

Noldus Observer XT: Usability Testing System

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Performance Analysis and Needs Assessment

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Index

A. Abstract	p. 3
B. Organizational Background	p. 3
C. What is actually happening?	p. 5
D. What should be happening?	p. 6
E. Performance Gap	p. 7
F. Data Collection Process	p. 7
G. Gap Analysis and Justifications	p. 10
H. Recommendations	p. 11
I. Conclusion	p. 16
I. Appendix	p. 18

Abstract

Usability testing and behavioral research are being considered as necessary topics to cover in a future class, called Human Factors, at James Madison University. It is important for future Human Resource Development professionals to understand human behavior in the form of emotions, facial expressions, and actions. The client had planned to use the Noldus Observer XT as a means to instruct students on usability testing and behavioral research. However, the Noldus Observer XT software is difficult to understand for novice users. The consultants were called in to develop a thorough instructional guide for conducting research with the software. Data was collected, regarding a previously created instructional guide, through interviews with the client and through the consultants following the guide to create an observation with the Noldus Observer XT system. Based on the data, the consultants deemed the original instructional guide to be inadequate. Therefore, the consultants created a more specific instructional guide for creating and carrying out observations on the Observer XT system, pulling information from Subject Matter Experts (SME), tutorials on the Noldus Observer XT website, and following the manual that accompanies the software. In addition to a new instructional hand out, the consultants created interactive PowerPoints that will help researchers understand key vocabulary and procedures in the system. The new instructional guide and the PowerPoints will help aide students and faculty in the Human Factors course or other classes in the College of Education at James Madison University, conduct valuable research.

Organizational Background

The consultants for this project, Nehali Shah and Britney Myers, were presented with a client that works within the College of Education at James Madison University. The client, Dr. Michelle Estes, presented a problem with the Noldus Observer XT system that is hoped to be

used in future courses in the Human Resource Development program as well as other programs at JMU.

The Noldus Observer XT system was bought by the College of Education in 2009 to conduct usability testing of software applications. The Observer XT software has only been used once since it was purchased. A graduate student in the Adult Education/Human Resource Development Master's program used the program for a reading and research project during the 2009-2010 school year.

The Observer XT is an advanced event-logging software that can be used by researchers attempting to present observational data. The software was launched in 1990, and over the years has evolved to allow researchers to incorporate video recordings of their participants, code and describe the observed behaviors in a quantitative manner, and share their coding schemes with other researchers. The Observer XT software can be used in a variety of fields of study including child-parent interactions, classroom observation, market and consumer research, psychiatric research, behavioral assessment, user experience research, usability testing and human factors research (Ouwerkerk, n.d.).

Originally, two complications were posed regarding the ease of the use of the Observer XT software. The first was the set up of the software, including the computer, video cameras, microphones, etc. Since this specific system is portable, it took the graduate student more time to use the system because he had to set everything up before he could begin the actual project/observation. Eventually, a permanent home was found to house the software so that setup was not required for every user wanting to use the program. The Observer XT software is now set up on the third floor in Memorial Hall. This is a secured room in which both a key and passcode are required to unlock and enter the room.

The second complication is what this project is addressing. After the setup complication was solved, there still existed the problem of learning how to actually set up a project and carry out an observation, in order to gather data and analyze results. The program and its options are very detailed and require a basic understanding of research, specifically behavioral research language. The rest of this document will cover the details in the complications of the use of the software as well as recommendations for the future use of the Observer XT software.

The software was originally bought in hopes of having a system for both students and professors to use for either behavioral research or usability testing of the application of software. Although the software can be very useful, both in research and other class activities, there seemed to exist a problem with the software's ease of usability. The client, Dr. Estes, told the consultants that there is an existing instructional handout, however, it does not seem to be efficient in directing new users on how to use the actual system. Dr. Estes was looking for some type of further instruction where new users can come in and be able to use the system fairly easily without having to reference the actual Observer XT manual. She stated that any kind of help as far as enhancing the support provided for using the software would be very beneficial to her as well as the future HRD Undergraduate Program that is currently being developed.

What is actually happening?

The Noldus Observer XT software currently lives in an observation room in Memorial Hall at James Madison University. It was originally purchased several years ago in hopes of being used by students in their research projects. Only one student has used the software since it was purchased in 2009. This number is much less than the amount that was expected by JMU and the professors who intended for students to use it.

A big factor that plays into the lack of use of the system is in using it. Last year, two graduate students from the Adult Education and Human Resource Development graduate program, set up the Noldus system in the room it is currently located in. This relieved the problem of having to set up the system each and every time it was to be used. Although the system was set-up in a permanent place, no other students or faculty have used it.

What should be happening?

Now that the software is housed in a constant and secured environment, it should be used much more than it currently is. The ideal situation the client is looking for is for anyone, including new users, to be able to approach the Observer XT program, use it, and then analyze results gathered from the software as easily as possible. Students and faculty should not be discouraged and/or confused while trying to use the system due to the lack of resources and help available. Rather, they should feel comfortable with the directions they are being given, in whatever format that may be.

With that said, it is not expected for someone with no research background to completely understand all of the terms and applications of the system immediately. Therefore, the system will ideally be used after some instruction and/or background is given about the purpose and uses that the software provides. The consultants decided that any instructional guide presented with the software, be user friendly, while incorporating necessary information regarding research. This means that the guide not only needs to be easy to follow, but should also provide enough background information about research in general, and should clarify any research jargon that must be known in order to use the software for a project.

Performance Gap

The original document was a two-page instructional handout of steps to guide the researcher on how to use the Observer XT software (Appendix A). The handout was broken into five categories: (1) Set up your project, (2) Carry out an observation, (3) Select data for analysis and export, (4) Analyze your data and (5) Export your data. Below each of those categories, anywhere between four and seven steps were provided on how to execute that category. While going through the process themselves, the instructional designers immediately saw where the handout was lacking in clarity of instruction. In fact, there was confusion in the very first step, on which program to open to begin a new project using the software. There was clearly a need for further instruction and description of what the proper steps the user needs to take in successfully testing software using the Observer XT. The consultants deemed it necessary to not only to add a significant amount of information to the current instructional handout, but also create more interactive learning modules. The gap that exists with the Observer XT program and its users is that the system is a very detailed software to use that requires a great deal of instruction on how to use it; however, that necessary instruction is lacking. Students and faculty wishing to use the software should be able to successfully set-up, carry out, analyze and export a project with the provided instructional materials with ease.

Data collection process

The data collection process consisted of consulting with the client/subject matter expert (SME), gathering data from the Observer XT manual, sources from the Internet, and finally the consultants' use of the actual software. The project consultants originally planned to interview with students and/or faculty that have used the software in the past, however that number is very limited- hence the need for help and instruction. It was discovered that no one had used the UTS

to conduct research in the past three years. The last student to use the software was a graduate student of the Adult Education and Human Resource Development program who graduated and no longer resides in Harrisonburg. Therefore, the consultants were limited to only having the client and one other professor available to interview and gather data from.

