

Best Practices in Behavioral Video Coding

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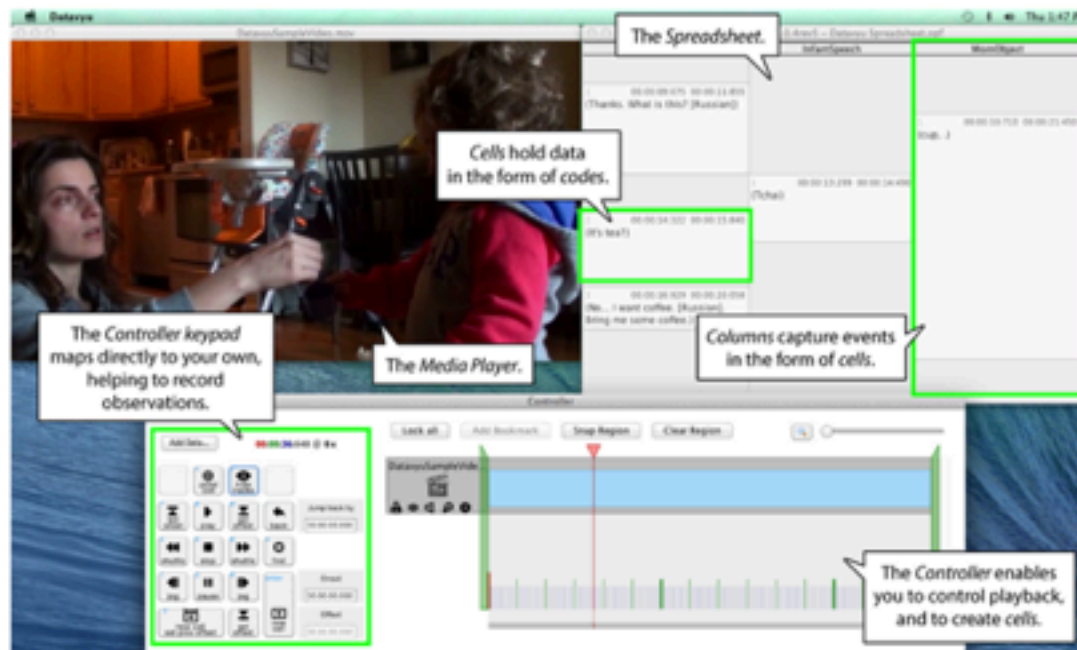
	Baby Talk (MARIKA)	MOM TALK (MARIKA)
00:00:15:470		
1	00:00:14:916 00:00:15:220 tea	1 00:00:10:831 00:00:11:111 What do you have?
2		2 00:00:16:282 00:00:21:111 It's tea? No I want coffee. Give coffee.
3		3 00:00:33:386 00:00:33:386 And a spoon.
00:00:37:695 00:00:37:695	2 00:00:37:695 00:01:28:001 Stir it.	
2	00:00:38:049 00:00:38:077 here	00:00:37:697 00:00:38:077 Stir it. Stir it.
00:01:31:611 00:01:31:611		

A video coding and data visualization tool

datavyu.com/user-guide/index.html

User Guide ▶

WELCOME TO DATAVYU'S DOCUMENTATION!



Datavyu is a complete software package for visualizing and coding behavioral observations from video data sources. Designed by – and for – behavioral scientists, Datavyu facilitates data coding and sharing through the ongoing [Databrary](#) data library project.

Datavyu

- Software Guide
- Ruby API
- Frequently Asked Questions
- Walkthrough Videos
- Coding Example


[Download the docs for offline viewing.](#)

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0 votes	3 answers	621 views	quicktime on mac with yosemite	quicktime playback java vlc yosemite	23 Feb, 10:29 Vicky Foo ♦ 46
0 votes	1 answer	107 views	Lost frames at end of videos	frame short video	06 Feb, 18:10 Vicky Foo ♦ 46
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0 votes	2 answers	111 views	"track timing information" error	tracktiming	30 Jan, 17:10 Sailaja 1
0 votes	1 answer	652 views	Quicktime's Java libraries are not found		

welcome to Datavyu Support

Help others by asking and answering Datavyu questions.

[about](#)
[faq](#)

164 questions

286 answers

Most recently updated questions

How support works:

1- **Search** to see if someone has already asked your question.

2a- Found someone who has already asked your question? Use the **thumb button to up vote** the question to make it easier for the

Datavyu is agnostic about how you code your data



WITH GREAT
POWER
COMES GREAT
RESPON-
SIBILITY

Rule of Thumb

- ▶ Coding is repetitive, but it should not be painful
- ▶ In Datavyu, if it feels grueling to code, if it's taking too long
 - ◀ Your codes are poorly planned
 - ◀ You are not taking advantage of Datavyu's functionality
 - ◀ There is a better way

datavyu.org/user-guide/best-practices.html

User Guide ▶

BEST PRACTICES FOR CODING BEHAVIORAL DATA FROM VIDEO

Overview of Coding Process

Welcome to the Best Practices Guide. These guidelines are intended as general suggestions for how to code behavioral data from video. The guidelines will help you to make the most of Datavyu, but the general principles are applicable for coding with any software tool or even for coding with paper and pencil.

