

The Observer XT

Quick Start Guide

**Using The Observer XT
for studying human behavior**

Noldus
Information Technology

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Documentation: Fabrizio Grieco, Patrick Zimmerman.

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Noldus Information Technology b.v.

International headquarters

Wageningen, The Netherlands

Phone +31-317-473300

Fax +31-317-424496

E-mail info@noldus.nl

For addresses of our other offices and support, please see our web site www.noldus.com

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1 Up and Running quickly

Thank you for purchasing The Observer XT. You are now the owner of a highly advanced system for the collection, management and analysis of observational data. We hope that you enjoy using the system and that you will benefit from it in your research.

Using this Quick Start Guide

Before you start using this Quick Start Guide, we would like to point out the following:

We assume that you are familiar with the basic operations of Windows XP or Vista.

Only the most basic features of The Observer XT are addressed in this guide. Inevitably, some features that may be vital to your application are not discussed. Where possible, a reference to the Reference Manual is given for additional information.



You can also access the printed documentation from your computer desktop. The Quick Start Guide and the Reference Manual are stored as PDF files on your PC, if you installed them (see Section 2.2 of The Observer XT 9.0 Reference Manual).

To access the PDF files, from the Windows **Start** menu select **All Programs, Noldus, The Observer XT 9.0** and then **Documentation**.



In The Observer XT, from the **Help** menu, select **Video Tutorial**. Watch the tutorial to learn about how to set up an observational study in The Observer XT 9.0.

2 Getting Started

Working with Projects

A project is the container of all information related to an experimental setup. A project contains a coding scheme and independent variables, but can have more than one observation.

You can create as many projects as you want. You can open one project at a time. Once you have opened your project, you can view its content in the Project Explorer (see Figure 1 below).

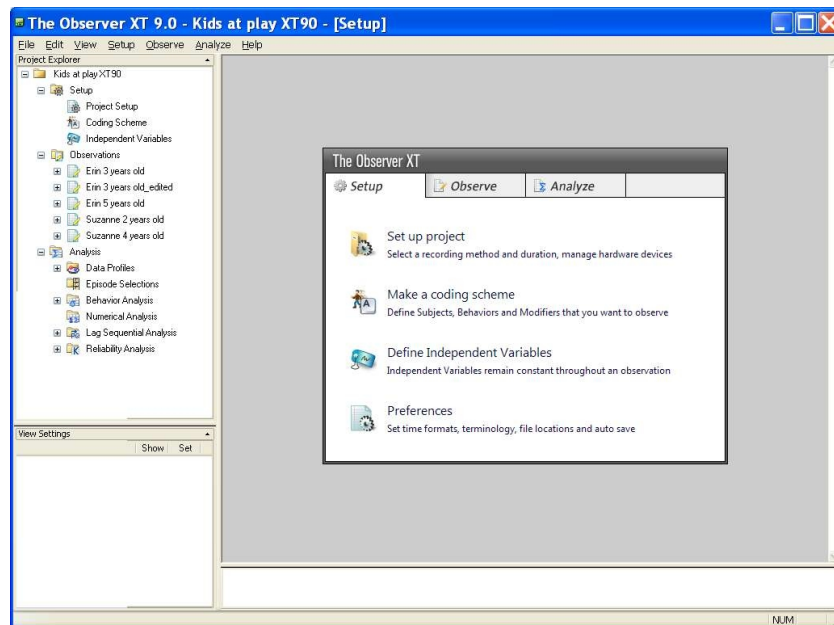


Figure 1. The main window of The Observer XT. The Project Explorer on the left contains the main items Setup, Observations and Analysis. The Components view (grey area) contains the Project Setup menu.

Creating a Project

- 1 When you start The Observer, click **The Observer XT project** under **Create a new project** in the window that appears.
- 2 Give your project a name.
- 3 Click the **Browse** button to specify a location on your PC where you want the project to be stored, or accept the default location.
- 4 Click the **OK** button. The **New Project** box closes and the project is displayed in the Project Explorer.
- 5 The **Project** window shows the main components: **Setup**, **Observe** and **Analyze**.



For more information about projects, see Chapters 4 and 15 of The Observer XT 9.0 Reference Manual.

To import an existing project from The Observer 4/5 versions, see Section 12.1 of The Observer XT 9.0 Reference Manual.

The sample projects

The sample projects are stored on the **Observer XT Sample Projects DVD for human research** that came with the software. Nine of them are about human behavior (from the field of psychology, usability and ergonomics):

A bad day in the office – In this project we see an office worker suffering from a badly designed system, which leads to frustration, and in his case, aggression. It is meant as an illustration of the importance of user-centered design, a design methodology that places the needs of the user in the center of the system design process.

Greeting rituals – In this sample project we are observing people greeting each other in the arrivals hall of an international airport.

Kids at play – This sample project concerns the behavior of two children, Suzanne and Erin, observed at different ages.

Parent-child interaction – This sample project shows the interaction between a 6-year old girl, Suzanne, and her father. Suzanne is offered a chest of drawers full of toys. Her behavior is videotaped and her heart rate is measured using a Polar heart rate monitor.

Discussion – This sample project shows a discussion between an employee and her boss how to best deal with a personal problem of the employee. The body language (both body postures and gestures) of both the boss and the employee has been coded in detail.

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RSI Research – This sample project illustrates the use of detailed video analysis for the study of complex and rapid behaviors. The case study concerns an experimental setup designed for systematic observation of movements of wrist, elbow and shoulder joints that are liable to cause repetitive strain injury (RSI).

Chat application – This sample project consists of a simulated usability test of a software applications Windows Messenger and Skype. The movie file shows the captured image of the participant’s computer, with a close-up of the participant’s face displayed in an insert window. The screen capture was produced with the Screen Capture Module, a software-based tool that generates a digital media file directly from the screen display. uLog was used to log keyboard-related behaviors.

Usability testing of cars – This project illustrates how you can use The Observer XT to code and analyze the behavior of a driver. The accompanying video footage has been taken from a camera and an eye-tracking device that the driver was wearing during the test. The gaze point of the driver was then superimposed on the video image to help the observer record manually where the driver is looking at. This way one can combine gazing behavior with route characteristics, driving behavior and other data like car speed that can be imported in The Observer.

