# Use of MediaLab™ in experimental behavioral research: The case of consumer decision making

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MediaLab™ is a software package developed by Empirisoft™ for the administration of psychological experiments in a computer lab which allows the creation of randomized experiments and the recording of data for each individual participant. This demonstrates how MediaLab™ can be used to arrange and record data to study individual choice behavior based on Herrnstein's (1961, 1970) behavioral model. The design and composition of the experiment in MediaLab™, the running of the experiment, and example of output data are all described. The use of Medialab™ for setting up experiments for research on consumer behavior is emphasized.

*Keywords*: MediaLab™, consumer choice, Matching Law, microworlds, computer-lab experiments

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Herrnstein (1961, 1970) developed an equation that makes it possible to predict and explain an organism's choice behavior. When given the choice of two or more behaviors, an organism is more likely to engage in the behavior that results in the higher or highest rate of reinforcement. Most studies on matching law have been done with nonhumans, though work increasingly involves humans. For example, consumer behavior studies by Foxall and James (2002, 2003), Foxall and Schrezenmaier (2003), and Foxall et al. (2004) have achieved comprehensive knowledge about consumers' choice pattern based on Herrnstein's (1961, 1970) behavioral model. However, due to an emphasis on the use of aggregated data, these studies do not always reveal information about choice patterns at the individual level. A study based on the observation of individual behavior would expand our knowledge about human behavior in choice situations.

MediaLab™ is software developed by Empirisoft™ for the creation of psychological experiments in a computer lab which makes possible multi-stimuli experiments and the recording of data on each individual participant. The main advantage of MediaLab™ is its ease of implementation since no formal programming skills are required. The software is built upon modularity which means that components of an experiment, from core manipulations to distracter tasks, from cognitive load manipulation to self-esteem scales, from cued recalls to thought-listings, may be created independently and saved as separate files. Such files may then be plugged into separate experiments. In ad-

dition, MediaLab™ is flexible with regard to multimedia presentation (e.g., image, video, sound, html files). Three elements are needed to conduct an experiment in MediaLab™ (Empirisoft, 2007). First, a design has to be defined. The software makes it possible to define several experimental conditions, and flexible randomization is feasible. MediaLab™ makes it possible to randomize stimuli within a single group and the order in which groups of stimuli are presented. Second, stimuli for the independent variable have to be composed. MediaLab™ has the capability to present many file types such as basic text, images, sound files or movie clips, display Microsoft Word™ documents, Microsoft Power Point™ presentations, html pages, or execute other stand-alone programs. Third, a dependent variable must be composed. If the dependent measures are questions they may consist of lengthy open-ended response, short fill-in-the-blank type responses, multiple choice and scale responses, thought or recall listings, or ratings of subjects' own responses. If html files or other web pages with active hyperlinks are used, it is possible to track browsing behavior as subjects navigate through local html files or the World Wide Web. MediaLab™ tracks every URL the subject follows and records in and out times. When running the experiment, MediaLab™ gathers the data and writes it to a single data file that can be read directly by Microsoft Excel™ or SPSS™. The software also creates a data input list for data sets in both Microsoft Excel™ and SPSS™ formats so that it is possible to start analyzing the data immediately. Moreover, MediaLab™ provides a data merging utility so that it is possible to easily combine data gathered on different computers before running the analysis.

Several technical articles both on how to use technology more effectively in research and how to use software in a more efficient way have appeared. For example, Gee (2007) has given a presentation on how to use interactive voice response systems and mobile telephones in research and therapy. In a follow up presentation from Carr and Burkholder (1998), Dixon et al. (2009) have given a demonstration of the task analysis for constructing various types of commonly used single-subject design graphs in Microsoft Excel™ 2007. For educational purposes, Empirisoft™ demonstrates how to use MediaLab™ by allowing users to download sample experiment files (Empirisoft corporation™). Social Thinking.org shares MediaLab™ files for the purpose of education and research in social psychology (Social Thinking.org). However, as far as we know, there has not been any presentation on the use of MediaLab™ in behavioral research. The purpose of the present paper is, therefore, to demonstrate how MediaLab™ can be used to administer and record data when studying consumer decision behavior based on Herrnstein's behavioral model. The paper is structured as follows: First, the design is presented together with a presentation of how the independent stimuli and the dependent measurement were composed. Second, a presentation of how the experiment was composed in MediaLab™ is given. Third, the running of the experiment and the output data is presented. The final section discusses the features and options that MediaLab™ makes available for investigating individual consumer choices in a controlled environment.

