Guide to BORIS

Last Updated: 3/5/2025 AMZ

BORIS 8.27.10 is the software used to code parent-child interactions. BORIS should be installed on a PC, as the Mac OS version has not been updated in a few years, and does not have updated functionality.

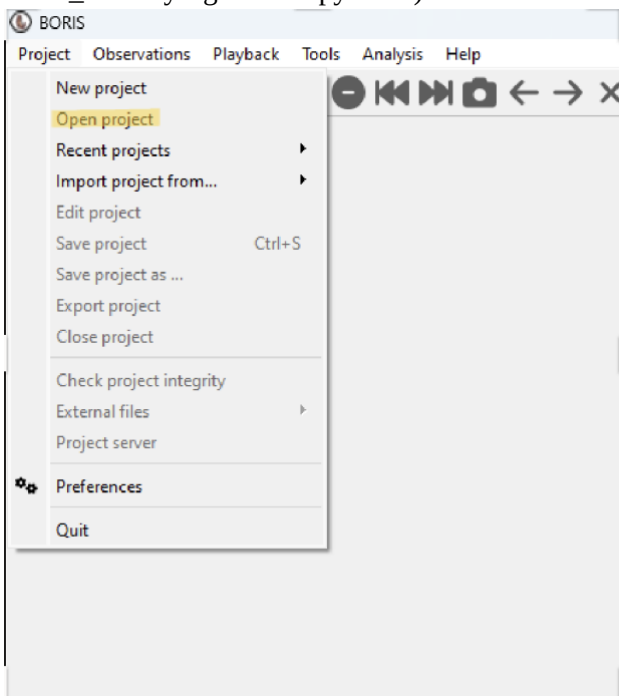
Citation:

Friard, O., & Gamba, M. (2016). BORIS: a free, versatile open-source event-logging software for video/audio coding and live observations. *Methods in Ecology and Evolution, 7*(11), 1325-1330. https://doi.org/10.1111/2041-210X.12584

When you first open the software, there will be a black system box that appears – wait before closing and re-opening the software; sometimes the software will take longer to fully load.

I. Creating a new observation

1. Open the project: **Project** > **Open Project**
   (on the E: hard drive > BEST Unpredictability Coding > BEST_AffectEntropy.boris or BEST_SensorySignalEntropy.boris)