Car race game – This project is an example of the use of The Observer in gaming research. It focuses on quantifying performance of computer game players in relation for example to their gaming experience or age. Each player is asked to play an online car race game a number of times. The observer can score data from two video files, one showing the computer screen with a close-up of the participant’s face displayed in an insert window, and the other displaying the gaze point recorded with a eye-tracking device. Computer events like key presses are also recorded with uLog, and imported as separate event logs within the observation. Furthermore, ECG is measured from each player, so it is possible to relate player’s behavior to changes in ECG activity.



For more information on the sample projects, see the **Description of Sample Projects of The Observer XT** on the Sample Projects DVD for human research.



Keep in mind that there are many ways to create a coding scheme, select data and analyze them. A sample project is only an example of the many possibilities, all of which depend on the needs of your research.

Using The Observer from start to finish



- 1 Set up the project to specify whether you observe a live scene or from video, how you record data, and other options.

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- 2 Design your coding scheme and define the independent variables important for your study.

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- 3 Start an observation and collect data.

→ page 18



If necessary, refine your coding scheme by adding elements or changing their properties. For example, add a behavior you had not considered when designing the coding scheme.



- 4 Select data to create a data profile. The data profile is shown in form of a sequence of selection filters (see Section 7.1 of the Reference Manual).

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- 5 Visualize your data in the form of charts, tables, and video highlights.

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- 6 Carry out analysis.

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- 7 If necessary, export the data and analysis result to other programs for further analysis, or to add them to a presentation.

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3 Setting up your project



Before you begin working with a project, you can customize The Observer in several ways. For more information, see Section 4.1 of The Observer XT 9.0 Reference Manual.

When you create a new project, the **Project** window appears. The three tabs in the Project window guide you through project settings. You start with setting the Project setup. Next, use the navigation pane at the bottom of the screen to move through the Project settings.



Project setup

Click **Set up project** in the Project window or **Project Setup** in the Project Explorer.

In the Project Setup, you specify:

The **Observation source** (**Live** or **From video**). In this section you also specify whether you record additional data (for example, physiological data) or video as you observe, and whether you want other programs to work together with The Observer XT.



If you plan to record video from a video camera connected to your computer or capture the screen of another computer, connect the video device before starting The Observer XT. Select **Live**, and select the video device. We advise you to record video to **DivX** format.

The **Observation method** (Continuous sampling, Instantaneous sampling or a combination of the two methods).

With continuous sampling, the event scored receives the actual time at which it has been entered.

With Instantaneous sampling, the event scored receives the time code of the sample point it belongs to.

You can combine the two methods by scoring one or few focal subjects with Continuous sampling, and others with Instantaneous sampling.

The **Observation duration** (open ended or limited by a maximum duration).



For more information about the Project Setup, see Section 4.3 of The Observer XT 9.0 Reference Manual.

Defining the Coding Scheme

In the coding scheme you define the behaviors and events you want to score and the subjects who perform those behaviors. For example:

Child Smiles.

You define **Child** as a **Subject**, and **Smile** as a **Behavior**.



For a proper scientific study, the best practice is to use a pre-defined coding scheme. You can alter a coding scheme whilst designing an experiment, but you should not compare data across observations made with different coding schemes.

Contrary to The Observer 5, in The Observer XT the coding scheme is not necessary to carry out an observation. You can record data by typing free text in the **Comments** column of the Event Log (see Section 5.4 of The Observer XT 9.0 Reference Manual). However, remember that The Observer does not calculate statistics on such data!

How to define a coding scheme

- 1 If you score events for two or more individuals during an observation, list them in your project and assign key codes to them in the **Subjects** view (see below).



If you score behaviors of one individual in each observation, you do not need to define Subjects. When you score data, it is implicit that all events belong to that subject. However, remember to define an independent variable (see page 19) that specifies the name of the individual for each observation.

- 2 List the behaviors and assign key codes to them in the **Behaviors** view. If two or more behaviors are related to each other, you can put them in a **Behavior group** (see page 13).
- 3 If a behavior requires modifiers (that is, attributes that can change during an observation, for example some detail to be added to the behavior), click the button in the **Modifiers** column (see page 15), and define modifiers for that behavior.
- 4 Check the coding scheme for errors and correct errors if there are any (see page 17).

Subjects

All possible individuals that perform a behavior must be defined as Subjects.



- 1 In the **Project setup** window, from the **Setup** menu, click **Coding Scheme**.
- 2 Click the Add Subject button, enter its **Name** and a **Start** key code.



Figure 2. Defining subjects in the **Subjects** view. Two Subjects have been defined in this example.



If you only have one subject per observation, you do not need to use subjects in your coding scheme.

If you combine the **Continuous recording** method with the **Instantaneous sampling** method, you can assign subjects to either methods, for example a focal subject to Continuous and other subjects to Instantaneous sampling.



If you score behaviors for two or more subjects in one observation, creating separate Subjects is not strictly necessary. To distinguish behaviors initiated by different individuals, you could define behavior categories specific for different individuals. For example, if your research involves studying the interaction behaviors between a parent and child (see Figure 2 above), you can define the following behaviors **Parent picks up object**, **Child picks up object**, **Parent smiles**, **Child smiles**, etc., This way Parent and Child do not need to be defined as Subjects, making scoring more efficient.

In general, you can choose between two strategies to code subjects and behaviors:

Define subjects, as many as there are individuals in an observation session. For example, **Parent**, **Child 1**, **Child 2**. For each behavior type define a behavior (see the below).

For each behavior type, **define as many behaviors as individuals in an observation session**, and give them unique names. For example, **Child 1 talks** and **Child 2 talks**. Do not define subjects.

The second strategy has the main advantage that you reduce the number of key presses necessary to score an event. On the other hand, it increases the number of behaviors in your coding scheme.

Whatever strategy you decide to apply, you probably wish to identify individuals in each observation session. For example, you want to know the names of the two or more children in a certain observation. Define as many independent variables (see page 19) as individuals in a single observation session, for example **Name of Child 1** and **Name of Child 2** for two children in your observation. Then you can enter the names for every observation.