## Design

We arranged an experiment to demonstrate the features and options of version 2008.1 of MediaLab™ in which a scenario was defined which required that participants buy 108 products on the Internet. They were told that for each product choice they could buy either from a blue web shop or from an orange web shop (in Norway neither "blue" nor "orange" is a brand name of any special shop or product). Free shipment was presumed to be a reinforcing stimulus, and was presented after the participant had chosen and confirmed the order. An FR1 schedule was arranged for the first four choices. Then, VR4 and VR8 schedules were arranged for the next 104 choices, i.e., the participants had to click on average 4 or 8 times to buy the product. For half of the participants, VR4 was arranged for choices on the blue web shop, while VR8 was arranged for choices on the orange web shop. For the other participants, the arrange-

ment for the reinforcement schedule and color were reversed. Beyond that, the web shops and the products were identical.

*Independent stimuli*

For each of the 108 choices, the participant was asked to buy a specific product within the broadly-defined consumer electronics product class. He or she was told that both the blue web shop and the orange web shop had the product in stock. Two web shops were made in Adobe Macromedia Dreamweaver™ and represented single html sites that were linked together. For each choice, participants could browse through four Phases respectively allowing them to (1) switch between the blue and the orange web shop, (2) display information about product and price, (3) display information about delivery and conditions, and (4) confirm their order. In Phase 1 (see Figure 1) the participant could switch between the two web shops by clicking on icons. Furthermore, to control for positional preferences, half of the participants had the blue web shop on left side and the orange web shop on the right side when they choose between alternatives. For the other participants, the positions were reversed. Phase 2 (see Figure 2) displayed a picture of the product and gave information about product functionality and price. Figure 3 shows Phase 3 where the screen display gave information about delivery options,
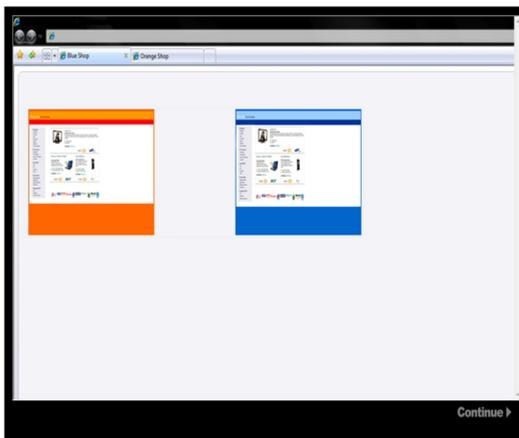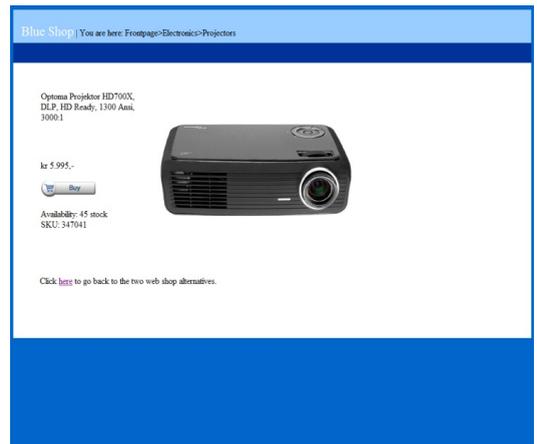


Figure 2. The Figure shows an example of the information about product and price of one product.
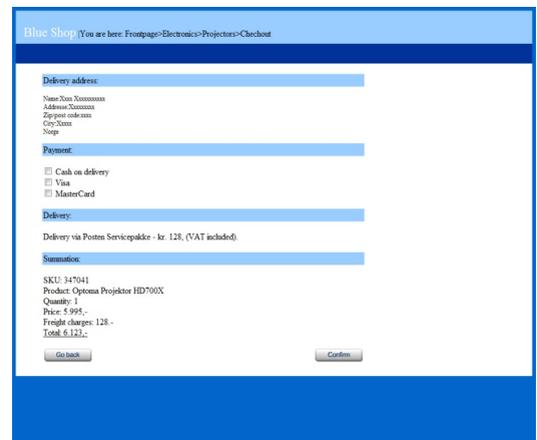


Figure 3. The Figure shows information about delivery and conditions.



