Noldus Observer Video-Pro Overview

J Talpos, A Heidema and RA McArthur Neurobiology Pharmacia & Upjohn 301 Henrietta Street Kalamazoo, MI, 49001, USA

Why should you use these manuals, and which one is right for you?

Members of the CNS division of Pharmacia have created two simple manuals for the observer software system. These manuals are not intended to replace those that come with the observer software, they are intended to act as a supplement to those that are provided. These manuals have been created out of experience. Sometimes, the hardest part about using a new program is figuring out the simple things like where to click. This manual walks you through simple problems like these that you are sure to encounter. Furthermore, the observer is a very powerful tool filled with a number of setup options. These options will greatly affect the output of your observations. Because of this, great pains have been made to describe the effects of certain options within the program that you will be likely to use.

You may notice that there are two different manuals contained here. The first manual describes the process for coding single subject observations. The second manual describes multiple subject observations. It may seem apparent when you should use which manual. However this is not really the case. The main advantage of the multiple subject (referred to as actors within the observer) observation setup is that is allows you to examine specific interactions between multiple subjects. For example, if you are examining aggression and you want to study the effects of barring teeth at another individual you will need a multiple subject design. However, if you wanted to study the relative rate at which teeth are shone when two animals are pair housed then it would likely be easier if you actually did a single actor observation twice, once for each animal. If you are not sure which way will work best for your experiment I suggest that you make two experiments in the observer and try both

methods running only a few observations. By doing this you will get a greater feel for the advantages and the disadvantages inherent in both methods of observations.

Noldus Observer Video-Pro Overview (single actor)

J **Talpos, A Heidema and RA McArthur** Pharmacia & Upjohn, Neurobiology

INTRODUCTION

The Observer defines a Project as a set of files encompassing an experiment. Each of these files is inter-related which means that they have to be kept as a single unit (Project). The Observer therefore is made up of a series of MODULES of which the PROJECT MANAGER is the core of the package. This module organizes and manages all the files of your Project.

Because all files of a Project are inter-related this means that individual data files, for example, can not be worked upon as a single unit. If you want to copy files from one computer to another, or to archive your Project, you must copy the entire project.

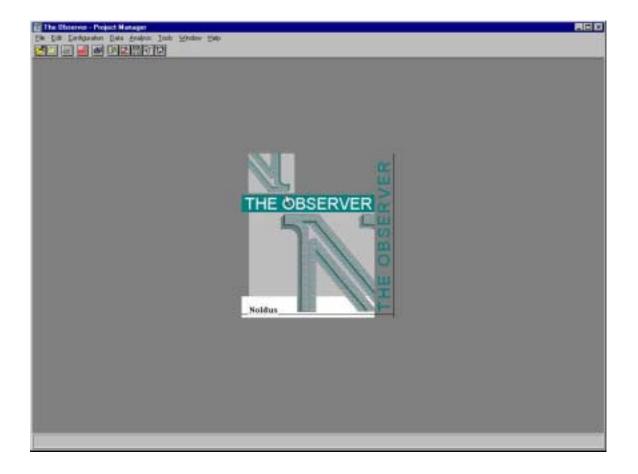
An Observer Project is made up of:

- Configuration file. This is where you first describe the experiment within the Observer Project Manager. You begin by describing the experiment in plain text in a word processor file. This helps you (and others) to remember what and how you did the study. Think of it as a supplementary lab notebook. In the configuration step you also define the way you are going to collect the data, what method you are using to time the observations, what your independent variables or category factors are, what behaviors you are going to measure and how those behaviors can be modified.
- 2. *Data files*. Once you have defined your experiment (and you are now COMMITTED to this definition), you are now ready to start observing the animal (s) and coding their

behaviors. Each animal has its own file once the behaviors are coded. The location of these files is managed through the Observer Project.

3. *Analysis files*. Having now coded the behaviors of all the animals in the experiment, the Observer can do single animal or group statistics. In general you will be calculating individual animal statistics (records) which will then be exported to Excel files and then use a stats package such as UNISTAT to calculate the group means and variance. Again, these files are included in and managed by the Observer Project.

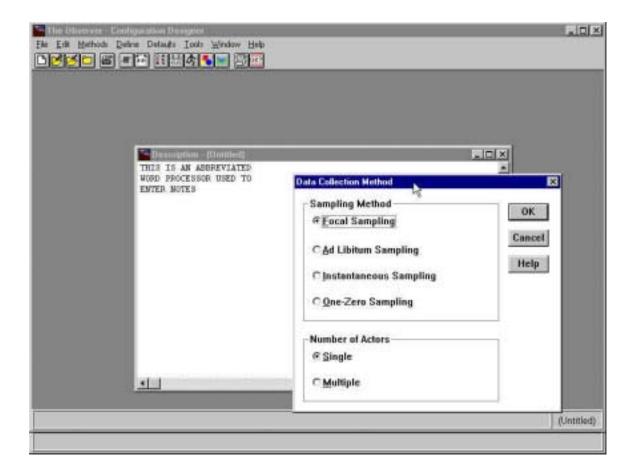
Open the **OBSERVER PROJECT MANAGER** by clicking on the icon.



1. DEFINING THE PROJECT

- Click on **Configuration**.
 - Select **Design Configuration**.
 - Select File > New Configuration.

The first window that appears is a mini- word processor into which you can type in your own description of the experiment (as in notes in your lab notebook). Use this window to make all your annotations.



- Select Methods
 - Select Data Collection Method.

Sampling Method

There are 4 types of methods by which you can *sample* or code behaviors:

- 1. *Focal*: This allows you to measure both the frequency (how often it happens) and duration (how long) of behaviors that you have defined. For example, you may want to measure how often a rat goes to sleep in its cage AND you want to know how long the rat has slept over the entire observation period. Focal sampling can be done with 1 or more subjects being observed simultaneously.
- 2. *Ad libitum*: This allows you to record the frequency of behaviors for observations with single or multiple subjects. Because only the frequency is being recorded, this data collection method is ideal for pre-study observations when you are starting to determine which behaviors are important for future observations.
- 3. *Instantaneous*: This method is used is used when you want to have a snap shot of defined behavior(s) at regular intervals. Suppose you want to look at a rat once every hour to see whether it is sleeping. This is a yes/no type of datum. This method can be used for one, or multiple actors.
- 4. *One-zero*: Similar to instantaneous sampling except that a regular interval is defined and you want to know whether a specific behavior (s) have occurred within that interval.

Number Of Actors.

This refers to how many subjects are being observed at the same time.

- 1. *Single*: Only one subject is being observed at a time. For example, 1 mouse in a plus maze. However, you can use this same setting if you are going to observer a setting in which there are multple animals but you are going to code only one at a time. An example of this would be two animals in an open field were you were examining frequency of behaviors but not how the animals interacted with each other.
- 2. *Multiple*: More than one subject is being observed. For example 2 rats interacting with each other in a social interaction test. You would primaly use this sort of setup when you are concidering interactions between the animals. For example, if you were studying the rate at which the showing of teeth by animal A results in submission displays by animal B, then you would use this sort of setup. Multiple observations can also be used if you

just want to code two or more animals at the same time, however this becomes very difficult because of the extra key strokes needed. Because of this we recommend that you use multiple observations with a single actor setup unless you are trying to observer some sort of reciprical behavior. That is to say behaviors in which one triggers another, like an event cascade.

- Select Methods.
 - Select **Timing Method**.

Duration.

At this point you define how long the observation period lasts.

- 1. *Open ended*: no maximum duration is set for the observation. Clicking on the end button ends the observation.
- 2. *Maximum*: A set time for observing is defined. When the computer timer reaches that time, the file will close and save the data. This is a way of standardizing the amount of time allowed to observe each animal. You can, however, end the observation before that time by clicking on the end button.

Edit Methodi Delau Control and Angel 22			
THIS I	Duration	I N	
	Copen Ended bh : mm : ss days Maximum: 00 : 05 : 00 Based on: Cobserved Time Cobserved Time Timing	Cancel	
<u></u>	Besolution: 0.1 second Sample Interval: 00 : 00 [mm:ss]		(Unit

When you are working on a *maximum* time observation, you can also define whether your observations are based on elapsed or actual observed time.

- 1. *Elapsed*: Refers to the duration of the behavior throughout the observation period of a specific length.
- 2. *Observed*: under some circumstances you may want to suspend coding a behavior. The timing picks up again when coding restarts. For example, a rat may have a sleeping box into which

it can disappear randomly. You may want to suspend coding of other behaviors until the rat re-appears.

Timing

- 1. *Resolution*: Three options are available, 1.0, 0.1, and .01 second. This determines if behavior will be coded in seconds, tenths of seconds or hundredths of seconds. The greater the resolution (0.01 second, the more precise the measure). 1 second is generally acceptable for our behavioral observations.
- 2. *Sample interval*: This is where you determine the sampling interval time when you are using instantaneous or one-zero sampling.
 - Select **Define.**
 - Select Independent Variables.

Independent Variable Name

Independent variables are categorizing names also known as FACTORS such as gender, strain, ID, treatment type, etc. Independent variables can have a subset of levels. For example gender can be made up of 2 levels: Male, Female. ID is made up of as many subjects you have such as Rat1, Rat2, Rat3. Type in the name of an independent variable.

Independent Variables			E	
Independent Variab	le Name: ID		ОК	
Data Type © Character Ω ○ Nymeric ☞ Eree Format	Ptions: Rat3 Rat1 Rat2	<u>- Add</u> <u>- I</u> temaw	Cancel E Help	
Iable: Nur Gender; Character	nber of Independen <free format=""> IMai</free>		E Add	
		NG	Bennye	
11				

Data Type

The type of variable can be either a *NUMBER* or a *CHARACTER*. ID, for example could be a numeric data type (1, 2, 3, 4,). It could also be a character type where you are combining alphabetic characters as well as a number (Rat1, Rat2, Rat3,, Rat02-15-2000). Determine how you want to enter this type of information.

1. *Character*: When you choose a character data type, you can either enter the elements at the time that you are coding (free-format) or you can set up a list (options) from which you can pick at the time you code. For example, under Independent variable ID, you may have a list of subjects already identified. They have been called Rat1, Rat2, Rat3, and Rat4. Each of these can be inserted as an option list by typing them in the Options

window and then adding them. This hardwires you to these subjects and you choose them from a pop-up list when you start to code.

a) If you don't know what animal ID is at the time you start coding and want to identify them at that time, then you can choose the FREE-FORMAT option that allows you to enter the ID at the time of coding. For example, Rat1, Mickey, 4, etc.b) You can even combine a specific list and free-format if you start off with a specific group of animals when you set up the Project, but when the time of the experiment arrived, you had to add more animals. Select both options and Free-format.

- 2. *Numeric*: If you choose to define the independent variable as numeric you will then be required to enter the minimum and maximum values used.
 - Select **Define**.
 - Select Behaviors.

The Observer defines behaviors in terms of a general CLASS that has a series of elements. For example, a behavioral class could be MOVEMENT. Within the behavioral class *Movement*, the following elements could be defined: walking, stretching, rearing, climbing, and falling. Another behavioral class could be POSITION. Within *Position* center, outer wall, open arm, etc. would be defined as elements of this class.

ie Ed Method Delse Dels Delse Ed anis (1			×		_	_
,ength of Input Code: Behavioral Class <u>N</u> ame: Inble: Movement: 5 elements: del	One Key Movement Number of Cl	and	OK Cancel	-		
Behaviora	l Elements	Section of the section of the	Element Name:	Stretch 8 I upper body stretc	hed	OK Cancel Help
		& Stretch;	Num W: State s; State		Conne>	Add
		Climbing	; r; State g: c; State f; Event			Bemove Replace

Length of input code

Coding in the Observer is done primarily by pressing a key on your computer key pad. Thus, you have to program specific keys or combination of keys to each behavior. For example, the occurrence of the behavior *walking* could be coded as W (length of input code = 1), or by pressing down more that 1 key such as CTRL W (input code = 2).

Behavioral Class Name

Define your behavioral class (Movement). When you type this in, add it to the table and select it. The BEHAVIOURAL ELEMENTS window will now light up. Click on it and enter the name of the elements (For example, walking).

- 1. *Code*: Select the key, or keys that will identify that behavioral element (W).
- 2. *Definition*: Write a brief definition of that behavioral element (example, Animal moves its four paws in any direction.).

- 3. *Type*: A behavioral element can be either a STATE or a discrete EVENT. Walking is a state behavior because it occurs often (frequency) and continues over time (duration). An event behavior can occur with different frequency, but does not have duration. Falling, for example is an event behavior. The DEFAULT option identifies the normally starting behavior at the time of coding. For example, coding of the subjects could always start when they are stretching. Each behavioral class must have an element that is the default element. In a plus maze, for example, the default (starting) POSITION would be the rat in the Center of the maze and the default MOVEMENT would be stretching.
- 4. Modifier: This function adds greater specificity to a behavioral class. For example, if you where observing children at play then you can create modifiers which will describe their interactions more accurately. For example, you could have a code "play", and then a list of modifiers such as ball, doll, jump rope which indicate what they were playing with. Each class of modifiers is associated with a specific behavior. For example, you could not use this list of play modifiers in conjunction with a set of codes for aggression. Each modifier class is associated with only one behavior. Modifiers can also be used to determine intensity of behavior. For example, you could have a behavior "cry" and then modifiers such as "soft", "normal", and "loud". Modifiers can also be used to determine to whom a behavior is targeted. For example if you were coding aggressive behaviors is monkeys, you might code monkey one as "hitting" and then have modifiers such as "monkey 1" "Monkey 2", and "monkey3." This way you can record who the aggression is aimed at.
 - Select **Define**.
 - Select Modifiers.
 - The process of defining modifiers is nearly identical as that for defining behaviors. See those directions for information on how to define a modifier.
 - Activating the modifier.
 - A modifier must be linked to a specific behavior before it can be used. In order to do this, reselect behavior under the define menu. Highlight the behavioral class of interest and then click on behavioral elements. You can now select your desired modifier. As you may have noticed, both actors and behaviors can also be selected to use as modifiers.

- Select **Defaults**.
 - Select Environment.