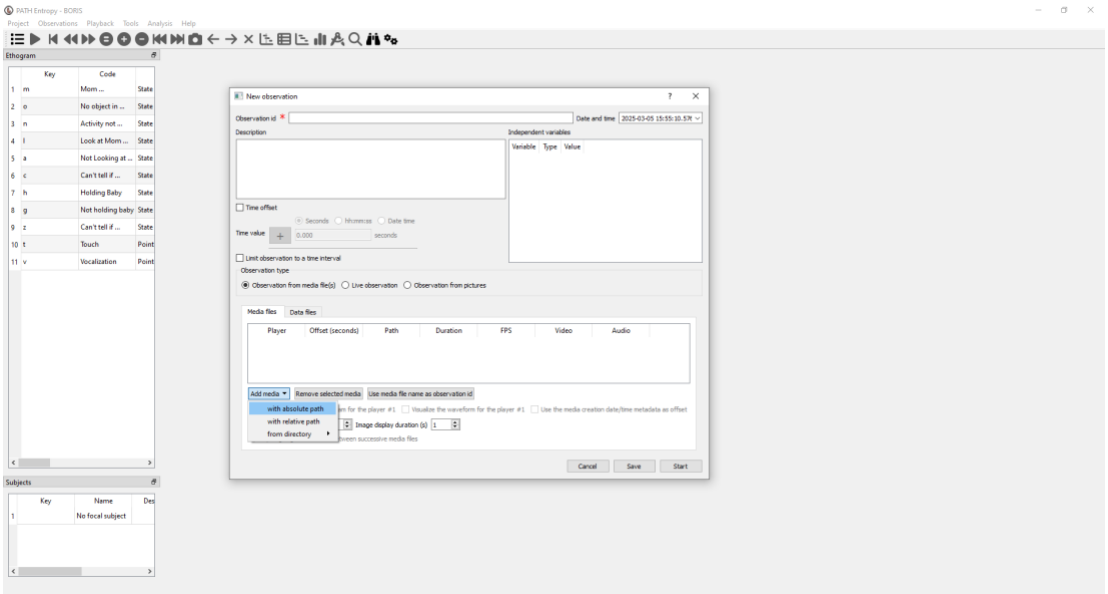


2. After the project is opened, check the Ethogram on the top left panel to make sure the codes match the coding manual
3. Check the Observations list to make sure the video hasn't been loaded already:
   Observations > **Observations list**
   a. If the ID and your initials are already in the list, go down to Step X of II. Editing an observation.
   b. If the ID and your initials are NOT in the list, select **Cancel**

4. To create a new observation: **Observations** > **New observation**

For Observation id, use the video ID followed by your initials (e.g., 2073AZ, 2050ES)

6. Select **Observation from media file(s)**
7. Select **Add Media** > **with absolute path**



8. Navigate to the Free Play video on the E: Drive
9. Select Limit observation to a time interval **if** the start and stop times are already in the coding tracker, timestamps for coding sheet. Use the start/stop times in seconds.
    a. If the timestamps have not yet been identified, leave this unchecked
    b. If you accidentally input the incorrect time, uncheck the box and check it again to re-enter the correct times
10. Select **Start**