Figure1. The figure shows the two web shops. The participant had to click on one of the icons of the web shpos.
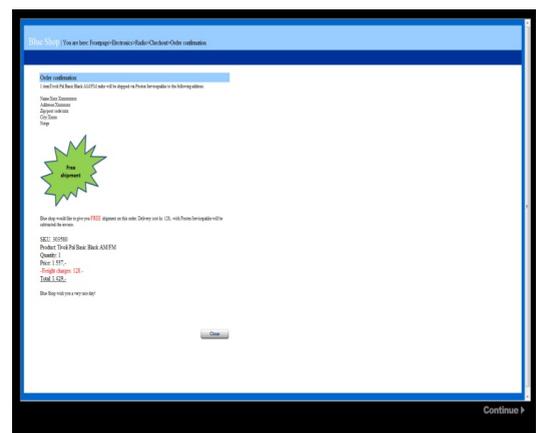


Figure 4. The Figure shows a confirming order step.

payment options and total price. Finally, Phase 4 (see Figure 4) displayed the opportunity of confirming the order information. Only in Phase 4 was the participant given information about free shipment. The offer of free shipment was depicted with a star and the money that could be saved by accepting this option was displayed. The participant could browse back and forth in each Phase, except for Phase 4 where the only option was to proceed to the purchase of the next product.

*Dependent measurement*

MediaLab™ was used to automatically record allocation of responses on the two alternatives for each of the 108 choices, start and stop times, and time spent on each choice, frequencies of switching within a choice (how often the participants looked at the alternatives before a choice was made), and, frequencies of switching between alternatives.

## Composing the experiment in MediaLab™

Once the design, the independent stimuli and the dependent measurement are defined, the experiment can be composed in MediaLab™. Two files have to be made in order to run the experiment: experiment file and questionnaire (Empirisoft, 2007). The experiment file (i.e., files with the .exp extension) specifies which files shall be presented in each condition and the order in which they shall be presented. The questionnaire (.que) is a file that is presented in one (or more) condition. Questionnaires differ in that they are a single self-contained file full of instructions for MediaLab™. These instructions can tell MediaLab™ to present various stimuli, but questionnaires also contain the instructions for the software to gather data. With the exception of questionnaires, no data is gathered for files that are specified. Here follows a step by step presentation of how the consumer choice experiment was composed in MediaLab™.

*Experiment file*

The experiment file and questionnaires files were created and edited in the Experiment Editor in MediaLab™. To launch the Experi-

