Application Manual

Using The Observer® XT in your research

Noldus
Information Technology

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Documentation: Fabrizio Grieco, Patrick Zimmerman, Olga Krips.

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Noldus Information Technology bv

International headquarters

Wageningen, The Netherlands

Telephone: +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 Introduction

Getting to know The Observer XT is one step. Making full use of The Observer XT for your own research is another step. It is obvious that use of The Observer XT differs per research area. If you study behavior of persons in a restaurant, you will use The Observer XT quite different than when you investigate the usability of a new software program.

This manual contains some common examples of applications for The Observer XT. It is by no means an instruction how to use the program. There is a lot of other material for that, like Quick Start Guide, Video Tutorial and The Observer XT Help.

This manual helps you how to translate a research question into a Coding Scheme and analysis data. It contains examples of Coding Schemes for several research areas. Where necessary, it contains specific other settings as well.

FROM RESEARCH QUESTION TO CODING SCHEME

It may sound obvious, but the first, and most important, step is to formulate a clear research question. And this question needs to be as concrete as possible. A research question like "I want to study the communication in a surgery room" is not easily translated into a Coding Scheme. You run a high risk that you score behaviors that are not relevant for your question, or, worse, do not score the ones that are. Better is a question like "Does a doctor look less at a patient when the patients file is on a tablet than when it is on paper?" This is easily translated into the following components in The Observer XT:

Subject – *Doctor*.

Behavior – *Look at patient*.

Independent variable – *Type of Patients file*, with *Paper* and *Tablet* as values.

FROM RESEARCH QUESTION TO ANALYSIS - THINK FROM BACK TO FRONT

The next step is to determine the analysis results you want to obtain. Considering the example above, what are the data you need? Do you want the duration the doctor looked at the patient? Or the number of times? This information is crucial to set up your project in The Observer XT. So you need to think from back to front. Determine the analysis data you want to obtain and the project setup will follow automatically.

- If you want to know durations of behaviors, create a Coding Scheme with behaviors that have duration (State events).
- If you only need to know how often a behavior takes place, define it as a behaviors without duration (Point event).
- If you want an accurate record of what is taking place throughout the entire observation, score your observation continuously.
- If you observe a large group, or have long observations, and you want an estimate of what everyone is doing over time, score at regular intervals (Instantaneous sampling).

SAMPLE PROJECTS

On the website of The Observer XT, you can download sample projects for several applications. You can download the projects from www.noldus.com/downloads. Note that you have to register and log in to access this area.

To open a sample project in The Observer XT:

1. Download the sample project **[project name] XT.vpb** and the associated video files and save them to your computer's hard disk. See the document **Description of sample projects of The Observer XT.pdf** on the same web page to see which video files you need to download.
2. Copy the video files to the **Video Files** folder of The Observer XT.

3. Start The Observer XT. In the start screen of The Observer XT, click **Restore backup** under **Open a project**. In the window that appears, browse to the downloaded *.vpb file and click **Open**.
4. The sample project opens on your screen.

Reviewing the sample project

To view the coding scheme used in this project, choose **Setup** >**Open Coding Scheme**.

To review data, Click on the observation name under **Observations** in the left panel to open it. Click the **Play** button in the **Playback Control** window to review the observation.

Sample projects contain archived analysis results. To open these results, in the Project Explorer, expand the **Analyses** item, then the **Behavior Analysis** folder (or **Numerical Analysis**, **Lag Sequential Analysis** and **Reliability Analysis**) and click the analysis result you want to open.

TIPS

If you will be analyzing prerecorded video, please take notice of the following tips before you start your own recordings.

- **Provide good lighting** – When possible, make sure that the subjects are evenly lit; avoid strong backlighting. Most modern cameras are very light sensitive, so bright lights are normally not necessary, but too much contrast can make it hard to get a good image. If possible, make sure that the camera's white balance is set correctly.
- **Use a tripod for the camera** – When you connect your camera to a tripod, the image will be more stable. This will dramatically improve the sharpness of your image; even in poor lighting you will be able to see the details on your film much better. It also enables you to better frame your subjects.

- **Check the subject's view** – If the presence of the camera might cause your subjects to behave differently, let them get used to it. If the camera has a zoom lens it can help to set a long focal length and move the camera further away. However, when a subject completely fills the viewfinder, make sure you move the camera when the subject moves.
- **Make sure that audio is good enough** – If you need to hear precisely what the is being said, the built-in microphone of your camera will often not be adequate. Therefore, use a separate microphone. Do not place the microphone near the cooling fan of a computer (or other source or background noise). Check that all subjects are clearly audible on the audio recording.

2 Clinical communication

The research area of clinical communication has grown a lot in the last thirty years. Studies on doctor-patient relations emphasize the importance of a doctor's communication skills and the effect on the patient's health. In general, behavioral analysis in clinical communication studies distinguishes between affective (socio-emotional) and instrumental (task-oriented) behavior, reflecting the care-cure distinction (Deveugele et al., 2004).

With The Observer XT, the interaction between a patient and a doctor can be recorded on video and the communication can be scored in detail. Furthermore, using The Observer XT allows you to simultaneously acquire psychophysiological data (such as blood pressure, heart rate or electrodermal response) and synchronize these with the scored observational data.

Sample project

On the website of The Observer XT, you can download the sample project **Medical Communication**. In this sample project, a doctor is observed while he has a patients file either on a tablet or on paper. The communication and gazing behavior of the doctor is analyzed.

PHYSICAL SETUP

A clinical communication study can, for example, be carried out using the Noldus Portable Observation Lab. This portable lab consists of a notebook with The Observer XT and MediaRecorder installed, two cameras and tripods, and additional cables and plugs. See Figure 1 for an example of a setup of the Portable Observation Lab. The Portable Observation lab can easily be set up in a doctor’s office. To study

communication in, for example, a surgery room, a setup with fixed cameras may be more suitable.