You can code behaviors using a variety of computers from PC's, MAC's, or even hand-held computers. Select the computer you are using in your study.

- Select **Defaults.**
 - Select Keyboard Definition.

Select whether you want to distinguish between upper and lower case.

- Select Tools
 - Select **Review Configuration**.

This will give you a listing of all your definitions that you have configured for your Project. This can be printed and included in your lab notebook for future reference.

The Diverses - Configuration Drangees		
He Enk Methods Deline Delaufts Loois Window Help		2010/06/07
Review of Cardigoration - DVETIVIEW/CMF		
DESCRIPTION		
AND DECKER AND DECKER	-	
This is an example of use of de	escriptors as a notebook 1	
Focal sumpling on a single actor		
Fixed timing of 5 minutes with a resolution	of 0.1 sec	
Independent variables are: gender male and		
Both of these independent variables are in f		
I am looking at 2 classes of behaviours: How		
Bovenent	Configuration Designer	×
Default advenent is stretching	+6	
walking	The configuration OVERVIEW.C	NF OK
rearing	is OK!	time and the second
cliabing		
Position Default position is centre		
open ara		
cloped ann		
Test of the state state state and the state of the	1.1.	
There is 1 event behaviour defined which is	falling off the safe.	
RETRODS		
Sampling Method Focal Sam		
Sumber of Actors Sindle	spirng	
Maximum Duration of Observations,: 00:05:00	00 (bhraaroo 03)	
and a second design of the second		
	12	
		OVERVIEW.CNF

- Select Tools
 - Select Test Configuration.

This is an automatic error trapping that the Observer does on your configuration. It will let you know whether you have omitted defaults, or whether you have forgotten to define certain elements. Observer will not let you continue with coding behaviors until the configuration is complete and logical.

- Click on **File**.
 - Select Save Configuration.
 - Enter a file name for the configuration file (*.cnf)

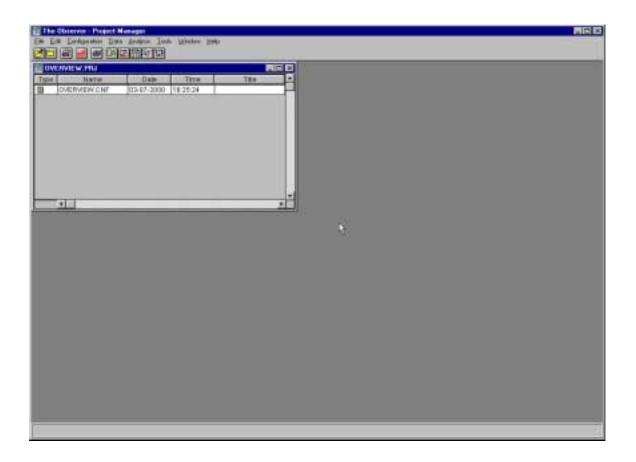
You now have to associate the configuration with the project that you are creating. This is a bit confusing because you have to first create and save the configuration file AND THEN create your Project. Noldus has presumably programmed the Observer to work this way because this order of events allows you to use a standard configuration for a plus maze study, for example, with many different Projects. This set of instructions following presumes that you want to use 1 configuration for 1 project. Remember that in the future you have the option to share your configuration files.

Minimize the *Configuration Designer* in order to get back to the Observer Project Manager.

- Select File.
 - Select New Project.
 - Enter the file name that you used to save your configuration file.

Open Configuration

Select the configuration file that you saved previously. Having done this a window will immediately appear on the screen with the configuration file indicated. This is the index of all files being managed by the Program Manager. Later, when coded data files are generated and analysis files as well, these files will be indexed in this window.



Close the Program Manager and Configuration Designer.

2. PREPARING THE CODING ENVIRONMENT FOR VIDEO ANALYSIS

Open the **OBSERVER VIDEO ANALYSIS NOT** the **OBSERVER EVENT RECORDER** Program by clicking on the Video Analysis icon.

A) Customization:

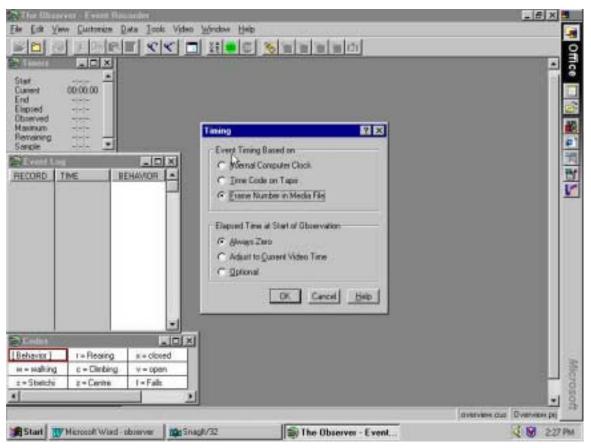
- Click on File.
 - Select Open.

Select the Project that you have configured. The Video analysis program will then load the basic video coding window.

🚳 The Observer - Exest Rece			110 (2)
He for your Detroit De	s Jun Ven Wester Bos [SiK] □ Itie[C] his[s]s[s]()		
Steen BEID 2		LON .	
Start	(Moutheast)		
Stanting	wase [
			Downworani
Bilet Malingivit	Witcout Wed strever. St The Glasses - Court.	(<u>5</u> 99	1831

This will include a window designated for the timer, event log and the channels. This view can be deselected if desired.

- Click on View.
 - Select **Codes** (This will open a window in which you can view your codes for individual behaviors as well as being able to use your mouse cursor to select behaviors.)
- Click on **Customize.**
 - Select Timing.



The first time you want to start coding behaviors using the Project that you have just configured, you will have to customize the environment under which you will be doing the coding. All Observer coding is based upon *time* and it is fundamental that you establish and standardize your time base. This will depend on whether you are coding behavior (1) "live", (2) off a videotape or (3) off a digitized video file on your hard drive or CD. If you are working off a video file then you need to use the frame number as your time base. If you are using a videotape then the internal time stamp on the tape provides the time base. Finally if

you are recording "live" then the computer's internal clock provides the time stamp. If you are working with a video file you must indicate the frame number option otherwise you will be unable to call up the file.

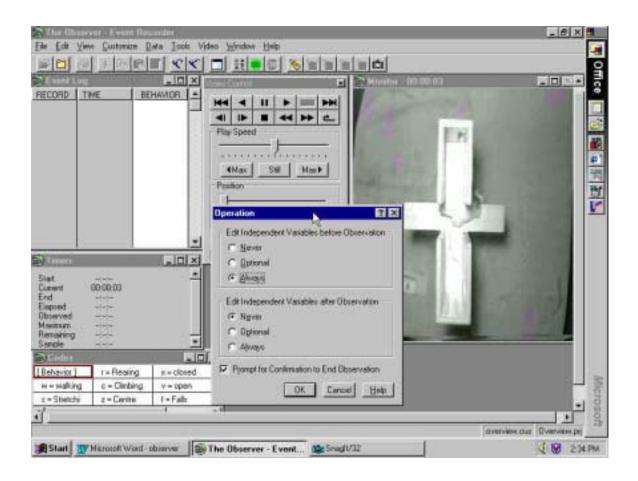
- 1. Event Timing Based On: Select "Frame Number on Video File".
- 2. Elapsed Time at Start of Observation: Select "Always zero".

When the timing method has been selected for a media file, a small monitor window will appear on the screen with a message "No media file selected". Select the media file containing the subjects whose behaviors are to be coded. In all likelihood this file will be on the CD-ROM drive. Selecting the media file will insert the file into the monitor window. Adjust the size of the window for confortable viewing. At this point, control/logging windows are to be placed on the screen and their position and size adjusted according to personal preferences.

- Click on **File**.
 - Select **Open**.
 - Select Media File.
- Click on **Customize**.
 - Select Operation.

This option allows you to set whether you can change the independent variables at the beginning or end of an observation ie, to set up and identify data files.

- 1. Edit Independent Variables Before Operation: Always
- 2. Edit Independent Variables After Operation: Never
- 3. Prompt for Confirmation to End Observation: On



You may now save the way that you have customized your coding window.

- Click on **File.**
 - Select Save.
 - Select Customization.

Save the customization file using the **ROOT file name** that you have been using to define the Project.

You may now start making your observations and coding behaviors. This can be done immediately after the observation window has been customized or at your leisure. If you choose to code behaviors at a later time. Close the Project by closing the Event Recorder. At a future date you may re-open this Project in order to start coding.

3) OBSERVING AND CODING BEHAVIOURS

Open the **OBSERVER VIDEO ANALYSIS** Program by clicking on the Video Analysis icon.

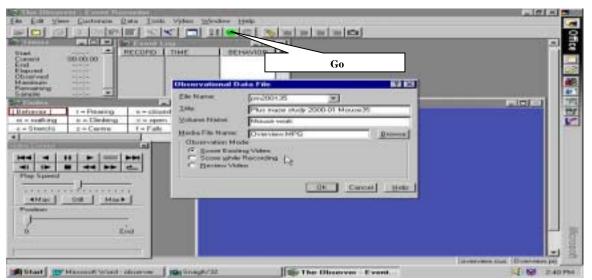
- Click on **File**.
 - Select **Open**.
 - Select Project

Select the Project that you have configured. The Video analysis program will then set up the screen that you have customized previously.

A) Initializing

Enter the name of the media file that you are about to code and set up the specifics of the subject (s) whose behaviors you are about to code.

- Click on **File**.
 - Select **Open**.
 - Select Media file
- Click the green **GO** button



- Select a file name. Each subject will have its own file name, so it is best to name the file in a way that will tell you which Project the subject belongs to, and something that describes the animals place in the Project. For example, in a plus maze study, a good file name would be pm01 indicating that the subject was the first subject coded in a plus maze study.
- 2. Title and volume name are parameters which identify the subject more clearly. You can, if you wish, leave these fields blank.
- 3. You can also select or change the media file you wish to observe at this stage. If you have already selected a media file as described above, this file name will also appear in this field. The select media file option can be tricky. It will often revert to files already used. Because of this, it is suggested that your file be selected at the beginning rather than at this stage. If the program makes you reselect a media file, the above information will be lost..
- 4. Score existing video.

• Click **OK**

Enter the **INDEPENDENT VARIABLES** identifying the particular subject.

Select the variables that accurately describe your subject. The variables will be the same as those you created in the project manager. If needed, you can also type in new variables.

• Click **OK**

Once you click ok, a new dialog box will be displayed which asks you to position your media file. The phrase "position your media file" means you should cue video track to the point where you want it to start observing. There are two ways to do this. If you know the time when your observation begins, you can use the find time function. The digitized video time frame can be found as the **current time** in the Timers Window.

Ele La Vien Cutteries Dete Jock Video Window Help	EX.
Find Time Function	Office
StatA CLANNT 00:00:00 End Description Permaing Sample	
Emilie Emilie Emilie [Behavior] 1 = Rearing is = closed is = closed is = Statichic z = Contra 1 = Falls DI OV	N R W
Hei II II Hei II Hei Hei Hei Hei	
Max Sill Max + Position	Mic
averview.c.a: Dverv Start Wind-observer - Event Science/V32	

If you do not know the video frame number then you will need to use the video controls to position your media files in a way similar to using your VCR.

- 1) To use "**find time**" function.
 - Select **Edit**, then choose **video time** to position your media file.
 - Enter the desired start time. Click on find. Your media file will now be positioned at the time selected.
 - Click on Close.
 - You can now click on **OK** in the media position dialog box.
- 2) To use the **video controls** to position your media file.

This method is more cumbersome then the find video time method described above. The video control panel works much like a VCR. You have functions such as play, fast forward and rewind to use. You can use these controls to find your ideal starting position.

- When you have found the start position, click on the stop button.
 - You can now click on **OK** in the media position dialog box.

B) Coding

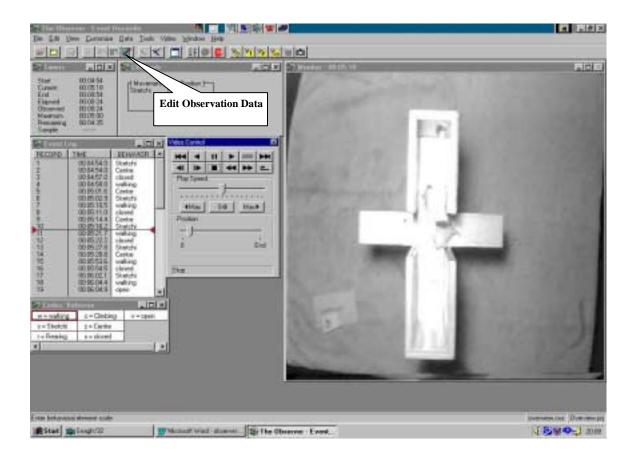
When you click on OK, another dialog box will appear. This one will ask you to "**Initialize Channels**." Click on the behavioral codes that represents the defaults of the animal being observed. In this example stretching and center have already been defined as default behaviors. If you haven't defined default behaviors when defining the Project (see above) then you must do so here. Behavioral codes have their own box. If the animal is stretching, then choose stretching and this behavior will be coded from the beginning of the observation. You will need to select a starting behavior for all behavioral classes.

- Select your desired behavioral class
 - Click on your starting code (In the code box)
 - Repeat for every behavioral class

You are now ready to begin coding. Select **Start**, and begin coding you first observation.

Changing observation speed.

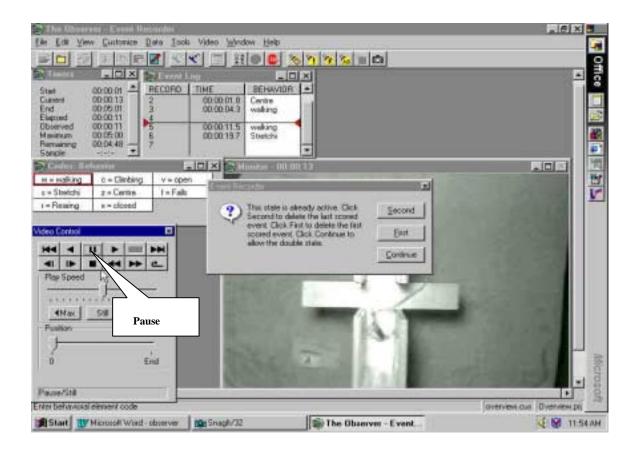
You can also select the SPEED with which the video track will play at any point during the observation session. This is a very useful feature if you are concerned that the video is going too fast and that you are missing behaviors. Use the mouse to slide the speed arrow to the left or right to select your more confortable viewing speed.