ment Editor, it is necessary to either click on 'EXPERIMENT EDITOR' in the main MediaLab™ window, or click the 'EXPERIMENT EDITOR' icon in the Microsoft Windows™ startup folder.
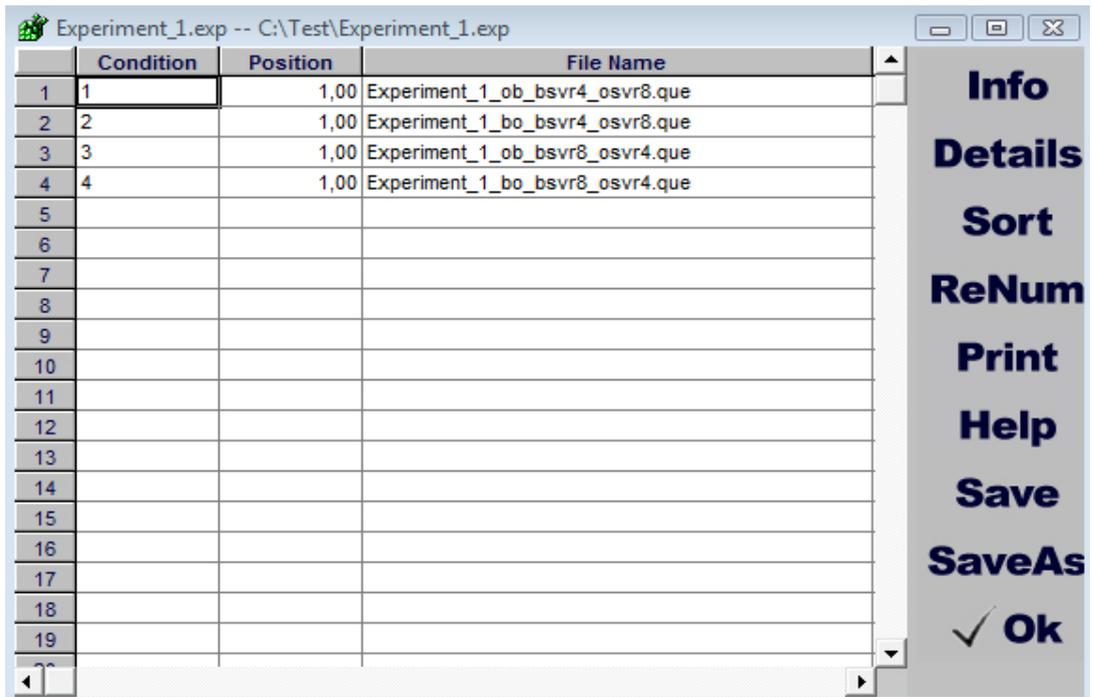
An experiment file was created by choosing "FILE" and then "NEW EXPERIMENT" from the option bar at the top of the screen. An "Experiment File Window" now appeared. In the "Experiment File Window," it is possible to define which files are presented to subjects for different experimental conditions, and the order in which they shall occur (see Figure 5). The "Condition field" identifies which files are presented together in an experimental session, "Position field" identifies the order in which files are presented in each condition, and "File Name field" is designations of the files to be presented in each condition.

To create the conditions in the "Experiment File Window," it is necessary to enter a unique identifier (e.g., 1, 2, 3, and so forth) in the "Condition field." Our consumer choice experiment has two variables with two values each, which gives a total of four conditions. The conditions were created by entering "1" in cell Condition1, "2" in cell Condition2, "3" in cell Condition3, and "4" in cell Condition4.

The "Position field" determines the order in which files are presented in each condition. MediaLab™ automatically sorts the files in each condition by the values that are specified in the 'Position field'. Our experiment had only one file for each condition so "1" was entered in cell Position1, Position2, Position3, and Position4.

To select files to be presented in the conditions, it is necessary to double-click cell File to browse the hard drive or press Enter to manually edit a file path. To be able to record data on choice behavior from each participant, our consumer choice experiment used questionnaire files for all conditions (examples of how questionnaire files are created are presented in the next section). This procedure was subsequently repeated for the next three conditions.

The experiment file must be saved by choosing "SAVE" from the menu on the right in the "Experiment File Window." The final consumer choice experiment file is shown in Figure 5.

Figure 5: The Figure shows the consumer choice experiment file window in MediaLab™. In the first field you have to list the experimental condition, in the second field you have to list the order and conditions (positions), and in the third field you have to list the different file names used in the specific conditions and order.

*Creating questionnaires*

A questionnaire file was created for each of the four conditions. To create a new questionnaire file, in the "Experiment File Window," it is necessary to choose "FILE" and then "NEW QUESTIONNAIRE" from the option bar at the top of the screen. A "Questionnaire File Window" now appears where it is possible to define and see which stimuli are presented to subjects in the experiment, and the order in which they are to occur (see Figure 6). The "Position field" identifies the order in which items are presented in the questionnaire. The "Name field" identifies the stimulus name and provides a variable name for the data file. "Item Type" identifies the stimuli types that are include in a MediaLab™ questionnaire. "Question Wording/File Name field" identifies the question wording for the stimuli being presented, or if the stimulus is a file (such as an image, sound, movie, executable, html or Word document) then the file name goes here. The following presentation shows how the questionnaire file was created for condition one.