Datavyu is agnostic about what researchers code and how they code it. This makes the software very powerful and flexible, but it puts the responsibility of designing the spreadsheet and coding criteria on the user. For a beginner setting out to code behavioral data for the first time, or a more experienced coder who is new to Datavyu, figuring out where to start can be daunting. This guide will help you to get started and will provide a framework for thinking about coding behavioral data from video.

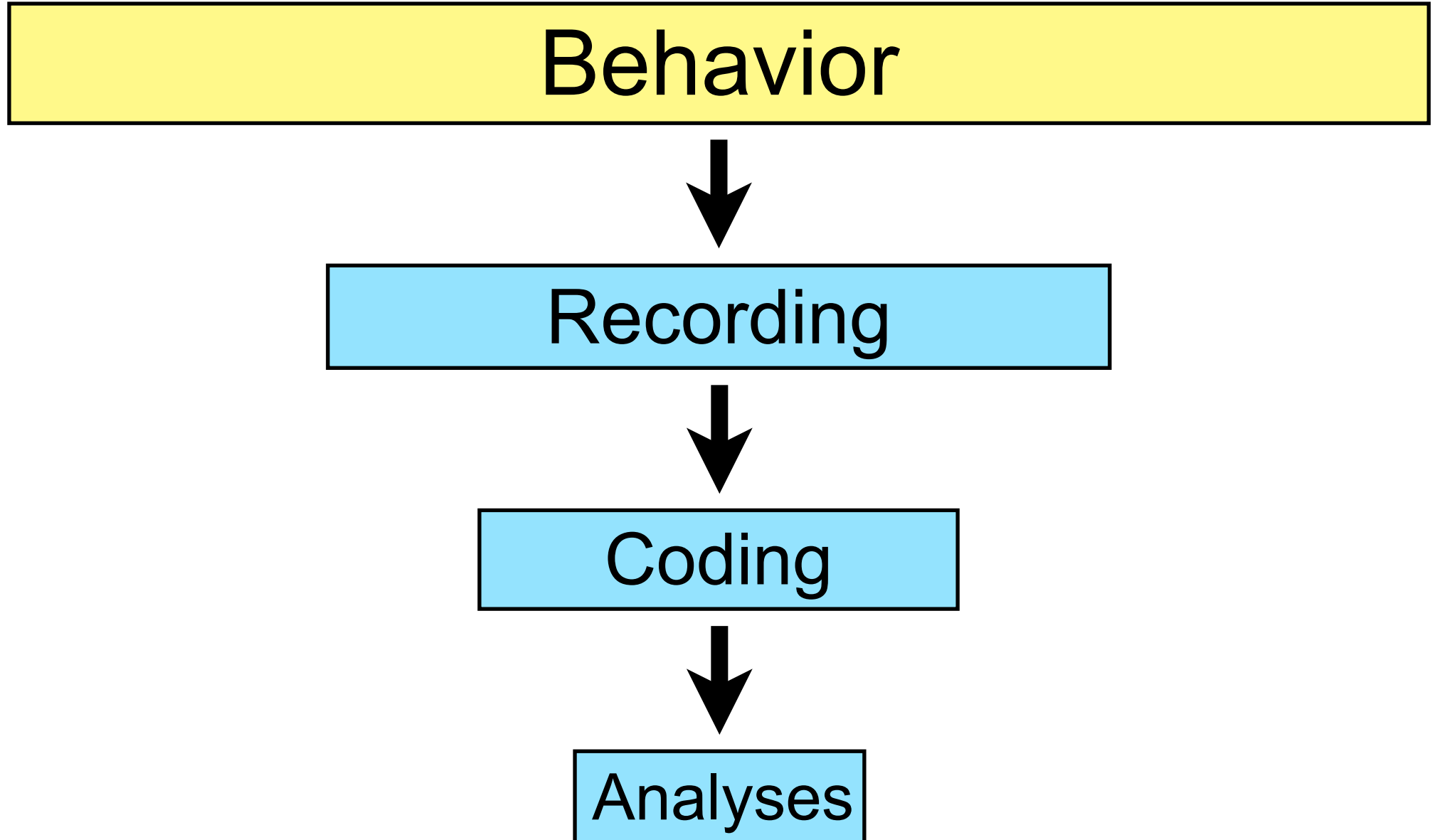
If you have questions or comments about behavioral coding, please go to the [Datavyu Support Forum](#). Other researchers may have run into the same problems, posted similar requests, or have offered similar suggestions for improving the coding process. Similarly, other researchers may benefit from hearing your questions and comments.