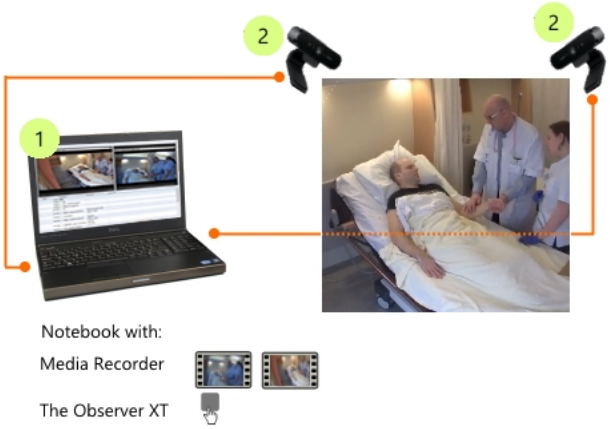


Figure 1 *An example of a setup for studying clinical communication. 1 - Notebook with MediaRecorder to record video and The Observer XT to annotate the behaviors of doctor and patient. 2 - Two camera that capture the scene from different angles.*

PHYSIOLOGICAL DATA

You may want to co-acquire physiological data of the patient during the observation. For example to measure the patient's heart rate or skin conductance. The Observer XT can send a synchronization signal to the system that collects physiological data. This way the observational and imported physiological data are automatically synchronized.

You can then carry out advanced analysis with the behavioral and physiological data. For example to determine the heart rate of the patient during the time the doctor was explaining.

See **External Data** in The Observer XT Help how to work with The Observer XT and external data.

CODING SCHEME EXAMPLES

Subjects

If you observe multiple persons in your observation, you can define them as subjects in the coding scheme. If you observe only one person in each observation, do not define subjects. Enter the names in the Independent Variables list instead. While scoring, you only enter the key codes for the behaviors, which saves you coding effort. See **Subjects** in The Observer XT Quick Start Guide for guidelines about subjects and independent variables. Example of Subjects in the Coding Scheme are:

- Patient
- Doctor
- Other medical personnel
- Patient's spouse
- Visitor

Behaviors

As an example, communication can be divided into the groups, *Speech*, *Gestures* and *Eye contact*. You can define each of those groups as a Behavior group in the coding scheme. Behavior groups in which the behaviors exclude each other are the easiest to work with (See **Behaviors** in The Observer XT Quick Start Guide for details). Examples for behaviors in each of the groups are:

- Doctor speech
  - Open question
  - Closed question
  - Personal remark
  - Social conversation
  - Instruction
  - Hum
  - Explanation
  - Approval
  - Compliment

- Interruption
- Other communication

- Doctor gestures
  - Point at screen
  - Point at patient
  - Point at patients file
  - Point at nurse
  - Emphasize words with hand gestures
  - Touch patient
  - Other gesture
- Doctor eye contact
  - Gaze at patient
  - Gaze at screen
  - Gaze at patients file
  - Gaze at nurse
  - Gaze at spouse
  - Other gazing

Modifiers

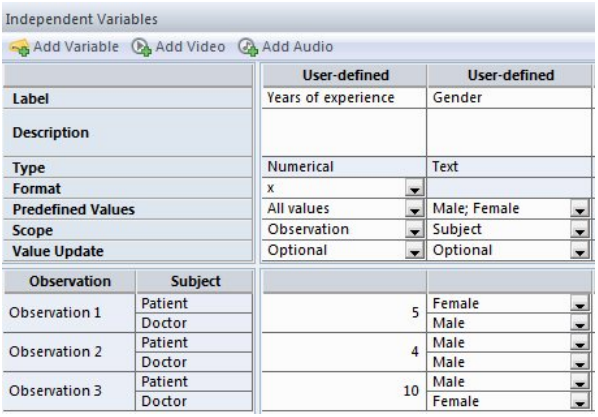
Use modifiers to further specify certain behaviors. Examples of modifiers are:

Behavior	Modifier
Explaining	Medical topic
	Other topic
Point at screen	To explain
	Other, not functional
Gaze at screen	While explaining
	While thinking
	Other

INDEPENDENT VARIABLES

The Independent Variables List is useful when you want to relate the results of your test to variables such as years of experience of the doctor or gender of doctor and patient. Also, if you observe one person, for example the doctor only, the Independent Variables list is the place where to keep track of your test persons identity.

Select **Subject** as **Scope** when you observe both doctor and patient in one observation and you want to enter details that may be different per subject, like the gender. Select **Observation** as **Scope** for variables that have one value for the entire observation, like the years of experience of the doctor. See below for an example.,



ANALYSIS EXAMPLES

Use the independent variables to analyze your data in groups. For example to compare the observations in which the patients file was on

paper with the ones with this file on a tablet. Use a data profile to define your selection and then run your analysis.

Behaviors		
	Mean duration	
	Paper patients file	Tablet patients file
Gazing at patient	3.3	4.2
Gazing at nurse	2.3	1.4
Gazing at patients file	2.5	2.1
Other/no gazing	2.5	3.4
No communication	2.0	2.7
Businesslike open question	3.8	7.6
Businesslike closed question	4.1	9.4
Empathic open question	3.0	-
Empathic closed question	-	-
Humming	0.4	0.7
Wrapping up	9.6	4.0
Explaining	8.0	6.2
Interrupting	-	-
Other communication	2.8	2.3

Use physiological data or manual annotations to define time intervals and analyze the other data during these intervals. The example below shows the intervals while the doctor was gazing at the patients file.

