot pool the data for these two subgroups. If you encounter problems with your design after having started the survey it is better to stop by changing the stop time and to conduct a new survey with subjects who have not participated so far.

5.2.14 Finishing the online survey

When the survey online time runs out, no participant will be allowed to start the survey. Note that there may be some subjects who are already participating and who might need some time to finish the experiment. Thus you should wait some hours before you download the data. Subjects will be automatically logged out 90 minutes after the last access to a page.

To move the survey from the current experiment's list to the list of finished experiments mark the experiment as finished in the 'Basic Data' section.

5.2.15 Downloading the data

To analyze the collected data you may download it with the help of the links in the results section at the very end of the survey's main page. 'Download decision data' opens an excel file with the complete data set of your survey including some participant data like gender, field of study, or profession. By clicking on

'Download participant data' you may download data about the participants of your survey, i.e. names, addresses etc.

On the one hand, privacy of participants means to keep decision and participant data separately. For this reason you may download the data in two distinct files. On the other hand, you may want to pay some of the participants according to their decisions. To make this possible, the decision as well as the participant data contain the column 'participant id'. With the help of this identification number you are able to identify participants' decisions.

5.3 Maintaining the subject pool

Although most of the work updating participant data should be done by the participants themselves, it is especially useful for problematic cases to edit the data by hand. To do that, several functions are provided.

5.3.1 Temporarily Registered Participants

On the *Overview* page you see a short summary about the participants in the database. By clicking on the *Registered but not confirmed* link you see a table containing all registrations not confirmed yet. By a click on *Delete* the corresponding row will be deleted immediately.

5.3.2 Creation of a new Participant

By clicking on *Add participant* on the participant overview page or on *Create new* on the participant section at the navigation bar you are directed to a form to add a participant. Required is the email address, which will be checked against the already existing addresses. Depending on the selected sub-subject pool you should either choose the main field of studies or the profession of the subject.

You can directly assign the participant to a session. Do this by checking the small box at the bottom of the form and selecting the desired session. A message will inform you about the changes after you have clicked on the *Add* button.

5.3.3 Edit Participants

By clicking on this link you will first get a page containing the same search form as used to assign participants to a experiment (see section 5.1.3 on page 24).

You can search participants by using this form or immediately click on the button what brings you directly to a list of *all* participants in the database. At the end of each row in the resulting list there is an *Edit* link. By following this you can change the participants data or delete him.

5.3.4 Delete Participants

By clicking on the *Delete* button on the edit page of a participant, you will receive a confirmation page containing the participants data and three options. You can cancel this action, of course, delete, or exclude the participant. When you delete a participant, a flag will be set in the database that this participant will not be available for experiments in the future. However, current registrations will not be affected by this. By explicitly excluding a participant an additional flag will be set. This is just to remember that this participant was not self-selecting to quit the database but was deleted for some serious reason. You can access and edit the data of deleted and excluded participants via the *Edit deleted participants* option on the participants overview page.

5.3.5 Edit deleted Participants

Via this option you can edit the data of deleted or excluded participants or reactivate them by clicking on the button 'Resubscribe'.

5.3.6 Statistics

This function delivers some statistics with regards to the subject pool - just for curiosity. This feature is helpful when starting to build a new subject pool. Figure 13 shows a screen-shot containing some of these statistics.

5.4 Calendar

The calendar in the experimenter area provides more information than the calendar in the subject area (see Figure 14). For every experiment it contains the internal name, the date and time, the experimenter, the number of already registered participants compared to the number of required and reserve participants, and a link directly to the participants list of this experiment. Again, a click on the *Print Version* link delivers a nice format pdf file of the calendar ready for printing.
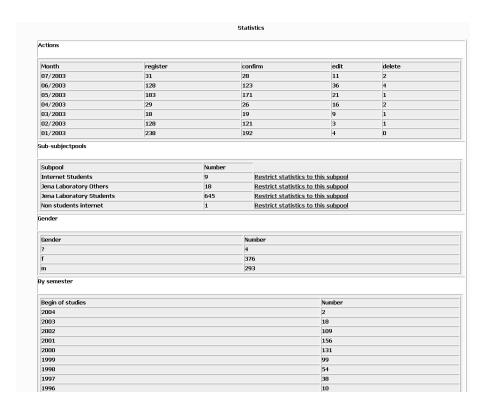
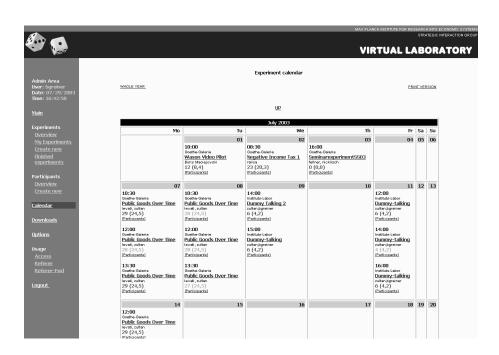Figure 13: Subject Pool Statistics.