Datavyu

- [Software Guide](#)
- [Ruby API](#)
- [Best Practices for Coding Behavioral Data from Video](#)
 - [Video Coding as a Series of Filters](#)
 - [4 Steps of Video Coding](#)
- [Frequently Asked Questions](#)
- [Walkthrough Videos](#)
- [Coding Example](#)

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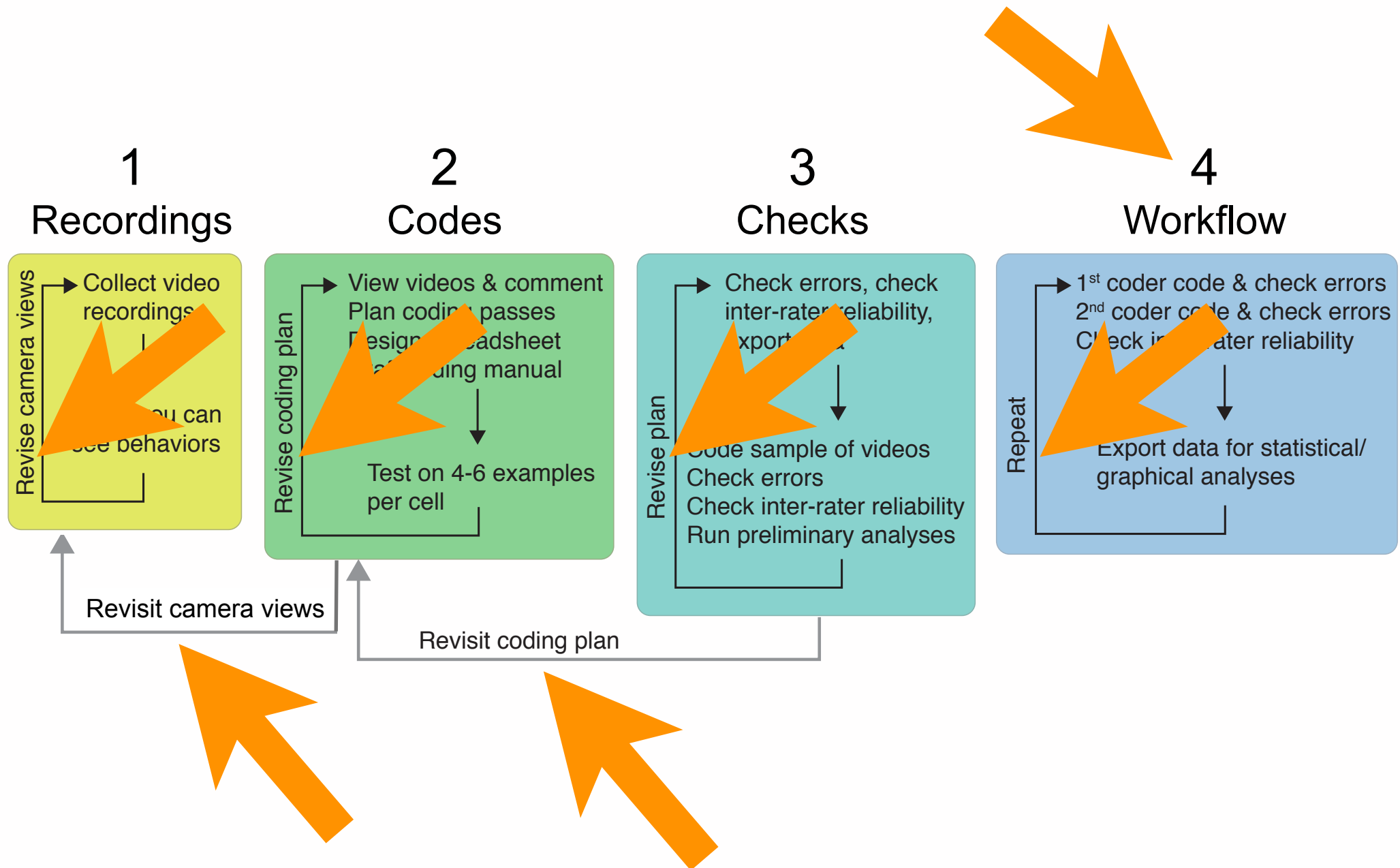
Video coding: A series of filters