See The Observer XT Help and Quick Start Guide how to define your selection and run the analysis.

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http://info.noldus.com/free-case-study-on-clinical-communication-in-an-observation-lab/

3 Usability research

In the recent years, usability has become increasingly important in the development of new products. User-centered design leads to a more efficient development process and better products at lower costs. Good usability allows users to achieve their goals more easily and with fewer errors. It also improves peoples' satisfaction with the systems and devices they use.

With The Observer XT, test participants are observed while completing a number of predefined tasks. The participant's actions and expression are recorded on video, logged, and analyzed using The Observer XT. Participants are usually asked to think aloud during the tests so the data from audio and video give a clear indication of where users have problems and where improvements can be made. The Observer XT generates reports with a summary of all tasks performed by the participants, offering an easy way of comparing the results.

uLog

You can combine The Observer XT with uLog to log keyboard and mouse events. This way you can, for example investigate the usability of a website or software program. uLog data can be imported into The Observer XT and synchronized with the observations for analysis.

uASQ

During the usability test you can use uASQ to send questions to the test participant's computer. The answers are imported into The Observer XT and can be used for further analysis of the manually scored events. You can, for example, analyze the manually scored behavior of test participants that gave a low score for a product.

FaceReader

Optionally, use FaceReader simultaneously with your usability test to analyze the facial expression of the test participants during the test. This way you obtain information how the test participant experience

the product. The FaceReader data can be imported into The Observer XT and synchronized with the manual annotations for further analysis.

The sample projects

In the sample project **Child FaceReader,** a 3-year old boy is observed during play with an online game. His face is filmed with a webcam, while a video of the screen is recorded as well. The video of the child's face was analyzed in FaceReader. By combining FaceReader and The Observer XT one is able to study both the behavioral and emotional response of the person playing the online game.

Others sample project that may be relevant for your study are **Driver assessment**, and **HILAS cockpit evaluation**.

PHYSICAL SETUP

In a common usability test with The Observer XT, two computers are used: the test computer, with the software to be tested, and the observation computer. The latter contains the programs The Observer XT for behavioral observations. It may also contain MediaRecorder for video recording. The two computers are then physically connected with each other by a screen capture device to record the test participants' monitor.

For more information, see the user manual that comes with your lab.

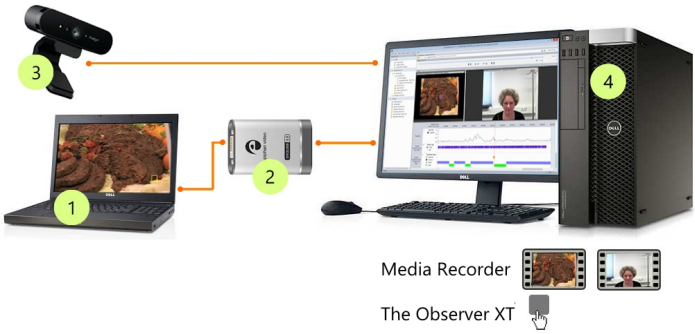


Figure 2 *An example of computer setup for usability testing that includes screen capture.*
1 - Testcomputer.
2 - Screen capture device to record test participant's screen.
3 - Camera to record test participant's behavior.
4 - Computer with MediaRecorder to record videos and The Observer XT to annotate test participant's behavior.

The observations in a usability study are often done live as they occur. Optionally, use MediaRecorder to record the test participants and monitor of the test computer. Set MediaRecorder up to start and stop recording together with the observation. See the MediaRecorder Help for the procedure.

CUSTOMIZING TERMINOLOGY

In The Observer XT, optionally change the default term **Behavior** to something that suits your research like *Event* or *Action*. Choose **File** > **Preferences** > **Terminology**. Enter the term and restart The Observer XT. Note that in the procedure below the term **Behavior** is used. In the program this will be replaced with the term you choose.

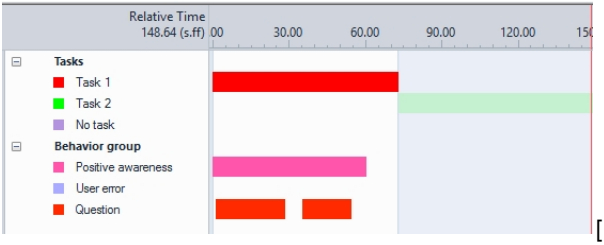
CODING SCHEME EXAMPLES

Subjects

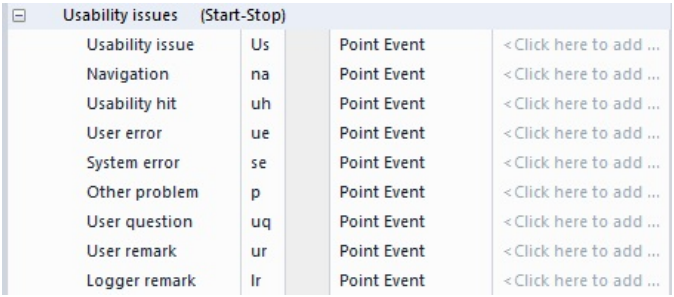
In general, one test participant is observed in each observation. Therefore it is not necessary to define Subjects in your coding scheme. Enter the identity and other details of the test participants in the Independent Variables list. See Subjects in The Observer XT Quick Start Guide for guidelines on using Subjects and Independent Variables.

Behaviors

To analyze the behavior of a test participant during specific tasks, define the tasks as behaviors with duration (State events). You can afterwards select the interval during which a certain task was performed and analyze the behavior of the test participant. Define a Behavior group in which behaviors exclude each other (mutually exclusive) en define the tasks as behaviors with duration (State events).