For condition 1, VR4 was arranged for choices on the blue web shop and VR8 was arranged for choices on the orange web shop, and, when participants could switch between web shops, the orange web shop was arranged on the left position and blue web shop was arranged on the right position.

Condition 1 initially involved informing participants about the study. In cell Position1, it is necessary to enter "1" which tells MediaLab™ that this is the first stimulus that shall be presented to participants. It is then necessary to identify the stimulus by entering "Introduction" in cell "Name1." To set the stimulus type, the mouse must be placed in cell "Item Type1," and the arrow must be clicked in order to open the drop down menu. From the drop down menu, it is necessary to choose "INSTRUCTIONS." In our consumer choice experiment the following text was entered in the cell "Question Wording/File Name1": "In this study you are going to buy some products online. You are going to buy 108 products in total, and you can

Figure 6: The Figure shows the consumer choice questionnaire file one. The Position field identifies the order in which items are presented in the questionnaire. The Name field identifies the stimulus name and provides a variable name for the data file. Item Type identifies the stimuli types that are include in a MediaLab™ questionnaire. Question Wording/File Name field identifies the question wording for the stimuli being presented.

choose to buy each product from the Blue web shop or from the Orange web shop. The task is, hence, to decide whether to buy from the Blue web shop or from the Orange web shop. Click CONTINUE to start."

It is then necessary to enter "2" in cell "Position2" which tells MediaLab™ that this is the second stimulus that will be presented to participants. Identify the stimulus by enter "Condition 1" in cell 'Name2'. To set the stimulus type, the mouse is placed in cell 'Item Type2', and the drop down menu is opened. From this, "WEBTRACER" is chosen. In order to select the files to be presented for condition 1, it is necessary to double-click cell "Question Wording/File Name2" to browse the hard drive or to press Enter to manually edit a file path. In our consumer choice experiment, the first file in the html sequence (C:\Test\Experiment_1_ob_bsvr4_osvr8\p1_i.html) was entered in cell "Question Wording/File Name2."

Condition 1 ends by giving information to the participants. In cell "Position3" it is necessary to enter "3" which tells MediaLab™ that this is the third stimulus that shall be presented. Identify the stimulus by enter "End" in cell 'Name3'. To set the stimulus type, the mouse is placed in cell 'Item Type3', and the drop down menu is opened. From this, "IN-STRUCTIONS'" is chosen. The following text was entered in cell "Question Wording/File Name3": "The study is now finished. Thank you very much for your participation."

The questionnaire file is saved by choosing "SAVE" from the menu on the right in the "Questionnaire File Window." The final consumer choice questionnaire file for condition 1 is presented in Figure 6. The procedure of making a questionnaire was subsequently repeated for the next three conditions.

## Running the experiment

Five male and 3 female students at the first

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Subject | Cond | URL | Date | TimeIn | TimeOut | ViewTime |
| 2 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\p1_i.html | 11.11.2008 | 09:02:47 | 09:03:18 | 31 |
| 3 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p1.html | 11.11.2008 | 09:03:18 | 09:03:27 | 9 |
| 4 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_1.html | 11.11.2008 | 09:03:27 | 09:03:44 | 17 |
| 5 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p1.html | 11.11.2008 | 09:03:44 | 09:03:45 | 1 |
| 6 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\bs_p1_1.html | 11.11.2008 | 09:03:45 | 09:04:08 | 23 |
| 7 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p1.html | 11.11.2008 | 09:04:08 | 09:04:10 | 2 |
| 8 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_1.html | 11.11.2008 | 09:04:10 | 09:04:15 | 5 |
| 9 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_2.html | 11.11.2008 | 09:04:15 | 09:04:25 | 10 |
| 10 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_1.html | 11.11.2008 | 09:04:25 | 09:04:32 | 7 |
| 11 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_2.html | 11.11.2008 | 09:04:32 | 09:04:35 | 3 |
| 12 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p1_3_o.html | 11.11.2008 | 09:04:35 | 09:04:56 | 21 |
| 13 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\p2_i.html | 11.11.2008 | 09:04:56 | 09:05:55 | 59 |
| 14 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p2.html | 11.11.2008 | 09:05:55 | 09:05:56 | 1 |
| 15 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p2_1.html | 11.11.2008 | 09:05:56 | 09:06:19 | 23 |
| 16 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p2.html | 11.11.2008 | 09:06:19 | 09:06:20 | 1 |
| 17 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\bs_p2_1.html | 11.11.2008 | 09:06:20 | 09:06:42 | 22 |
| 18 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p2.html | 11.11.2008 | 09:06:42 | 09:06:43 | 1 |
| 19 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p2_1.html | 11.11.2008 | 09:06:43 | 09:06:50 | 7 |
| 20 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p2.html | 11.11.2008 | 09:06:50 | 09:06:51 | 1 |
| 21 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\bs_p2_1.html | 11.11.2008 | 09:06:51 | 09:07:07 | 16 |
| 22 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\choice_p2.html | 11.11.2008 | 09:07:07 | 09:07:08 | 1 |
| 23 | 1 | 1 | C:\Test\Eksperiment_1_ob_bsvr4_osvr8\os_p2_1.html | 11.11.2008 | 09:07:08 | 09:07:13 | 5 |