The data collection officially began after the initial meeting with the client/SME. The initial meeting allowed the consultants to discuss with Dr. Estes her needs and wants for the project and provided an overall explanation at the perspective project at hand. After the first meeting, the consultants were able to conclude that a performance gap definitely existed, and that is one in which needs assessment and performance analysis would help begin to solve. The client and both consultants agreed on terms to which the consultants would fulfill for this project (Appendix B).

To gain a more thorough understanding, the consultants used the actual Observer XT system as one of the data collection processes. The consultants began by starting a new project and followed the original instructional handout through each of the steps provided. This was thought to be the best approach in order for the designers to truly understand where the needs were.

It was immediately evident that the current instructional handout is not only not very user friendly, but also missing multiple key steps in all of the sections of setting up and conducting an observation. As they walked through the Observer XT program, the instructional designers composed notes on where the instruction was incorrect, unclear, or simply missing. This was an efficient method because the consultants both have a research background, but no experience with the Noldus system, nor any experience with behavioral research, which the system

primarily uses behavioral research language. This allowed the consultants to really view the instructional handout and software from the perspective of a future user.

One of the next data collection processes included the consultants referencing the Observer XT manual and online sources. This was deemed necessary since the assessors could only gather so much information from the existing handout and since they had no prior knowledge of the software. The assessors carefully dissected the manual to see what kind of information would be necessary to include in an upgraded version of an instructional guide. They tried to make sure no “nice to know” information would be in the recommendation to add to the guide since too much information can overwhelm students and/or professors when using a new software program.

Internet sources were also believed necessary to include as a part of the data collection. Although the manual provided useful information, the Internet provided further instructional help that was also user-friendly. The website that was most used was the Noldus Information Technology site. Although a lot of the information included in the Observer XT User Manual was on the website, the website also contained tutorials and more information on the use of the system. The site also included information on the latest version of the Observer XT software – Observer XT 10.5.

Interviews with the client/SME were another data collection process that was used throughout the entire course of the project. Information such as the background of the past uses of the Observer XT software, lack of information on the program and information on the software itself was gathered from the SME. The consultants had several meetings throughout the semester with Dr. Estes to discuss the progress of the project as well as any questions the consultants had at that point in time.

Consultants were also able to meet with a professor in the psychology department at JMU. For this project, Dr. Krisztina Jakobsen, is also considered as one of the SMEs of the project. Dr. Jakobsen works in the psychology department, where the second Noldus Observer XT system that JMU owns is housed. The purpose of this meeting was to collect more information about the software, as well as to gather information about the behavioral side of the software program, since it is heavily based in behavioral research. The consultants, as well as the client, were able to collect very useful data (Appendix C).

Gap analysis and justifications

While the consultants followed the original instructional guide, multiple instances were found in which clarity, necessary steps, and valuable information were lacking. For example, in the section titled “Set up your project,” information was not given on how to even open the Noldus Observer XT software (Appendix A). Through conversations with Dr. Estes and trial and error, the consultants realized that simply double-clicking on the Noldus Observer XT icon on the desktop does not open the program. A USB key must be inserted prior to even opening the program. If this step is missed, the program will show an error message and shut itself off. Therefore, the consultants decided to start the “Set up your project” process by instructing users to first insert the USB key and then to double-click on the Observer XT icon on the desktop (Appendix D). Similarly, clarity was lacking in the original handout regarding selections of independent variables and behaviors of interest. It seemed as though the previous handout assumed that all users of the software will be highly knowledgeable regarding vocabulary associated with these topics. For example, the instructions of the original handout concerning selection of behavior groups start by stating, “Create behavior groups (mutually-exclusive or start-stop)” (Appendix A). By working through the software using the original instructional

guide, the consultants realized they did not know the definitions for “mutually-exclusive” nor “start-stop.” Therefore, the consultants referenced the user manual for the software and provided these definitions as a part of the interactive PowerPoint they created, titled, “Subjects, Behavior, and Coding” (Appendix E).

Based on their observations and consultation meetings with their client and SMEs, the clients decided that this gap in ease of use needed to be filled. It was clear that the software itself is difficult to understand, for even knowledgeable professors who have conducted vast amounts of research. It was thought that if the software was confusing for them, then students, especially those in their undergraduate career, would have an even more difficult, frustrating time attempting to use the Observer XT program. Therefore, the consultants decided that in order for this program to play an important role in the new Human Factors course, a more in-depth, yet easy to follow instructional guide be developed. In order to be certain that the guide covered the necessary steps in creating, conducting, and analyzing a project, the consultants further decided to use accompanying materials, in the form of interactive PowerPoints to help students and faculty understand more basic, background information, like definitions of key terms (Appendix E).

Recommendations

There are several recommendations the consultants developed to provide to the client regarding the Observer XT software.

Recommendation One

The first recommendation is to keep an instructional handout similar to the existing one. The paper handout should be kept in the same place, next to the computer where the software is used in the UTS room. This allows any users to have immediate and direct access to instructions

and details of how to start and carry out an observational project. The only change is that a newer version of that handout is suggesting to be used instead of the existing handout. This revised version includes much more detail and clarification on the steps involved to create a new project, carry out an observation, and analyze and export data gathered from the observation. The details added to the existing handout include information that is on a ‘need to know’ rather than a ‘nice to know’ basis.

The consultants recreated the first section of the revised version of the existing instructional handout to give to the client. Before making any changes, the consultants took into high consideration that the bulk of the future users of this software will have little to no background on research. Therefore, the first step to enhancing the instructional handout the consultants took was to define or clarify any type of behavioral research language that someone with little to no research background would not understand without any explanation. For example, definitions and clarifications between “continuous” and “instantaneous” sampling were written out within the new handout (Appendix D).

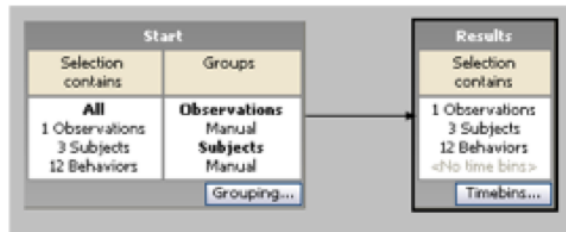
Students taking courses in the AHRD minor are good candidates for completing the remaining section of the revised handout. The rest of the sections could be reevaluated by the students to see how much more detail is needed. Although some detail and clarification was added to the instruction in sections two through four, only section one was completed in its entirety. The completion of the remaining four sections could be done by referencing both the Observer XT manual, the Observer XT website and the trial use of the Observer XT program itself. This would make a good project for any of the higher-level classes of the AHRD minor.