To analyze user experience it is often sufficient to mark the moment an event takes place. To do so, create behaviors without duration (Point events).

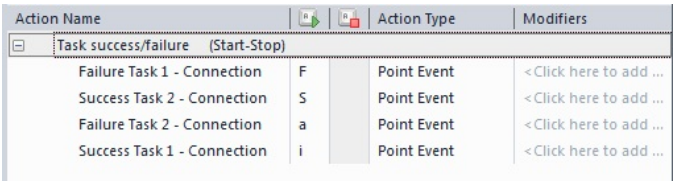


Usability issues (Start-Stop)				
Usability issue	Us		Point Event	<Click here to add ...
Navigation	na		Point Event	<Click here to add ...
Usability hit	uh		Point Event	<Click here to add ...
User error	ue		Point Event	<Click here to add ...
System error	se		Point Event	<Click here to add ...
Other problem	p		Point Event	<Click here to add ...
User question	uq		Point Event	<Click here to add ...
User remark	ur		Point Event	<Click here to add ...
Logger remark	lr		Point Event	<Click here to add ...

To analyze the instances when the user deviates from the optimal navigation path, one could define events describing the level at which the error is made, relative to the optimal path: *Same level* (error in the same page), *Level 1* (user deviates one level from the optimal path), *Level 2*, etc.

Deviation from optimal path (Start-Stop)			
Same level	s		Point Event
Level 1	1		Point Event
Level 2	2		Point Event
Level 3	3		Point Event
Level 4	4		Point Event

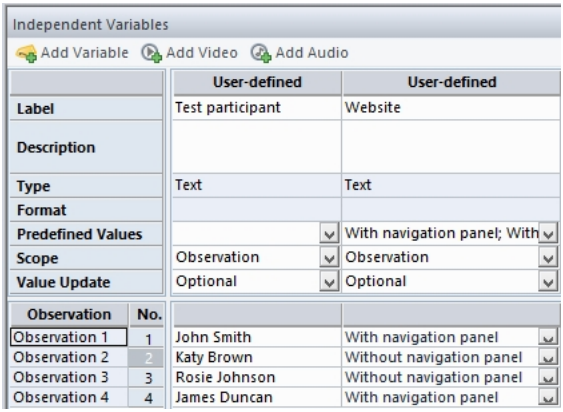
To analyze success rate, one can score the number of times *Success* and *Failure* takes place for each task. Define *Success* and *Failure* for each task as behaviors without duration (Point events).



Action Name			Action Type	Modifiers
Task success/failure (Start-Stop)				
Failure Task 1 - Connection	F		Point Event	<Click here to add ...
Success Task 2 - Connection	S		Point Event	<Click here to add ...
Failure Task 2 - Connection	a		Point Event	<Click here to add ...
Success Task 1 - Connection	i		Point Event	<Click here to add ...

INDEPENDENT VARIABLES

The independent variables list is the place to keep track of your test participants' identity. In addition to this you can, for example, add the type of product, type of website, or other conditions under which the test takes place.



Independent Variables

Add Variable | Add Video | Add Audio

	User-defined	User-defined
Label	Test participant	Website
Description		
Type	Text	Text
Format		
Predefined Values		With navigation panel; With
Scope	Observation	Observation
Value Update	Optional	Optional

Observation	No.		
Observation 1	1	John Smith	With navigation panel
Observation 2	2	Katy Brown	Without navigation panel
Observation 3	3	Rosie Johnson	Without navigation panel
Observation 4	4	James Duncan	With navigation panel

ANALYSIS EXAMPLES

Use the independent variables to analyze your data in groups. For example to analyze the male and female test participants separately. Use a data profile to define your selection and then run your analysis.

Result Container				
	Page navigation	Error	Scroll	Gaze at box
Males	102.72	165.43	59.71	44.69
Females	11.05	195.90	0.51	0.81

Use manual annotations to define time intervals and analyze the other data during these intervals. The example below shows the behaviors during interval *Task one*.

Behavior Analysis

Calculate | Settings | Layout | Statistics | Charts

	Observations	Result Container	Behaviors	
Statistics				Total number
	Observation 5	During task 1	Same level	3
			Level 1	3
			Level 2	2
			Level 3	1
			Level 4	1

See The Observer XT Help and Quick Start Guide how to define your selection and run the analysis.

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4 Human factors research

Human factors research involves the study of the physical or cognitive properties of humans which influence functioning of technological systems. The aim of human factors research is to improve operational performance and safety. When measuring human performance, a monitoring method is essential to capture and identify the occurrence of human error in normal operational processes. This leads to system and process redesign. The system is designed in iterative stages of monitoring, analysis, process redesign and implementation.

In this chapter we describe how to carry out evaluation of human factors using key features of The Observer XT, namely the ability to take notes and code human behavior manually and the ability to integrate a variety of data sources.

uASQ

During the test you can use uASQ to send questions to the test participant's computer, like whether the participant feels alert and how the system is experienced. The answers are imported into The Observer XT and can be used for further analysis of the manually scored events. You can, for example, analyze simulator data during the time the participants indicated low awareness.

Sample projects

The **HILAS cockpit evaluation** sample project illustrates an example of how The Observer XT can be used to analyze human factors in the development of aviation systems. Each observation (test session) is associated to video material. Important data like latitude, longitude, height etc. are also given in a graphical form.

The **Driver assessment** sample project illustrates how the gazing behavior of a driver can be assessed with an eye tracker. The eye tracker video and data are imported into The Observer XT and can be analyzed together with manual annotations.

PHYSICAL SETUP

In a common human factors experiment carried out with The Observer XT, the main computer (computer with The Observer XT and MediaRecorder) records the video footage from one or more video cameras pointed to the test subjects. Another computer (External data recording system) records the continuous variables (for example height, speed like in a cockpit simulator).