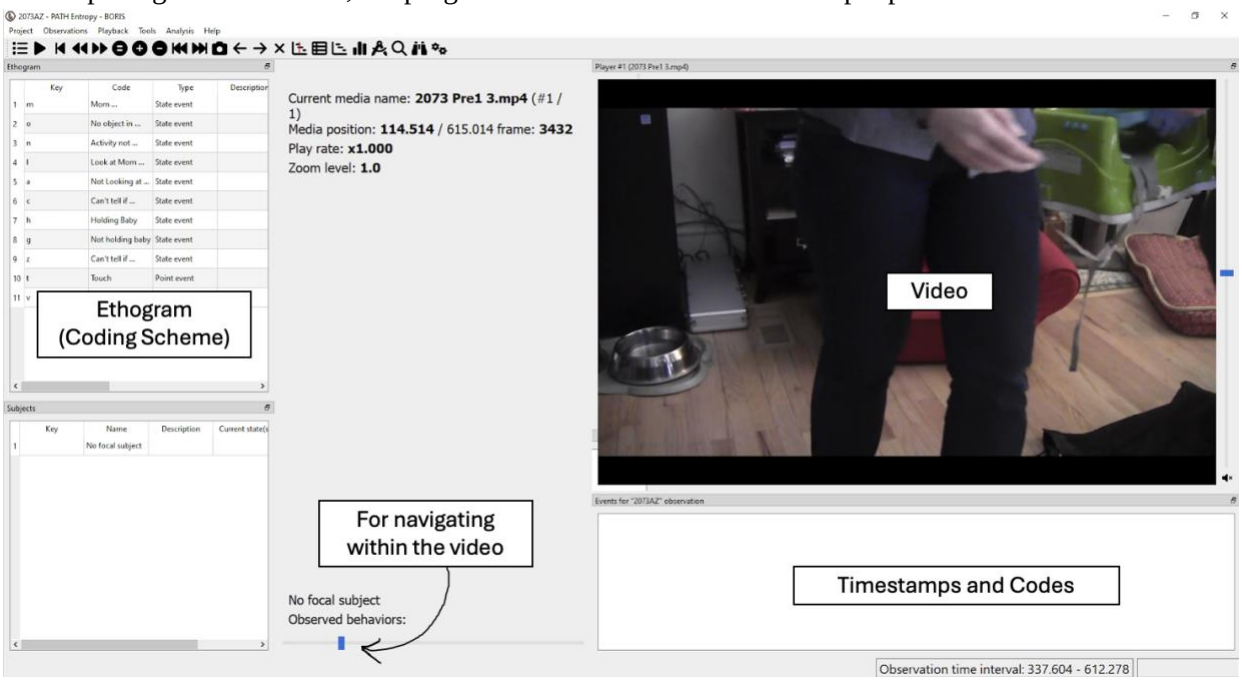
II. Editing an Observation

This is needed if the observation has already been made, but there are edits needed: for example, timestamps were not identified previously, the previous path to the video no longer loads, or the wrong video was loaded

1. Open the project: **Project** > **Open Project**
   (on the E: hard drive > BEST Unpredictability Coding > BEST_AffectEntropy.boris or BEST_SensorySignalEntropy.boris)
2. After the project is opened, check the Ethogram on the top left panel to make sure the codes match the coding manual
3. **Observations** > **Observations list**
4. In the Observations list, find the observation with your initials, click on the row, and then select **Edit**.
5. Edit the Observation:
   a. To add start and stop times, select **Limit observation**, and input the start/stop times in seconds based on the coding tracker, timestamps for coding sheet. If you accidentally input the incorrect time, uncheck the box and check it again to re-enter the correct times
   b. If the video is not loading or the wrong video was added**,** select the video file in the Media files section and select **Remove selected media.** Add the correct video file by selecting **Add media** > **with absolute path** again.

III. Coding an Observation

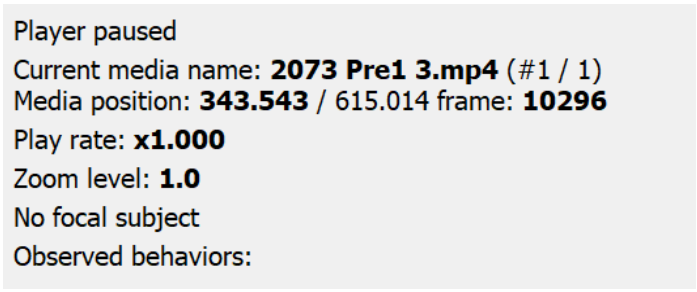
After opening an observation, the program will look like this with multiple panels:



The panels can be rearranged based on user preference - however, it is important to ensure that timestamps and codes are visible, and the ethogram is visible (especially with the corresponding keys)

Before Coding:

1. Ensure that the observation time interval matches the start/stop times on the coding tracker.
2. Make sure that the video time is in seconds at the correct start time at the media position



   a. If the video is not in seconds, click **Projects** > **Preferences** and make sure that the default project time format is in seconds. Click **OK**.

To navigate the video:

1. To start and stop the video, hit the spacebar on the keyboard.
2. To move the video frame by frame, pause the video and use the forward and backwards arrow keys.
3. You can also control the video by sliding the blue tab on the horizontal bar.

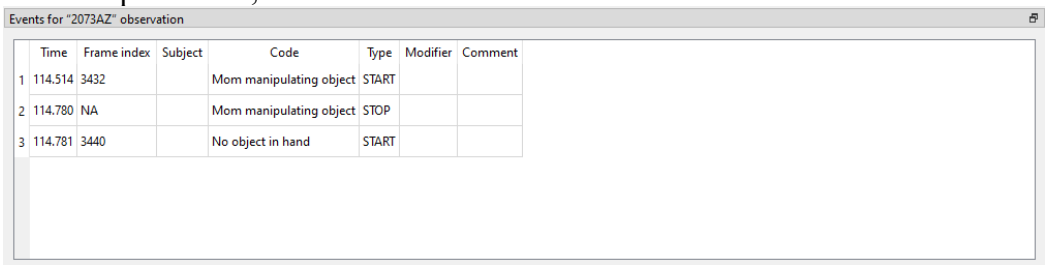
Coding the video:

1. **For STATE codes:** when a behavior occurs that you want to code, hit the corresponding key that matches the code on the keyboard based on the ethogram. Each state code should have a corresponding START and STOP code at the time of onset/offset.