Figure 14: The internal calendar in the Experimenter area.

5.5 Downloads

This module is just to provide some convenience. You can upload and therefore also download instructions (upload via the experiment's page!) and every other type of file.

5.6 Options and Settings

Beware, the following settings should be done by an administrator. Except the *User Profile* all of them have consequences on the behavior and appearance of the whole system.

5.6.1 User Profile

He you can make your own settings. Currently, there are only four options you can change: your preferred language when working in the experimenter area, whether you want to receive the weekly calendar and the monthly subject pool statistics, and your login password.

You should handle your password very carefully. This system is connected to the internet. And a system is only as secure as its doors. An experimenter account usually has the right to change nearly everything saved in the database. So, by using a bad password or by not keeping it secret you do not only jeopardize you own data, but as well the data of your colleagues. The password you use will be immediately encrypted using the unix crypt algorithm when arriving at the server and also saved encrypted in the database. A good password consists of 8 letters including numbers and special characters.

5.6.2 Laboratories, Sub-subject pools, Main Fields of Study, and Professions

By using these options you determine the choices participants have when choosing their sub-subject pool, their main field of studies, or their profession in the registration form and name and description of laboratories the system is aware of. Following the link for the laboratories, you can add a new one by entering a name and an address, alter their properties, or delete one.

Field of study and profession can be given in different languages. You can add and delete the available language with the English language being the default when on a certain page the used language is not available. When adding a new field of study or profession, you have to provide its name in every language

known by the system.

On the 'Sub-subject pools Settings' page you first get a list of known sub-pools and their descriptions. When adding or changing a subpool, you have to provide the following information:

Name: The name of the sub-subject pool as used internally on the experimenter pages.

Description: A short description of the subject pool for other interested experimenters.

Registration page type 1: This defines, whether for this subpool the *Main field of studies* or the *Profession* selection list appears at the participants registration page.

Registration page type 2: State, whether the subjects of this subpool can register only for internet experiments or for laboratory experiments as well.

Registration page options (en, ...): In these fields you have to fill in some self-describing sentences regarding the created sub-subject pool in the corresponding languages. Something like 'I live in Jena and I am a student' and so on.

5.6.3   Public Content

In the subject area of the system there are some pages which show site specific content like participation rules, privacy policy, a welcome message etc. You can edit this content. The page lists the content name and the content itself in the configured languages. By clicking on edit you may change the content. You are allowed to use HTML tags in the text boxes.

In the MetaHTML file which generates the corresponding site the content you entered will be presented using the function

```
<content::get-content "content name">
```

. Thus you may create a new page, give the content of it a name and create a new database entry by clicking on 'Create new' at the 'Public Content' options page.

5.6.4   Languages

The system allows you to change the language used throughout the subject and experimenter area. To do so, click on 'Edit language files' at the options page.

You will get a menu to select the language file you want to edit. After choosing a language, you will get a long table consisting of 500 to 600 rows.

In each row, first the name of the symbol is shown. This name often corresponds to the English representation of it. In the next column you see the representation in the language you use at the experimenter area. In the last column you see a text field, which contains the current representation of the symbol in the language you have chosen for editing. You may change the text. Note, that you are not allowed to use HTML tags in the fields.

After editing click on the 'Change' button at the top or the bottom of the page to save your changes. Check you changes that they appear correctly on the page.

There is another way to change the language file: you can just edit the file itself. Please read the part on languages in the system configuration section at page 50.

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A   Installing the system

You may download the systems' source code from our website.[20]   For every release you will find some instructions how to install a new system or how to update your existing one. Unpack the tarball and follow the instructions. Note, that you have to install the MetaHTML server (or a MetaHTML Apache cgi-engine) first. Then you can install the application.

```
install/
```

These instructions are also available on the website.

B   Configuring the system

B.1   Overview

B.2   Basic settings

The major configuration file is

```
/docs/config/settings.mhtml
```

In the following we will explain the different variables. In MetaHTML a variable is set by the command:

```
<set-var varname="value">
```

The quotation marks are not required but should be used for text entries.

settings::root-directory: Just leave this empty. This is the relative path from your server's document root to the system's root directory. If you use a MetaHTML server, what is the only option so far, you do not need to change this. For later releases we are planning to support the Apache server with MetaHTML CGI engine, and we will need this option then.