Behaviors

- 1 To open the Coding Scheme, in the **Project Explorer**, click **Coding Scheme**.
- 2 If you have chosen the Continuous sampling method, in the **Behaviors** view, click the **Add Behavior group** button. In the **New behavior group** window, you can select either:
 - Mutually exclusive states** – Use this type of group to define behaviors that cannot occur at the same time. A behavior group with mutually exclusive elements corresponds to a **Behavioral Class** in The Observer 4/5.
 - Start-stop states** – Behaviors in this group can occur at the same time. You have to manually stop a behavior. Choose this option also if all the behaviors of this group are Point events (that is, with no duration).
- If you have chosen the Instantaneous sampling method, in the **Behaviors** view, click the **Add sample group** button.
- If you have chosen to combine Continuous sampling and Instantaneous sampling, click the **Add Behavior group** button.
- 3 Next to **Group name**, enter the name of the behavior or sample group.
- 4 Under **Behaviors**, add the behaviors (or samples) that form the group. For Continuous sampling, specify whether each behavior is an **Initial State Event**, a **State event** or a **Point event** (see the next page). If you use Instantaneous sampling, all samples are considered automatically as State events with duration equal to the sample interval.
- 5 When ready, click **Create group**. You can now assign the start and/or stop code for each behavior, if necessary.

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Types of behaviors

You can define three types of behaviors:

State Events — Behaviors that take a period of time and therefore have a duration. For example, *Typing*. For State Events you can define a **Start** key code and a **Stop** key code. If a State Event belongs to a group of mutually-exclusive behaviors, you only need a **Start** key code, because the start of a subsequent behavior automatically stops the previous behavior.

Point Events — A behavior that only takes an instant in time, or whose duration is not important. For example, *Hit a key on the keyboard*. For Point Events you only define a **Start** key code, not a **Stop** key code.



If you want a state behavior from a mutually exclusive to be scored automatically at the start of the observation, select **Initial State Event** as Type.

Sample — When scoring data with the Instantaneous sampling, behaviors are assumed to last as long as the current sample interval. For samples you can define a **Start** keycode. The start of a new sample automatically stops the current sample (unless you have scored the same behavior at subsequent sample points).

To create a new behavior in an existing group, click **Add behavior** or **Add sample** (depending on the observation method).

Behaviors			
Add Behavior group...	Add Behavior		
Behavior Name	Type	Modifiers	
Behavior (Mutually exclusive)			
Typing	t	State Event	Object
Gaze at	g	State Event	Object
Sign of despair	d	State Event	<Click here to add M...
Slam	s	State Event	Object
Pound	p	State Event	Object
Beat	b	State Event	Object
Walk away	w	State Event	<Click here to add M...
Kick	k	State Event	Object
Other behavior	o	Initial State Event	<Click here to add M...

Figure 3. The **Behaviors** view from the Sample project **A bad day in the office**.

Examples of Behavior groups

Example 1 – To score interactions between two individuals and their body language, you might have the following behavior groups:

Gesture – With *hands together, hand pointing*, etc.

Posture – With *upright, leaning forward*, etc.

Gaze – With *Looking to, Looking away*, etc.

Example 2 – In a study of usability testing of cars, you might have the following behavior groups:

Turns – With behaviors *turn right* and *turn left*.

Driver's gaze – With behaviors *gaze at left mirror, gaze at right mirror, gaze at dashboard*, etc.

Car motion– With behaviors in *motion, still*.



If two or more behaviors can occur simultaneously, put them (a) in separate behavior groups or (b) in a start-stop behavior group.

Example 3 (for Instantaneous sampling) – To quickly record the gaze behavior of two subjects, you might have the sample group **Gaze** with samples *Gaze at other subject, Gaze at table, Gaze at book, and Gaze at anywhere else*.

Behavior Modifiers

Use Modifiers to specify attributes of a behavior that can change during the observation. Modifiers are optional. You can attach one or more modifiers to a behavior, in such a way that when you score a behavior you can also score one or more modifiers.

1 To open the Coding Scheme, in the **Project Explorer**, click **Coding Scheme**.

To add a modifier, you need to have the **Modifiers** view open: to open the **Modifiers** view, in the **View Settings** pane, select the Modifiers checkbox.



2 In the **Modifiers** view, click the **Add Modifier group** button.

3 Enter the name of the **Modifier group**, add **Modifiers**, link the **Modifier group** to one or more **Behaviors** and click **Create group**.

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You can now change the start code, if necessary.



Figure 4. Nominal Modifier group for the behavior *Play* from the Sample project **Kids at play**. The modifiers in this group are mutually exclusive, nominal and are not required to be scored when you score behavior *Play*.

Example of Behavior modifiers

To record what type of play behavior a child exhibits, define the behavior *Play*. Then, in the **Modifiers** view, add a nominal **Modifier group** '**Type of play**' and add all relevant types of play (see Figure 4 for an example). Next, in the **Link to Behaviors** table, select the behavior *Play* and click **Create group**. In the **Behaviors** view, the **Modifier group Target** is now listed in the **Modifiers** column.

If you create modifiers, you need more key presses to score a complete event. You can prevent this by re-formulating the behaviors in such a way that they describe all possible combinations between the previous behaviors and their modifiers. For example, instead of defining the behavior *Gaze at* and its modifiers *Keyboard*, *Monitor* and *Colleague*, define the behaviors *Gaze at Keyboard*, *Gaze at Monitor* and *Gaze at Colleague*.

For more information on behaviors, see **Behaviors** in Section 4.4 of The Observer XT 9.0 Reference Manual.

Checking your Coding Scheme

Let The Observer check the validity of your coding scheme, for example to verify that all behaviors have a unique key code. From the **Setup** menu, select **Check Coding Scheme...**

For more information on correcting coding scheme errors, see **Checking your Coding Scheme** in Section 4.4 of The Observer XT 9.0 Reference Manual.

Independent Variables

Independent Variables can potentially influence the observation, and are assumed to remain constant for a certain subject (like a person's gender) or an observation session (like temperature). Define the variables that are important for your study (for example, the location or the social group size).

- 1 From the **Setup** menu, select **Independent Variables**. The **Independent Variables List** window appears.
- 2 Click **Add User-defined** Variable in the top-left corner of that window.
- 3 Specify **Name**, **Description** (optional), **Type**, **Format**, **Predefined Values** (optional), **Scope** and **Value Update** for the new variable. Repeat steps 2-3 to add more variables (see Figure 5 for an example).

You can also add system variables, that is, variables automatically provided by the program, like the start time of an observation. Click **Show Independent Variables** and select the system variables you require.