C) Mistakes and editing.

1) Selecting a behavior that is already active.

Occasionally you will select a behavior that is already active. The following error message will appear, "This state is already active....". **PAUSE** the video immediately and delete the second state. Start the video in order to pick up coding from where you left off.



- 2) Editing during or after an observation.
 - Click on the "Edit observational data" button.
 - Highlight the behavior you would like to change
 - Press the appropriate code key for that behavior, or delete if you would like to remove the code all together.
 - When done making changes click on the edit mode key to start observations again.

If you discover that you have coded a behavior incorrectly during an observation it is possible to edit the behavior file. You can do this either after you made your original observation or during. It is best to edit the file during the observation, however as you have to remember the exact time on the video file where you made your mistake. Stop the video and use the EDIT > FIND function in order to go back to the mistake time. Click on the edit icon. This button has a piece of paper and a pencil for its icon. In edit mode the video

controls are still active, so you can replay portions of the video file. It is also possible to click on the behaviors and change them. Behaviors can be changed either by highlighting them, and then pressing a key that has been linked to a behavior, or they can be deleted outright. Once any behavioral changes have been made, click on the edit key and the observation will continue. The observation will continue to run while you are in edit mode so you may want to pause the observation before you start editing the file.

3) Multiple observations of the same media file.

- Record the start time of the first observation
 - Select GO
 - Click on the down selection arrow on the File name field and select the file to which you want to add new codes.

When coding complex behaviors it is often useful to watch the video file twice. This allows you to concentrate on coding one behavior class at a time. In order to do this, record the time at which you started your first observation. When you have finished your first observation start the process of coding again. As usual select the green GO icon but rather than entering a new file name, click on the down selection arrow of the File name field and select the file you want to add additional codes. Follow the usual procedure for starting to code an observation. When you are prompted to select a starting point for the observation use the edit function and select time, then select find time. Enter the same starting time you used in the first observation of the file. This procedure insures that you are coding the same video segments in both observations.

4) STATISTICS

When you have finished your observations it is time to perform statistical analyses. This is done in 2 stages. The Observer software package is used to format the information in a manner that will allow it to be exported to a spread sheet program such as Excel to be analyzed by Unistat.

Open the **OBSERVER PROGRAM MANAGER**

- Click on File.
 - Select **Open**.
 - Select **Project**

Select the Project that you have configured. The Project manager screen will then display all of the files related to your Project.

	Name Defe Term Term 0VERVEXVCNF 03-07-2000 85-94-44	he Disterve - Project	Hanager		1440					
Name Date True True OVERVIEW CNF 03-67-2000 18 54.44 Image: Comparison of the compari	Nervic Defe Trrat Time 0.4E90429VCNF 03.47-2000 18.54.44 Image: State of the s			Sugar 1	040					
Nerve Dete Trrat Title 0VERVENCNF 03-07-2000 18:54.44	Name Defe Term Term 0VERVEXVCNF 03-07-2000 85-94-44	the second s	SCI 10 DEG	-			-	_	_	 _
OVERWENCOMF 23.87.2000 18.84.44 Image: State of the state of	OVERVEWONF 23.07.2000 18.54.44 Image: control of the second s					-				
premiera tual 03-87-3000 17-36-02 metri Judi 03-87-3000 17-35-02 hote32 adf 03-87-3000 16-85-54 hote32 adf 03-87-2000 16-85-54 hote32 adf 03-87-2000 18-85-58 Johenac adf 03-87-2000 28-35-58	premiew rust 03-67-2000 17:36:02 werflaw 03-67-2000 17:35:02 boxe3.pdf 03-67-2000 16:56:42 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 18:36:58 boxe3.pdf 03-67-2000 18:36:58				100					
Invert.odf 03-87-2000 17-33-12 Nons0.adf 03-87-2000 14.56-42 This is a title to fello of some and the some a	Invert.odf 03-87-2000 17-33-12 Nons0.adf 03-87-2000 14.56-42 This is a title to fello of some and the some a				+					
Inclusion Inclusion <t< td=""><td>Inclusion Inclusion <t< td=""><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td></t<></td></t<>	Inclusion Inclusion <t< td=""><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td></t<>					1				
bels2.adf 03-07-2000 18-56-54 hels3.adf 03-67-2000 19-33-42 2belsec.adf 03-67-2000 28-35-59	bels2.adf 03-07-2000 18-56-54 hels3.adf 03-67-2000 19-33-42 2belsec.adf 03-67-2000 28-35-59				This is a two to bello of					
win3.adf 03.67-2000 18.32.42 Jawnw.edf 03.67-2000 28.25.59	win3.adf 03.67-2000 18.32.42 Jawnw.edf 03.67-2000 28.25.59				TOTAL ST STORY SETTER OF	1				
25ektwr.88f 022-67-2000 28:35:58	25ektwr.88f 022-67-2000 28:35:58					1				
					-	1				

1) Selecting data for analysis.

OVERVIEW.CNF 03-08-2000 10.52:56 overview.cus 03-08-2000 10.20:46 mwin1.odf 03-08-2000 12.25:28 biobs3.odf 03-08-2000 10.00:14 P hob2.odf 05-08-2000 P bob3.odf 03-08-2000 P bob2.odf 05-08-2000 P bob3.odf 03-08-2000 P bob2.odf 05-08-2000 P bob3.odf 05-08-2000 P bob3.odf 05-08-2000 P bob3.odf 05-08-2000	114	ERVIEW PHU			3	- D ×		
overview cus order vector overview cus order vector overview cus oves overview cus overview cus overview cus overview	Type	Name	Date	Time	TRE	^		
Invert off 03-08-2000 12.25.28 Import off 03-08-2000 10:00.14 Import off 04-08-2000 04-08-14 Import off 04-08-14 04-08-14 Import off	8	OVERVIEW.CNF	83-D9-2000	10.52.58				
Available: Available: Over1.odf Bob2.odf Deservations Available: Over1.odf Bob2.odf Bob3.odf Select Select / Independent Variable Select / Independent Variable	6	the second s	and the second se	and the second second				
Available: available: Select All Select / Independent Variable Deselect / Independent Variable Selected: available:	P	treer1.odf		12:25:28	1 marine marine			
P bo02.0df P 2behav.odf P 3behav.odf Debay.odf over1.odf bob3.odf This is a title to help me understand whats what bob2.odf bob3.odf Bibehav.odf Sibehav.odf This is another bit of description Sibehav.odf Select All Select / Independent Variable Deselect / Independent Variable Selected: Select / Independent Variable	ρ	bobs3.odf	03-08-2008	10:00:14	This is a ste to	help m		
P 2behav.odf P 3behav.odf P 3behav.odf This is a title to help me understand whats what bob2.odf bob3.odf 3behav.odf 3behav.odf <t< td=""><td>ρ</td><td>the state in the second state</td><td>Observations</td><td></td><td></td><td></td><td></td><td></td></t<>	ρ	the state in the second state	Observations					
P Behavodr over1.odf Bachavodr over1.odf bob3.odf bob3.odf Bachavodr Bachavodr Select Select All Select / Independent Variable Deselect / Independent Variable Selected: Selected:	<u>e </u>		Augilable					
sourcest bobs3.odf This is a title to help me understand whats what bob2.odf bob3.odf bob3.odf bob3.odf bob3.odf Behav.odf This is another bit of description select / Independent Variable Deselect / Independent Variable Select / Independent Variable Deselect / Independent Variable	<u>P</u>							
Selected:		Jabeniek.odf	bobs3.odf bob2.odf bob3.odf		2		whats v	what
		4 5.409	bobs3.odf bob2.odf bob3.odf 3bchav.od	lf This is	aanother bit of	description		
2behav.odf		4 5.409	bebs3.odf beb2.odf beb3.odf 3bebby.od Sglea	IT This is	aanother bit of Seject All	description Gradie	11.	Deselegt A
		4 5.409	bobs3.odf bob2.odf bob3.odf Dichov.od Sglea Select / Selected:	l This is ct	aanother bit of Seject All	description Gradie	11.	Deselegt A

- Click on Analysis
 - Select **Elementary statistics**
 - Select Data
 - Select Observations

The first step is to select the files that you want to analyze. This is done by selecting elementary statistics, followed by data and observations. You can select individual data files, or you can select them by using the SELECT/INDEPENDENT VARIABLE option. Once this is complete, select nesting levels under the data icon.

• Select Nesting levels

Selection of nesting levels allows more complex analysis of behavior. By selecting nesting levels you can design a statistics output that will consider multiple dependent variables and their interactions at once. When nesting levels are not specified the Observer would only

consider how much time the animal spent in each location and how much time spent in each behavior. When nesting levels are selected, on the other hand, the Observer will analyze how much time was spent in each behavior for each location. Consider for example a plus maze experiment. Specifying nesting levels allows an examination of how much time a mouse spent in the open arm and walking. Without nesting levels selected, you could only examine how much time the mouse spent walking or in the open arm. This will give you a much more complete picture of the behavior being analyzed. (Remember, you must also click on the add button for the nesting levels to actually take effect).

11.2	ERVIEW PHU			_ 🗆 ×		
Type	Name	Date	Time	TRE		
0	OVERVIEW.CNF	83-08-2000	10.52.56			
2	overview.cus	00 05 5000				(FT)
P	treert.odf	Nosting Leve	ola	N.		83
\$	babs3.odf	Class:	Movement			
0	hob2.odf			CANADA STRUCTURE		
р р	boblodf	Behavier		Modifier 1:	Modifier 2:	
β ⁰	2behav.odf	walking		No Medifier)	No Modifier)	8
EN 1	3behakodf	Stretchi				
		Rearing			2	
		Cumping			3	
				÷	1	2
-	1	ET Collb	-	17 C D	ET Colle	-
	-	= F Split		P Split	P Split	
		Nesting L				
		L1: Move	ment; Alt; Alt	; All	* Add	
					Dester	
					Beplac	5
					- Remov	e
		-				-
		Combina	tions		OK Cancel Help	
		(Cold States of Cold	Local Boost		and and they	
		No.				

- i. Select Split. When SPLIT is selected this means that each of the behavioral elements will be analyzed separately ie, for Behavioral class Movement, walking, stretching, rearing, climbing and falls will be analyzed individually. If SPLIT is deselected the Behavioral class elements will be added together as a single value.
- ii. Select the desired behaviors and click add.

iii. If you want more complex nesting levels then the Combinations function can be used. This will allow you to look at behaviors in a more detailed fashion. This is primarily used when you have multiple subjects per observation.

宿川日	Distance - Liver	wharp Statistics				
Ele E		Tort Mindow Help				- seventen
30				-12		
Ser. 10	ERVIEW PHD		_ D ×			- D
Type	Name	Date Time	Title			
10	OVERVIEW.CNF	103.05.000 1057.60				
1	01010101010000	Events			×	
d ^p	over1.odf bobs3.odf	Behaviors:	Modifiers 1:	Modifiers 2:		
5 ²³	hob2.odf	walking 🔚	(No Modifier)	(Ne Medifier)		
all a	hob3.odf	Stretchi Rearing		The second se		
σ ^p	2behav.odf	Climbing				
1	3behav.odf	Centre		8		
1990-1990 1990 -		closed				
		open Falls				
	4	₽ Split	🖬 Split	₽ Split		
		BUUT NAME	10 mp.m.	1.		
		🗆 Subjects as Agtors				
		C Subjects as Receiver	8			
			and the second se	K Cancel Help		
				e cencel Deb	1	
			16			
				OVERVIEW PRJ	<untitled></untitled>	<untěled></untěled>

• Select Events

When you are doing statistical analysis you may not want to include all behaviors and subjects in your analysis. By using events you can select only those which are desired.

- i. Choose the desired actors and behaviors
- ii. By deselecting the **split** option all of the behaviors will be lumped together into one category. This would be useful if you were examining aggressive behavior and you wanted to do statistical analysis on the frequency of aggressive behavior instead of the frequency of specific aggressive behaviors.
- iii. By selecting **subjects as actors**, you can select the behavior of specific subjects for analysis.

- iv. By selecting **Subjects as receivers** you can select only those behaviors in which a specific subject was acted on. For example, if you were studying dominance, then you might want to see which animal was bitten the most often.
 - Events versus Nesting

These two functions are very similar, and can cause some confusion. Nesting allows you to analyze behavior either at the level of the behavioral class (ie, movement in general or position in general) or at the level of the individual behavioral elements (ie, walking, stretching, climbing/rearing and sniffing). For example. If you were to nest the different elements of movement such as walking within position, the Observer would calculate the frequency and duration of walking within the open arm, walking within the closed arm and walking within the center. It would also calculate the frequency and duration of stretching, etc. in these positions. Using nesting level you are not adding or removing data, you are just controlling how you are looking at it.

Events allow you actually to exclude data. By selecting the actors, behaviors or modifiers that you are interested in it would be possible to select just one very specific behavior for statistical analysis. By using the event function, you can concentrate on specific behaviors for analysis even though more behaviors have been coded.

- 2) Configuring how you want to generate your **RESULTS** table.
- i. Report layout
- ii. Report format. Useful only for configurations with multiple actors and/or modifiers.
- 3) Generating individual statistics on each behavior.
 - Click on Analysis
 - Select Statistics

You can now select which statistics you wish to have included. In general, we are using this module of the Observer software in order to generate individual data for each subject. Thus,

means are not averages of a group (this will later be calculated by Unistat), but rather the mean behavior of an individual subject. Therefore, you should calculate statistics **per observation**. In general the statistics to be selected are: Frequency and Mean duration.