It may be of use for you if you use the MetaHTML server, but you copy all folders in the document root (/docs) to a new location at a higher level, let's say 'docs/recruitment-system'. Then you have to state here '/recuitment-system' as value.

settings::root-to-server: Here you have to specify the full path starting with / and ending with your system's MetaHTML server directory.

settings::dir-to-root-directory: You should not change this setting, because it builds the full path to your system document root from the variables above.

---

[20]

tthttp://www.orsee.org

settings::root-url: Fill in the URL for your document root directory of your server. That means, this is the URL pointing to your settings::dir-to-root-directory.

settings::upload-dir and **settings::gen-pdfs-dir**: These directories are used to store uploaded files like a manual or experiment instructions and to store pdf files generated from the system, i.e. the experiment calendar and participant lists. From time to time you should clear these directories because so far this is not done automatically. In the next release we will include a cron job for this task.

Normally it is not necessary to change these directories. If you nevertheless do so, please make sure that the directories are writable and readable for the user you run your system's webserver with.

site::database-host: The host your mysql database is running on.

site::database-database: The name of the database of your recruitment system.

site::database-admin-username: The username to access the database.

site::database-admin-password: The password to access the database.

site::database-type mysql: The database type. So far we only support MySQL, and we don't have plans to add other RDBMS in the future.

settings::stop-public-site: If you set this to "y" then visitors of the subject area will be redirected to an error page stating that the system is currently maintained. However, when you are logged in as an administrator you are still allowed to visit the subject area. Thus with this feature you can easily check out changes you made before letting other people see it.

settings::stop-admin-site: Stating here "y" allows nobody to access the system's experimenter area via a web browser. This might be useful if you do database changes by hand.

Note that both preceding options should be only used if you have small changes on the system to do. If you want to develop it we highly recommend not to work on the running system and rather to copy it to a development folder and start a different server to test it.

settings::support-mail: This is the email address where your participants may send questions to. Furthermore it is the default sender address for emails sent out by the system.

settings::admin-standard-language: This is the default language which is used in the experimenter area. Experimenters can change it in their options section to another installed language.

settings::public-standard-language: This language will be used in the subject area per default. At the Welcome page visitors may switch to a different installed language. However, the default email texts are taken from this language's files, and other default texts visible in the subject area too.

Currently (except at the registration page) we do not support more than one language for the participants. Thus only the language you specify here will be used for communication with participants. However there are plans to implement 'multiple language at once' support.

settings::styles[]: This is a MetaHTML array which contains the styles available for the system and for online surveys. The style names must be identical with the folder names in /docs/styles and separated by new lines.

settings::standard-style: This is the style used by the system itself in the subject and the experimenter area. In the future administrators will be able to choose in which style they want to see the admin area.

settings::experiment-types[]: Here the different types of experiments supported by the system are listed. Do not change if you haven't hacked a new one. The type 'Internet Experiments is not fully implemented yet.

However, if you want to disable online surveys and/or internet Experiments, just delete the corresponding lines.

settings::max_lab_participants: Fill in the number of participants you maximally want to participate in one session of your experiments. You may change this later. This setting will only restrict the participant's number select field at the session creation page.

settings::def_lab_participants: This is the default number of session participants which will be preselected at the session creation page. Why not set this to the number of computers available?

settings::max_reserve_participants and **settings::def_reserve_participants**: State the maximum and default number of reserve participant you want to invite to each session to overcome the problem of no-show-up of some subjects.

settings::max_experiment_duration_hour: The maximum number of hours a session will last.

settings::def_experiment_duration_hour and **settings::def_experiment_duration_minute**: The default time a session will last given in hours and minutes.

settings::experiment_time_steps: The granularity of time for the settings of experiment start and duration, given in minutes.

settings::def_session_reminder_hours, **settings::session_reminder_hours_steps** and **settings::max_session_reminder_hours**: The session reminder email will be send out to registered participants some time before the session start.