				User-defined	User-defined	User-defined	User-defined
Label				Name of operator	Gender	Age	Workstation
Description							
Type				Text	Text	Numerical	Text
Format						x	
Predefined Values					male; female	From 18 To 60	
Scope				Event Log	Event Log	Event Log	Event Log
Value Update				Compulsory	Compulsory	Compulsory	Compulsory
Observatio	Event Log	Subject	No.				
ELBOW	Event log000		1	Patrizia	female	38	Ignition welding machine
ELB_SH	Event log000		2	Patrizia	female	38	Ignition welding machine

Figure 5. The user-defined variables **Name of operator**, **Gender**, **Age** and **Workstation** from the Sample project **RSI Research**.

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For more information on independent variables, see Section 4.5 of The Observer XT 9.0 Reference Manual.

4 Carrying out an observation

Before you carry out an observation, you can adjust the **Observation Settings**.

Observation Settings

Observation Settings help you customize the way you record data: for example, you can automatically generate keycodes, set keycodes to required, pause playback of video when scoring, etc.

To open Observation Settings, from the **Setup** menu, select **Observation Settings**.



For more information on Observation Settings, see Section 5.2 of The Observer XT 9.0 Reference Manual.

Scoring the events



The following section refers to scoring events with the Continuous Recording method. If you score events with the Instantaneous sampling method, see page 21.

- 1 Create a new observation by doing one of the following:

In the Project window, in the **Observe** tab, click **Create new observation**.

From the **Observe** menu select **Observation**, then **New**.

Press **ALT+F6**.



You can also open an existing observation that you scored from video (tape or media file). Simply click the observation in the Project Explorer.

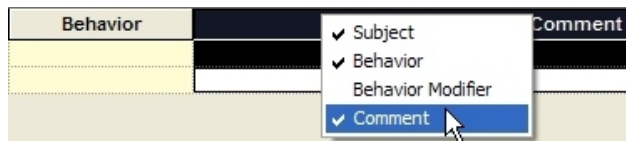
- 2 If you have specified **Offline observation** in the Project setup (see page 10), the **Video Selection** window appears. Select the video file(s) you want to use, and click **Open**.

Carrying out an observation



If you have the **Video Support** module, you can score from up to two video files simultaneously. With the **Multiple Video** extension, you can score from a maximum of four video files simultaneously.

- The Event Log only shows the columns that apply to your coding scheme and the **Comment** column. If you want to hide the Comment column during the observation, right-click one of the column titles and de-select **Comment**.



If some behaviors have been defined as **Initial State Event** (see page 14), these are scored automatically at time 0, so you do not need to score them again.



For more information on initializing subjects, see Section 5.3 of The Observer XT 9.0 Reference Manual.



- Start the observation: click the **Start Observation** button in the **Playback control** window.
- In the **Enter User Defined Variable values** window, enter the values of the independent variables for that observation session.
- When an event occurs, score data by either clicking the coding scheme elements in the **Codes** window, or pressing the keyboard keys corresponding to the codes. Score the sequence **Subject - Behavior - Modifiers** (if applicable). The way you score data depends on whether behaviors are defined as State Events or Point Events; see the notes below.

Scoring State events

If **State** behaviors in a group are **mutually exclusive**, scoring one excludes all others. This means that when you score a behavior, the behavior of the same group that is currently active is stopped automatically. For example, when a child in a playground starts **Climbing**, click the **Start** code or press the corresponding key(s).

	Status	Start key
▶ Locomotion		
👤 Climbing		c
👤 Walking		w
👤 Running		r

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Pay attention to when the next behavior starts. Press the key for the new state (in this example, **Walking**, see below) or click the corresponding **Start** code. If none of the codes apply to the new state of the subject, define an additional state in the coding scheme.

	Status	Start key
▶ Locomotion		
👤 Climbing		c
👤 Walking		w
👤 Running		r



Result – In the Event Log window, The Observer adds a **Start** line for the state **Climbing** (marked by a green triangle), and next a **Start** line for the new state **Walking**.

If **State** behaviors are **Start-Stop**, click the **Start** code or press the corresponding key(s).

	Status	Start key	Stop key
▶ Play behavior			
👤 Non-functional use		n	N
👤 Functional use		f	F
👤 Break up		b	B
👤 Put together		t	T

Pay attention to when the behavior ends. On that moment, press the stop key(s) for that behavior, or click the **Stop** code.

	Status	Start key	Stop key
▶ Play behavior			
👤 Non-functional use		n	N
👤 Functional use		f	F
👤 Break up		b	B
👤 Put together		t	T



Result – A **Stop** line (indicated by a red square) is added for the behavior just ended.

Scoring Point events

To score point events, press the corresponding key(s) or click the **Start** code. You do not need to stop a Point event.

Carrying out an observation



- When the observation is finished, click the **Stop Observation** button in the **Playback control** window. The observation is saved automatically after each event line.

Do not stop the observation if you just want to re-position the video. To do so, simply operate the Playback buttons.

Scoring events with Instantaneous sampling

- Create a new observation and select a video file (when applicable).

- Start the observation.



- A sound marks the start of the first sample interval. A number of rows appear below the **Start** row. These show each combination between a subject and a behavior group.

	Event Time	Subject	Behavior
Start	00:00:00.00	Start	
2	00:00:00.00	Instantaneous Sample (1)	
3	00:00:00.00	Mother	Vocal communication
4	00:00:00.00	Mother	Emotion
5	00:00:00.00	Twin 1	Vocal communication
6	00:00:00.00	Twin 1	Emotion
7	00:00:00.00	Twin 2	Vocal communication
8	00:00:00.00	Twin 2	Emotion

- In each row, score the state of the subject for the corresponding behavior group, by either clicking the coding scheme elements in the **Codes** window, or pressing the keyboard keys corresponding to the codes.

For example, score the state **Silent** for the subject **Mother** and the behavior group **Vocal communication**. Next, score the state **Neutral** for the subject **Mother** and the behavior group **Emotion**. The name of the state is displayed under **Behavior**.

	Event Time	Subject	Behavior
Start	00:00:00.00	Start	
2	00:00:00.00	Instantaneous Sample (1)	
3	00:00:00.00	Mother	Silent
4	00:00:00.00	Mother	Neutral
5	00:00:00.00	Twin 1	Vocal communication
6	00:00:00.00	Twin 1	Emotion
7	00:00:00.00	Twin 2	Vocal communication
8	00:00:00.00	Twin 2	Emotion

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5 When the next sample comes, a new group of rows appears below. Score the states as in the previous step.

If the state of the subject has not changed from the last sample, score the state anyway.