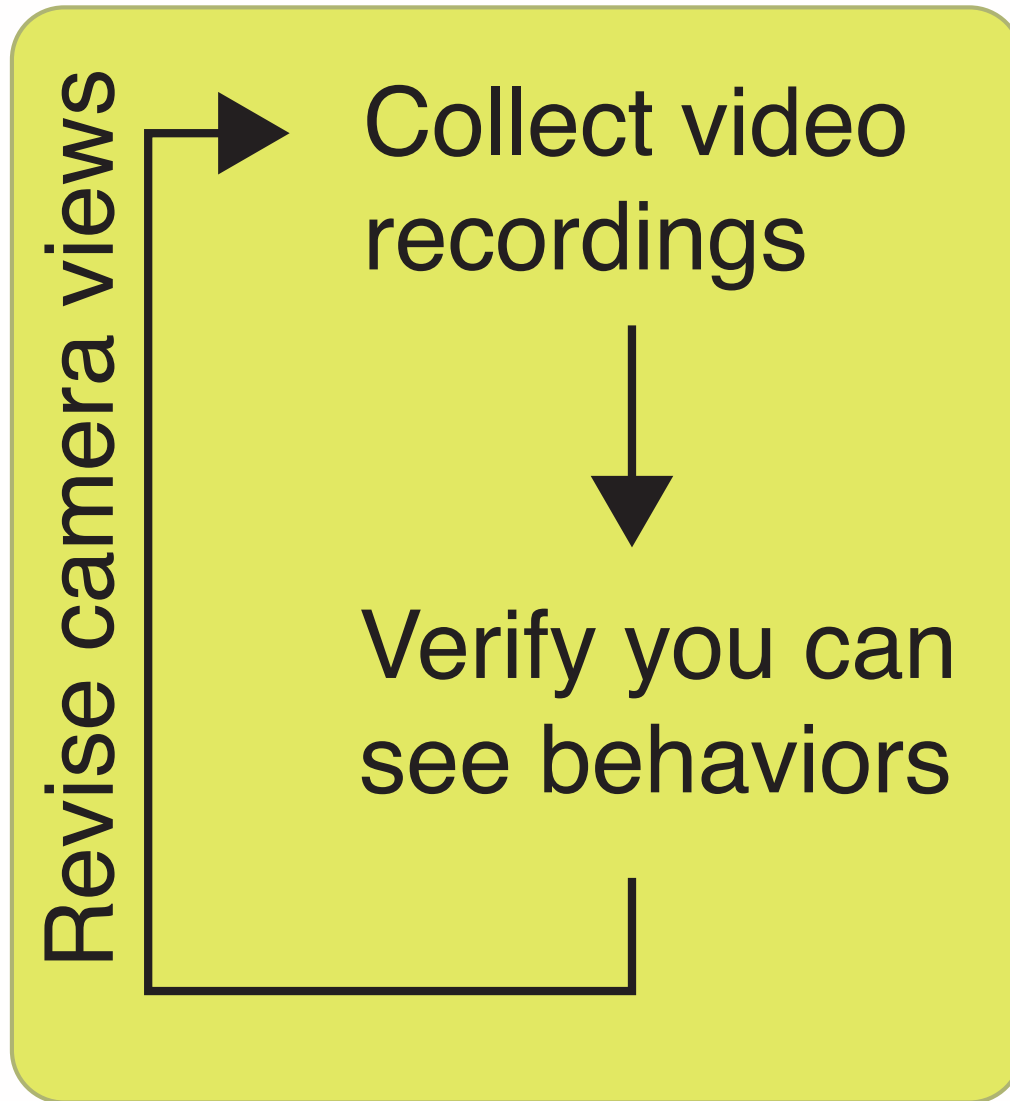
Coding is iterative

- ▶ Multiple steps
- ▶ Each step: Planning, testing, revising
- ▶ **Expect to revise! It's a good thing!**
 - ◀ Easy to revise in Datavyu