Hante	,Dado	Timp	THE			
INTERVIEW COR	\$3.07.2008	17.36.02				
svert adt	82-07-3888					
AND A TANK	10101-0080	10:00:42	No. 10 is 20% to fully in			
to 62 and 1	03-07-1008		1			
bakTist Ikakacunt	03-01-1000	19.12.42			101	
200003316			111.2 No.			
		Coloulate State	dies:			
		# Per Observ	alles.		OK	
					Canaal	
		C Across Ob:	ervellerve			
		Both			Help	
		allable:			11	
		atency	ALC: NO.	Selected: Prequency	10	
	37	etel duration	100	Meen duraties		
		telal duration/N Inteland deviation		ALL		
	1	Rendered error	10000	centred as		
		divinues durat	0.0	and a second second second		
		Assimum darø	-I C-Der	satura da	14	

Click on the green **GO** button to calculate the statistics for individual subjects.

		million	412		1015 1814
The Diseasure 1.5 ELECTORY.	ITATLETTEE III	1-177-32000			1
FRESSET DERFER, BAI Configuration: DEFENSER, DAF					
Observational data fils This	00x 04x 84. 84				
Discontional data file Title	Place of shreet				
Renting Condition					
Lovel 1: Contes					
Class; Boreast.					
Beigetlogal Elements	22+4	taberely .	20.00		
watking stoeocht	13 20	7.6 0.0	3.45	De .	
Total	38	0:0	1.15		
Receipy Condition Level 1: slored					
CLARS ROTAGEST					
Belgericiul Elements		haroney			
walking Turetohi Beertag	52 6 1	4,0 3,0 349,5	9,52 3,58 37,58		
11					ع
				OVERVIEW	FRI -Unifad> -Unifad-

5) EXPORTING DATA TO EXCEL

Before you try to export the file into an Excel file, review your output and look for any calculations that do not seem right. If you find an observation that contains data that is incorrect, it will behoove you to correct at this point. Discard the statistics you have just performed. Return to the *Project Manager* and select data, then edit observational file. You can make changes to the observation file. After you have made changes save the new file under a different name. In case you have done something wrong, this will be critical in returning to the original state of the file. Before re-running the statistics analysis restart the Observer software. When this is done, follow the instructions for statistics analysis again, but remember to exclude the file with incorrect data and to include the corrected file.

To make corrections:

- Open Project Manager
 - Select data, then edit observational file.
 - Make any needed changes.
 - Save as a new file.
 - Re-start the observer

Repeat the process for statistical analysis.

From the **Elementary Statistics** or **Lag Sequential Analysis** modules, invoke the Statistics dialog box by selecting **Statistics** from the **Analysis** menu. In this dialog box choose from the group box Calculate Statistics either "**Per Observation**" or "**Across Observations**", but not "**Both**".

Elementary Statistics or Lag Sequential Analysis output files can easily be imported into an Excel spreadsheet (Version 5.0 or higher). To do so, follow these steps within The Observer:

• Open the Export Specifications dialog box by selecting Export Specifications from the Analysis menu. In this dialog box select the following options:

Contraction of the local division of the loc	Bala Analysis T	-1. Window He	ip.	_	-	-	-		
20									
和いい	ENVELW, PHU			10	9				
Type III 4	Name OVERVIEW.CNF overview.cus	Export	Specifica	tions					
¢٩	treef1.odf	03-08-2000	12.25-28						
5 ⁴⁰	bobs3.odf	03-08-2000	10:00:14	This is a ste to help m					
150 150	hob2.odf hob3.odf	03-08-2000	10:00:14						
6ª	2behavedf	03-08-2000	10:00 14	Export Specifications			×		
¢ ²	3behavioar	03-08-2000	10.57.18	Spacing C Eixed & Free Format			OK Cancel Help		
				Field Separator:	Comma	-			
				Record Separator:	LF		i l		
				Code for Missing Value	: 1		Ŭ I		
				Maximum Line Length:	240		6		
				File Name Extension:	TXT		<u> </u>		
				$\Box \underline{\mathbf{Q}}$ uotes around Text	₽ Inc	lade Colum	n Titles		
1					Ĩ	OVERVIEW	PRJ <urb< td=""><td>tled> <t< td=""><td>Intëlad></td></t<></td></urb<>	tled> <t< td=""><td>Intëlad></td></t<>	Intëlad>

- Run the analysis by selecting GO from the Analysis menu. This yields an Analysis Report.
- Generate the export file by selecting Export from the File menu.

	andary Statistics				
Ele Edit Data Analys		Heb			
Type	Date	Time	Base Name for Esport	***	
ED 0		0 105258	Statistics and statistics	2012 CO. 10	
🙋 🕴 Exp	ort File	0 10:20:46	File paret	Enklers k:_\rollbar\overview	DK.
api a bobs3.bdf	83-08-20	0 122520	-		Cancel
hob2.ott	83-08-20	And all a grant of a lot of a lot of the lot	POSNEST TXT	CNSDATA	
toblotf	03-00-20	and the second se	Ē	PINCA -	d230k
d ^g 2behaviodf		30 10:00:14		PROGRAMS	
Thereasers		10 10 57-11		DVERVIEW #	101
Trujectt OVE			and the second se		*
Configuration: GVE			List Nes of poer	Driven	
Selected Observati	onal Data File	101	Filmi (*.TXT)	k: \\USk20F503\11	
File name Dat		time Total da			
Gends: - Mals ID - hobe30 Notes of Shehav.od no notes found in	+				عام
0.925				OVERVIEW PRJ «Unit	lied> <untitled></untitled>
The Observer - Eler Ele Edit Data Analysi					
🗢 🛄 💷 🕬 🖬 Sy dverview prj	• • • • • • • •	J	- D ×	า	-
E St untitled of OVE	RVIEW PRJ				- 0 ×
E Centre	Export Log				
7			T RULEWSDATE BREAK	ROGRAMS\NOLDUS\OVERVIEW\OVERVIE	CH. CHE
d Total	D		(AT (CROVALE (PALSE)))	CONTRACTOR OF THE OFFICE OFFIC	and well a
Mesting Condi		generated for			
d					

OVERVIEW.PRJ		<u></u> ×	
of untitled of Div	/ERVIEW_PBJ		- 0
Centre	Export Log		
Total	N	RI\CNEDATA\FRCA\FROSFAMS\NOLDOS\OVERVIEW.OVERVIEW.CNF	
Mesting Condi	report-rire(s)	generated for reports	
Level 1: Clim	K:\CNSDATA\RM	CA\PROGRAMS\MOLDUS\OVERVIEW\MUH01.TXT	
Class: Positi	Labels	File	
Behavioral El	083	HUH01.TXT	
	SDATE	HUH01. DXT	
Centre	STIME	HUH01.TXT	
	GENDER	HUH01.TXT	
Total	ID	HUH01.TXT	
	STRATE	HUNDL.TOT	
Mesting Condi	MOL REEA	HUH01.TXT	
	MOL MOD.1	HUH01.TXT	
Level 1: Snif	M01_M0D2	HUH01.TXT	
Class: Fositi	A.R.	HUH01.TXT	
-1993: 1081C1	1101	HUH01.TXT	
Behavioral El	INTLEN	HUH01.TXT	
Dendo lordi el	EEHA	HUH01.TXT	
Centre	MOD 1	HUH01.TXT	
	1900.2	HUND1.TXT	
Total	FREQ	HUH01.TXT	
	TOTDUR4	HUH01.TXT	

• Open the export file in Excel and select Text Files from the File Types option.

🖉 Missensidi B	Einst O Sheett		_ 5 X
BH EAR	Yew Insent Fornat Iools Data Window Help Graph Statist Statist		<u>শহাস্য</u>
	※ □ ● □ ▼ ↓ □ ● □ ▼ ↓ □ ● □ ▼ ↓ □ ● □ ▼ ↓ □ ● □ ▼ ↓ □ ● ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ □ □ ■ □ ■ □ ■ □ ■ □ ■ □ □ ■ □ □ ■ □ ■ □ □ ■ □ □ ■ □ ■ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		
A)	<u> </u>		
A .	B C D E F G H	1 1	K I
2 3 4 5 5 6 7 8 9 9 0 0 1 1 2 3 3 4	Text Import Wissed - Step 1 of 3 The Text Woord has determined that your data is Delinited. If this is correct, choose Next, or choose the Data Type that best describes your data. Original data type Choose the file type that best describes your data: If this is correct, choose Next, or choose the Data Type that best describes your data. Original data type Choose the file type that best describes your data: If The dypth - Characters such as comment of tabs reparate seath field. If The dypth - Fields are aligned in columns with space-between each field. Seat import at gon: If Image Tele Origin: Windows (AACD) Preview of File K: (CHEDATAIrms:s)/PROGRAMES(NextlaYELHEDL.TxT.		
15 16 17 18 19 20 21 22 22 24 22 24 25 24 55 24 19 19 19 20 21 21 21 21 21 21 21 21 21 21	Cancel < 0.0.0 Next > En		

the second s	yery part		t Ind	i Qata	Window	v Help	graph 9	dig Stat	4					
B	æ ⊡ ♥ • □	0 *		er u							3 100% + 3 - ,			
A	8	=	0	D		E	F	0	8	H	1	1	K	-
	Text Impo This stree how your Deliviter IF Lat Data prev	n lets y text is S	nou set i affectei F Seg	the delin d in the p jcckon	ilbers yo preview		Гта		tive d	elmiters as o	*			
() HI/Sh adv	CBS 3behav 3behav 3behav 1behav 4	03-	08-00	00 00 1	19:30 19:30 19:30	Male	Mick Mick Mick Mick	ry Hick ry Hick	ey av	RO1_BEHA walking walking walking ralking itratchi		-		

The Import Wizard of Excel will then pop up. Simply choose "Delimited", click Next, and select "Comma" as delimiter.

		8 ° 4 1 7	X 98 6	. et 10	+ (2 +)		F- 21 31	n 94	100%	2		
4			0 • B	/ U II		B \$ %	. 24 .23	1	- A.			
	A1	*	= OBS					1.00		_		_
	A	B	C	D	E	F	G	н	1	J	K	-
1	OBS	SDATE	STIME	GENDER	D	STRAIN	Access of the second		ND1_MOD.	AR	INT	INT
2	Sbehav	3/6/00	0:19:30	Male	Mickey	Mickey	walking			A		1
3	3behav	3,6,00	0.19.30	Male	Mickey	Mickey	walking			A		1
4	3behav	38.00	0:19:30	Male	Mickey	Mickey	walking			A		1
5	3behav	3.6.00	0.19.30	Male	Mickey	Mickey	walking			A		1
Б.	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Stretchi			A		1
7	3behav	3/6/00	0:19.30	Male	Mickey	Mickey	Stretchi			A		1
8	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Stretchi			A		1
9	3behav	36.00	0:19:30	Male	Mickey	Mickey	Stretchi			A		1
10	3behav	3.6.00	0:19:30	Male	Mickey	Mickey	Rearing			A		1
11	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Rearing			A		1
12	Sbehav	3/6/00	0:19:30	Male	Mickey	Mickey	Rearing			A		1
13	3behav	3,6,00	0:19:30	Male	Mickey	Mickey	Rearing			A		1
14	3behav	38.00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
15	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
16	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Climbing			A		1
17	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
18	3behav	36.00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
19	3behav	3.6.00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
20	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
21	3behav	3/6/00	0.19.30	Male	Mickey	Mick	Sniffing			A		1
	m99	3/6/00	0:14:44		m99	m99	walking			A		1 8
20	P PI H	2000	0		00	-00				÷	-	1.00

• Click Finish.

UNISTAT ANALYSIS

1) Calculating means

M T 0	8 0			w Help Graph	Rets] Statis] Descriptive Statistics Distribution Functions			- 비즈 🧃 Office
L 🖨 🖬	- 1	64 -64 H.	<u>и</u> ша		Parametric Tests		4	ě
Al		= OBS	N 10- 1		Correlation Coefficients Goodness of Fit Tests		3	
F	G	H	1			and a state	0 P	- 2
53 m100	Rearing	A	1	151 Falls	Nonperametric Tests (1-2.5	1	0 . F	- 10
54 m100		A	1	151 Centre	Nonparametric Tests (Multis	ampie)	_	
55 m100		Â	1	151 close	Tables	1		
56 m100		Â	1	151 apen	Metrix Statistics			
57 m100		A	1	151 Falls	Regression Analysis			6
58 m100	Sniffing	A	4	151 Control	ANOVA and GLM	F. 1		
59 m100	Sniffing	A Table	of Means		Tests for ANOVA	•		
0 m100	Sniffing	A Homo	geneity of Vari	age Tests	Sample Size and Power Esti	nation 🕨		
61 m100	Sniffing	A Multip	de Comparisons		0 0	-1		
2		Regro	ession with Rep	icates				1
53			ogeneity of Re	and the second second				10
34								
35								
36								
57								
58								
39	-							_
70								_
71								
2	-				_			
73	_							
74								
4 > > >	UH01 /				4	In the second se		1 9
leady.					Sum=3924273.2	98		

Noldus Observer Video-Pro Overview (multiple subjects)

J **Talpos, A Heidema and RA McArthur** Pharmacia & Upjohn, Neurobiology

INTRODUCTION

The Observer defines a Project as a set of files encompassing an experiment. Each of these files is inter-related which means that they have to be kept as a single unit (Project). The Observer therefore is made up of a series of MODULES of which the PROJECT MANAGER is the core of the package. This module organizes and manages all the files of your Project.

Because all files of a Project are inter-related this means that individual data files, for example, can not be worked upon as a single unit. If you want to copy files from one computer to another, or to archive your Project, you must copy the entire project.