If you do not want to score the state of the subject for that sample, click another cell under **Behavior** to score the state for another subject/behavior group.



6 When the observation is finished, click the **Stop Observation** button in the **Playback control** window.

You can also score data combining Instantaneous sampling with Continuous recording. See Section 4.3 of The Observer XT 9.0 Reference Manual.

Controlling the video



If you use video files, operate the black buttons on the Playback control window to play back and forward the video, at the speed you require.

Finding events

You can search for specific events, events that share some elements (for example, the same subject), or free text entered in the Comments column of the event log. To search for events, press **Ctrl+F**.

Adding elements to the coding scheme as you observe

Click **Add Behavior...** at the bottom of the codes window.

In the **Add Behavior** window (Figure 6), you can enter the name and the keycode of the new element, and select the type of Behavior and to which group you want to add the behavior.



You can also create a new subject, a new behavior group, a new modifier or modifier group while observing.

To modify an existing coding scheme element, you first need to stop the observation; then click the **Coding Scheme** in the Project Explorer.



For more information, browse The Observer XT 9.0 Reference Manual:

For creating/opening observations and score data – See Section 5.3.

For changing the coding scheme, correcting scoring errors, creating more event logs in the same observation – See Section 5.4.

For customizing the observation screen – See Section 5.5.

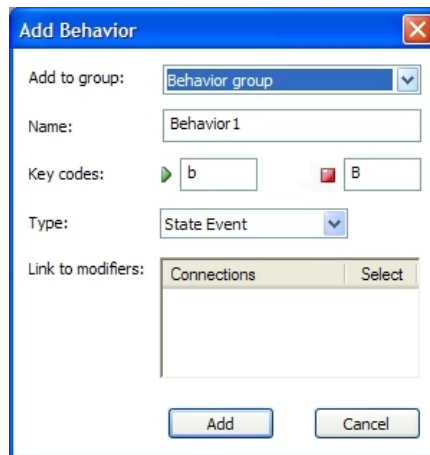


Figure 6. The Add Behavior window.

For additional functions like quickly reviewing sections of video, suspending and resuming observations, playing back data, see Section 5.6.

Recording physiological data

With The Observer XT you can associate observational data scored manually with physiological or any other type of data acquired with a Data Acquisition (DAQ) system, for example, the EEG data of a human or driving speed data from a car. This can be done by collecting observational data on the Observer computer while the DAQ system acquires the external data and stores them on a second computer. The external data can then be imported into the Observer. Observational data and external data can be synchronized automatically, so you can analyze them as if they were a single data set.

General procedure

- 1 Connect your DAQ system to the Observer computer and its dedicated computer.

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You can also use DAQ systems that are not physically connected to the Observer computer. In such cases, you need to import the external data in The Observer and synchronize them manually with the scored events (see Section 6.2 of The Observer XT 9.0 Reference Manual).

- 2 In the Observer, select **Live observation** in the Project setup and select **DAQ Settings**. Click **Edit Settings** and specify the acquisition settings you require.
- 3 Create a new observation (see page 18).
- 4 Start the observation. At that moment, The Observer starts sending a synchronization signal to the DAQ system. This signal will be used by the program when you import the external data (see below). Score data as usual (see Section 5).
- 5 When you are done, stop the observation as usual and import the external data (from the **File** menu, select **Import** and then **External Data...**).



For more information on recording external data, see Section 5.7 and Chapter 6 of The Observer XT 9.0 Reference Manual.

5 Selecting data



Why select data? – You select data in the following cases:

When you want to analyze events or categories in groups. This is called **Grouping**.

When you want to **analyze some events or categories, not others**, for example behaviors showed by male subjects only. This is called **Filtering**.

When you want to **analyze events that occurred in specific intervals**, which can be of three types:

Free intervals (from a time/event to another time/event).

Nesting (the time period when one or more state events occurred).

Time bins (regular time intervals).

The data selected are subject to all analysis functions: Visualization, Behavior analysis, Numerical modifier analysis, Lag sequential analysis and Reliability analysis.

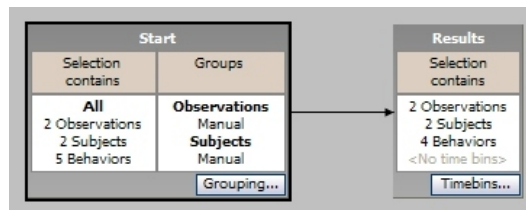
If you do not select data, all data in all your observations are used for analysis. The default data selection is stored in the default **Data Profile** that you can locate in the Project Explorer, under **Data Profiles**.

You can create more Data Profiles, each one with its own selections. For example, a Data Profile specifying all data, and another considering only female subjects.

Procedure

- 1 From the **Analyze** menu, select **Select Data** and then **New Data Profile**. Name the data profile and click **OK**. The new Data Profile appears.

The first box, named **Start**, contains all observations and all events within them. The second box, **Results**, contains the data currently selected. Since the two boxes are connected directly, all data are currently used for analysis. Now you can insert selection boxes between the two to refine your selection.



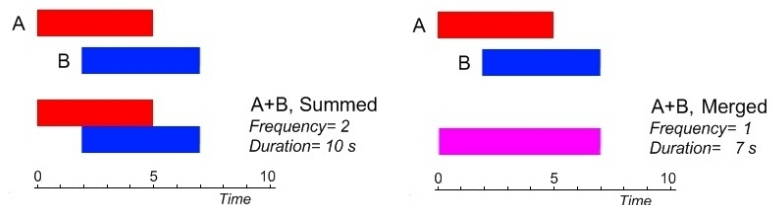
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2 Do one or more of the following:

To group data, click the **Grouping...** button on the **Start** box and create the groups of subjects, behaviors and modifiers you require. You can group data manually or by the values of independent variables (for observations and subjects only):

Elements in **Summed groups** are still considered as separate units (see the figure below, on the left).

Elements in **Merged groups** are truly merged on the time line and counted as one (see the figure below, on the right).



To filter data, click the button in the blue column that corresponds to the data you want to analyze. For example, if you want to filter behaviors, click the button next to **Filter Events - By Behaviors**. Specify the elements you want to analyze and click **OK**.

To analyze free intervals, click the button next to **Select Intervals - Free interval selection**. Specify the start and the end point of the interval to be analyzed.