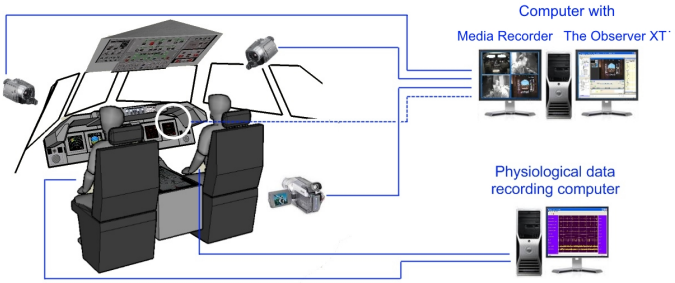


Figure 3 *An example of setup for human factors research. Video cameras provide video footage of the crew members and of the cockpit simulator. The Observer XT computer records video with MediaRecorder to digital media files. A separate computer records the crew's physiological data and simulator data. These data are imported in The Observer XT after the test and synchronized with the other data sets.*

The Observer XT computer and the External data recording computer can be physically connected with a synchronization cable. A synchronization signal sent out from The Observer XT to the external data computer will automatically synchronize the various data files with the observational data. Video recorded with MediaRecorder are automatically synchronized as well.

You do not need to have The Observer XT computer and the External data recording computer connected. You can synchronize your data

after the test by the timestamps present in the data files or manually by adjusting the time offset between the files.

See the External Data in The Observer XT Help how to work with The Observer XT and external data.

CUSTOMIZING TERMINOLOGY

In The Observer XT, optionally change the default term **Behavior** to something that suits your research like *Event* or *Action*. Choose **File** > **Preferences** > **Terminology**. Enter the term and restart The Observer XT. Note that in the procedure below the term **Behavior** is used. In the program this will be replaced with the term you choose.

CODING SCHEME EXAMPLES

Subjects

If you observe multiple persons in your observation, you can define their roles as subjects in the coding scheme. If you observe only one person in each observation, do not define subjects. Enter the names in the Independent Variables list instead. See **Subjects** in The Observer XT Quick Start Guide for guidelines about subjects and independent variables.

If you have multiple subjects and you define events that are not carried out by a specific person (for example, *Start test* or *Aircraft landing*), define a generic subject (for example, *Generic*), together with the other subjects. This is because each event, either scored manually or imported from another program (like the flight simulator), must be attached to a subject if you defined subjects.

Examples of subjects are:

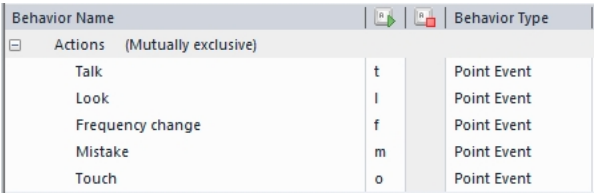
- Driver and Passenger (and Generic).
- Instructor, Captain, First Officer and Air Traffic Controller (and Generic).

Behaviors

To analyze certain phases in the test, for example during takeoff, flight, and landing of an airplane, define these as Behaviors with duration. You can afterwards select a phase and analyze the simulator data or manually scored events during this phase. Define a Behavior group in which behaviors exclude each other (mutually exclusive) and define the phases as behaviors with duration (State events).

Behavior Name	Description		Behavior Type
Flight phases	(Mutually exclusive)		
Takeoff		t	State Event
Flight		f	State Event
Landing		l	State Event
On ground		g	State Event

For many user actions it is sufficient to mark the moment they occur. Define such actions as behaviors without duration (Point events). If you need to know the duration of such actions, define them as behaviors with duration (State events).



Behavior Name			Behavior Type
Actions	(Mutually exclusive)		
Talk	t		Point Event
Look	l		Point Event
Frequency change	f		Point Event
Mistake	m		Point Event
Touch	o		Point Event

Modifiers

Use modifiers to further specify certain behaviors. Examples of modifiers are:

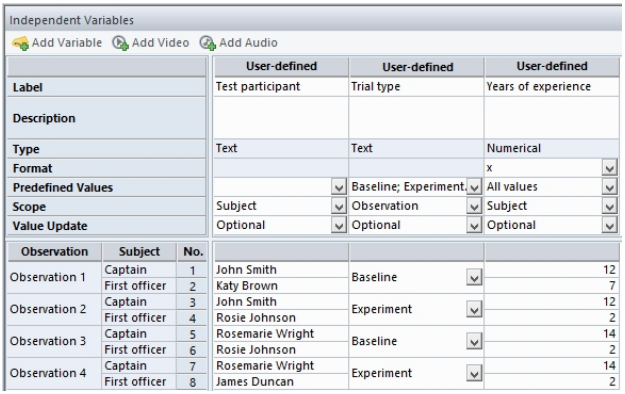
Behavior	Modifier
Look	At road
	At left mirror
	At right mirror
	At rearview mirror
	At passenger
	At other
Point	At display
	At monitor
	At person
	At other

INDEPENDENT VARIABLES

The Independent Variables list is the place to keep track of your test participants' identity. In addition to this you can, for example, add variables like the type of trial (baseline or experimental), the technology being tested, years of experience, etc.

If you observe multiple persons in each observation, define the Scope of the Independent Variable. The scope determines for which factor the independent variable varies. An independent variable like *Identity* varies per subject. An independent variable like the type of trial is the

same for all subjects in one observation and therefore varies per observation.