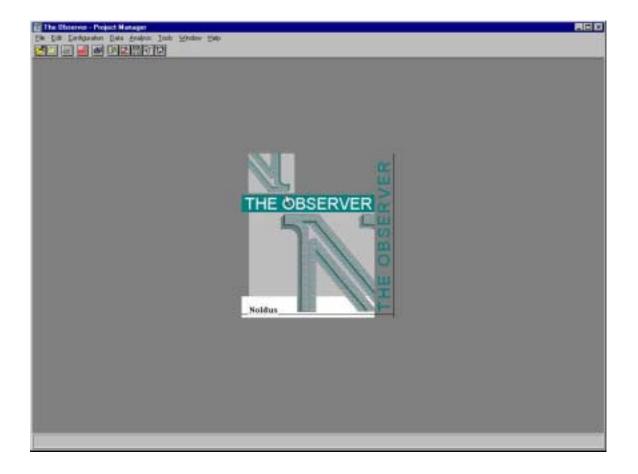
An Observer Project is made up of:

- 4. Configuration file. This is where you first describe the experiment within the Observer Project Manager. You begin by describing the experiment in plain text in a word processor file. This helps you (and others) to remember what and how you did the study. Think of it as a supplementary lab notebook. In the configuration step you also define the way you are going to collect the data, what method you are using to time the observations, what your independent variables or category factors are, what behaviors you are going to measure and how those behaviors can be modified.
- 5. *Data files*. Once you have defined your experiment (and you are now COMMITTED to this definition), you are now ready to start observing the animal (s) and coding their

behaviors. Each animal has its own file once the behaviors are coded. The location of these files is managed through the Observer Project.

6. *Analysis files*. Having now coded the behaviors of all the animals in the experiment, the Observer can do single animal or group statistics. In general you will be calculating individual animal statistics (records) which will then be exported to Excel files and then use a stats package such as UNISTAT to calculate the group means and variance. Again, these files are included in and managed by the Observer Project.

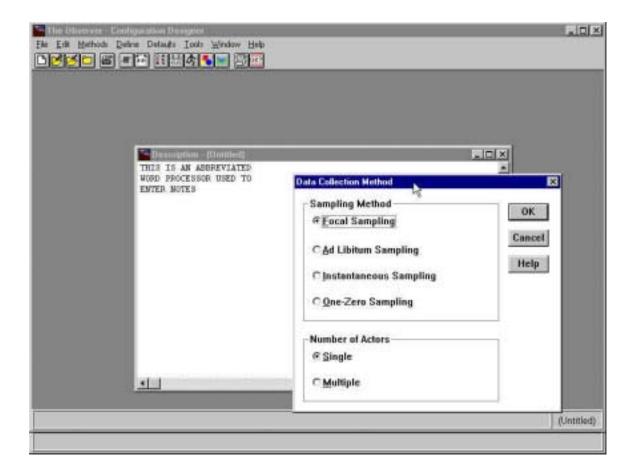
Open the **OBSERVER PROJECT MANAGER** by clicking on the icon.



2. DEFINING THE PROJECT

- Click on **Configuration**.
 - Select **Design Configuration**.
 - Select File > New Configuration.

The first window that appears is a mini- word processor into which you can type in your own description of the experiment (as in notes in your lab notebook). Use this window to make all your annotations.



- Select Methods
 - Select Data Collection Method.

Sampling Method

There are 4 types of methods by which you can *sample* or code behaviors:

- 5. *Focal*: This allows you to measure both the frequency (how often it happens) and duration (how long) of behaviors that you have defined. For example, you may want to measure how often a rat goes to sleep in its cage AND you want to know how long the rat has slept over the entire observation period. Focal sampling can be done with 1 or more subjects being observed simultaneously.
- 6. *Ad libitum*: This allows you to record the frequency of behaviors for observations with single or multiple subjects. Because only the frequency is being recorded, this data collection method is ideal for pre-study observations when you are starting to determine which behaviors are important for future observations.
- 7. *Instantaneous*: This method is used is used when you want to have a snap shot of defined behavior(s) at regular intervals. Suppose you want to look at a rat once every hour to see whether it is sleeping. This is a yes/no type of datum. This method can be used for one, or multiple actors.
- 8. *One-zero*: Similar to instantaneous sampling except that a regular interval is defined and you want to know whether a specific behavior (s) have occurred within that interval.

Number Of Actors.

This refers to how many subjects are being observed at the same time.

- 3. *Single*: Only one subject is being observed at a time. For example, 1 mouse in a plus maze. However, you can use this same setting if you are going to observer a setting in which there are multiple animals but you are going to code only one at a time. An example of this would be two animals in an open field were you were examining frequency of behaviors but not how the animals interacted with each other.
- 4. *Multiple*: More than one subject is being observed. For example 2 rats interacting with each other in a social interaction test. You would primarily use this sort of setup when you are observing interactions between the animals. For example, if you were studying the rate at which the showing of teeth by animal A results in submission displays by animal B, then you would use this sort of setup. Multiple observations can also be used if

you just want to code two or more animals at the same time, however this becomes very difficult because of the extra key strokes needed. Because of this we recommend that you use multiple observations with a single actor setup unless you are trying to observer some sort of reciprocal behavior. That is to say behaviors in which one triggers another, like an event cascade.

- Select Methods.
 - Select **Timing Method**.

Duration.

At this point you define how long the observation period lasts.

- 3. *Open ended*: no maximum duration is set for the observation. Clicking on the end button ends the observation.
- 4. *Maximum*: A set time for observing is defined. When the computer timer reaches that time, the file will close and save the data. This is a way of standardizing the amount of time allowed to observe each animal. You can, however, end the observation before that time by clicking on the end button.

Ed Method Dehre Delad			
THIS I	S AN ADEREVIATED ROCESSOR USED TO WITES Timing Method		
	Duration C Open Ended bh : mm : ss days @ Maximum: 00 : 05 : 00 Based on: @ Elapsed Time C Observed Time	OK Cancel Help	
<u></u>	Timing Besolution: 0.1 second Sample Interval: 00 ; 00 (mm:ss)		(Unti

When you are working on a *maximum* time observation, you can also define whether your observations are based on elapsed or actual observed time.

- 3. *Elapsed*: Refers to the duration of the behavior throughout the observation period of a specific length.
- 4. *Observed*: under some circumstances you may want to suspend coding a behavior. The timing picks up again when coding restarts. For example, a rat may have a sleeping box into which

it can disappear randomly. You may want to suspend coding of other behaviors until the rat re-appears.

Timing

- 3. *Resolution*: Three options are available, 1.0, 0.1, and .01 second. This determines if behavior will be coded in seconds, tenths of seconds or hundredths of seconds. The greater the resolution (0.01 second, the more precise the measure). 1 second is generally acceptable for our behavioral observations.
- 4. *Sample interval*: This is where you determine the sampling interval time when you are using instantaneous or one-zero sampling.
 - Select **Define.**
 - Select Independent Variables.

Independent Variable Name

Independent variables are categorizing names also known as FACTORS such as gender, strain, ID, treatment type, etc. Independent variables can have a subset of levels. For example gender can be made up of 2 levels: Male, Female. ID is made up of as many subjects you have such as Rat1, Rat2, Rat3. Type in the name of an independent variable.

Independent Variables			E	
Independent Variab	le Name: ID		ОК	
Data Type © Character Ω ○ Nymeric ☞ Eree Format	Ptions: Rat3 Rat1 Rat2	<u>- Add</u> <u>- I</u> temaw	Cancel E Help	
Iable: Nur Gender; Character	nber of Independen <free format=""> IMai</free>		E Add	
		NG	Bennye	
11				

Data Type

The type of variable can be either a *NUMBER* or a *CHARACTER*. ID, for example could be a numeric data type (1, 2, 3, 4,). It could also be a character type where you are combining alphabetic characters as well as a number (Rat1, Rat2, Rat3,, Rat02-15-2000). Determine how you want to enter this type of information.

3. *Character*: When you choose a character data type, you can either enter the elements at the time that you are coding (free-format) or you can set up a list (options) from which you can pick at the time you code. For example, under Independent variable ID, you may have a list of subjects already identified. They have been called Rat1, Rat2, Rat3, and Rat4. Each of these can be inserted as an option list by typing them in the Options

window and then adding them. This hardwires you to these subjects and you choose them from a pop-up list when you start to code.

a) If you don't know what animal ID is at the time you start coding and want to identify them at that time, then you can choose the FREE-FORMAT option that allows you to enter the ID at the time of coding. For example, Rat1, Mickey, 4, etc.b) You can even combine a specific list and free-format if you start off with a specific group of animals when you set up the Project, but when the time of the experiment arrived, you had to add more animals. Select both options and Free-format.

4. *Numeric*: If you choose to define the independent variable as numeric you will then be required to enter the minimum and maximum values used.

Defining actors.

If you are using a multiple actor setup then you must define your actors. There are two ways to go about doing this depending on the constraints of your experiment. If you are examining group behavior in a lab setting and you can control which animals are present then you should give your animals general names that can be applied over and over again. For example, if you were examining the behavior of two rats in an open field and you were going to run a total of 25 trails, you should not number your rats from one to fifty. If you do this then the program will expect you to be observing 50 rats at one time. Rather you should name your rats ratA and ratB and then use that designation for each trial. You will of course need to be consistent in deciding which group will be A vs. B for later statistical analysis.

You may find that you are in a situation in which you don't have this ability to control which subjects are being included. This might be the case if you were doing a play group study or a study in a naturalistic setting. If this is the case then it might make sense to have very specific subject names. For example if you were watching ten children on a play ground you may wish to enter all of there names. This still leaves you with the problem of what you should do when not all of the subjects are present. In this case you should create a behavioral code under define behaviors to account for the situation. This can be done by creating an event behavior title "not present." One this is done you can just enter the code "not present" for any subjects you have named, but are not presently in the interaction. This method is more complicated and time consuming, but it may be the only option available in an uncontrolled observation.

Select Define.

Select subject.

Enter the subject name. This is the name by which you want the subject to referred. This could be ratA, Billy, or monkey 10. Next you will need to enter the subjects code. In this context the code is the key you will hit during an observation to signal which animal you are about to code for. Last, you can add a definition such as "ratb is the control group for this study," or "ratb corresponds to group b." When done, click on **add**. You will need to repeat this process for each subject, or groups of subjects you wish to give a name.

Select Define.

• Select Behaviors.

The Observer defines behaviors in terms of a general CLASS that has a series of elements. For example, a behavioral class could be MOVEMENT. Within the behavioral class *Movement*, the following elements could be defined: walking, stretching, rearing, climbing, and falling. Another behavioral class could be POSITION. Within *Position* center, outer wall, open arm, etc. would be defined as elements of this class.

			×		-	
Length of Input Code: Behavioral Class <u>N</u> ame: Lable: Movement: 5 elements: dei	One Key Movement Number of Cl		OK Cancel			
Behaviora	Behavioral Elements		Element Name:	Stretch s	Iched	OK Cancel Help
		Type: Medifier <u>1</u> : Jable: Walking & Stretch:	Num W: State	C Event E Reciproce Modifier 2: ber of Elements:	(nnne) 5	Epp
		Rearing Climbing	: r; State g: c; State f: Event		~	Bemove Reglace

Length of input code

Coding in the Observer is done primarily by pressing a key on your computer key pad. Thus, you have to program specific keys or combination of keys to each behavior. For example, the occurrence of the behavior *walking* could be coded as W (length of input code = 1), or by pressing down more that 1 key such as CTRL W (input code = 2).

Behavioral Class Name

Define your behavioral class (Movement). When you type this in, add it to the table and select it. The BEHAVIOURAL ELEMENTS window will now light up. Click on it and enter the name of the elements (For example, walking).

- 5. *Code*: Select the key, or keys that will identify that behavioral element (W).
- 6. *Definition*: Write a brief definition of that behavioral element (example, Animal moves its four paws in any direction.).

- 7. *Type*: A behavioral element can be either a STATE or a discrete EVENT. Walking is a state behavior because it occurs often (frequency) and continues over time (duration). An event behavior can occur with different frequency, but does not have duration. Falling, for example is an event behavior. The DEFAULT option identifies the normally starting behavior at the time of coding. For example, coding of the subjects could always start when they are stretching. Each behavioral class must have an element that is the default element. In a plus maze, for example, the default (starting) POSITION would be the rat in the Center of the maze and the default MOVEMENT would be stretching. There is also an option entitled RECIPRICAL. This option refers to behaviors that only occur with both subjects. For example, if you were studying mating pattern, a behavior in which two individuals take part in at the same time then you may want to select RECIPRICAL. When this is selected, by coding one subject for the behaviors you will code both subjects for the behavior.
- 8. Modifier: This function adds greater specificity to a behavioral class. For example, if you where observing children at play then you can create modifiers which will describe their interactions more accurately. For example, you could have a code "play", and then a list of modifiers such as ball, doll, jump rope which indicate what they were playing with. Each class of modifiers is associated with a specific behavior. For example, you could not use this list of play modifiers in conjunction with a set of codes for aggression. Each modifier class is associated with only one behavior. Modifiers can also be used to determine intensity of behavior. For example, you could have a behavior "cry" and then modifiers such as "soft", "normal", and "loud". Modifiers can also be used to determine to whom a behavior is targeted. For example if you were coding aggressive behaviors is monkeys, you might code monkey one as "hitting" and then have modifiers such as "monkey 1" "Monkey 2", and "monkey3." This way you can record who the aggression is aimed at.
 - Select **Define**.
 - Select Modifiers.
 - The process of defining modifiers is nearly identical as that for defining behaviors. See those directions for information on how to define a modifier.
 - Activating the modifier.

- A modifier must be linked to a specific behavior before it can be used. In order to do this, reselect behavior under the define menu. Highlight the behavioral class of interest and then click on behavioral elements. You can now select your desired modifier. As you may have noticed, both actors and behaviors can also be selected to use as modifiers.
- Select **Defaults**.
 - Select Environment.

You can code behaviors using a variety of computers from PC's, MAC's, or even hand-held computers. Select the computer you are using in your study.

- Select **Defaults.**
 - Select Keyboard Definition.

Select whether you want to distinguish between upper and lower case.

- Select Tools
 - Select **Review Configuration**.

This will give you a listing of all your definitions that you have configured for your Project. This can be printed and included in your lab notebook for future reference.