Recommendation Two

The second recommendation, which was partly created by the consultants, includes additional components to the instructional handout. Screenshots of examples of the steps involved in a new project on the Observer XT were also added to the first section of the new user handout. Additional screenshots are also being suggested for use for the rest of the handout. One example area of where the screenshots can be useful for users is in section three of the instructions when it talks about how to “filter observations by name or independent variable value” (Appendix A). All of the screenshots that are included and/or being suggested will provide a visualization of the steps that the users need to follow (Appendix D). Appropriate areas where screenshots can be helpful include any section or steps that include areas that are more in-depth and content-heavy. Here are some examples that the consultants added to the upgraded version of the handout:

Section 3: Select Data for analysis and export

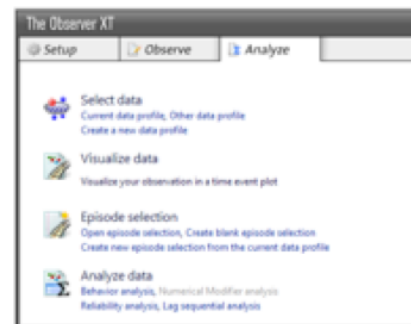
1. Click on the **Analyze** tab
2. Click on **Create a new data profile** under **Select Data**
3. Name your new data profile based on the selection you are choosing to analyze
4. Filter entire observations by name or independent variable value
5. Group observations or behaviors (Click the Grouping button in the Start box)
6. Filter out behaviors you do not want to analyze
7. Nest your data (Ex: To find out what A was doing whilst B walked)
8. Make multiple result containers to compare the results of different selections in one overview



Step 4

Section 4: Analyze your data

1. To visualize a plot of your raw data, click **Visualize Data**.
2. Select which set of data you want to see in the pop up window titled **Select Observation** and click **Ok**
3. Analyze a specific behavior to answer a research question
 - a. Under **Select Data**, click **Create a new data profile**
 - b. In the pop up window, enter the type of event you want to analyze (Ex: "Look at adult") and click **Ok**.
 - c. By default, all of your data will be selected. You must now select the filter from the left hand side through which you want to narrow the data



A second component that was made in addition to the screenshots on the handout includes interactive PowerPoints. These PowerPoints were designed to further aide any user to help clarify both definitions of research terms and the guidance of the steps. The consultants suggest that these PowerPoints be placed on the desktop of the laptop where the Observer XT software program lives so that at any point in time, the user can open the interactive PowerPoint for further help. The consultants designed three interactive PowerPoints that include information on the first section of the revised instructional handout (Appendix D).

The third component the assessors would suggest for the client to consider using are screencasts. Screencasts would be yet another step up from interactive PowerPoints and would include voice within the instruction. This would provide even further guidance to the user because he or she would both be able to visually see the steps happening in a video as well as hear a person talking and guiding him or her through the appropriate steps. This is another component that could be developed by students in the AHRD minor at JMU.

Recommendation Three

Third, the consultants suggest that the College of Education upgrades to the newest version of the Noldus. Currently, the College of Education owns the Observer XT 9.0. However, the software has been updated to version 10.5, which carries more user-friendly features and is available for purchase. The Observer XT 10.5 was developed in response to user concerns. It includes improvements in navigation via drop down menus and button bars, a screen layout that users can manipulate themselves, an option for researchers to easily share their projects, and easier instructions on how to set up their project, conduct an observation, and analyze their results (Ouwkerk, n.d.).

Recommendation Four

The fourth recommendation the consultants would like to present, is the use of the technical support provided by Noldus Information Technology. The team at Noldus offers help regarding both human and animal research in the form of consultations, customer support, and training courses. It is suggested that the College of Education focus on the customer support help desk and then consulting services Noldus Information Technology offers regarding human factors research. Technical support for any Noldus product can be attained through the Noldus website (www.noldus.com), telephone, e-mail, Skype, and remote assistance (Appendix F). If

contacted, Noldus says they will help researchers set up a test lab environment, conduct a test, and present the results (Ouwerkerk, n.d.).

Recommendation Five

The fifth recommendation the consultants suggest is pilot testing. Upon discussion between Dr. Jakobsen, Dr. Estes, and both consultants, it was decided that pilot testing would be an effective and efficient approach to conducting research with the Observer XT system. Dr. Jakobsen noted that she had performed pilot testing in the past, before conducting her research. This helped her research team decide the specific behaviors that would be observed given the conditions they presented in the test environment. Furthermore, pilot testing also aided the team in choosing the appropriate independent variables to study. The consultants believe that conducting pilot testing with the software will help students and faculty using the system conducts more thorough research that has a clear focus.

Conclusion

The Observer XT software proves to be a very useful program both in and outside of the classroom. As stated earlier, it was originally purchased so that both students and faculty would have an outlet to use for both behavioral research and usability testing of software applications. Although there is an existing instructional piece to help guide along new users of the system, it was found to be inadequate in both efficiency and information. It has become more pertinent for revised and additional instructional pieces to be added since it is planned to be used a part of a project in the Human Factors course that will be a part of the AHRD major in the near future. With the five recommendations taken into consideration, the consultants believe that the system will not only be able to be used with more ease but also be used more often than it currently is. Even implementing one of the recommendations will help future users be able to work through

the system with greater ease than compared to using the current instructional handout. With the help of AHRD students these recommendations can be developed and eventually implemented to ensure that the system will be used as it is expected to, for both students and faculty.

Appendix A

Previous Instructional Handout

The Observer XT in a nutshell

Set up your project



- Create a project (**Ctrl+N**)
- Decide how you will observe (live, from video files, with Pocket Observer, with external physiological data, etc) and set the method in your Observation Settings
- Decide what behaviors you want to observe, and define them in your coding scheme:
 - Create behavior groups (mutually-exclusive or start-stop).
 - Define behaviors and their keystrokes.
 - ⊕ If you group behaviors that cannot occur at the same time in mutually-exclusive groups, it saves keystrokes when scoring. No need to score 'stop running', just score 'start walking' and running stops automatically. If durations do not matter, just define point events.
 - Optionally define modifiers (linked to behaviors), and subjects.