4 steps of behavioral video coding



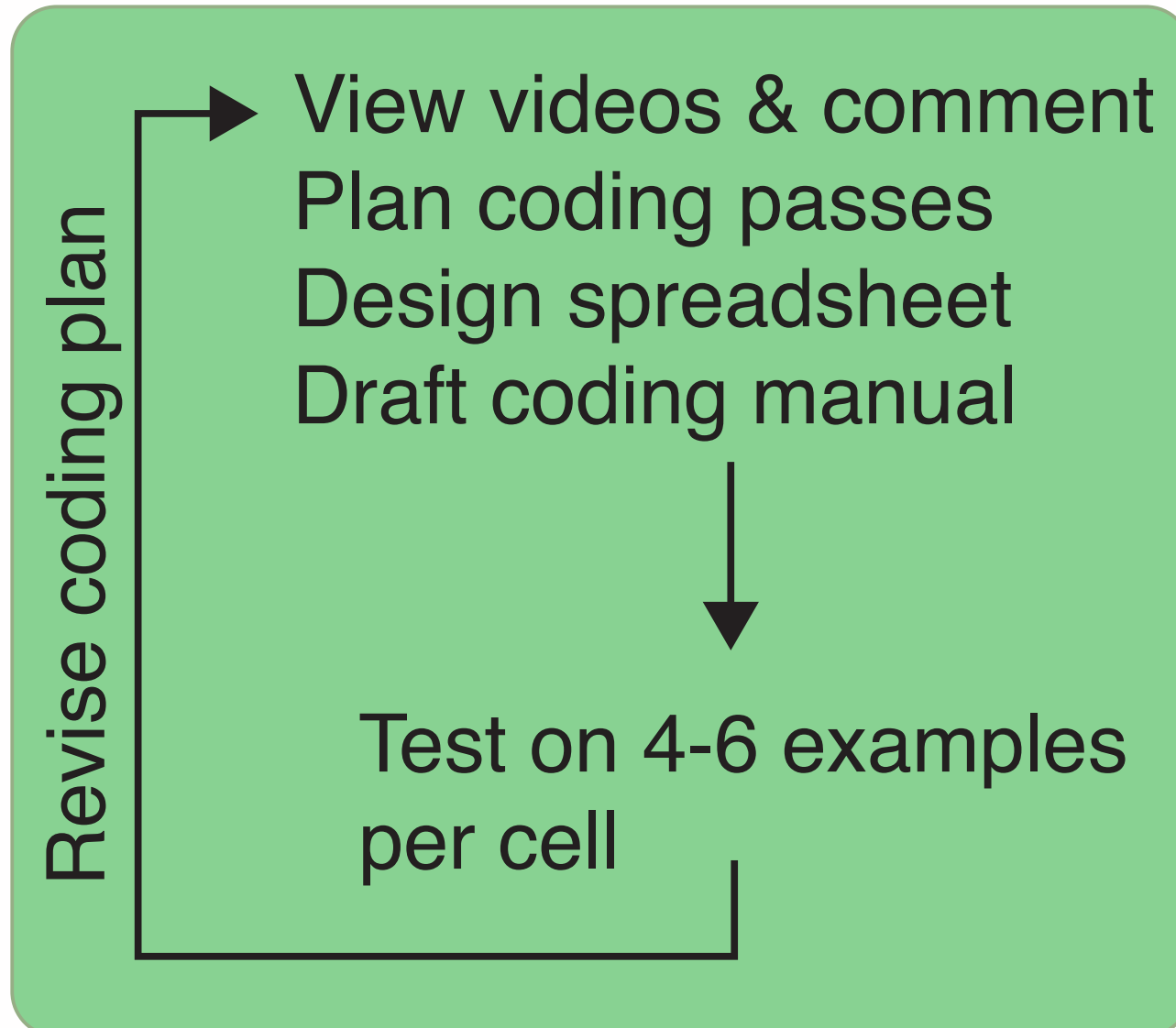
Step 1: Recordings



What it means to “see” behaviors

- ▶ If not on camera...never happened
- ▶ Check various viewing speeds
- ▶ Multiple camera views = good
 - ◀ Small body parts
 - ◀ Obscured events
- ▶ Use visual contrast (not sound!) to demarcate sections of video
 - ◀ High contrast for small body parts

Step 2: Codes



Some definitions

“Code”

- ▶ Tags section of video
- ▶ Outcome measures (behaviors)

- ▶ Participar
- ▶ IVs; struc
- ◀ Tasks, (

b_location	
1	00:07:22:544 00:07:29:547
(f)	
2	00:07:29:548 00:07:33:967
(h)	
3	00:07:33:968 00:10:16:521
(f)	

per

“Coding manual”

- ▶ Documents what coders did & what new coders should do
 - ◀ Formalizes coders’ decisions
 - ◀ Useful when revisiting data
 - ◀ Useful for sharing & repurposing data

w = walk.

Baby attempts to walk independently down the step.

If both feet and butt touch: feet must step over brink before butt touches. If butt hits before foot steps over, code as sit.

EMBARC: When 1 foot has touched the landing platform.

“Coding pass”

- ▶ Complete scoring of video file for a code or set of codes

	b_location
1 (f)	00:07:22:544 00:07:29:547
2 (h)	00:07:29:548 00:07:33:967
3 (f)	00:07:33:968 00:10:16:521
4 (h)	00:10:16:522 00:10:22:165
5 (f)	00:10:22:166 00:10:55:247
6 (c)	00:10:55:248 00:12:04:369
7 (f)	00:12:04:370 00:12:08:109
8 (c)	00:12:08:110 00:12:08:585
9 (f)	00:12:08:586 00:12:09:129
10 (c)	00:12:09:130 00:12:18:615
11 (f)	00:12:18:616 00:12:27:795
12 (y)	00:12:27:796 00:12:49:827
13 (f)	00:12:49:828 00:12:53:737
14 (y)	00:12:53:738 00:13:06:351
15 (h)	00:13:06:352 00:13:07:507

“Coding spreadsheet”

- ▶ The spreadsheet that stores & organizes your codes for a particular video file

“Comment”

- ▶ A note by a coder
 - ◀ Free form
 - ◀ Formalized

```
3          00:11:29:418  00:11:29:418
BABY POST REL: start sit here? KK
9/16/13 started sit when foot
flipped over/knee was basically
on ground AJ KK 920. Also coded
baby with one foot flat on ground
and one foot flat on platform as m
```

```
4          00:12:02:636  00:12:02:636
BABY POST REL: sit onset? these
upright/sit transitions are really
weird. KK 9/16/13 yes
```


“Onset & offset times”

- ▶ Onset & offset = start & end of event
- ▶ Time sampling (event is arbitrary time)
- ▶ Continuous events
 - ◀ Onset of new event = offset of previous event
- ▶ Isolated events
 - ◀ Event surrounded by non-events
- ▶ Events that do not require offsets

Coding criteria

	Implicit	Explicit
Pros		
Cons		

Events are nested & interleaved

id	mom_et	baby_et	baby_posture	mom_posture
00:10:25:242 00:15:25:242 play, 24, m, 08/30/2012, 013, w, 08/15/2013, 013, 04/05/2013, 03/05/2013, 013, n, y, m, 10/07/1974)	1 00:10:25:242 00:10:25:463 (p, <target2>)	1 00:10:25:242 00:10:26:347 (n, .)	1 00:10:25:242 00:10:26:279 (s)	1 00:10:25:242 00:10:26:279 (d)
	2 00:10:25:464 00:10:26:041 (f, <target2>)			
	3 00:10:26:042 00:10:26:075 (p, <target2>)			
	4 00:10:26:076 00:10:26:211 (n, <target2>)			
	5 00:10:26:212 00:10:26:823 (., <target2>)			
			2 00:10:26:280 00:10:50:419 (m)	
			2 00:10:26:348 00:10:26:449 (., .)	
			3 00:10:26:450 00:10:26:619 (p, .)	
			4 00:10:26:620 00:10:27:231 (c, s)	
	6 00:10:26:824 00:10:26:959 (p, <target2>)			
	7 00:10:26:960 00:10:27:061 (f, <target2>)			
	8 00:10:27:062 00:10:27:231 (n, <target2>)			
	9 00:10:27:232 00:10:27:435 (d, <target2>)		5 00:10:27:232 00:10:27:265 (n, .)	
			6 00:10:27:266 00:10:27:333 (p, .)	
		7 00:10:27:334 00:10:37:261		