The Diverses - Configuration Drangees		
He Enk Methods Deline Delaufts Loois Window Help		2010/06/07
Review of Cardigoration - DVETIVIEW/CMF		
DESCRIPTION		
AND DECKER AND DECKER	-	
This is an example of use of de	escriptors as a notebook 1	
Focal sumpling on a single actor		
Fixed timing of 5 minutes with a resolution	of 0.1 sec	
Independent variables are: gender male and		
Both of these independent variables are in f		
I am looking at 2 classes of behaviours: How		
Bovenent	Configuration Designer	×
Default advenent is stretching	+6	
walking	The configuration OVERVIEW.C	NF OK
rearing	is OK!	time and the second sec
cliabing		
Position Default position is centre		
open ara		
cloped ann		
Test of the state state state and the state of the	1.1.	
There is 1 event behaviour defined which is	falling off the safe.	
RETRODS		
Sampling Method Focal Sam		
Sumber of Actors Single	spirng	
Maximum Duration of Observations,: 00:05:00	00 (bhraaroo 03)	
and a second		
	12	
		OVERVIEW.CNF

- Select Tools
 - Select Test Configuration.

This is an automatic error trapping that the Observer does on your configuration. It will let you know whether you have omitted defaults, or whether you have forgotten to define certain elements. Observer will not let you continue with coding behaviors until the configuration is complete and logical.

- Click on **File**.
 - Select Save Configuration.
 - Enter a file name for the configuration file (*.cnf)

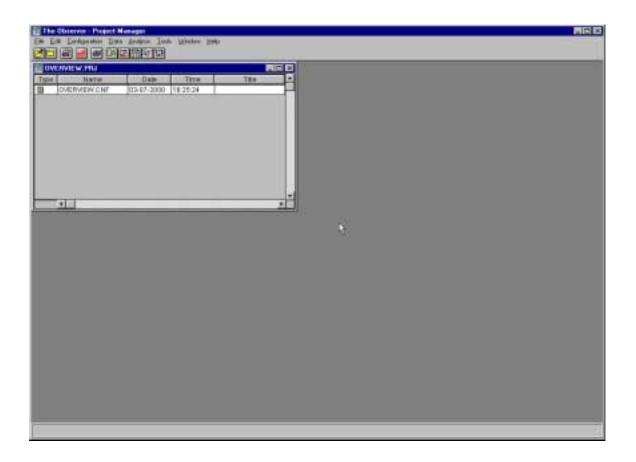
You now have to associate the configuration with the project that you are creating. This is a bit confusing because you have to first create and save the configuration file AND THEN create your Project. Noldus has presumably programmed the Observer to work this way because this order of events allows you to use a standard configuration for a plus maze study, for example, with many different Projects. This set of instructions following presumes that you want to use 1 configuration for 1 project. Remember that in the future you have the option to share your configuration files.

Minimize the *Configuration Designer* in order to get back to the Observer Project Manager.

- Select File.
 - Select New Project.
 - Enter the file name that you used to save your configuration file.

Open Configuration

Select the configuration file that you saved previously. Having done this a window will immediately appear on the screen with the configuration file indicated. This is the index of all files being managed by the Program Manager. Later, when coded data files are generated and analysis files as well, these files will be indexed in this window.



Close the Program Manager and Configuration Designer.

2. PREPARING THE CODING ENVIRONMENT FOR VIDEO ANALYSIS

Open the **OBSERVER VIDEO ANALYSIS NOT** the **OBSERVER EVENT RECORDER** Program by clicking on the Video Analysis icon.

B) Customization:

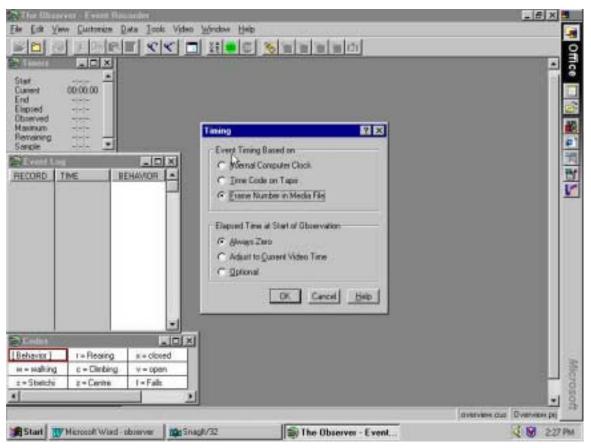
- Click on File.
 - Select Open.

Select the Project that you have configured. The Video analysis program will then load the basic video coding window.

🚳 The Observer - Exest Rece			110 (2)
He for your Detroit De	s Jun Ven Wester Bos [SiK] □ Itie[C] his[s]s[s]()		
Steen BEID 2		LON .	
Start	(Moutheast)		
Stanting	wase [
			Downworani
Bilet Malingivit	Witcout Wed strever. St The Glasses - Court.	(<u>5</u> 99	1831

This will include a window designated for the timer, event log and the channels. This view can be deselected if desired.

- Click on View.
 - Select **Codes** (This will open a window in which you can view your codes for individual behaviors as well as being able to use your mouse cursor to select behaviors.)
- Click on **Customize.**
 - Select Timing.



The first time you want to start coding behaviors using the Project that you have just configured, you will have to customize the environment under which you will be doing the coding. All Observer coding is based upon *time* and it is fundamental that you establish and standardize your time base. This will depend on whether you are coding behavior (1) "live", (2) off a videotape or (3) off a digitized video file on your hard drive or CD. If you are working off a video file then you need to use the frame number as your time base. If you are using a videotape then the internal time stamp on the tape provides the time base. Finally if

you are recording "live" then the computer's internal clock provides the time stamp. If you are working with a video file you must indicate the frame number option otherwise you will be unable to call up the file.

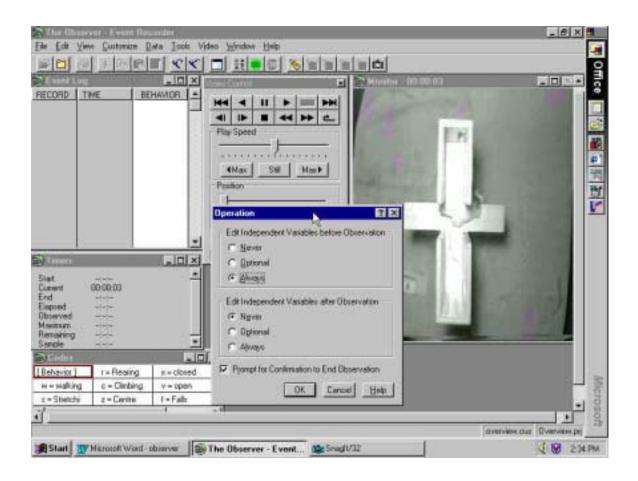
- 3. Event Timing Based On: Select "Frame Number on Video File".
- 4. Elapsed Time at Start of Observation: Select "Always zero".

When the timing method has been selected for a media file, a small monitor window will appear on the screen with a message "No media file selected". Select the media file containing the subjects whose behaviors are to be coded. In all likelihood this file will be on the CD-ROM drive. Selecting the media file will insert the file into the monitor window. Adjust the size of the window for confortable viewing. At this point, control/logging windows are to be placed on the screen and their position and size adjusted according to personal preferences.

- Click on **File**.
 - Select **Open**.
 - Select Media File.
- Click on **Customize**.
 - Select Operation.

This option allows you to set whether you can change the independent variables at the beginning or end of an observation ie, to set up and identify data files.

- 4. Edit Independent Variables Before Operation: Always
- 5. Edit Independent Variables After Operation: Never
- 6. Prompt for Confirmation to End Observation: On



You may now save the way that you have customized your coding window.

- Click on **File.**
 - Select Save.
 - Select Customization.

Save the customization file using the **ROOT file name** that you have been using to define the Project.

You may now start making your observations and coding behaviors. This can be done immediately after the observation window has been customized or at your leisure. If you choose to code behaviors at a later time. Close the Project by closing the Event Recorder. At a future date you may re-open this Project in order to start coding.

3) OBSERVING AND CODING BEHAVIOURS

Open the **OBSERVER VIDEO ANALYSIS** Program by clicking on the Video Analysis icon.

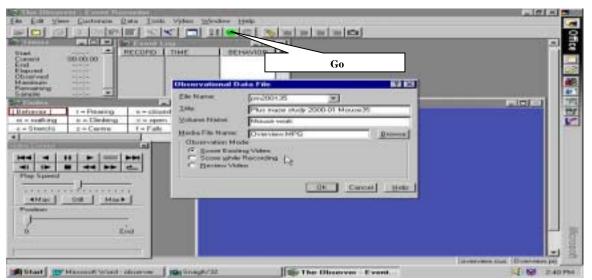
- Click on **File**.
 - Select **Open**.
 - Select Project

Select the Project that you have configured. The Video analysis program will then set up the screen that you have customized previously.

A) Initializing

Enter the name of the media file that you are about to code and set up the specifics of the subject (s) whose behaviors you are about to code.

- Click on **File.**
 - Select **Open**.
 - Select Media file
- Click the green **GO** button



- 5. Select a file name. Each subject will have its own file name, so it is best to name the file in a way that will tell you which Project the subject belongs to, and something that describes the animals place in the Project. For example, in a plus maze study, a good file name would be pm01 indicating that the subject was the first subject coded in a plus maze study.
- 6. Title and volume name are parameters which identify the subject more clearly. You can, if you wish, leave these fields blank.
- 7. You can also select or change the media file you wish to observe at this stage. If you have already selected a media file as described above, this file name will also appear in this field. The select media file option can be tricky. It will often revert to files already used. Because of this, it is suggested that your file be selected at the beginning rather than at this stage. If the program makes you reselect a media file, the above information will be lost..
- 8. Score existing video.
 - Click **OK**

Enter the **INDEPENDENT VARIABLES** identifying the particular subject.

Select the variables that accurately describe your subject. The variables will be the same as those you created in the project manager. If needed, you can also type in new variables.

• Click **OK**

Once you click ok, a new dialog box will be displayed which asks you to position your media file. The phrase "position your media file" means you should cue video track to the point where you want it to start observing. There are two ways to do this. If you know the time when your observation begins, you can use the find time function. The digitized video time frame can be found as the **current time** in the Timers Window.

The London Customers Date La	ol: Video Window Help			×
Find Time F	Intel stelsta			n Office
StatA Cusient 000000 End Diserved Maximum Soncie*	TIME BEHAVIOR			
Behavior F=Rearing v=cl H=Halking c=Dimbing v=cr z=Stetchi z=Centre f=Fa +	pen 👘	_AY		No.
Heil I	Hedia File Position	ere you went to start your observation. Up	e either the Vicko	
0 End		Cancel Heb	overview cur Diverview	Microsoft
Start Word - observer	The Observer - Event	Snaglt/12		(03 PM

If you do not know the video frame number then you will need to use the video controls to position your media files in a way similar to using your VCR.

- 3) To use "**find time**" function.
 - Select **Edit**, then choose **video time** to position your media file.
 - Enter the desired start time. Click on find. Your media file will now be positioned at the time selected.
 - Click on Close.
 - You can now click on **OK** in the media position dialog box.
- 4) To use the **video controls** to position your media file.

This method is more cumbersome then the find video time method described above. The video control panel works much like a VCR. You have functions such as play, fast forward and rewind to use. You can use these controls to find your ideal starting position.

- When you have found the start position, click on the stop button.
 - You can now click on **OK** in the media position dialog box.

B) Coding

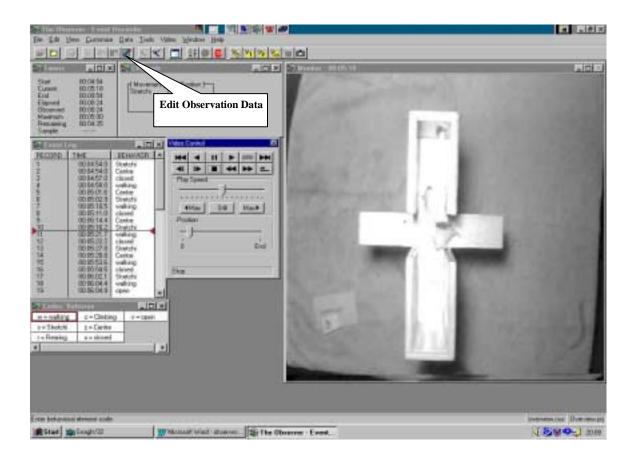
When you click on OK, another dialog box will appear. This one will ask you to "**Initialize Channels**." Click on the behavioral codes that represents the defaults of the animal being observed. In this example stretching and center have already been defined as default behaviors. If you haven't defined default behaviors when defining the Project (see above) then you must do so here. Behavioral codes have their own box. If the animal is stretching, then choose stretching and this behavior will be coded from the beginning of the observation. You will need to select a starting behavior for all behavioral classes.

- Select your desired behavioral class
 - Click on your starting code (In the code box)
 - Repeat for every behavioral class

You are now ready to begin coding. Select **Start**, and begin coding you first observation.

Changing observation speed.

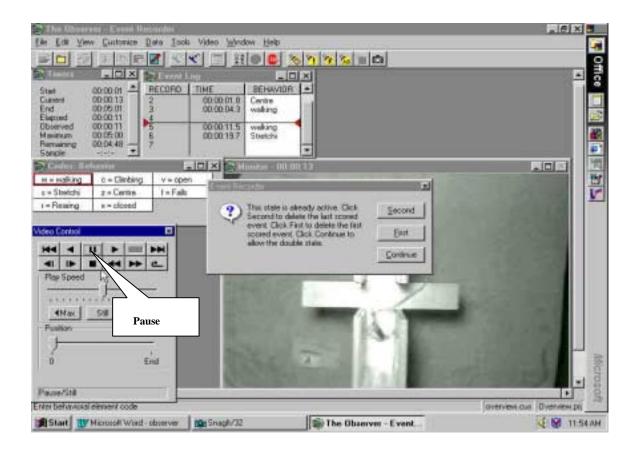
You can also select the SPEED with which the video track will play at any point during the observation session. This is a very useful feature if you are concerned that the video is going too fast and that you are missing behaviors. Use the mouse to slide the speed arrow to the left or right to select your more confortable viewing speed.



C) Mistakes and editing.

3) Selecting a behavior that is already active.

Occasionally you will select a behavior that is already active. The following error message will appear, "This state is already active....". **PAUSE** the video immediately and delete the second state. Start the video in order to pick up coding from where you left off.