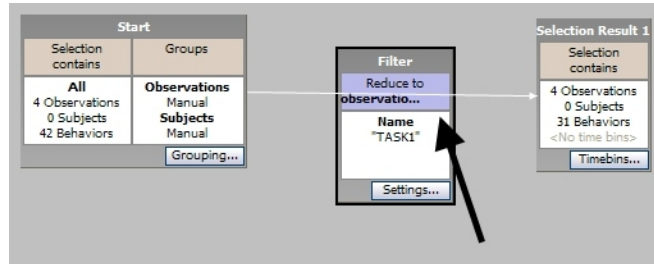
To analyze the time when specific subjects or behaviors were scored as state events, click the button next **Select Intervals - Nest over Behaviors** or **Select Intervals - Nest over Subjects** and specify the subject/behavior that defines that interval. For example: analyze the time when the *Mother* was *outside the room*.

To analyze data in regular time intervals, click the **Timebins** button in the **Results** box. Specify the number or the duration of such intervals.

3 Choosing **Filter Events** or **Select Intervals** results in creating a new selection

Selecting data

box. Click the title of that new box and drag it over the arrow that connects the two original boxes.



Example:

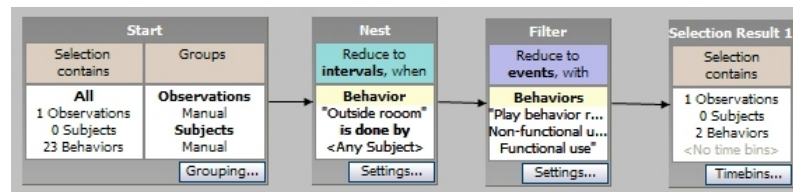


Figure 7. An example of data selection combining Nesting (second box from the left) and Filtering (third box from the left).



Always put green **Nest** boxes before all your **Filter** boxes, otherwise you will filter out the events before you specify the interval based on those events.

4 Run the analysis you require (see the next sections).



For more information on data selection, see Chapter 7 of The Observer XT 9.0 Reference Manual.

6 Visualizing data



Before you choose one of the options below, make sure that the Data Profile containing the data you want to visualize is highlighted in blue in the Project Explorer. If not, click the Data Profile.

Creating a chart

A **chart** plots the scored events relative to time.

From the **Analyze** menu, select **Visualize Data**. Select the observation you want to visualize and click **OK**.

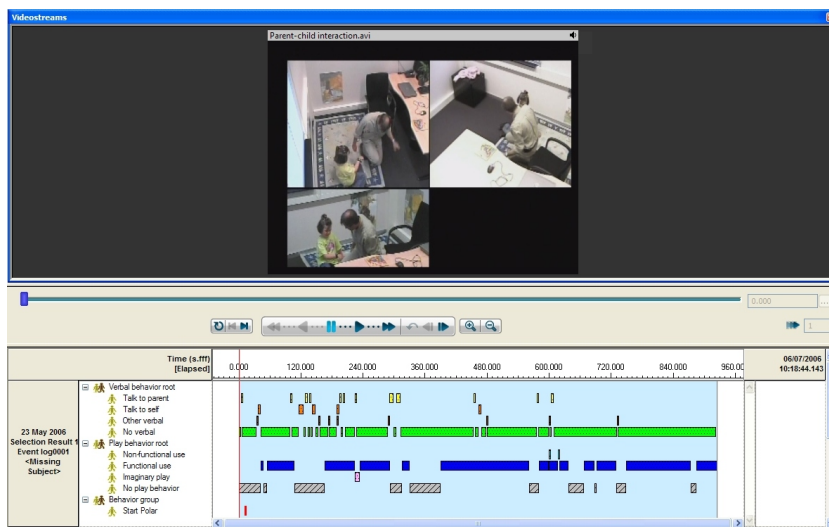


Figure 8. Visualization of event data and video.

Data are shown in the form of colored bars (horizontal for state events, vertical for point events). You can play the event sequence back together with the corresponding video.

Creating a table of the events (Episode selection)

You can create a table listing all the events or those selected in a Data Profile. From the **Analyze** menu, select **Episode Selection**, then select **New Episode Selection**, then **New From Current Data Profile**.

Visualizing data

Data are shown in the form of a table where each row corresponds to an event. Events that are part of the same event log or interval are grouped in **Episodes**. Each episode is marked by its own title row (in orange).

	Event name	Observation	Stop time	Event Dur...	Behavior ...	Roll-on time	Roll-off time	Subtitle text	Subtitle Du...
Episode 1									
1	Play	Suzanne 4 year	11/22/2004 0	0.400	Type of play (	2.880	2.000	Play	2.000
2	Play	Suzanne 4 year	11/22/2004 0	6.440	Type of play (l	3.000	2.000	Play	2.000
3	Play	Suzanne 4 year	11/22/2004 0	9.920	Type of play (	3.000	2.000	Play	2.000
4		Suzanne 4 year	11/22/2004 0	0.000		3.000	2.000		2.000
5		Suzanne 4 year	11/22/2004 0	0.000		3.000	2.000		2.000
6	Play	Suzanne 4 year	11/22/2004 0	0.600	Type of play (	3.000	2.000	Play	2.000
7	Play	Suzanne 4 year	11/22/2004 0	11.480	Type of play (l				
8	Play	Suzanne 4 year	11/22/2004 0	35.280	Type of play (
9	Play	Suzanne 4 year	11/22/2004 0	3.960	Type of play (l				
10	Play	Suzanne 4 year	11/22/2004 0	36.480	Type of play (
11	Play	Suzanne 4 year	11/22/2004 0	8.320	Type of play (l				
12	Play	Suzanne 4 year	11/22/2004 0	6.760	Type of play (
13	Play	Suzanne 4 year	11/22/2004 0	3.640	Type of play (l				
14	Play	Suzanne 4 year	11/22/2004 0	16.640	Type of play (
15	Play	Suzanne 4 year	11/22/2004 0	3.160	Type of play (l				
16	Play	Suzanne 4 year	11/22/2004 0	0.760	Type of play (
17	Play	Suzanne 4 year	11/22/2004 0	0.600	Type of play (
18	Play	Suzanne 4 year	11/22/2004 0	12.600	Type of play (
19	Play	Suzanne 4 year	11/22/2004 0	6.280	Type of play (l				
20	Play	Suzanne 4 year	11/22/2004 0	3.880	Type of play (	3.000	2.000	Play	2.000



Figure 9. Table of events in an Episode Selection. During playback of the Episode Selection, the corresponding video is highlighted in red.