Behavior Name	AP	AP	Type	Modifiers
Locomotion (Mutually exclusive, Exhaustive)				
Stand	s		Initial State Event	+Click here to add Modifier groups
Walk	w		State Event	+Click here to add Modifier groups
Run	r		State Event	Speed
Jump	j		Point Event	+Click here to add Modifier groups

- Define your independent variables (treatments, conditions, etc).
- Create a read-only project for a student to use with the settings you have made

Carry out an observation



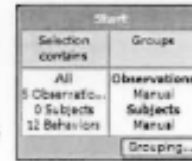
- Create an observation (**Alt+F6**)
- If you are working offline, select a video file. If you are working live this is not necessary.
- Start recording the observation by pressing the green button (**Ctrl+Alt+B**)
- Press the keys you have assigned, or click on the codes window to score the events
- Stop the observation (**Ctrl+Alt+Q**)
- If you have co-acquired external data, import it



	Event Time	Behavior	Behavior Modifi	Comment
Start	+0.00:28.000			
1	+0.00:28.000	> stand		
2	+0.00:33.631	> stand		
3	+0.00:33.631	> walk		
4	+0.00:35.571	Shout		"hey"
5	+0.00:35.563	> walk		
6	+0.00:35.563	> run	10	

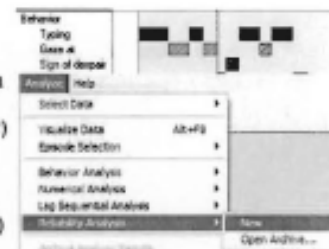
Select data for analysis and export

- Filter entire observations by name or independent variable value
- Group observations or behaviors (click the Grouping button in the Start box)
- Filter out behaviors you do not want to analyze
- Nest your data (to find out what A was doing whilst B walked)
- Make multiple result containers to compare the results of different selections in one overview

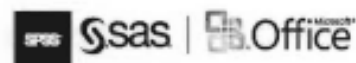


Analyze your data

- Visualize a plot of your scored behaviors, video and external data
- Analyze behaviors (how often did A run? How long was C sitting?)
- Analyze numerical modifiers (what was the average speed?)
- Analyze the sequence of events (How often did run follow walk?)
- Analyze the reliability of your scoring (how does my observation compare to another?)



Export your data



- Export your analysis results for statistical tests in SPSS or further calculations in Excel
- Create an episode selection (Analyze menu):
 - Generate a highlight video of the behaviors that interest you (this is what I mean by aggression!)
 - Export the physiological data for your data selection (the heart rate for one minute after he started running)
 - Export the event data from all your observations together in one file
- Export all your data together in one XML file (*.odx) for import into another project on another computer to analyze together
- Create a backup of your project for safe keeping of your data.

Noldus

Appendix B

Client/Consultant Agreement

Ultimate Goal:

To clarify the instructional guide for the Usability Testing System. This will be accomplished through creating a more detailed and user-friendly step-by-step handout.

Procedure/Process:

A. Use Wix versus Weebly to understand how to use the UTS

1. Take notes on where steps may be missing with established guide
2. Both Nehali and Britney will test and learn how to use the UTS
3. Figure out where instruction is needed

B. Interview with Dr. Estes and any other individuals who have used the system within the past year

1. Gather further information about where the guide falls short for the user

Overarching Framework

1. Break up guideline into however many sections to be able to provide the best training
 - a. Sections will include “Setting up the Codes”, “Implementing the Experiment” and “Analyzing the Data”
 - b. More sections will be added if needed
2. Create entire first section (Setting up the Codes)
3. For the rest of the sections, we will provide a descriptive outline with suggestions of what content needs to be included in the instruction for those particular pieces
4. The provided modules and outline will be provided to the client in both paper and electronic form
5. We will also provide the client with suggestions to who would be good candidates to work on pieces of a section(s) in the future

Client Signature:

Date:

Consultant #1 Signature:

Date:

Consultant #2 Signature:

Date:

Client/Consultant Agreement

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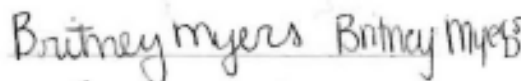
Client Signature:



Date:

2-23-12

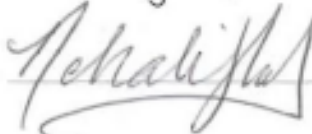
Consultant #1 Signature:



Date:

2/22/12

Consultant #2 Signature:



Date:

3/27/12

Appendix C

Notes taken during meeting with Dr. Krisztina Jakobsen

- Set up as much as you can in the beginning, because some things you cannot change in the middle of the project
- Tech support is always helpful
- Add Pilot testing to recommendations
- For this project, focus is on frequency rather than duration

Dr. Jakobsen took the consultants and client through a run-through of how to set up a project using the Noldus system. Here were the notes that were taken:

Creating new project:

1. Observations
 - a. Offline or live
2. Coding scheme
 - a. Add subjects
 - i. Example: (1) Mom, (2) Child
 - ii. Example: (1) Student A, (2) Student B
3. Behaviors
 - a. ***Really important to add before starting project because they are one of things that you cannot change later on in the observation***
 - b. Setting up behavior groups
 - i. Mutually exclusive*
 1. Choose when you cannot a behavior running at the same time as another behavior
 2. Example: Cannot have “Facial Expressions” and “Think Aloud” running at the same time
 - a. It does not make sense for someone to look happy, but say they are confused
 3. Example set up of behavior groups:
 - a. Facial Expressions
 - i. Frustrated
 - ii. Happy
 - iii. Sad
 - iv. Confused
 - b. Think Aloud
 - i. Frustration
 - ii. Anger
 - iii. Excited
 - iv. Confusing
 - ii. Start-stop behavior:
 1. If one behavior starts, you can also start one simultaneously
4. Independent variables

- a. It is possible to not put IV in the Noldus system, but rather have IV on a spreadsheet and then combine the data (not necessarily useful for this specific project)
- b. The system already tells you start, stop and duration time
- c. Example set up of Independent Variables:
 - i. Age
 - 1. Type:
 - a. Numerical
 - 2. Predefined variables:
 - a. Define a range; Example 18-21 years, so if someone puts in that they are 24 years old, it would say he or she is not eligible for this testing
 - ii. Language
 - 1. Type:
 - a. Text
 - 2. Predefined variables:
 - iii. Consent
 - 1. Type:
 - a. Text
 - 2. Predefined variables:
 - a. (Add in) Yes consent
 - b. (Add in) No consent
 - iv. Native Language
 - 1. Type:
 - a. Text
 - 2. Predefined variables:
 - a. (Add in) English
 - b. (Add in) Spanish

5. Creating Observation

- a. Include participants
 - i. Name: (name of person, ID number, etc.)