Independent Variables

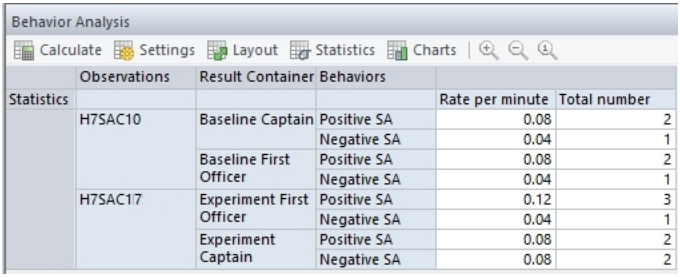
Add Variable | Add Video | Add Audio

	User-defined	User-defined	User-defined
Label	Test participant	Trial type	Years of experience
Description			
Type	Text	Text	Numerical
Format			x
Predefined Values		Baseline; Experiment	All values
Scope	Subject	Observation	Subject
Value Update	Optional	Optional	Optional

Observation	Subject	No.			
Observation 1	Captain	1	John Smith	Baseline	12
	First officer	2	Katy Brown		7
Observation 2	Captain	3	John Smith	Experiment	12
	First officer	4	Rosie Johnson		2
Observation 3	Captain	5	Rosemarie Wright	Baseline	14
	First officer	6	Rosie Johnson		2
Observation 4	Captain	7	Rosemarie Wright	Experiment	14
	First officer	8	James Duncan		2

ANALYSIS EXAMPLES

Use the independent variables to analyze your data in groups. For example to analyze the subjects and trial types separately. Use a data profile to define your selection and then run your analysis.



Behavior Analysis

Calculate | Settings | Layout | Statistics | Charts

	Observations	Result Container	Behaviors		
Statistics				Rate per minute	Total number
	H7SAC10	Baseline Captain	Positive SA	0.08	2
			Negative SA	0.04	1
		Baseline First Officer	Positive SA	0.08	2
			Negative SA	0.04	1
	H7SAC17	Experiment First Officer	Positive SA	0.12	3
			Negative SA	0.04	1
		Experiment Captain	Positive SA	0.08	2
			Negative SA	0.08	2

Use simulator data, or manual annotations to define time intervals and analyze the other data during these intervals. The example below shows the interval *From Fuel imbalance* to *Touch down*. See The

Observer XT Help and Quick Start Guide how to define your selection and run the analysis.

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5 Parent-Child interaction

An important aspect in the study of developmental psychology is the interaction between parent and child. It is obvious that the parent plays an important role in the development of a child, from infancy to adulthood. An example of a test from developmental psychology is Ainsworth's Strange Situation Assessment (Ainsworth and Bell, 1970). Based on this test, the style of attachment between a child and one of the parents can be determined. These early attachment styles can help predict behaviors later in life.

With The Observer XT, the interaction between a child and a parent can be recorded on video and scored in detail. For example, for the Strange Situation Test, you can score the style of attachment of the child. Additionally, you can carry out a Lag Sequential Analysis with The Observer XT to examine how the behavior of the parent affected that of the child and vice versa.

PHYSICAL SETUP

A parent-child interaction study can, for example, be carried out using the Noldus Portable Observation Lab. This portable lab consists of a notebook with The Observer XT and MediaRecorder installed, two cameras and tripods, and additional cables and plugs. See Figure 4 for an example of a setup of the Portable Observation Lab. The Portable Observation lab can easily be set up in a home, or a psychologist's practice.

It is, of course also possible to use a stationary setup in a psychologist's practice. Often a one-way mirror is used to observe the interaction unobtrusively.

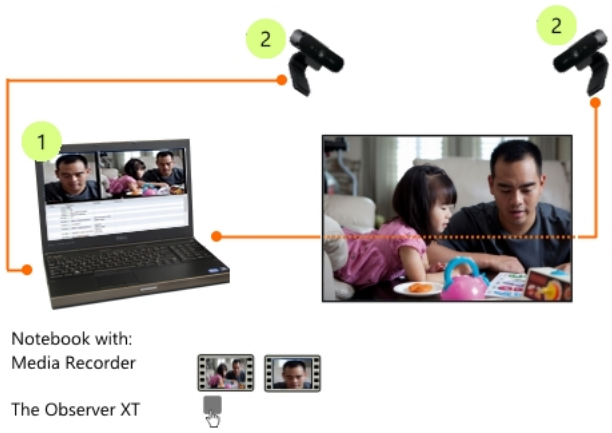


Figure 4 *An example of a setup for studying Parent-child interaction.*
1 - Notebook with MediaRecorder to record video and The Observer XT to annotate the parent and child behaviors.
2 - Two cameras that record parent and child from different angles.

CODING SCHEME EXAMPLES

Subjects

Typical examples of subjects in a Parent-child interaction are:

- Child
- Father
- Mother
- Stranger

If you observe only the parent or only the child in one observation, do not define subjects. Define the identity in the Independent Variables

instead. See **Subjects** in The Observer XT Quick Start Guide for guidelines about subjects and independent variables.