	Key	Code	Type
1	m	Mom ...	State event
2	o	No object in ...	State event
3	n	Activity not ...	State event
4	l	Look at Mom ...	State event
5	a	Not Looking at ...	State event
6	c	Can't tell if ...	State event
7	h	Holding Baby	State event
8	g	Not holding baby	State event
9	z	Can't tell if ...	State event
10	t	Touch	Point event

   a. For example, if you are coding “no object in hand” (object manipulation), press “o”.
   b. Be sure to hit the key at the exact frame that the behavior starts. This code will become visible in the event box with a START to the right.

c. When you are coding within a category (e.g., object manipulation), the codes are mutually exclusive. So when the code changes (e.g., from "mom manipulating object" to "no object in hand"), there will be **two** codes - one that is a stop code from the prior code, and a start code for the new code.



	Time	Frame index	Subject	Code	Type	Modifier	Comment
1	114.514	3432		Mom manipulating object	START		
2	114.780	NA		Mom manipulating object	STOP		
3	114.781	3440		No object in hand	START		

d. When you reach the end of the video, make sure to code <u>STOP</u> for the most recent code.

2. **For POINT codes**: when you code a point event (e.g., vocalization), there will be no start/stop codes. There will only be one code per event.

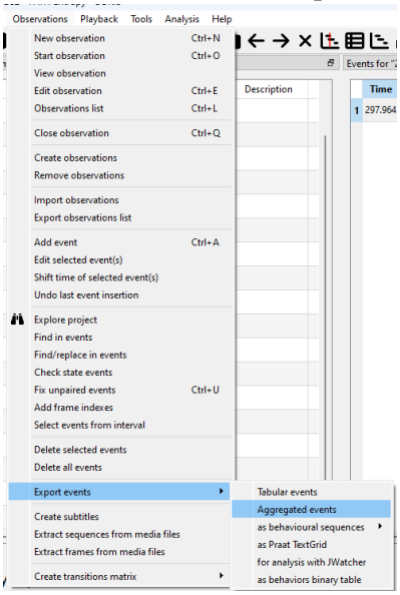
To delete a code:

1. Right-click on the event you want to delete, and select **Delete selected events**
2. If you are deleting a **STATE** code, make sure that you delete the STOP code for the previous event, or that start/stop codes still line up

IV. Exporting an Observation

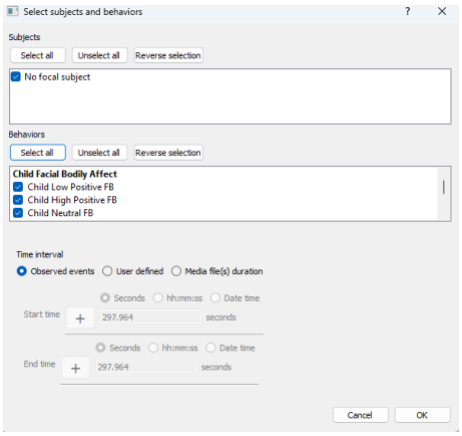
After you have completed coding, make sure to export the codes as a .csv file