Events are nested & interleaved

- ▶ Time-nested events
 - ◀ Event 1 inside of Event 2
 - ◀ Session within participant
 - ◀ Conditions or tasks within session
 - ◀ Trials or behaviors within conditions & tasks

Events are nested & interleaved

- ▶ Interleaved events
 - ◀ One event begins or ends while another event is ongoing

Maximize gain, minimize pain

- ▶ Manual coding needs coder's attention
 - ◀ Do not divide coder's attention
 - ◀ Attend to one thing in one place
 - ◀ If you see it (**& don't have to think about it**), code it
- ▶ Reduce memory load
 - ◀ No remembering letters (prompt instead)
 - ◀ No using 0-1 codes (letters instead)

Maximize gain, minimize pain

- ▶ Manual coding requires motor actions!
 - ◀ Minimize movements of hands & eyes
 - ◀ Small finger movements are good



Maximize gain, minimize pain

- ▶ Manual coding requires motor actions!
 - ◀ Minimize movements of hands & eyes
 - ◀ Small finger movements are good
 - ◀ Mousing is bad
 - ◀ Single-letter codes minimize movements

Before designing your coding scheme

- ▶ Watch segments of videos
 - ◀ Each cell in your research design
- ▶ Write comments about what you see

Planning your codes

- ▶ Start simple
- ▶ Code in passes
 - ◀ Do not require coders to watch the same bits of video repeatedly in the same coding session
 - ◀ Enable coders to move through the video file as fast as possible while focusing on one set of behaviors

Planning your codes

- ▶ Use a coding pass to demarcate important sections of the session
 - ◀ Tasks, conditions
- ▶ Use a coding pass to tag information about participant(s) on the video
- ▶ First real pass: Your most important DV
 - ◀ If you could code only 1 thing, this is it!

Drafting your coding manual

- ▶ Write the manual for a stranger
 - ◀ Avoid shorthand, acronyms, lab-specific terms
- ▶ More detailed documentation is better
 - ◀ o = object touch (bad)
 - ◀ o = object touch, must be detached object child can hold in hands, hand contact > 0.5s (better)
 - ◀ Include photos, video clips in manual

Coding definitions with photos



b=blocked. When there is an obstacle in front of the baby (within about 1 foot) at the end of a bout. Change in elevations count as obstacles. Toys count as obstacles.