Description: (don't necessarily have to put a description: could also put the ID of a person here so you can protect their identity)

Appendix D

Noldus Observer XT Instructional Guide
Newly Developed Instructional Handout
(Only section one fully completed)

Sections:

- | | |
|--|------|
| 1. Setting up your project | p. 2 |
| a. Observation | p. 2 |
| b. Subjects, behaviors and coding | p. 3 |
| c. Independent variables | p. 4 |
| 2. Carry out an observation | p. 6 |
| 3. Select Data for Analysis and Export | p. 7 |
| 4. Analyze your Data | p. 7 |
| 5. Export Data | p. 8 |

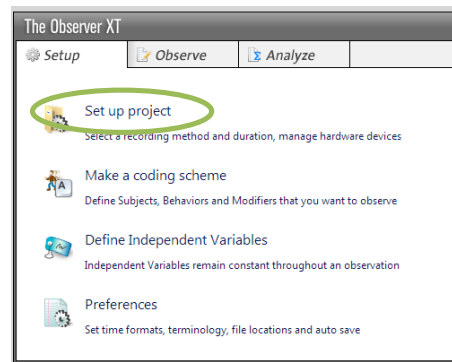
Section 1: Set up your project

1. Insert the USB drive
2. Double click **The Observer XT 9** on the desktop
3. Create a project (CTRL+N)
4. Click **Set Up Project**

Observation

(See “Interactive PowerPoint Observations” on desktop for further instructions/help)

5. Choose how you will observe (Instructions provided here are for a Live Observation)
 - a. Offline Observation (pre-recorded media file)
 - b. Live Observation (live event)
6. If you are conducting a live observation, click **Devices** to choose which device(s) you will be using:
 - a. Sony DV Device
 - b. VGA2USB V2U18761
7. Choose your Observation Method
 - a. **Continuous Sampling:**
 - i. You record all occurrences of the behaviors of interest of one or more subjects for a specified length of time.
 - ii. Choose when you want to calculate absolute frequencies and durations of the behaviors of interest
 - b. **Instantaneous Sampling:**
 - i. You record the behavior of one or more subjects at preselected moments in time (sample points).
 - ii. Choose when you want to calculate relative frequencies of behaviors (Ex: time, budgets), general activity of one or more subjects, behavioral synchronization of several subjects and spatial relations in groups
 - iii. Not suitable when you want to record behaviors with a very short duration.
 - iv. Important to choose an appropriate interval between sample-point to yield meaningful data.
 - c. **Combine Continuous and Instantaneous Sampling:** use when you want to record the behavior of one or more subjects in detail (focal subjects) while recording the behavior of other subjects in less detail
8. Choose your Observation Duration:
 - a. **Open-ended observation:** Choose this if you want to end observation manually.
 - b. **Duration based on elapsed time:** Choose this option if you want to stop the observation when the time from the start (including the time the observation was suspended) has reached the Observation duration.
 - c. **Duration based on observed time:** Choose this option if you think you may suspend an observation at some time and want to stop the observation when the Observation duration has been reached, excluding the time the observation was



suspended.

9. Click **Coding Scheme** (Right Green Arrow) at bottom right of screen when finished

Subjects, Behaviors and Coding

(See “Interactive PowerPoint Subjects, Behaviors & Coding” for further instructions/help.)

10. Under *Subjects* click **Add Subject**

a. Type a name in the **Subject name** column, then press **Enter**.

11. Under *Behaviors* click **Add Behavior Group** to create behavior groups. Pick between:

a. **Mutually Exclusive states:**

- i. Select this option if the state behaviors within that group exclude each other at any time. When one of the behaviors is active, the other behaviors within the same group cannot be active.
- ii. The advantage of mutually exclusive behaviors is that during coding, you do not need to stop behaviors. When you start a new behavior, the previously coded behavior of the same group automatically stops.
(Ex: walk and sit)

iii. If you choose this, you have the following option:

1. **Exhaustively active behavior group:**

- a. Select if you want to score the behaviors of this group in such a way that no “empty” time line is left between successive events.

b. **Start-Stop states:**

- i. Select this option if the state behaviors within that group are independent of each other with regard to their onset. Such behaviors do not stop automatically when a new behavior is scored and have, therefore, in addition to a start key-code, a stop code to stop it.
(Ex: Task 1 and User error. These behaviors describe independent events, since the beginning of one does not necessarily mean the end of the other.)

12. Enter a group name for your behavior group

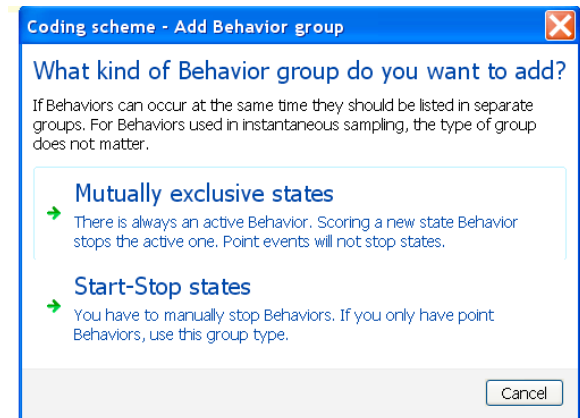
(Ex: Facial Expression, Think Aloud, etc.)

13. Enter behaviors

(Ex: Under ‘Facial Expression’: Sad, Confused, Happy, etc.; Under ‘Think Aloud’: Confusion, Excitement, etc.)

14. For each behavior determine its behavior type in the drop down menu from the following:

- a. **Initial State Event:** is automatically scored at the start of an observation
- b. **State Event:** have a distinct start and end. Besides the frequency of occurrence, the duration is recorded
(Ex: walking, playing, grooming)
- c. **Point Event:** behaviors without measurable or relevant duration. Either their



duration is very (immeasurably) short (Ex: hitting) or you are not interested in the duration of the behavior but only in its frequency (Ex: talking)

15. When finished, click **Create Group**.

a. If you want to add another group(s), repeat steps 11 to 15.

16. When finished creating groups, click **Independent Variables (IV)** down at the bottom right of the page.

Independent Variables

(See “Interactive PowerPoint Independent Variables” on desktop for further instructions/help)

Definition of an independent variable: An independent variable is a variable you have control of, the one you can manipulate (Ex: Research present or research absent during observation)

17. Click **Add User-defined** to name your IV(s).

		System	System	System	User-defined
	Label	Stop Time	Duration	Start Time	<Enter name 1>
	Description	The stop time of the observation	The duration of the observation	The start time of the observation	
Add User-defined	Type	Timestamp	Duration	Timestamp	Text
Add Digital Media	Format	MM/dd/yyyy HH:m	s.ff	MM/dd/yyyy HH:	
Show Independent Variables	Predefined Values				
	Scope	Observation	Observation	Observation	Observation
	Value Update	Automatic	Automatic	Automatic	Optional

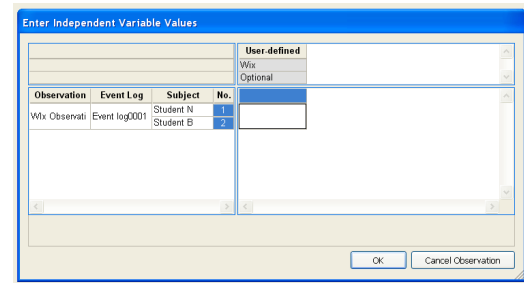
18. Fill in the following fields:

- Label:** Here is where you name your independent variable. Each different variable must have its own unique name.
- Description:** This part is optional. It allows you to enter text about the background information of that variable.
- Type:** Choose one of the following from the drop-down list:
 - Text:** Variable is indicated by alphanumeric characters, composed of letters, numbers or both (Ex: the name of the observer)
 - Numerical:** Variable is represented by numbers only (Ex: the age of the subject)
 - Timestamp:** Variable is represented by a time stamp (Ex: the starting date and time of experiment)
 - Duration:** Variable is represented by a duration (Ex: the duration of the treatment)
 - Logical:** A variable that is either ‘False’ or ‘True’ (Ex: whether or not the observer is present during the test)
- Format:**
 - For Text Variables:** If the variable is text only, a ‘format’ does NOT need to be specified.
 - For Numerical Variables:**
 - Click in the **Format** box

2. Select the **No. of decimals** box and enter the number of decimals your variable has. If your variable has zero decimal places, leave the box blank.
 3. Check the **Scientific notation** box if you want to write your numerical variable in scientific notation form
(Ex: 1485.236 as 1.485e+0.03)
 4. In the Unit field, enter the unit of your variable
(Ex: 'years' for the age of the subject)
 5. Click **OK**
- iii. **For Timestamp Variables:**
1. Click in the **Format** field.
 - a. If variable is a System variable (one that includes Start Time, Stop Time and duration of your observation), the **Time Format** preferences window appears instead of the **Format** string window.
 - b. Enter your preferred format in the field at the top and click **OK**.
- iv. **For Duration Variables:**
1. Click in the **Format** field.
 2. Enter your preferred format in the field at the top and click **OK**.
- v. **For Logical Variables:** You do not need to specify a format.
- e. **Predefined Values:**
- i. **For Text Variables:**
 1. Click in the **Predefined Values** field.
 2. Enter a value for your independent variable
(Ex: name of one of the observers)
 3. Click **Add**. The value you entered will move to the **Predefined Items** field. You can enter the other names of the other observers.
 4. Keep the **Allow other values** check box selected if you are not sure whether the values you have defined are exhaustive.
 - ii. **For Numerical Variables:**
 1. Double-click in the **Predefined Values** box.
 2. Enter the minimum and maximum values for your independent variable. Then click **OK**.
 - iii. **For Timestamp and Duration Variables:** You do not need to specify any predefined values.
 - iv. **For Logical Variables:**
 1. Click in the **Predefined Values** box.
 2. Enter values for 'False' and 'True'
(Ex: If your variable is 'presence of observer', you may define the values 'No' (False) and 'Yes' (True)).
- f. **Scope and Value Update.**
This value is already established. If you would like to change it, see the Observer XT reference manual. (Chapter 4; p. 121)

Section Two: Carry out an observation

1. Create a new observation
 - a. Enter the name of the observation
 - b. Add description of observation (if desired)
 - c. Click on the **Devices** tab and select the necessary devices to use your recording
 - d. Click **OK**
2. If you are working offline, select a video file (if you are working live this is not necessary)
3. Starting and Observation
 - a. Define which behaviors are active at time zero.
 - b. One way to do this is to add “Initial State” to each behavior group
4. Start recording observation
 - a. From the **Observe** menu, select **Start Observation**
 - b. Click the **Start Observation** button (green button at the top left of the screen) to start recording
 - c. If you have defined independent variables in your project setup and you chose to edit them before the observation, the Enter Independent Variables values pops up. Choose the values for each independent variable, and click **OK**.
 - d. After entering the values for your independent variables, the observation will begin.
5. Press the keys you have assigned, or click on the codes window to score the events
 - a. Clarify that as it is recording, press appropriate established code buttons when those codes arise
 - b. Make sure to click the letter assigned to “Participant One” and then the key code if there is more than one subject
6. Stop the observation (Ctrl+Alt+Q)



Section 3: Select Data for analysis and export

1. Click on the **Analyze** tab
2. Click on **Create a new data profile** under **Select Data**
3. Name your new data profile based on the selection you are choosing to analyze
4. Filter entire observations by name or independent variable value
5. Group observations or behaviors (Click the Grouping button in the Start box)
6. Filter out behaviors you do not want to analyze
7. Nest your data
(Ex: To find out what A was doing whilst B walked)
8. Make multiple result containers to compare the results of different selections in one overview

Section 4: Analyze your data

1. To visualize a plot of your raw data, click **Visualize Data**.
2. Select which set of data you want to see in the pop up window titled **Select Observation** and click **Ok**
3. Analyze a specific behavior to answer a research question
 - a. Under Select Data, click **Create a new data profile**
 - b. In the pop up window, enter the type of event you want to analyze (Ex: "Look at adult") and click **Ok**.
 - c. By default, all of your data will be selected. You must now select the filter from the left hand side through which you want to narrow the data you are analyzing (Ex: "Look at adult")
 - d. Clicking the **Settings** button allows you to change what filter(s) you are using
 - e. Click **Select Analysis** button to proceed when ready.
4. Analyze numerical modifiers
(Ex: What was the average speed?)
5. Analyze the sequence of events
(Ex: How often did run follow walk?)
6. Analyze the reliability of your scoring
(Ex: How does my observation compare to another?)