1. Select **Observations** > **Export Events** > **Aggregated Events**



2. Choose your observation (double check the coder initials!), and select **OK**

3. Select all behaviors



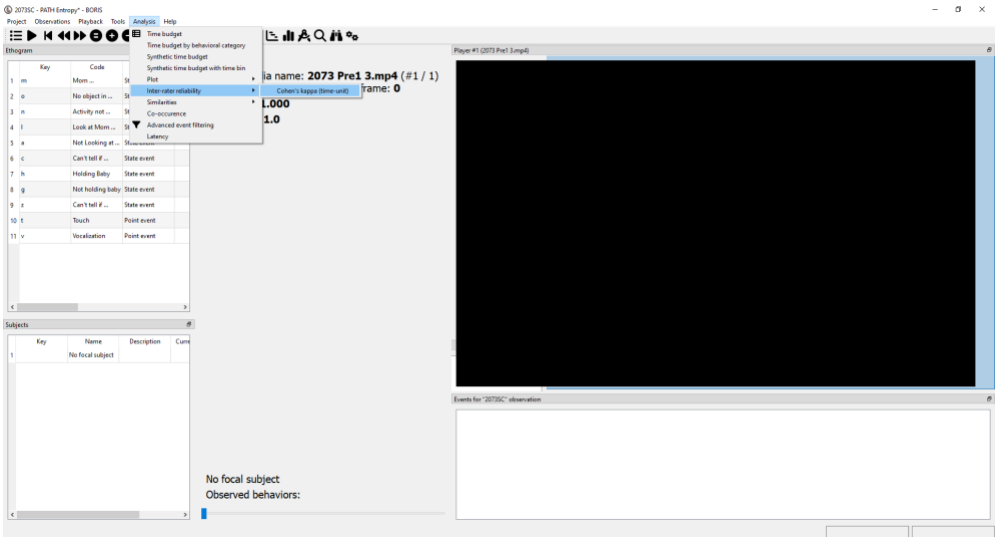
4. Save the file to the E: drive (BEST Unpredictability Coding > Entropy Coding > Sensory Signal Exports OR BEST Unpredictability Coding > Entropy Coding > Affect Exports)
    a. Include both the ID and your initials in the file name
    b. Make sure to select .csv as the file type

V. Assessing Reliability

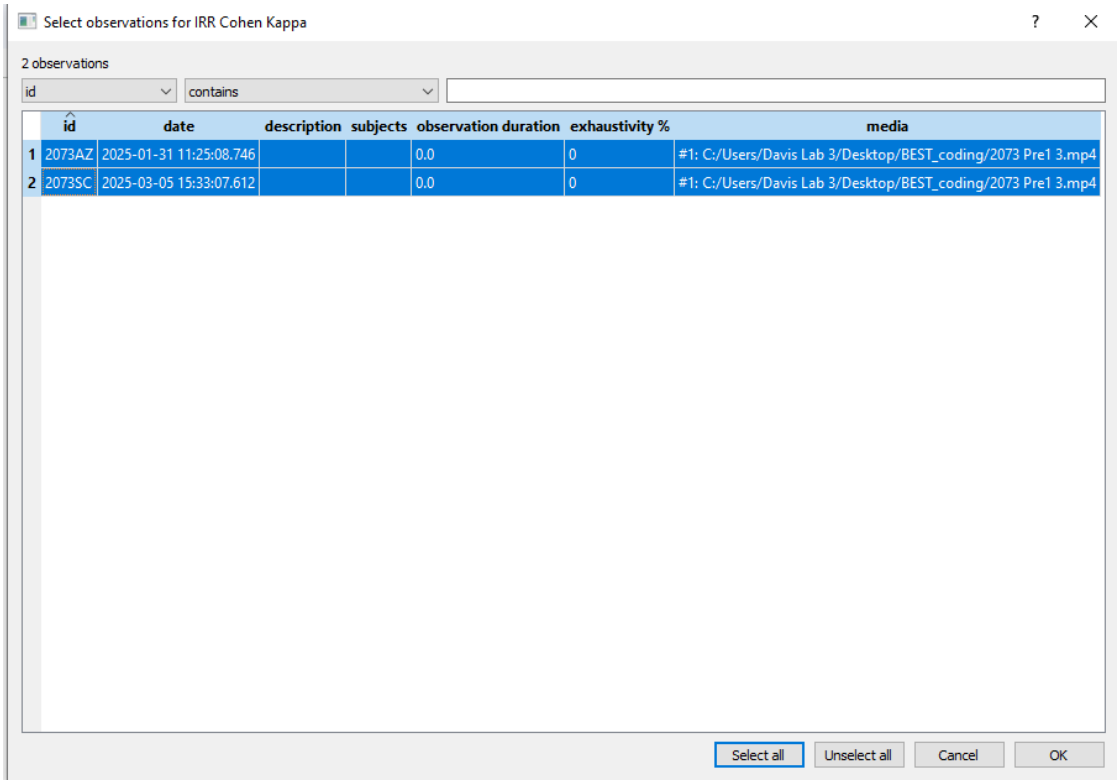
Within BORIS, you can examine reliability between two coders using Cohen's kappa as well as similarities. The main caveat with assessing reliability using the functions within the program is that it does not identify *where* the discrepancies are (i.e., it only gives you an overall reliability index with no further info on where coders are discrepant with each other). ECBER (developed by Dr. Elisa Ugarte & Chitra Mukherjee), code for processing behavioral data output from BORIS, also has reliability functionality after exports, but has similar limitations as the reliability function within BORIS. https://github.com/chitram1/ecber/tree/main