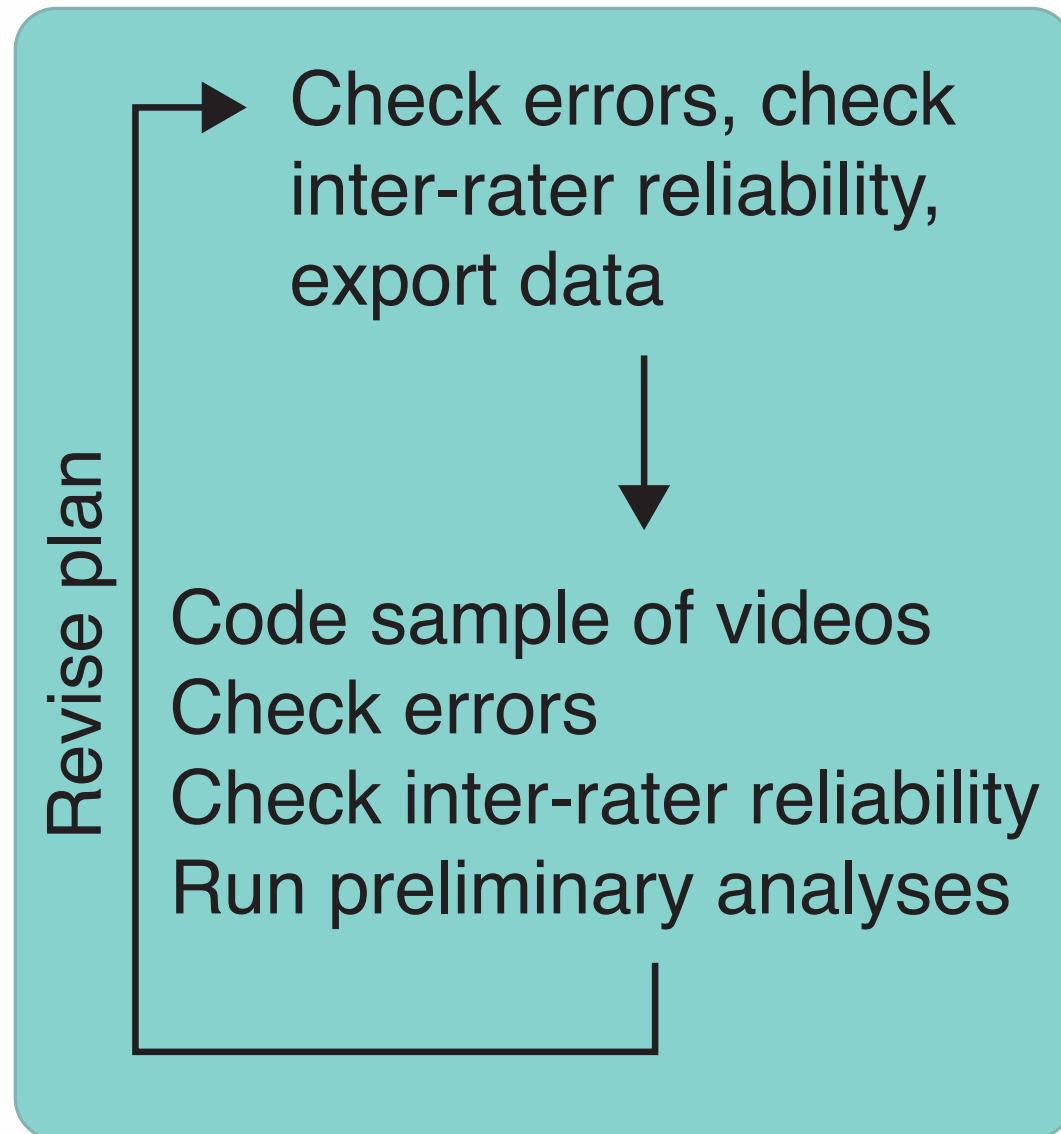


u=unblocked. When there is no obstacle in front of the baby at the end of a bout. So, essentially stops in the middle of the floor.

Test your coding scheme

- ▶ Code representative segments of videos (few minutes from each cell in your research design)
- ▶ Verify that codes work for all of your conditions/tasks, age groups
- ▶ Verify that codes are not too grueling

Step 3: Checks



Careless errors

- ▶ All coders will make careless errors
 - ◀ Typos, illegal letters, forget an offset time, insert an extra event, etc.
- ▶ Check for careless errors
 - ◀ Ensure all letters are legal
 - ◀ All durations within acceptable limits
 - ◀ No out of range values
 - ◀ All codes are logically compatible
 - ◀ No impossible relations

Errors in judgment

- ▶ Disagreement among coders
- ▶ Testing inter-rater reliability
 - ◀ Kappas instead of % agreement
 - ◀ Report inter-rater reliability in write-up
 - ◀ Careless errors lower inter-rater reliability, so eliminate them first
- ▶ Coding drift
- ▶ How much video to check? 25% per S
- ▶ “Best eyes” on entire dataset

Exporting data

- ▶ Be sure that you can export the data in the format you want for analyses
 - ◀ Variable types (strings, numerics)
 - ◀ Square spreadsheet (repeating information down rows)