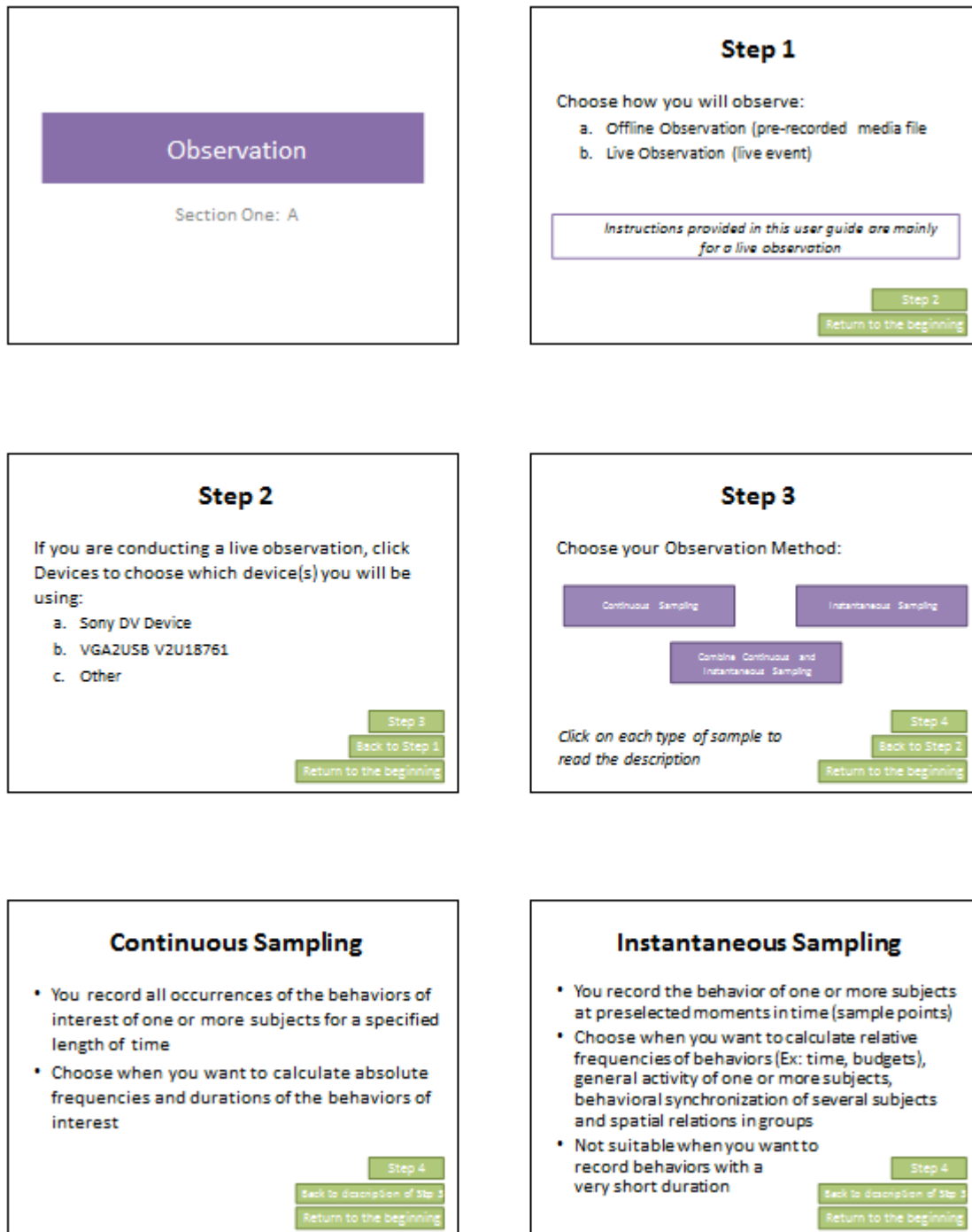
Section 5: Export your data

1. Export your analysis results for statistical tests in SPSS or further calculations in Excel
 - a. To export the results of your behavioral analysis click on **Behavior Analysis** under **Analyze Data**.
 - b. In the **Analysis Settings** window, select which elements you would like to have shown in rows, columns, or separate sheets. Then, click **Ok**
 - c. A table will display the results of your selected behavioral profile (Ex: "Look at adult")
 - i. To add more statistics to your table, click the **Statistics** tab above the table. Choose what statistics you want to display, and then click **Ok**
 - d. To export your results to SPSS or another statistical analysis software, click the **Export** button above the table.
 - e. In the next window, you can choose to export to an .xls, .xml, or .txt file. Choose which option you want to use, and then click **Export**
2. Create an episode selection (Analyze menu) under **Episode Selection**
3. Generate a highlight video of the behaviors that interest you (this is what I mean by aggression)
4. Export the physiological data for your data selection
(Ex: The heart rate for one minute after he started running)
5. Export the event data form all your observations together in one file
6. Export all your data together in one XML file (*.odx) for import into another project on another computer to analyze together by going to **Analyze** and clicking **Export data**
7. Create a backup of your project for safe keeping of your data

Appendix D

Interactive PowerPoints

Section One: Observation



Combine Continuous and Instantaneous Sampling

- Choose this when you want to record the behavior of one or more subjects in detail (focal subjects) while recording the behavior of other subjects in less detail

[Step 4](#)
[Back to description of Step 3](#)
[Return to the beginning](#)

Step 4

Choose your Observation Duration:

[Open-ended observation](#)
[Duration based on elapsed time](#)
[Duration based on observed time](#)

Click on each type of sample to read the description

[Step 3](#)
[Back to Step 3](#)
[Return to the beginning](#)

Open-ended observation

- Choose this if you want to end observation manually

[Step 3](#)
[Back to description of Step 4](#)
[Return to the beginning](#)

Duration based on elapsed time

- Choose this option if you want to stop the observation when the time from the start (including the time the observation was suspended) has reached the Observation duration

[Step 3](#)
[Back to description of Step 4](#)
[Return to the beginning](#)

Duration based on observed time

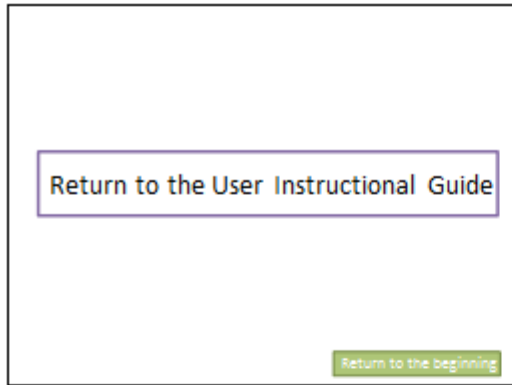
- Choose this option if you think you may suspend an observation at some time and want to stop the observation when the Observation duration has been reached, excluding the time the observation was suspended

[Step 3](#)
[Back to description of Step 4](#)
[Return to the beginning](#)

Step 5

- Click Coding Scheme (right green arrow) at the bottom right of screen when finished

[Go to End](#)
[Back to Step 4](#)
[Return to the beginning](#)



Section One: Subjects, Behaviors and Coding

Subjects, Behavior and Coding

Section One: B

Step 2
Return to the beginning

Step 1

- Under *Subjects*, click **Add Subject**
- Type a name in the **Subject name** column, then press Enter

Step 2
Return to the beginning

Step 2

- Under *Behaviors* click **Add Behavior Group** to create behavior groups. Pick between:

Mutually Exclusive States

Start-Stop States

Click on each type of sample to read the description

Step 3
Back to Step 1
Return to the beginning

Mutually Exclusive States (a)

- Select this option if the state behaviors within that group exclude each other at any time. When one of the behaviors is active, the other behaviors within the same group cannot be active.
- The advantage of mutually exclusive behaviors is that during coding, you do not need to stop behaviors. When you start a new behavior, the previously coded behavior of the same group automatically stops. (Ex: walk and sit)

Description (b)
Back to description of Step 2
Return to the beginning

Mutually Exclusive States (b)

- If you choose this option, you have the following option:
 - Exhaustively active behavior group
 - Select this if you want to score behaviors of this group in such a way that no "empty" time line is left between successive events.

Step 3
Back to description of Step 2
Return to the beginning

Start-Stop States

- Select this option if the state behaviors within that group are independent of each other with regard to their onset. Such behaviors do not stop automatically when a new behavior is scored and have, therefore, in addition to a start key-code, a stop code to stop it.
- Ex: Task 1 and User error. These behaviors describe independent events, since the beginning of one does not necessarily mean the end of the other

Step 3
Back to description of Step 2
Return to the beginning

Step 3

- Enter a behavior name for your behavior group
 - Example: Communication, expression, etc.