Behaviors

In a parent-child interaction often the duration of behaviors is important. Define those behaviors as behaviors with duration (State events). Use groups in which the behaviors exclude each other (mutually exclusive), since these are the easiest to work with. Examples of behavior groups in a parent-child interaction are:

Child verbal behavior:

- Talk to self
- Talk to toy
- Talk to parent
- No noise
- No verbal behavior
- Other verbal behavior

Child gestures

- Point at parent
- Point at toy
- Touch parent
- Touch toy
- No/other touching

Parent gestures

- Pick up child
- Touch child
- Comfort child
- Point at child
- Point at toy
- Other/no gestures

Modifiers

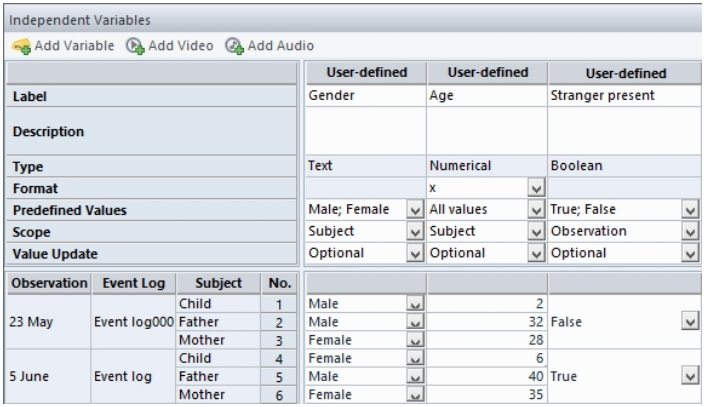
Use modifiers to further specify certain behaviors. Examples of modifiers are:

Behavior	Modifier
Talk to toy	Book
	Piano
	Doll
Pick up child	To comfort
	To place
	To dress
	To change nappies

INDEPENDENT VARIABLES

The Independent Variables list is the place to keep track of the identity of the persons that are observed. In addition to this you can, for example, add variables like the age and gender of the child and the parents.

If you observe multiple persons in each observation, define the Scope of the Independent Variable. The scope determines for which factor the independent variable varies. An independent variable like *Age* varies per subject. An independent variable like *Stranger present* is the same for all persons in one observation and, therefore, has the scope **Observation**.



Independent Variables

Add Variable Add Video Add Audio

	User-defined	User-defined	User-defined
Label	Gender	Age	Stranger present
Description			
Type	Text	Numerical	Boolean
Format		x	
Predefined Values	Male; Female	All values	True; False
Scope	Subject	Subject	Observation
Value Update	Optional	Optional	Optional

Observation	Event Log	Subject	No.			
23 May	Event log000	Child	1	Male	2	
		Father	2	Male	32	False
		Mother	3	Female	28	
5 June	Event log	Child	4	Female	6	
		Father	5	Male	40	True
		Mother	6	Female	35	

ANALYSIS EXAMPLES

Use the independent variables to analyze your data in groups. For example to group the observations in which a stranger was present or absent. Use a data profile to define your selection and then run your analysis.

Result Containers	Subjects	Behaviors		
			Mean duration	Total number
Stranger present	Child	Talk to parent	6.90	4
		Talk to self	148.61	3
		Other verbal	195.04	2
		No verbal	12.33	5
		Functional use	199.91	4
		No play behavior	31.38	4
	Father	Talk to self	4.40	1
		Other verbal	103.61	1
		No verbal	163.43	5
		No play behavior	462.59	2
	Mother	Talk to parent	2.98	1
		Other verbal	47.84	1
		No verbal	218.59	4
		No play behavior	462.59	2
Stranger absent	Child	Talk to parent	5.98	4
		Talk to self	255.75	3
		Other verbal	64.68	1
		No verbal	9.90	7
		Functional use	272.66	3
		No play behavior	35.73	3
	Father	Talk to self	4.40	1
		Other verbal	729.77	1
		No verbal	63.67	3
		No play behavior	925.17	1
	Mother	Talk to parent	2.98	1
		Other verbal	47.84	1
		No verbal	437.18	2

Use manual annotations, or physiological data, to define time intervals and analyze the other data during these intervals. The example below shows the intervals during which the child was playing. See The Observer XT Help and Quick Start Guide how to define your selection and run the analysis.

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6 Consumer behavior

Studying consumer behavior is an expanding field of research. Traditionally, methods like questionnaires and interviews are used to assess consumer preferences and food habits. Behavioral studies can have additional benefits. Asking people what they like, forces them to actively think about their choices. By observing people, you can get an idea of the unconscious choices that people make when selecting food.

The consumers' choosing behavior is typically recorded on video. The videos can be opened in The Observer XT and the behavior can be logged and analyzed. By defining independent variables like gender and age, it is possible to group the data and calculate whether men choose different products than women or whether age groups show differences in choosing behavior.

FaceReader

Optionally, use FaceReader simultaneously with your observations to analyze the facial expression of the consumers when they, for example, taste a product. This way you obtain information how they experience a certain product. The FaceReader data can be imported into The Observer XT and synchronized with the manual annotations for further analysis.

Sample project

The **Consumer behavior** sample project is an example of a study carried out in the Restaurant of the Future. The Restaurant of the Future is a facility for research on food-related behavior in Wageningen (The Netherlands). The restaurant is part of the campus of Wageningen University and looks like a normal restaurant but is equipped with 18 cameras mounted in the ceiling.

In the sample project, thirty consumers were observed while choosing their lunch from a buffet in the restaurant. The buffet contained three schnitzel-like products that were labeled as either 'healthy', 'welfare friendly' and 'new'. Other products in the buffet were: French fries,

vegetables, salad, tomatoes, cucumber, hamburger buns, onions, mayonnaise, ketchup, mustard, mineral water and Coca Cola.

PHYSICAL SETUP

A consumer behavior study can be carried out with a Noldus Portable Observation lab. This lab consists of a notebook with The Observer XT and MediaRecorder installed, and two IP cameras. The lab can easily be taken to and set up in a restaurant. See Figure 5 for an example of a setup of a Portable Observation Lab for studying consumer behavior (please note that the type of hardware in your Observation Lab might be different).