Figure 7: The Figure shows an example of result file in Microsoft Excel™. Column A shows the subject number and column B shows the condition that was exposed for the participants. The http tracks are presented in column C where it is possible to see each single click that participants did when choosing between web shops. Column D shows the date when the experiment was run. Column E and F shows time in and time out on each single web site, respectively. Column G shows view time at each single web site.

author's college were recruited. All participants had shopped on the Internet before. By volunteering, each participant obtained a gift voucher value 149 Norwegian Kroner (approximately 16.4 Euro) which could be used at one of the local record shops. The experiment was conducted in a room with one computer. However, it is possible to run MediaLab™ experiments over a network. The computer had 2.4 GHz Intel™ Celeron™ processors, together with 19 inches wide monitor and a resolution of 1280 x 960 pixels. Standard keyboard and mouse were used to direct their actions and select options. Below follows a detailed presentation of how the consumer choice experiment was done by the use of MediaLab™.

In the MediaLab™ program window, it is necessary to click on "SELECT AND RUN AN EXPERIMENT" from the "Run menu" from the option bar at the top of the screen. This allows the user to search through the folders on the computer to find the desired experiment. The experiment file (the file with the .exp extension) is located: it is necessary either to double click on it, or select it and click "OPEN." An "Enter Codes window" now appears. The participant's number is entered in 'Subject ID', after which "Enter" is pressed. A condition experimental number is entered in "Condition", and "OK" is clicked. The experiment can now go ahead.

Upon arrival, participants were led by the experimenter to the computer. The experimenter then explained that all necessary information for the exercise would be presented via the monitor. Each participant's first choice was, nevertheless,

made with the experimenter beside him or her so that they could ask questions about the tasks. Participants then completed the experiment alone.

The data are located in a data folder contained in the same directory as the experiment. From the "Data menu" the participant selects "LAUNCH EXPLORER." In the 'Data folder' located inside, there will be two folders and one text file (file with a .txt extension). Double click on the 'text file'. The experiment data file now appears in Microsoft Notepad™ as raw data.

To analyze the data we recommend copying them to Microsoft Excel™ (or SPSS™). Click on "EDIT" and then "SELECT ALL" in the main Microsoft Notepad™ window. Click "EDIT" ones again and then "COPY." Open Microsoft Excel™ and paste the data in one of the spreadsheets. A section of Participant #1's first choice and the beginning of the second choice are shown in Figure 7. Column A shows the subject number and column B shows the condition that was exposed for the participants. The http track is presented in column C where it is possible to see each single click that participants made when choosing between web shops. By knowing the file structure, the http track provides information about how often the participant looks at the alternatives before a choice is made (switching within a choice) and frequencies of switching between alternatives. Column D shows the date when the experiment was run. Columns E and F show time in and time out

on the respective web sites. Column G shows view time at each web site.