State the default time, the granularity and the maximum time in hours for the session reminder time select field at the session creation page.

settings::send_reminder_on_part_needed: This flag specifies the condition under which the session reminder should be sent out. If it is set to "true" or another non-empty value, the session reminder will be sent out if there are as much participants registered for the session as exactly needed. Thus, the number of registered reserve participants will be ignored. If the variable is commented out by ";;;" or is set to an empty string, the reminder email will only sent out if there are also enough reserve participants, i.e. the session is completely full.

settings::def_registration_end_hours, **settings::registration_end_hours_steps** and **settings::max_registration_end_hours**: These settings are analogous to the session reminder settings above, but for the end of the registration period.

settings::default_subpool_id: This is the default sub-subject pool id for subject pool select fields and for registrations where no subject pool determination was carried out before.

settings::os_question_types[]: This array contains the available question types in online surveys implemented so far. If you have reason to extend the list, i.e. if you have implemented something new, let us know.

settings::os_default_window_size_x and **settings::os_default_window_size_y**: The default size of the online survey window in pixel.

settings::os_default_textarea_width and **settings::os_default_textarea_height**: Default columns (width) and rows (height) for text boxes in online surveys. This can be changed on the item creation page.

settings::os_default_num_start, **settings::os_default_num_end** and **settings::os_default_num_step**: Default starting number, last number and granularity for select_numbers fields in online surveys. These values are just defaults for the item creation page.

settings::os_default_textline_size and **settings::os_default_textline_maxlength**: The default size and maximum length for textline items to be pre-selected at the item creation page.

settings::os_missing_field_color: The background color to mark fields which are not filled in in the survey but are required. Although this should be in the color settings file, it's still here because of the relation to online surveys. Will be changed later.

system::version: You should never change this. This value is used to determine your system's state when updating to a new version.

B.3   Layout and colors

You may change some color specifications in the file

`/docs/config/colors.mhtml`

The MetaHTML variables are defined as described in the section above. The color specifications are not located in this file throughout the system, but this is already on our todo-list.

As values for the color variables you may fill in standard color names or RGB hex values preceded by a '#' (i.e. 'white' or '#FFFFFF').

The main layout settings are done in the folder

`/docs/style/layoutname/`

To create a new layout, cd to the /docs/style folder and copy the standard /virtual folder to a different name:

`cp -r virtual yourlayoutname`

Now edit the files in the folder. It follows a short description of these files.

stylesheet.css: This is the stylesheet file used throughout the subject and experimenter area.

stylesheet_print.css: This stylesheet is used for pages prepared for printing, for instance the list of future experiments a participant has registered for.

html_header.inc: This is the HTML head which will be included on every page. It contains the main layout frame. Due to layout flexibility reasons it was not possible to leave out MetaHTML commands in this file. Thus when editing the file be careful with these commands. A short description of the commands:

`<get-var settings::root-directory>`

will be substituted by the settings::root-directory value from the settings.mhtml file in the config folder.

Don't change the

`<when <match ... and <if <match ...`

clauses. They just include a Javascript for the admin login page.

The lines

```
<if <get-var-once expadmindata::username>
 <include <get-var settings::root-directory>/admin/navigation.mhtml>
 <include <get-var settings::root-directory>/public/navigation.mhtml>
>
```

include the navigation menu which is shown in the standard style in the subject and adminstration area on the right side. You may copy these lines to a different location to fit your layout, but you should leave them unchanged.

html_footer.inc: This file will be included at the end of the page. Make sure that you close all table and other tags you opened in the header file. Together both files should produce a HTML page with the navigation code lines above to be substituted by the navigation and the space between the files to be substituted with the page content.

help_html_header.inc and **help_html_footer.inc**: These are the layout files for the small browser windows for the online help and the FAQ answers.

All other files: You should place all images and other files you use for your layout in the same folder. For the standard style named 'virtual' there are some GIF images.

C   Tips and Tricks

C.1   Two definite subgroups in one session

Imagine you want to conduct a gender experiment and to invite half boys and half girls. To do this within the system, you create two different experiments: one for the male and one for the female subjects. Now you register every session twice in each of the both experiments. Remember to specify only the half of the needed subjects in each created session. You can ignore the error message telling you about another experiment at the same time in the same laboratory: you already know that. Now, indeed, you assign only girls to the first and boys to the second experiment, and voíla: you have to definite subgroups.

C.2   Handle newcomers on the lab's door

Imagine there is a guy at the lab's door, who is not registered for your experiment. But at the same time you have so much no-shows that you need another subject. Now, do the following:

1. Don't forget to save the data you already filled in.

2. Let the guy show his id card. Search the participants data for his name by going to Participants/Edit participants.

3. If you find him, copy his email address, go to the assign page of your experiment and assign the guy to your experiment. Then click on *Assigned*

participants at the end of your experiment's main page and register the person for your session.

4. If you don't find him, create a new participant. At the bottom of the page, choose your session.

5. Now the guy should be listed at your session's participant list.