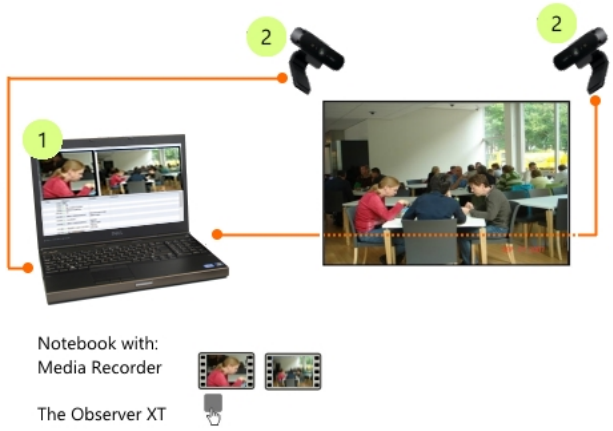


Figure 5 *An example of a setup for studying consumer behavior.*
1 - Notebook with MediaRecorder to record video and The Observer XT to annotate the behavior of the consumers.
2: Two cameras that record the scene from different angles.

CODING SCHEME EXAMPLES

Subjects

If you follow only one person in each observation, do not define subjects. If you follow more persons, you could define them as *Consumer 1*, *Consumer 2* etc. Optionally, define their names in the Independent Variables list. See **Subjects** in The Observer XT Quick Start Guide for guidelines about subjects and independent variables.

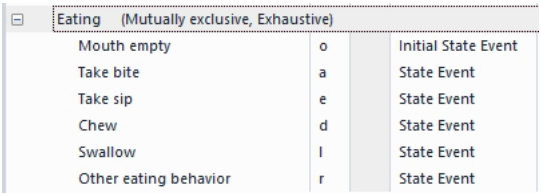
Behaviors

The behaviors of course depend on what you want to study. To study what the consumers choose, define the options they can choose from as behaviors. Most likely it will be sufficient to know how often certain products were chosen. Therefore you can define the products as behaviors without duration (Point events).

Behavior Name			Behavior Type
Food items (Start-Stop)			
chicken - healthy	h		Point Event
chicken - welfare friendly	w		Point Event
chicken - new	n		Point Event
French fries	f		Point Event
vegetable mix	v		Point Event
salad	s		Point Event
tomatoes	t		Point Event
cucumber	c		Point Event

If you are interested in the way the food is consumed, define the options like chewing, swallowing etc. as behaviors. Most likely you are not only interested how often these occur, but also how long they last. Therefore, define behaviors with duration. A behavior group in which

behaviors exclude each other (mutually exclusive) is easiest to work with. See **Behaviors** in The Observer XT Quick Start Guide for details.

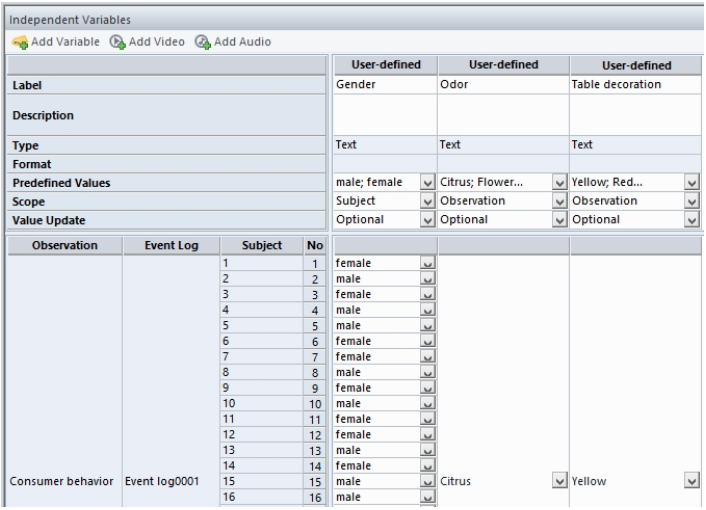


Eating (Mutually exclusive, Exhaustive)			
Mouth empty	o		Initial State Event
Take bite	a		State Event
Take sip	e		State Event
Chew	d		State Event
Swallow	l		State Event
Other eating behavior	r		State Event

INDEPENDENT VARIABLES

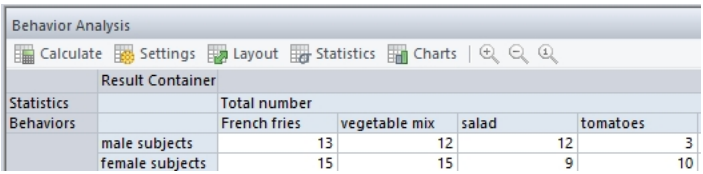
The Independent Variables list is the place to keep track of the identity of the persons that are observed and, for example their age or gender. These variables may differ per person and, therefore, have the scope **Subject**. In addition to this you can add variables that vary between observations and potentially influence the consumers' behavior. Examples are an odor in the restaurant, the way the tables are

decorated, the order the meals are presented at a buffet. These variables have scope **Observation**.



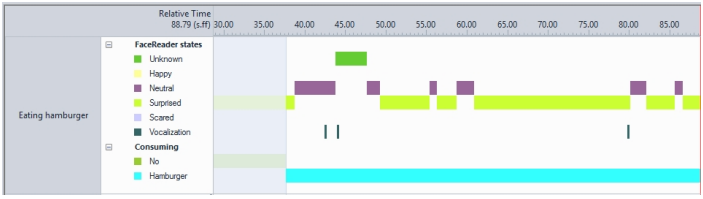
ANALYSIS EXAMPLES

Use the independent variables to analyze your data in groups. For example to analyze male and female consumers separately. Use a data profile to define your selection and then run your analysis.



Use behaviors to define time intervals and analyze the other data during these intervals. The example below shows the intervals during which a consumer was eating a hamburger. The facial states analyzed

by FaceReader are shown during this interval. See The Observer XT Help and Quick Start Guide how to define your selection and run the analysis.



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