You can edit the Episode Selection by adding, removing and sorting events and export it to a text file.

Making a highlight video clip

You can play back the events in the Episode Selection and create a video clip that shows those events. Create a new episode selection (see above). To generate the corresponding video clip, from the **Analyze** menu, select **Episode Selection**, then **Generate Media File....** Select **MainConcept MPEG-4 Video Encoder** and click **Generate**.



For more information on Data Visualization, see Chapter 8 of The Observer XT 9.0 Reference Manual.

7 Calculating statistics



Before calculating statistics, make sure that the Data Profile containing the data you want to analyze is highlighted in blue in the Project Explorer. If not, click the **Data Profile**.

Behavior Analysis

With Behavior analysis you calculate for example the average duration or the total frequency of behaviors.

- 1 From the **Analyze** menu, select **Behavior Analysis**, then **New**.
- 2 In the Analysis Settings window, in the **Layout** tab, select the categories you want to have in the results table. Drag a category to a different box. For example, drag **Observations** to **On Sheets** to have the results of different observations displayed on separate sheets. Choose the remaining options and click **OK**.
- 3 A table with values appears.

Result Cont	Behaviors			
		Total number	Total Duration	Mean
Selection Result 1	Turn right	4	-	-
	Turn left	2	-	-
	Gaze at left mirror	3	1.520	0.507
	Gaze at right mirror	3	2.440	0.813
	Gaze at rearview mirror	23	15.840	0.689
	Gaze at road	95	304.785	3.208
	Gaze at dashboard	3	2.200	0.733
	Gaze at other object	66	65.855	0.998
	Gaze at crossing car	3	2.870	0.957
	Gaze at traffic light	5	2.920	0.584
	Gaze at bike	2	4.480	2.240

Figure 10. Behavior Analysis results table.

Numerical Modifier Analysis

With Numerical modifier analysis you can calculate statistics of the numbers scored as Numerical modifiers (see page 17). For example, the average value of the modifier *Aggression level*.

- 1 From the **Analyze** menu, select **Numerical Analysis** then **New**.
- 2 Under **Layout**, select the categories you want to have in the results table. Drag a category to a different box for example drag **Subjects** to **On Columns** to have the results of different subjects displayed on separate columns. Choose the remaining options and click **OK**.
- 3 The results table with values appears.

Tips

To re-arrange the layout of the table, click the **Layout** button on the results window.

To save the results within the project, click the **Archive Results** button on the results window.

To export the results, click the **Export** button on the results window.

You can also analyze the numerical modifiers as nominal modifiers in the behavior analysis, for example to calculate how often '2' was scored.



For more information on Calculating Statistics, see Chapter 9 of The Observer XT 9.0 Reference Manual. For an example of numerical modifiers, open the sample project 'Usability testing of cars XT80' available on the Sample Projects DVD.

Hypothesis testing

The Observer XT does not make any statistical test like t-test or ANOVA. To analyze data in such a way, first export your observational data or results (see page 34) and then import them into your statistical package.

8 Lag sequential analysis

With Lag sequential analysis you calculate frequencies of transitions between pairs of events within a certain lag, in a time series. It helps you answer questions like:

In the interaction between a *Boss* and an *Employee*, how often was the event *Lean backward* followed by *Looking away* from other person or *Looking at* other person?

How likely was the event *Boss Talking to* followed by *Employee Looking away*?

The lag can be either a **state lag** or a **time lag**:

State lag – To calculate transitions between events that are separated by a fixed number of events. For example, the transitions from an event to the next (state lag =+1), or the second next (state lag=+2) etc. Lag order can be from -9 to +9. The time interval between events does not influence the calculations.

Time lag – To calculate transitions between events that are separated by less than a specific time (time lag). For example, the transitions from an event and those occurring in the next 10 seconds. The order in which events occur within the time lag does not influence the calculations.



Before running an analysis, make sure that the Data Profile containing the data you want to analyze is highlighted in blue in the project Explorer. If not, click the Data Profile.

- 1 From the **Analyze** menu, select **Lag Sequential Analysis**, then **New**.
- 2 Under **Analysis Settings**, select whether you want to perform state lag or time lag analysis, and choose the remaining options. Under **Layout**, specify how you want the table to look like (for example, to collapse the data across observations). Next, click **OK**.
- 3 A table appears on your screen. Each cell contains the frequency (or probability, depending on what you have chosen in the Analysis Settings) of the transitions from the event of the corresponding row and the event of the corresponding column.



For more information on Lag Sequential Analysis, see Chapter 10 of The Observer XT 9.0 Reference Manual.

	Subjects	Behaviors							
Subjec			Boss				Employee		Y0
Behavi			Talking	Not talking	Leaning for	Leaning back	Talking	Leaning back	
	Boss	Talking	0	4	0	3	2	0	0
		Not talking	5	0	0	0	9	0	0
		Leaning forw	0	0	0	0	0	0	0
		Leaning back	0	2	0	1	2	0	0
	Employee	Talking	6	1	0	0	0	0	0
		Not talking	5	3	1	2	0	0	1
		Leaning forw	-	-	-	-	-	-	-
		Leaning back	1	0	0	0	0	0	0
	X0		0	1	0	0	0	1	

Figure 11. This example has been taken from the sample project **Discussion** which you can find on the Sample Projects DVD. The observation contains data of a discussion between a Boss and one of his Employees. The observations focuses on body language: body posture and gestures. To know how the behavior of the Boss affects the body language of the Employee, Lag sequential analysis with state lag order= +1 has been carried out.

9 Reliability analysis

When comparing two observations (or groups of), reliability determines how consistently the behavior was measured. You can check your own consistency over time, or that between researchers.

In Reliability analysis, the observations are paired and events are compared, producing a **Comparison list**:

The Reliability Result calculates the following statistics:

- Number of agreements and disagreements.
- Proportion of agreement.
- Cohen's Kappa (and its statistical significance).
- Pearson's Rho (and its statistical significance).



Before running an analysis, make sure that the Data Profile containing the data you want to analyze is highlighted in blue in the Project Explorer. If not, click the Data Profile.

- 1 From the **Analyze** menu, select **Reliability Analysis**, then **New**.
- 2 In the **Settings** tab, choose the observations you want to compare from the list. If you want to compare more than two observations, create a new pair by clicking **Add pair**. Specify the **Tolerance window** (the maximum acceptable

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discrepancy between timing of events for these to be considered an agreement). Choose the remaining options and click **OK**.