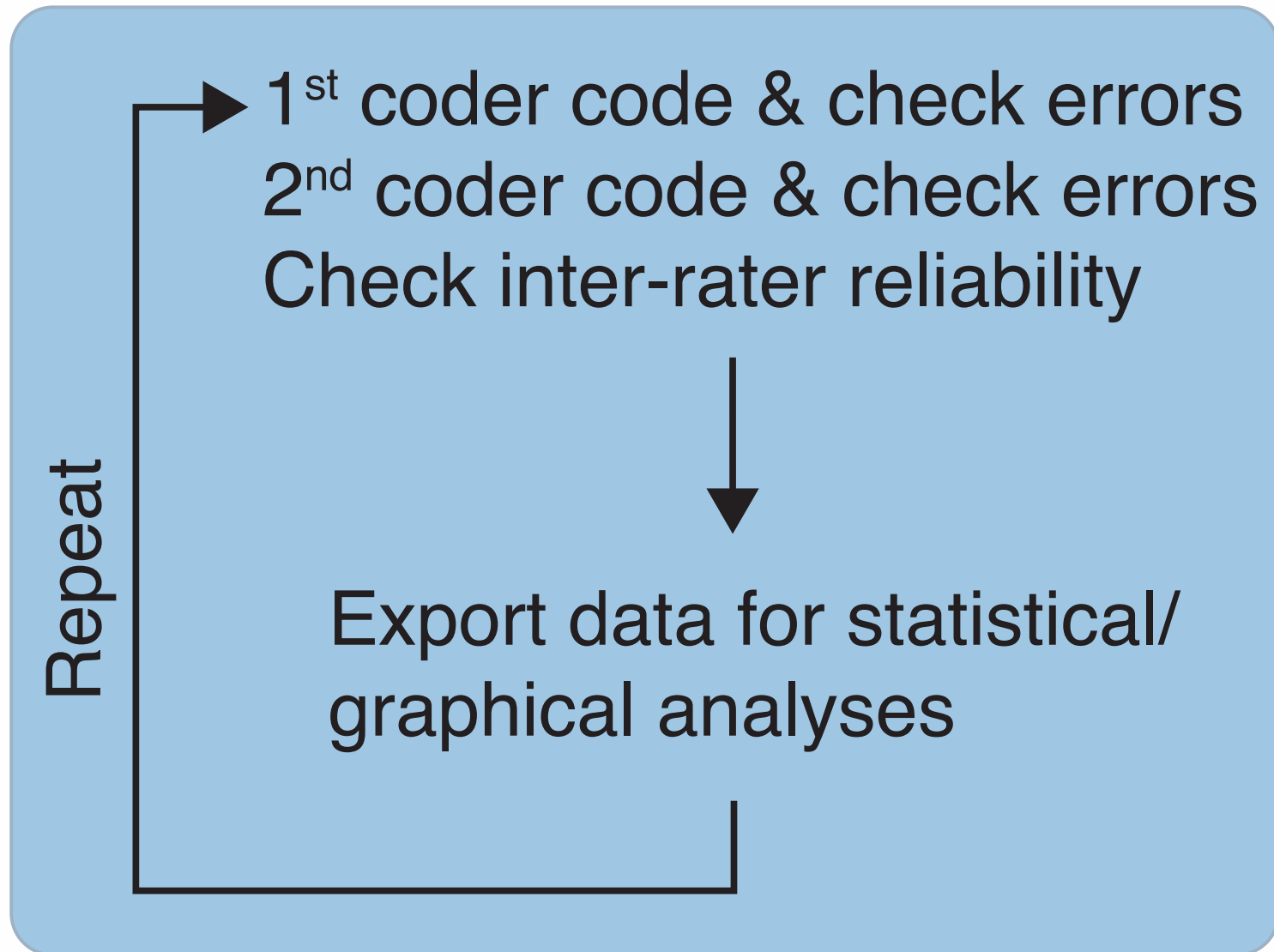
Exporting with Datavyu scripts

The screenshot displays the Datavyu software interface, which is used for video analysis and data export. The interface is divided into several panels:

- Script Table:** A table with columns for ID, text, and fixations. The text contains various observations and questions related to a child's interaction with a yellow toy.
- Video Feeds:** Four video windows showing different perspectives of the child and the toy. The bottom two windows have red and green crosshairs overlaid, indicating tracking or region selection.
- Data Viewer Controller:** A panel at the bottom right with various controls for video playback and data viewing, including buttons for 'Lock all', 'Add Bookmark', 'Snap Region', and 'Clear Region'. It also features a timeline with a red vertical line indicating the current position.

ID	momtalk	fixations
1	00:00:02.544 00:00:08.300 (L, 05/02/2013, 05/08/2014, m, m)	00:01:58.830 00:02:00.005
2	00:00:03.536 00:00:06.864 (Hello!)	00:02:00.004 00:02:00.39
3	00:00:09.824 00:00:15.390 (Look at that! Where's his nose? Oh!)	00:02:00.394 00:02:02.29
4	00:00:19.924 00:00:21.945 (Fell on the floor! Look guys! Woof! Woof! Woof! Woof!)	00:02:02.298 00:02:02.36
5	00:00:19.924 00:00:21.945 (Okay, where you want to go now?)	00:02:02.368 00:02:02.53
6	00:00:23.358 00:00:36.246 (Oh... it's an apple! Apple. Look at that! It's an apple! Where are the eyes? Do you see the eyes of the apple? No? Oh.)	00:02:02.536 00:02:02.67
7	00:00:23.358 00:00:36.246 (Fell on the floor?)	00:02:02.672 00:02:02.97
8	00:00:39.848 00:00:41.854 (Up and down. You want to put it down again?)	00:02:02.976 00:02:03.04
9	00:00:43.457 00:00:46.670 (It makes noise!)	00:02:03.046 00:02:03.35
10	00:00:55.420 00:00:56.825 (Shake shake shake shake shake! Shake shake shake!)	00:02:03.352 00:02:04.33
11	00:01:10.380 00:01:11.996 (Another shake shake shake?)	00:02:04.338 00:02:06.27
12	00:01:15.872 00:01:16.507 (Yeah, they're eyes.)	00:02:06.276 00:02:06.34
13	00:01:18.132 00:01:23.090 (Where is the nose? Can you see the nose? Press the nose!)	00:02:06.344 00:02:06.44
14	00:01:25.204 00:01:26.388 (Uh oh!)	00:02:06.514 00:02:07.19
15	00:01:28.676 00:01:29.972 (Yeah?)	00:02:07.194 00:02:07.36
16	00:01:32.888 00:01:47.509 (Give it to mommy. Can I	00:02:07.364 00:02:07.73
17		00:02:07.738 00:02:08.17
18		00:02:08.180 00:02:09.29
19		00:02:09.200 00:02:09.84
20		00:02:09.846 00:02:09.87

Step 4: Work flow



File organization

- ▶ Videos, spreadsheets, coding manual, exported data, other
- ▶ Establish naming convention for files
 - ◀ Videos & spreadsheets
- ▶ Keep record of who coded what when
- ▶ Keep record of reliability decisions
- ▶ Store videos on Databrary
 - ◀ When you're ready, share your videos!

Questions? Comments?