*Output data*

All 8 participants completed the 108 choices. Table 1 summarizes the results for choices 5 to 108 (choices on FR1 are not included). The indicator is based on a calculation from Herrnstein's (1961) equation in which relative responding is divided by relative reinforcement. There is perfect matching if the value of the matching indicator is equal to one, e.g., relative responding is equal to relative reinforcement. Table 1 indicates matching for Participants #1, #2, #3 and #6 and undermatching for Participants #4, #7 and #8. Participant #5 allocated responses equally to both alternatives. Undermatching may be due, among other factors, to too short change over delays (Baum, 1979). The Matching law states that the response rate to an alternative in a concurrent situation is proportional to the rate of reinforcement of that alternative relative to the rate of reinforcement on the other concurrent activities (Herrnstein, 1961, 1970). Switching between alternatives is, therefore, an important expectation in situations of choice. Table 2 shows, for choice 5 to choice 108, how often participants switched within alternatives before making a choice, and how often they switched between alternatives. Table 2 shows that most participants switched within alternatives before a choice was made (only Participants #6 and

Table 1. The Table shows proportions of responses and proportions of reinforcers. Participants' numbers are presented in the first column. Columns two and three show the proportion of responses and proportion of reinforcers, respectively. An indicator for matching is given in column four.

| Participants | $B_1/(B_1+B_2)$ | $R_1/(R_1+R_2)$ | B/R |
|---|---|---|---|
| #1 | $61/(61+43) = 0.587$ | $26/(26+13) = 0.667$ | 0.880 |
| #2 | $84/(84+20) = 0.808$ | $26/(26+13) = 0.667$ | 1.211 |
| #3 | $62/(61+43) = 0.587$ | $26/(26+13) = 0.667$ | 0.880 |
| #4 | $32/(32+72) = 0.308$ | $26/(26+13) = 0.667$ | 0.462 |
| #5 | $53/(53+51) = 0.510$ | $26/(26+13) = 0.667$ | 0.765 |
| #6 | $57/(57+47) = 0.548$ | $26/(26+13) = 0.667$ | 0.822 |
| #7 | $40/(40+64) = 0.385$ | $26/(26+13) = 0.667$ | 0.577 |
| #8 | $44/(44+60) = 0.423$ | $26/(26+13) = 0.667$ | 0.634 |

Table 2. The Table shows the frequencies of switching within (column two and three) and switching between (columns four) for all eight participants (choice 5-108).

| Participants | Switching within | | Switching between |
|:---:|:---:|:---:|:---:|
| | Yes | No | |
| #1 | 98 | 6 | 54 |
| #2 | 46 | 58 | 34 |
| #3 | 66 | 38 | 52 |
| #4 | 101 | 3 | 33 |
| #5 | 104 | 0 | 48 |
| #6 | 24 | 80 | 62 |
| #7 | 104 | 0 | 50 |
| #8 | 2 | 102 | 45 |

Table 3. The Table shows the average choice time for each participant (choice 5-108). Column two show the time (in seconds) for choice 5-30 for each participants. Likewise column three to five shows the time for choice 31-56, 57-82 and 83-108.

| Participants | Choices in four categories | | | |
|:---:|:---:|:---:|:---:|:---:|
| | Choice 5 - 30 | Choice 31 - 56 | Choice 57 - 82 | Choice 83 - 108 |
| #1 | 29.26 | 22.30 | 18.76 | 12.80 |
| #2 | 20.76 | 15.96 | 16.26 | 20.25 |
| #3 | 14.80 | 13.57 | 13.53 | 13.19 |
| #4 | 31.46 | 20.26 | 14.00 | 12.38 |
| #5 | 30.11 | 21.92 | 18.61 | 17.26 |
| #6 | 21.11 | 12.69 | 11.88 | 14.00 |
| #7 | 20.00 | 17.65 | 13.42 | 12.00 |
| #8 | 12.34 | 08.11 | 08.38 | 08.69 |

#8 rarely did so). However, the most significant indicator of matching is the participant's frequency of switching between alternatives. Table 2 shows that all participants switched between the alternatives when choices 5 to 108 were made. Table 3 shows the average choice time (in seconds) in 4 categories: choices 5-30, choices 31-56, choices 57-82 and choices 83-108. The result shows that average choice time decreases for most participants. Only for a few participants (#2, #6 and #8) does choice time increase in some categories, and then only by a few seconds in each case.