- 3 A table appears on your screen. Click the buttons **Statistics**, **Confusion Matrix**, **Comparison List** to view the results.

Result	Erin 3 years old / Default Criterion 1	Erin 3 years old_edited / Default Criterion 1
-	0.000 Observation start	0.000 Observation start
-	0.000 Synchronization point	0.000 Synchronization point
✓ Agreement	0.000 ▶ <Unspecified Verbal behavior root>	0.000 ▶ <Unspecified Verbal behavior root>
✓ Agreement	0.000 ▶ Interaction undetermined	0.000 ▶ Interaction undetermined
✓ Agreement	0.000 ▶ Gaze elsewhere	0.000 ▶ Gaze elsewhere
✓ Agreement	1.920 ▶ Gaze object	1.920 ▶ Gaze object
✓ Agreement	3.000 ▶ No interaction	3.000 ▶ No interaction
✓ Agreement	5.680 ▶ Gaze adult	5.680 ▶ Gaze adult
✗ Disagreement	7.960 ▶ Gaze object	7.960 ▶ Gaze elsewhere
✓ Agreement	9.760 ● Talk	9.760 ● Talk
✓ Agreement	31.160 ▶ Gaze elsewhere	31.160 ▶ Gaze elsewhere
✗ Disagreement	35.600 ▶ Gaze object	35.600 ▶ Gaze adult
✓ Agreement	37.880 ● Talk	37.880 ● Talk
✓ Agreement	45.240 ● Talk	45.240 ● Talk
✓ Agreement	54.480 ● Talk	54.480 ● Talk

Figure 12. Reliability analysis result - Comparison List. The example was taken from the sample project **Kids at play**. A copy of the observation *Erin 3 years old* has been edited to make it slightly different and saved as *Erin 3 years old_edited*. In *Erin 3 years old*, the observer scored *Gaze object* at 7.96 s and *Gaze object* at 35.6 s, while in *Erin 3 years old_edited* this was changed to *Gaze elsewhere* and *Gaze adult*, respectively. This results in two disagreements (see first column).



For more information on Reliability Analysis, see Chapter 11 of The Observer XT 9.0 Reference Manual.

10 Managing data and results

See the following sections to create copies of your projects, import data and export data, analysis results and episode selections to your favorite spreadsheet or statistics package.

Backing up a project

You can copy an entire project by making a backup file. A backup file is like a ZIP file containing your project files, including data and analysis results. It proves very handy when you want to move your data to another computer or send it via email to a collaborator.



We advise you to make a backup of your projects at least once a day. Copy the backup to a secure medium like a network drive.

- 1 From the **File** menu select **Save As**.
- 2 From the **Save in** list choose the folder in which you want to save the copy, then type a name in the **File name** field and choose **The Observer XT Project Backup (*.vpb)** from the **Save as** type list. Next, click **Save**.

To re-open the project from a Backup file, from the **File** menu select **Open Project**, and choose **The Observer XT Project Backup (*.vpb)** from the **Files of type** list. Click the **Change directory** button to specify where to save the project.



Project backups do not contain the video files used to score the data.

Importing and exporting projects

You can also import/export projects of previous Observer versions (4 / 5 / XT 6.x / XT 7.x / XT 8.0).

To import and export observations to/from projects, see the next page.



For more information, see Section 12.1 of The Observer XT 9.0 Reference Manual.

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Using projects with multiple coding stations

You can set an Observer XT project in such a way that data can be shared with multiple computers working as coding stations.

You define a project with a coding scheme on the main computer. Each coding station receives a copy of this project, where one can record events but not change the coding scheme (read-only project). You can then import the data from the coding stations to perform analysis.



For more information, see **Creating a multiple coding station configuration** in Section 12.1 in The Observer XT 9.0 Reference Manual.

Exporting observational data

To export your data (including independent variables and optionally media files and physiological data):

- 1 From the **File** menu select **Export Observational Data**. Choose the observations you want to export and click **Next**.
- 2 Choose a name for your export file, select the format (*.odx), specify whether you want to include media files and external (physiological) data together with the observational data, and click **Export**.



To export data of a single observation, right-click the observation in the Project Explorer and select **Export**. You can also export event log data as ASCII (*.txt) files.



For more information, see Section 12.2 of The Observer XT 9.0 Reference Manual.

Importing observational data

You can import data files of previous Observer versions (3/4/5) or any other behavioral data in ASCII format.

- 1 From the File menu select **Import**, then **Observational data**.
- 2 Click **Custom Import Profiles** and then **Create New** if you want to import data of format other than Observer 3/4/5. If the data to import are stored in a ODX file, make sure **ODX File (*.odx)** is selected from the **Files of type** list.



For more information, see Section 12.3 of The Observer XT 9.0 Reference Manual.

Exporting analysis results to a file

- 1 Make sure that the analysis result you want to export is open on your screen. If necessary, adjust the layout of the result table to suit the import requirements of your statistical package (see page 31).
- 2 From the **Analyze** menu, select **Export Analysis Results**, or click the **Export** button in the results window.
- 3 Choose a name for your file, specify the format (XML or text) and click **Export**.

When exporting to text, results displayed on each sheet will be exported to a separate file.

Copying and pasting to other programs

To quickly export an analysis result to other programs, such as Excel, select the whole table (from the **Edit** menu select **Select All**) or part of it, then from the **Edit** menu select **Copy**. In the other program, from the **Edit** menu select **Paste**.



For more information, see Section 12.5 of The Observer XT 9.0 Reference Manual.

Exporting episode selections

To export all your episode selections:

- 1 From the **Analyze** menu, select **Episode Selection** and then **Export**.
- 2 Enter a base filename for your files and click **Export**. Your files are saved in ASCII format.



To export a single episode selection, right-click that episode selection in the Project Explorer and select **Export Episode Selection**.



For more information, see Section 12.6 of The Observer XT 9.0 Reference Manual.

Exporting physiological data

If your observation includes physiological data, you can export them together with your behavioral data, using an episode selection.

- 1 Make a data profile that filters the observation (see Section 6, page 26) and then an episode selection that includes both the behavioral and physiological data (see Section 7, page 28).

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2 Export the episode selection: From the **Analyze** menu, select **Episode Selection** and then **Export...** .



For more information, see Section 12.6 of The Observer XT 9.0 Reference Manual.