- 4) Editing during or after an observation.
 - Click on the "Edit observational data" button.
 - Highlight the behavior you would like to change
 - Press the appropriate code key for that behavior, or delete if you would like to remove the code all together.
 - When done making changes click on the edit mode key to start observations again.

If you discover that you have coded a behavior incorrectly during an observation it is possible to edit the behavior file. You can do this either after you made your original observation or during. It is best to edit the file during the observation, however as you have to remember the exact time on the video file where you made your mistake. Stop the video and use the EDIT > FIND function in order to go back to the mistake time. Click on the edit icon. This button has a piece of paper and a pencil for its icon. In edit mode the video

controls are still active, so you can replay portions of the video file. It is also possible to click on the behaviors and change them. Behaviors can be changed either by highlighting them, and then pressing a key that has been linked to a behavior, or they can be deleted outright. Once any behavioral changes have been made, click on the edit key and the observation will continue. The observation will continue to run while you are in edit mode so you may want to pause the observation before you start editing the file.

4) Multiple observations of the same media file.

- Record the start time of the first observation
 - Select GO
 - Click on the down selection arrow on the File name field and select the file to which you want to add new codes.

When coding complex behaviors it is often useful to watch the video file twice. This allows you to concentrate on coding one behavior class at a time. In order to do this, record the time at which you started your first observation. When you have finished your first observation start the process of coding again. As usual select the green GO icon but rather than entering a new file name, click on the down selection arrow of the File name field and select the file you want to add additional codes. Follow the usual procedure for starting to code an observation. When you are prompted to select a starting point for the observation use the edit function and select time, then select find time. Enter the same starting time you used in the first observation of the file. This procedure insures that you are coding the same video segments in both observations.

4) STATISTICS

When you have finished your observations it is time to perform statistical analyses. This is done in 2 stages. The Observer software package is used to format the information in a manner that will allow it to be exported to a spread sheet program such as Excel to be analyzed by Unistat.

Open the **OBSERVER PROGRAM MANAGER**

- Click on File.
 - Select **Open**.
 - Select **Project**

Select the Project that you have configured. The Project manager screen will then display all of the files related to your Project.

Column Date Synthetic Dete Marrie Date Train Train Marrie Date Train Train VPCFERGENY Date Date Train VPCFERGENY Date Date Train Train VPCFERGENY Date Date Date Train VPCFERGENY Date Date Date Date JPC Date Date Date Date JPC <t< th=""><th>Narw Date Trm Tm OVERVENONF 23.67.2000 18.54.44 Im overview sus 03.67.2000 17.10.02 Im overview sus 03.67.2000 18.56.44 Im overview sus 03.67.2000 18.56.44 Im overview sus 03.67.2000 18.56.54 Im binits aff 03.67.2000 18.32.55 Im</th><th>a Diserve - Project</th><th>Manager</th><th></th><th>1910</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Narw Date Trm Tm OVERVENONF 23.67.2000 18.54.44 Im overview sus 03.67.2000 17.10.02 Im overview sus 03.67.2000 18.56.44 Im overview sus 03.67.2000 18.56.44 Im overview sus 03.67.2000 18.56.54 Im binits aff 03.67.2000 18.32.55 Im	a Diserve - Project	Manager		1910								
Nervic Defe Trrat Time 0.4E90429VCNF 03.47-2000 18.54.44 Image: State of the s	Name Defe Time Time 0VERVENVENF 03-67-2000 18:54:44 Image: Comparison of the second se			- Windley 1	040								
Name Defe Term Term 0VERVEXVCNF 03-07-2000 85-94-44	Name Deta Term Term 0VERVAEWCNF 03-07-2000 18:54:44	the second design of the second second	disciplination and			-	-	-	-	_	_	_	_
OVERVEWONF 23.07.2000 18.54.44 Image: control of the second s	OVERVENCINF 03.87.2000 18.84.44 averview sus 03.67.2000 17.16.02 averview sus 03.67.2000 17.23.12 averview sus 03.67.2000 18.56.42 box0.3.aff 03.67.2000 18.95.54 aversiew suff 03.67.2000 18.93.42 28ehrsc.aff 03.67.2000 28.25.58			-									
premiew rust 03-67-2000 17:36:02 werflaw 03-67-2000 17:35:02 boxe3.pdf 03-67-2000 16:56:42 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 16:56:54 boxe3.pdf 03-67-2000 18:36:58 boxe3.pdf 03-67-2000 18:36:58	overview 03-67-2000 17-36-02 wwerliew 03-67-2000 17-35-02 howsol.odf 03-67-2000 18-56-42 howsol.odf 03-67-2000 18-56-42 howsol.odf 03-67-2000 18-56-54 howsol.odf 03-67-2000 18-56-54 howsol.odf 03-67-2000 18-35-59					1.1							
Invert.odf 03-87-2000 17-33-12 Nons0.adf 03-87-2000 14.56-42 This is a title to fello of some and the some a	Invert.odf 03-87-2000 17-33-12 Nons0.adf 03-87-2000 14.56-42 This is a title to feas or bids2.adf 03-87-2000 14.56-54 Non3.adf 03-87-2000 14.56-54 Investigation 14.25-58 Jointrac.adf 03-87-2000 24.25-58 Investigation 14.25-58				+								
Inclusion Inclusion <t< td=""><td>None2.adf 03-07-2000 NE.50-42 This is a the to return bx02.adf 03-07-2000 NE.50-42 Nine3.adf bx03.adf 03-07-2000 NE.50-42 Nine3.adf bx03.adf 03-07-2000 NE.50-42 Nine3.adf bx04.adf 03-07-2000 NE.55-50 Nine3.adf</td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	None2.adf 03-07-2000 NE.50-42 This is a the to return bx02.adf 03-07-2000 NE.50-42 Nine3.adf bx03.adf 03-07-2000 NE.50-42 Nine3.adf bx03.adf 03-07-2000 NE.50-42 Nine3.adf bx04.adf 03-07-2000 NE.55-50 Nine3.adf					1							
bels2.adf 03-07-2000 18-56-54 hels3.adf 03-67-2000 19-33-42 2belsec.adf 03-67-2000 28-35-59	bels2.adf 03-07-2000 18-56-54 hels3.adf 03-67-2000 19-33-42 2belsec.adf 03-67-2000 28-35-59				This is a the to below								
amit aff 03-67-2000 19-32-42 Jawner aff 03-67-2000 28-25-59	amit aff 03-67-2000 19-32-42 Jawner aff 03-67-2000 28-25-59				TOT I ALM ALM ALM A	1							
25ekiw.stf 02267-2000 28:3558	25ektwr.88f 022-67-2000 28:35:58					1							
						1							

2) Selecting data for analysis.

OVERVIEW.CNF 03-08-2000 10-52-56 overview.cus 03-08-2000 10-20-46 p invier1.odf 03-08-2000 12-25-28 p bobs3.odf 03-08-2000 10-00-14 p bobs2.odf 03-08-2000 10-00-14 p bobs3.odf 03-08-2000 10-00-14 p bobs2.odf Observations p bob3.odf Available:	114	ERVIEW PHU			3	_ _ N		
orientiew.cus 03-08-2000 10/20/46 insert.odf 03-08-2000 12/25/28 bobs3.odf 03-08-2000 12/25/28 bobs3.odf 00-00-04 this is a title to help me understand whats what bob2.odf bob3.odf 3behacodf Select Select All Select / Independent Variable Deselect / Independent Variable Selected:	Type	Name	Date	Time	THE	^		
gP misin odf 03-08-2000 12:25:28 gP biob53.odf 03-08-2000 10:00.14 This is a title to help in gP biob2.odf Observations gP 2bishav.odf Available: gP 3bishav.odf Over1.odf gP 3bishav.odf Over1.odf gP 3bishav.odf Over1.odf gP 3bishav.odf Over1.odf gP 3bishav.odf This is a title to help me understand whats what bob2.odf bob3.odf 3bishav.odf This is another bit of description	10	OVERVIEW.CNF	83-D9-2000	and the second second second				
bobs3.odf 03-08-2000 10:00.14 This is a stie to help m bob2.odf Observations Available: Over1.odf 2 behav.odf over1.odf bob2.odf Description 3 behav.odf Select Select All Desclect / Independent Variable 4 Select / Independent Variable Desclect / Independent Variable			and the second se	10:20:48	-			
Available: Available: Over1.odf Bob3.odf	P			12:25:28				
P both 20df P 2behaviolf P 3behaviolf Select Select All Select / Independent Variable	P		03-08-2008	10:00:14	This is a ste to	help m		
P 2behav.odf P 3behav.odf P 3behav.odf Deb3.odf This is a title to help me understand whats what bob2.odf bob3.odf 3behav.odf Select Select All Select / Independent Variable Deselect / Independent Variable Select d: Select d:	ρ	and it's index manufactures	Observations					
Interview over1.odf Interview over1.odf	<u>P</u>		Augilable					
bobs3.odf This is a title to help me understand whats what bob3.odf bob3.odf This is another bit of description Sglect Seject All Condition Select / Independent Variable Deselect / Independent Variable Selected:	P		Contractor and the local division of					
Selected		Procession of the	bobs3.odf bob2.odf bob3.odf		3		hats w	hat
		4 5.409	bobs3.odf bob2.odf bob3.odf 3bchav.od	If This is	another bit of	description	_	
2behav.odf		4 5.409	bebs3.odf beb2.odf beb3.odf 3bebby.od Sglea	IT This is	aanother bit of Seject All	description Description		Deselegt Al
		4 5.409	bobs3.odf bob2.odf bob3.odf Dichby.od Sglei Select / Selected	t This is	aanother bit of Seject All	description Description		Deselegt Al

- Click on Analysis
 - Select **Elementary statistics**
 - Select Data
 - Select Observations

The first step is to select the files that you want to analyze. This is done by selecting elementary statistics, followed by data and observations. You can select individual data files, or you can select them by using the SELECT/INDEPENDENT VARIABLE option. Once this is complete, select nesting levels under the data icon.

• Select Nesting levels

Selection of nesting levels allows more complex analysis of behavior. By selecting nesting levels you can design a statistics output that will consider multiple dependent variables and their interactions at once. When nesting levels are not specified the Observer would only

consider how much time the animal spent in each location and how much time spent in each behavior. When nesting levels are selected, on the other hand, the Observer will analyze how much time was spent in each behavior for each location. Consider for example a plus maze experiment. Specifying nesting levels allows an examination of how much time a mouse spent in the open arm and walking. Without nesting levels selected, you could only examine how much time the mouse spent walking or in the open arm. This will give you a much more complete picture of the behavior being analyzed. (Remember, you must also click on the add button for the nesting levels to actually take effect).

Type Name Date Time Time OVERVIEW CONF 03-08-2000 10.52.56 Image: Configuration of the second of the sec
Orenview cus Orenview cus Nosting Levels Nosting Leve
Desting Levels Nesting Levels No P bobs3.odf Class: Movement Image: Class: Modifier 1: Modifier 2: P bobs3.odf Behavior: Modifier 1: Modifier 2: Modifier 1: Modifier) Image: Class: Image: Class: Image: Class: Modifier 1: Modifier 2: Image: Class: Image: Class:<
Interfold Movement hobz3.odf Cless: Movement hob2.odf Behavior: Modifier 1: bob3.odf Behavior: Modifier 1: 2behavioff Stretchi Interfold Behavior: No Modifier) Interfold
Ebetracodf Stretchi Rearing
Behavior Stretchi Rearing
Benacor Stretchi Rearing
Benacor Stretchi Rearing
Rearing
<u> </u>
I I Split I Split I Split
Nesting Levels:
L1: Movement; All; All; All
Beplace
+ Remove
the second secon
Combinations OK Cancel Help

- iv. Select Split. When SPLIT is selected this means that each of the behavioral elements will be analyzed separately ie, for Behavioral class Movement, walking, stretching, rearing, climbing and falls will be analyzed individually. If SPLIT is deselected the Behavioral class elements will be added together as a single value.
- v. Select the desired behaviors and click add.

vi. If you want more complex nesting levels then the **Combinations** function can be used. This will allow you to look at behaviors in a more detailed fashion. This is primarily used when you have multiple subjects per observation.

宿110	Utionwer - Elume	wharp Statistics				
Ele Er		Tort Window Help				
20						
和いる	CERVICE WE PHEA		-0	9		
Type	Name	Date Time	TRE			
10	OVERVIEW ONF	loa.no.tonn lan state Events			×	
100 A	averview.cus averview.cus	100 - 100 La 10 - 100 V	and an an an	C 247-886 (1) 73-74		
¢₽ ¢₽	bobs3.odf	Behaviors:	Modifiers 1;	Modifiers 2:		
100	hob2.odf	walking 😑	(No Medifier)	(Ne Medifier)		
122	boblodf	Rearing				
0 ^p	2behav.odf	Climbing				
de la	Ibehakodf	Centre		1 8		
		open				
		Falls				
-	11	×	the second second	1 <u> </u>		
		F Split	F Split	🛱 Split		
		C Subjects as Actors				
		C ampera na Aguna				
		C Subjects as Receiver	8			
			0	K Cancel Help		
	2				· .	
				201	9 H	
				OVERVIEW PRJ	<untitled></untitled>	<untitled></untitled>

• Select Events

When you are doing statistical analysis you may not want to include all behaviors and subjects in your analysis. By using events you can select only those which are desired.

- v. Choose the desired actors and behaviors
- vi. By deselecting the **split** option all of the behaviors will be lumped together into one category. This would be useful if you were examining aggressive behavior and you wanted to do statistical analysis on the frequency of aggressive behavior instead of the frequency of specific aggressive behaviors.
- vii. By selecting **subjects as actors**, you can select the behavior of specific subjects for analysis.

- viii. By selecting **Subjects as receivers** you can select only those behaviors in which a specific subject was acted on. For example, if you were studying dominance, then you might want to see which animal was bitten the most often.
 - Events versus Nesting

These two functions are very similar, and can cause some confusion. Nesting allows you to analyze behavior either at the level of the behavioral class (ie, movement in general or position in general) or at the level of the individual behavioral elements (ie, walking, stretching, climbing/rearing and sniffing). For example. If you were to nest the different elements of movement such as walking within position, the Observer would calculate the frequency and duration of walking within the open arm, walking within the closed arm and walking within the center. It would also calculate the frequency and duration of stretching, etc. in these positions. Using nesting level you are not adding or removing data, you are just controlling how you are looking at it.