## Discussion

The purpose of this paper as been to demonstrate how MediaLab™ can be used to administer experiments within behavioral psychology exemplified with a consumer choice experiment. We have described three necessary phases in preparing an experiment in MediaLab™; composing a design, setting up the experiment in MediaLab™, and running the experiment by the use of MediaLab™. The current experiment included 2 different VR schedules of reinforcement that were arranged for choices among 2 web shops, i.e., VR4 and

VR8. For half of the participants, VR4 was arranged for choices on the blue web shop, while VR8 was arranged for choices on the orange web shop. Apart from that, the web shops and the products were identical. One experiment file and four questionnaire files were composed in MediaLab™. When running the experiment, the software traced the http sequences for each participant so that it was possible to identify which web shop that was chosen. MediaLab™ recorded frequencies of switching within a choice; how often the participants look at the web shops before a choice was made. In addition, MediaLab™ recorded frequencies of switching between alternatives. Finally, time of starting and stopping and time spent on each choice were recorded. Our conclusion is that MediaLab™ remains useful for behavior analysts desiring to study consumer decision behavior from observing individual behavior.

The ongoing discussion within psychology between field and laboratory research is particularly relevant for the study of consumer decision behavior. According to Brehmer and Dörner (1993), one could relate this discussion to the difficulties posed by complexity: the uncontrollable complexity of the field research creates problems of inference, while the controlled laboratory setting may generate weak external validity. DiFonzo et al. (1998) argue that the use of computer-simulated microworlds offers a compromise to this dilemma. The term microworlds appears to be used for the first time by Turkle (1984), who describes it as carefully constructed, graphically rich, and complex rule-governed worlds of video games. Further, within the field of decision making studies, Brehmer (1992) and Bremher and Dörner (1993) define microworlds as computer generated simulation environments that real subjects interact with and that possess, to varying degrees, a dynamic, complex, and opaque character. The ability to simulate dynamic decision systems, the use of computer-simulated microworlds offer a level of experimental realism not often experienced in traditional laboratory research (e.g., DiClemente & Hantula, 2003; Hantula, Brockman, & Smith, 2008; Hantula & Bryant, 2005; Omodei & Wearing, 1995;

Smith & Hantula, 2003). Moreover, the use of computer-simulated microworlds provides a high level of experimental control and thus includes the advantage of experiments - effects due to experimental manipulation. The consumer choice experiment presented in this paper can be categorized as a type of computer-simulated microworld study in which the dynamic aspect is only partly pronounced. Based on a simulated shopping situation, participants interact with the environment by browsing between two web shops and decide which option to choose. MediaLab™ made it possible to set up the experiment and automatically record data. Thus, microworlds bring favorable features to behavior analysts including realism and high levels of control, and, MediaLab™ is software that can be used to administer the study.

We would first emphasize from our experience with the program that MediaLab™ is easy to use, i.e., programming skills are not necessary. Second, the modularity on which MediaLab™ is built is flexible and functional. Modules that are made for a specific experimental purpose can easily be plugged into separate experiments, and be shared with others. Third, the way MediaLab™ collects the data makes it easy to retrieve them again. However, because we used the webtracer it was to some extent hard to analyze data because the http sequence had to be read manually. By the use of Microsoft Excel™ we managed to increase the quality and efficiency of analyzing the http sequences.

In summary, the current paper demonstrates how consumer choice experiments can be administrated by the use of MediaLab™. However, only basic functionality is exhibited in this demonstration. A follow-up study could investigate various reinforcement schedules to see whether cases with matching are more frequentin the case of leaner schedules. For example, reinforcers can be arranged for different VI schedules in which we could vary the VI/VI values and also have a higher number of data points for each participant. The experiment can be administrated by MediaLab™ to randomize the order in which the conditions are presented within groups. Another issue that needs to be clarified is what type of stimuli are going to be used as

consequences since we do not know the effect of free shipment. Post-experimental interviews are another feature that can be included in a follow up study, and that can easily be arranged in MediaLab™ at the end of the choice session as open-ended questionnaires. Open-ended questions like "What influenced you in your choice of web shop?" or "What were the differences between the two web shops?" might give information about rules that participants bring with them into the experiment session and rules that are established through the experiment.

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