Cohen's Kappa

1. Select **Analysis > Inter-rater reliability > Cohen's Kappa (time-unit)**



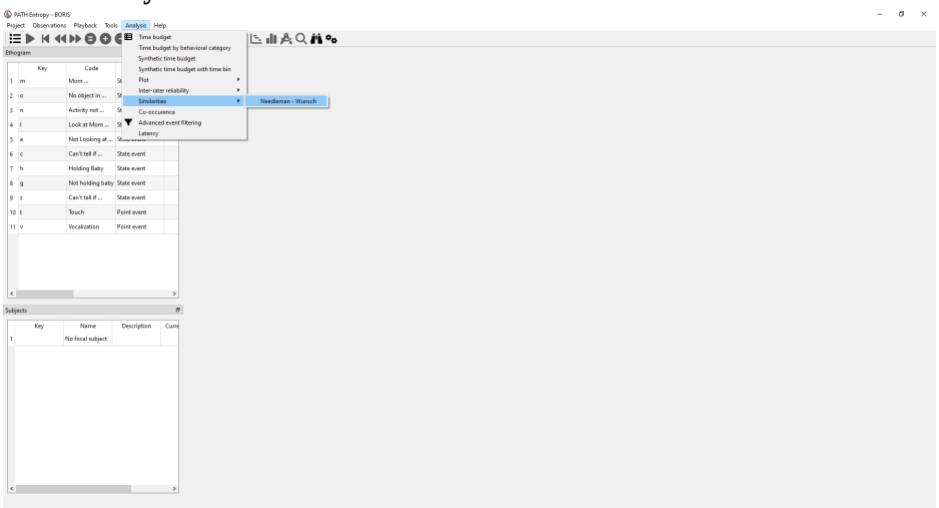
2. In the window, select the two observations of the **same** video coded by different coders. Click **OK**



3. Select all behaviors, and click **OK**
4. Leave the time unit as 1.000s. Click **OK**
5. A window will open up with the Inter-rater reliability.

Needleman-Wunsch (Similarities)

1. Select **Analysis > Similarities > Needleman-Wunsch**



2. In the window, select the two observations of the **same** video coded by two different coders.
3. Select all behaviors. Click **OK**

4. Leave the time unit as 1.000s. Click **OK**
5. A window will open up with the % of how similar the files were coded.

Trouble-shooting

Preferences

If things are looking funky (e.g., time is displayed in hh:mm:ss instead of seconds), odds are the preferences need to be checked! To check preferences, **Project** > **Preferences**

Here are the preferences we want our project to have:

Under the **Project** tab

- Default project time format: **seconds**
- Auto-save project every (minutes): **1**

Under the **Observations** tab

- Fast forward/backward value (seconds): **10**
- Check the **Adapt the fast forward/backward jump to playback speed** box
- Playback speed step value: **0.1**
- Time offset for video/audio reposition (seconds): **0**

Once these have been selected, click **OK**