Events allow you actually to exclude data. By selecting the actors, behaviors or modifiers that you are interested in it would be possible to select just one very specific behavior for statistical analysis. By using the event function, you can concentrate on specific behaviors for analysis even though more behaviors have been coded.

- 4) Configuring how you want to generate your **RESULTS** table.
- iii. Report layout
- iv. Report format. Useful only for configurations with multiple actors and/or modifiers.
- 5) Generating individual statistics on each behavior.
 - Click on Analysis
 - Select Statistics

You can now select which statistics you wish to have included. In general, we are using this module of the Observer software in order to generate individual data for each subject. Thus,

means are not averages of a group (this will later be calculated by Unistat), but rather the mean behavior of an individual subject. Therefore, you should calculate statistics **per observation**. In general the statistics to be selected are: Frequency and Mean duration.

hare	,Dado	Time	THE			
INTERVIEW COR	\$3.07.2008	17 36/02				
svert adt	82-07-3888					
AND A TANK	10101-0080	10:00:42	Total Io al 2010 No Funda Inc.			
to 62 and 1	03-07-1008		1 D			
bakTist Ikakacunt	03-01-1000	19.12.42			101	
200003316						
		Coloulate State	ditte:			
		# Per Observ	a line		OK.	
					Canaal	
		C Across Obs	ervaliana			
		Both			10 the lips	
		allable:			5. A	
		atency	ALC: NO.	Selected: Prequency		
	37	etel duration	100	Meen duraties	- E	
		telal durationN Insulant deviation		et Alt ->		
	1	Rendered error	10000	central		
		divinues davat	04	and a second second second		
		Assimum dare	-I C-Der	satur dil	14	

Click on the green **GO** button to calculate the statistics for individual subjects.

		in the second	412		1015 1814
The Diseasure 2.5 ELECTRICITARY	STATISTICS III	1-07-32001			1
FRESSET DERFER.MAN					
Observational data fils Title	00x04-2085				
Disectoricani data filoi Tilloi Pros To	PLACE OF PRIME				
Renting Condition					
Lovel 1: Contes					
Class; Boyant					
Beigetlogal Elements	P2+4	latercy	20.00		
watking storocht	13 20	7.6	1.45	R	
Total	23	0.0	2-13		
Receipy Condition Level 1: slared					
CLARS Rotains					
Belaytoisi Elekante		Lanspery			
walking Tunntohi Beartag	1	4.0 5.0 349.5	9,52 3,58 37,58		
11					ع
				OVERVIEW	PRI SUMPARS SUMPRAS

5) EXPORTING DATA TO EXCEL

Before you try to export the file into an Excel file, review your output and look for any calculations that do not seem right. If you find an observation that contains data that is incorrect, it will behoove you to correct at this point. Discard the statistics you have just performed. Return to the *Project Manager* and select data, then edit observational file. You can make changes to the observation file. After you have made changes save the new file under a different name. In case you have done something wrong, this will be critical in returning to the original state of the file. Before re-running the statistics analysis restart the Observer software. When this is done, follow the instructions for statistics analysis again, but remember to exclude the file with incorrect data and to include the corrected file.

To make corrections:

- Open Project Manager
 - Select data, then edit observational file.
 - Make any needed changes.
 - Save as a new file.
 - Re-start the observer

Repeat the process for statistical analysis.

From the **Elementary Statistics** or **Lag Sequential Analysis** modules, invoke the Statistics dialog box by selecting **Statistics** from the **Analysis** menu. In this dialog box choose from the group box Calculate Statistics either "**Per Observation**" or "**Across Observations**", but not "**Both**".

Elementary Statistics or Lag Sequential Analysis output files can easily be imported into an Excel spreadsheet (Version 5.0 or higher). To do so, follow these steps within The Observer:

• Open the Export Specifications dialog box by selecting Export Specifications from the Analysis menu. In this dialog box select the following options:

a second second	Refa Andrea	Set Window He	iþ.						
	Name OVERVIEW CNF Overview cus Inventew cus	Export 03-08-2000 03-08-2000 03-08-2000	10.00 14	This is a the to help re Export Specifications C Eixed C Eixed C Free Fgrmat			OK Cancel	3	
				Field Separator: Record Separator: Code for Missing Value Maximum Line Length: File Name Extension: □ Quotes around Text	240 T×T	iude Colum	<u>H</u> elp n Titles		
						OVERVIEW	V.PRJ <u< td=""><td>-titled></td><td><untěled></untěled></td></u<>	-titled>	<untěled></untěled>

- Run the analysis by selecting GO from the Analysis menu. This yields an Analysis Report.
- Generate the export file by selecting Export from the File menu.

	nordary Statistics				
Ele Edt Data Analysis		Heb			
Type	Date	Time	Base Name for Export		
ED 4		0 105258	Statistics and statistics	3.14.10.14	
🙋 🕴 Expo	ort File	0 10:20:46	File paret. MDVNEST TXT	Enders D	
op o bobs3.0df	83-08-20	0 122520	-	Car	cel .
1002.0tf	83-08-20	statistics in a second state in the later way was a second state of the second state o	POSNEST TXT		
tob3.otf	03-00-20	the division of the second	E	P RMCA	<u></u>
2behavodf		80 10:00:14		PROGRAMS	
These of the terms		10 10 67-11		DVERVIEW #	100
Truject OVES			and the second se		*
Configuration: 0VES			List Nes of goe	Drives	
Selected Observatio	onal Data File	151	Filmi (*.TXT)	K. WJ5k20F503/11	
File name Date		time Total da			
Gends: - Male ID - hohe30 Notes of Ibehav.odf no notes found in t	-				_ الح الح
01925				OVERVIEW PRJ «Untitled	i> <untitled></untitled>
The Observer - Elem Ele Edit Data Analysis					
😂 🛄 🔝 🖬 📾 🖬)	_D ×	1	-
I Er ustilled of OVER	IVIEW PRJ				- 0 ×
E Centre	Export Log				
74 Co			I KIACHEDATAARMCAAFE	ROGRAMS\NOLDUS\OVERVIEW\OVERVIEW.	CNF
of Total	D-				
Mesting Condi		generated for			

OVERVIEW.PRJ		<u></u> ×	
of untitled of Div	/ERVIEW_PBJ		- 0
Centre	Export Log		
Total	N	RI\CMEDATA\BRCA\FROGRAMS\NOLDOS\OVERVIEW.OVERVIEW.CNF	
Mesting Condi	report-rire(s)] generated for reports	
Level 1: Clis	K:\CNSDATA\RM	CA\PROGRAMS\NOLDUS\OVERVIEW\MUH01.TXT	
Class: Positi	Labels	File	
Behavioral El	083	HUH01.TXT	
	SDATE	HUH01. DXT	
Centre	STIME	HUH01.TXT	
	GENDER	HUH01.TXT	
Total	ID	HUH01.TOT	
	STRATE	HUNDL.TOT	
Mesting Condi	MOL REEA	HUH01.TXT	
	MOL MOD.1	HUH01.TXT	
Level 1: Snif	M01 M0D2	HUH01.TXT	
	A R	HUH01.TXT	
Class: Fositi	101	HUH01.TXT	
Behavioral El	INTLEN	HUHD1.TXT	
penavioral El	EEHA	HUH01.TXT	
Centre	MOD 1	HUH01.TXT	
	1900.2	HUH01.TXT	
Total	FREQ	HUH01. DAT	
	TOTDUR4	HUH01.TXT	

• Open the export file in Excel and select Text Files from the File Types option.

🖉 Missensidi B	Einst O Shoutt		_ 5 X
Be Edit	Yew Insent Figmat Icols Data Window Help Graph State1 State2		<u>শহাস্য</u>
	※ □ ● □ ▼ × □ ● ○ ○ ○ ● ● ● ○ × □ ↓ □ ● ● ○ × □ ↓ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ ■ □ ■ ■ □ ■ ■ □ ■ ■ ■ □ ■ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		
A1	× =		
A .	B C D E F G H	1 1	K I
2 3 4 5 5 6 7 8 9 9 9 10 11 12 13 14	Text Import Wissed - Step 1 of 3 The Text Woord has determined that your data is Delinited. If this is correct, choose Next, or choose the Dota Type that beit describes your data. Original data type Choose the file type that best describes your data: If this is correct, choose Next, or choose the Dota Type that best describes your data. Original data type Choose the file type that best describes your data: If Theod with the that best describes your data: If Texter are digned in columns with spaces between each field. Start import at type: 1 Preview of File CICNEDATAIrmes/PROGRAMELINGLA	***	
15 16 17 18 19 20 21 22 22 24 22 24 25 24 55 24 19 19 19 20 21 21 21 21 21 21 21 21 21 21	Cancel < tiab Next > Bre		

And the second second	yery part	and the state	t Iook	(geta	'Endow	140	graph SI	di1 92d	4					
B	3 Q 7	0 *		e . u					_		3 100% + _ • _ 3 • ,			
A	8	=	2	D		E	F	0	8	H	4	J	K	-
	Text Impo This stree how your Deliviter I Int Int Spa Data prev	n lets y text is S o i ace	ou set t	the defini d in the p icolon	Rers you review b		E te		tive d	elmiters as o	0e			
() ► [H]\sh	C65 3behav 3behav 3behav 3behav <u>3behav</u> <u>4</u>	03-	08-00 08-00 08-00	00 1	9:30 9:30 9:30	Male	Mick Mick Mick Mick	ry Hick	cey cey	NO1_EEHA walking walking walking walking itretchi t>t				

The Import Wizard of Excel will then pop up. Simply choose "Delimited", click Next, and select "Comma" as delimiter.

		8 ° 4 1 2 7	X 98 6	. et 10	+ (2 +)		r- 21 ≩1	11 9 4	100%	0		
4			0 • B	/ U II		B \$ %	. 24 .23	I STATISTICS	- A.			
	A1	*	= OBS							_		_
	A	B	C	D	E	F	G	н	1	J	K	-
1	OBS	SDATE	STIME	GENDER	D	STRAIN	No. of the local data of the l		ND1_MOD.	AR	INT	INT
2	Sbehav	3/6/00	0:19:30	Male	Mickey	Mickey	walking			A		1
3	3behav	3,6,00	0.19.30	Male	Mickey	Mickey	walking			A		1
4	3behav	38.00	0:19:30	Male	Mickey	Mickey	walking			A		1
5	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	walking			A		1
Б.	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Stretchi			A		1
7	3behav	3/6/00	0:19.30	Male	Mickey	Mickey	Stretchi			A		1
8	3behav	3,6,00	0:19:30	Male	Mickey	Mickey	Stretchi			A		1
9	3behav	36.00	0:19:30	Male	Mickey	Mickey	Stretchi			A		1
10	3behav	3.6.00	0:19:30	Male	Mickey	Mickey	Rearing			A		1
11	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Rearing			A		1
12	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Rearing			A		1
13	3behav	3,6,00	0.19.30	Male	Mickey	Mickey	Rearing			A		1
14	3behav	3.8.00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
15	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
16	3behav	3/6/00	0.19.30	Male	Mickey	Mickey	Climbing			A		1
17	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Climbing			A		1
18	3behav	3.6.00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
19	3behav	3.8.00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
20	3behav	3/6/00	0:19:30	Male	Mickey	Mickey	Sniffing			A		1
21	3behav	3/8/00	0.19.30	Male	Mickey	Mick	Sniffing			A		1
	m99	3/6/00	0:14:44		m99	m99	walking			A		1 8
20	P HA	aug 2000	0.11.11		00	-00				1	-	dist (inter-

• Click Finish.

UNISTAT ANALYSIS

2) Calculating means

M 1 0	8 👓			w Help Graph :	Rats] Statis2 Descriptive Statistics Distribution Punctions	;		네츠 🦂 Office
L 🚔 🖬	- 1 - 1	64 -64 -6	Z 11 11E 3		Parametric Tests			ĕ
Al		= OBS			Correlation Coefficients Goodness of Fit Tests		1	
F	G	- 055	1			and Street	0 P	
3 m100	Rearing	A		151 Falls	Nonperametric Tests (1-2 5/	1	0 P	Ê B
54 m100	Climbing	A	1	151 Centre	Nonparametric Tests (Multis	ampie)	_	
5 m100		A	1	151 close	Tables			
6 m100		A	1	151 apen	Metrix Statistics			
7 m100	Climbing	A	1	151 Falls	Regression Analysis			6
8 m100	Sniffing	A	i	151 Control	ANOVA and GLM	× 1		
59 m100	Sniffing	A Tabi	e of Means		Tests for ANOVA	•		
0 m100	Sniffing	A Hors	ogeneity of Vari	age Tests	Sample Size and Power Estin	nation 🕨		
1 m100	Saifing	A Mult	ple Comparison	e 🔰	0 0	-1		
2		Reg	ession with Rep	écates				12
53		Hate	rogeneity of Ra	gression Test				1
54								
35								
36								
57								
58	_							
39								
70								
71	-							
3	-							
74	-							
No.	_						_	
4 > H/H	UH01/						1.00	
leady.					Sum=3924273.29	8		

6) SOFTWARE SUPPORT

Hopefully you will not encounter to many problems that cannot be answered by the above. When you do encounter problems that are not addressed above, which you will, may I suggest that you get in touch with the following individuals.

Rolf Leurink Noldus Information Technology Wageningen, The Netherlands

Phone: +31-317-497677 Fax: +31-317-424496 E-mail: <u>r.leurink@noldus.nl</u>

Bart van Roekel Noldus Information Technology Inc 6 Pidgeon Hill Drive, Suite 180 Sterling VA 20165 USA Phone: (703) 404-5506 or 1-800-355-9541 Fax: (703) 404-5507 E-mail: <u>Bart@noldus.com</u>

You can also try sending questions to Info@noldus.com

John Talpos 616- 833-4721 john.talpos@pharmacia.com

Remember that there is a time difference when calling, it is best to try and get your problems taken care of in the morning.