[Step 4](#)
[Back to Step 2](#)
[Return to the beginning](#)

Step 4

- Enter behaviors
- Example:
 - Facial Expressions
 - Sad
 - Happy
 - Confused
 - Think Aloud
 - Confused
 - Anger
 - Excitement

[Step 3](#)
[Back to Step 3](#)
[Return to the beginning](#)

Step 5

- For each behavior, determine its behavior type in the drop down box menu from the following:

Initial State Event

State Event

Point Event

Click on each type of sample to read the description

[Step 6](#)
[Back to Step 4](#)
[Return to the beginning](#)

Initial State Event

- Choose this if you want the behavior to be automatically scored at the start of the observation

[Step 6](#)
[Back to description of Step 5](#)
[Return to the beginning](#)

State Event

- Have a distinct start and end. Besides the frequency of occurrence, the duration is recorded

[Step 6](#)
[Back to description of Step 5](#)
[Return to the beginning](#)

Point Event

- This includes behaviors without measurable or relevant duration. Either their duration is very (immeasurably) short (Ex: hitting) or you are not interested in the duration of the behavior but only in its frequency (Ex: how many times participant talks)

[Step 6](#)
[Back to description of Step 5](#)
[Return to the beginning](#)

Step 6

- After choosing a behavior type for your behavior group, click **Create Group**
- If you would like to create another Behavior Group, repeat steps 1 through 5

[Step 7](#)
[Back to Step 5](#)
[Return to the beginning](#)

Step 7

- When you have finished creating all your desired groups, click **Independent Variables (IV)** down at the bottom right of the page

[Go to End](#)
[Back to Step 6](#)
[Return to the beginning](#)

[Return to the User Instructional Guide](#)

[Return to the beginning](#)

Section One: Independent Variables

Independent Variables

Section One: C

What is an Independent Variable?

The variable you have control of, the one you can manipulate

Continue to Step 1

Step 1

At this point, you have clicked on the Independent Variables (IV) down at the bottom right of the page...

Now, click Add User-defined to name your IV(s)

Continue to Step 2

Return to the beginning

Step 2

Fill out the information on your Independent Variables. It is important that you go in the order that is shown below. Click on each tab to be taken to learn how to fill out that specific form for each independent variable.

A. Label

B. Description

C. Type

Label

- This is where you *name* your independent variable. Each different variable must have its own unique name.

Next step: B. Descriptions

Back to Step 2

Return to the beginning

Description

- This part is optional. It allows you to enter text about the background information of that variable

Next step: C. Type

Back to Step 2

Return to the beginning

Type

Choose one of the following from the drop-down list:

1. **Text:** Variable is indicated by alphanumeric characters, composed of letters, numbers or both (Ex: the name of the observer)
1. **Numerical:** Variable is represented by numbers only (Ex: the age of the subject)
1. **Timestamp:** Variable is represented by a time stamp (Ex: the starting date and time of experiment)
1. **Duration:** Variable is represented by a duration (Ex: the duration of the treatment)
1. **Logical:** A variable that is either 'false' or 'true' (Ex: whether or not the observer is present)

[Stop 3: Variable Format](#)

[Back to Stop 2](#)

[Return to the beginning](#)

Step 3: Variable Format

Now that you have chosen the Type of your independent variable(s), click on it below to move onto the next step:



Text

- Text variables do not need a specified format

[Click Here to go to Stop 4: Predefined Variable Values](#)

[Back to Stop 3](#)

[Return to the beginning](#)

Numerical

1. Click in the **Format** field
2. Select the **No. of decimals** box and enter the number of decimals your variable has. If your variable has zero decimal places, leave the box blank.
3. Check the **Scientific notation** box if you want to write your numerical variable in scientific notation form (Ex: 1485.236 as 1.485e+0.03)
4. In the **Unit** field, enter the unit of your variable (Ex: 'years' for the age of the subject)
5. Click **OK**

[Click Here to go to Stop 4: Predefined Variable Values](#)

[Back to Stop 3](#)

[Return to the beginning](#)

Timestamp

1. Click in the **Format** field
 - a. If variable is a System variable (one that includes Start Time, Stop Time, and duration of your observation) the **Time Format** preferences window appears instead of the **Format** window
2. Enter your preferred format in the field at the top and click **OK**

[Click Here to go to Stop 4: Predefined Variable Values](#)

[Back to Stop 3](#)

[Return to the beginning](#)

Duration

1. Click in the **Format** field
2. Enter your preferred format in the field at the top and click **OK**

[Click Here to go to Stop 4: Predefined Variable Values](#)

[Back to Stop 3](#)

[Return to the beginning](#)

Logical

- For **Logical** variables, you do not need to specify a format

[Click here to go to Step 4: Predefined Variable Values](#)

[Back to Step 3](#)

[Return to the beginning](#)

Step 4: Predefined Variable Values

Again, click on the Type of independent variable you chose at the beginning to move onto the next step:



Text

- Click in the **Predefined Values** field
- Enter a value for your independent variable (Ex: name of one of the observers)
- Click **Add**. The value you entered will move to the **Predefined Items** field. You can enter the other names of the other observers.
- Keep the **Allow other values** check box selected if you are not sure whether the values you have defined are exhaustive.

[Go to End](#)

[Return to the beginning](#)

Numerical

- Double-click in the **Predefined Values** box
- Enter the minimum and maximum values for your independent variable. Then click **Ok**

[Go to End](#)

[Return to the beginning](#)

Timestamp

- You do not need to specify any predefined variables

[Go to End](#)

[Return to the beginning](#)

Duration

- You do not need to specify any predefined variable values

[Go to End](#)

[Return to the beginning](#)

Logical

1. Click in the Predefined Values box
2. Enter values for 'False' and 'True' (Ex: If your variable is 'presence of observer', you may define the values 'No' (False) and 'Yes' (True).

[Go to end](#)[Return to the beginning](#)[Return to the User Instructional Guide](#)[Click here to return to the beginning of Presentation](#)

Appendix F

Noldus Help Desk

Opening hours, in local times of help desks

Help desk	Phone	Time zone	Opening hours	Days	Language
US West coast	+1-866-860-3580 Toll free	PST	9 am - 5pm	Monday to Thursday, Friday morning	English
US East coast	+1-877-266-5387 Toll free	EST	9 am - 5pm	Monday to Friday	English
European	+31-317-47-3333	CET	06:00 - 16:00	Monday to Friday	English, Dutch
Germany	+49-6094-9885612	CET	08:30 - 17:00	Tuesday – Thursday, Monday afternoon, Friday morning	German, English
China	+86-10-62111073	CST	09:00 - 18:00	Monday to Friday	Chinese, English

References

Grieco, F., Loijens, L., Zimmerman, P., & Spink, A. (2009). *The Observer XT: Reference Manual Version XT 9.0*. Wageningen, The Netherlands: Noldus Information Technology.

Ouwerkerk, N. (n.d.). Noldus Information Technology. Retrieved from <http://www.noldus.com/>.