App-Based Data Collection in Birth Cohorts: Implementation of a Video Function in the BabySteps App

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Children of the 2020s

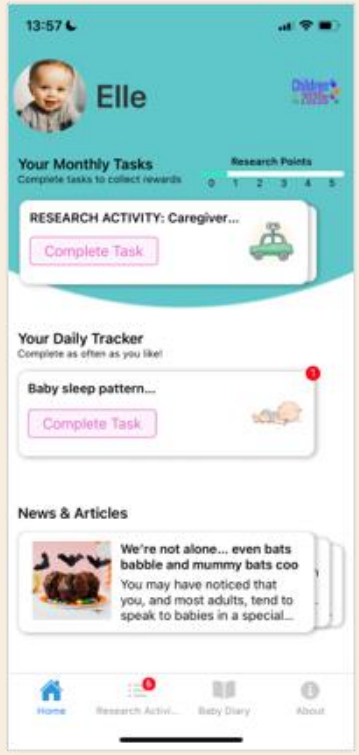
9 months → Age 2 → Age 3 → Age 4 → Age 5

- A national cohort study of 8,500 children and their families born in England at the start of the 2020s
- Commissioned by the Department for Education, led by University College London (UCL).
- Currently in the third wave of data collection (in person)
- Study app: ‘BabySteps - Children of the 20s’



Professor Pasco Fearon
Dr. Laurel Fish
Dr. Marialivia Bernardi

BabySteps App



Data collection

Monthly research activities

- Mini questionnaires
- Video and audio recordings
- Monetary rewards

Participant engagement

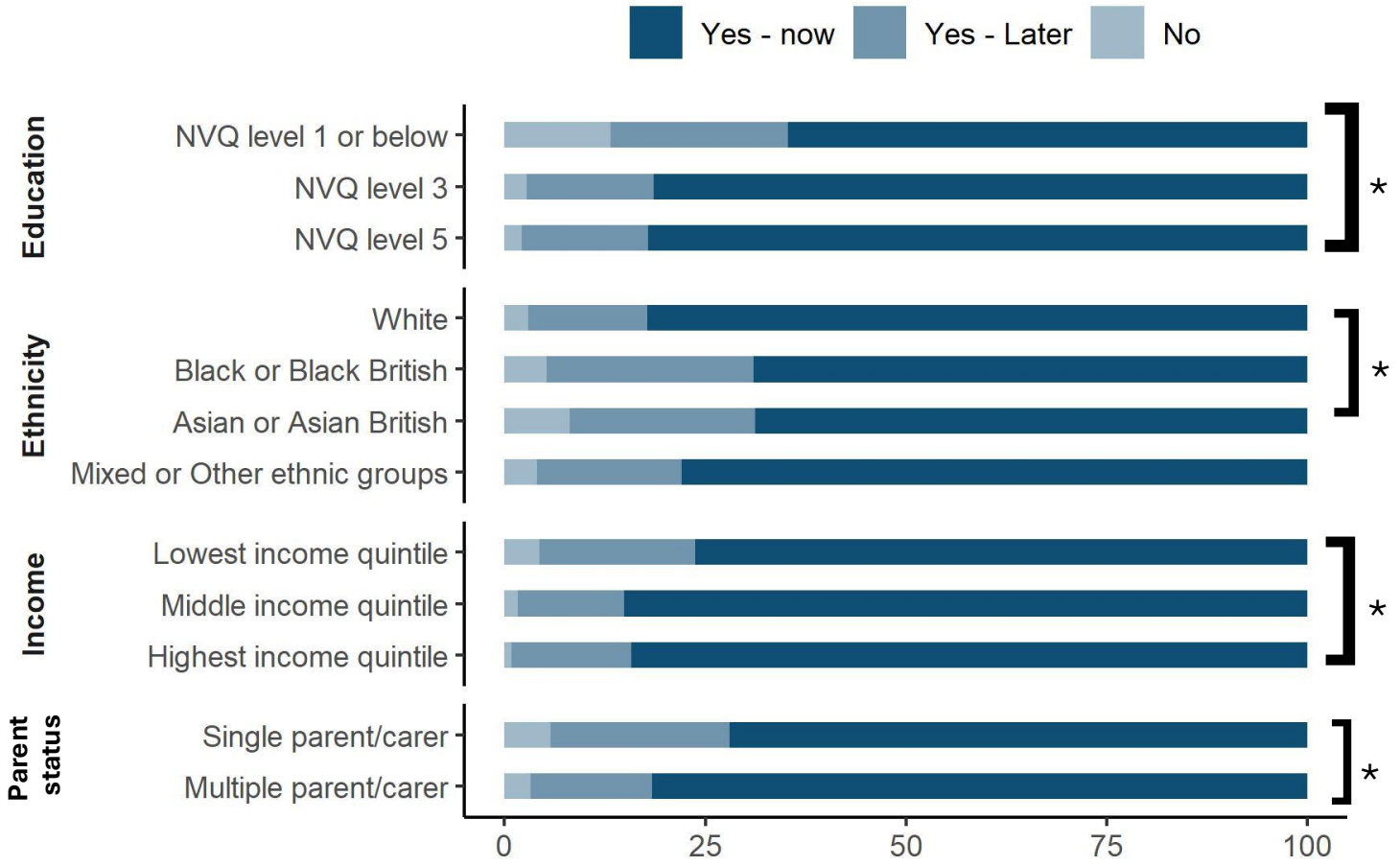
- Baby Diary
- News & Articles
- Daily trackers

Download and registration

Download during 1st the interview: 79%

(N = 6825)

Currently 7033 registered accounts (82%)



BabySteps – ongoing engagement

Task	Age when available	Task completion | % of those registered on app (% of sample)
Do you use greenspaces?	*From 8 m to 8 m and 21 d*	*23.79% (18%)*
Help us study baby's milestones!	*9-12 months*	*75.26% (56%)*
How your baby explores!	*10-12 months*	*60.23% (45%)*
How do you use smartphones!	*11-13 months*	*55.80% (41%)*
Your baby's attention!	*12-14 months*	*49.18% (36%)*
Your baby's emotions!	*13-15 months*	*48.36% (36%)*
What do toddlers get up to?	*14-16 months*	*44.24% (33%)*
Milestones updates	*15-17 months*	*45.41% (34%)*
Language updates	16-18 months	43.60% (32%)
Update your toddler's attention	17-19 months	39.33% (32%)
Life at home	18-20 months	39.02% (29%)
Toddlers' sleep habits!	19-21 months	37,07% (29%)
Interactions and behaviours	20.5-22.5 months	33.16% (25%)
Looking after your toddler!	21-23 months	33.71% (25%)
Toddler milestones update	22-24 months	33.62% (25%)
No task	**23-25 months**	**Age 2 Main Survey**
Your child's experiences!	25-27 months	33.15% (25%)
Your child's playtime!	26-28 months	32.60% (25%)

Task	Age when available	Task completion | % of those registered on app (% of sample)
Toddler milestones update 2	27-29 months	31.99% (24%)
Interactions and behaviours - update	28-30 months	31.62% (24%)
Eating habits!	29-31 months	30.82% (23%)
Tricky situations!	30-32 months	30.26% (23%)
Being helpful	31-33 months	29.56% (22%)
Childcare	32-34 months	28.6% (22%)
Learning how to talk - update!	33-35 months	27.21% (21%)
Learning how to talk – part 2	34-36 months	26.86% (20%)
Language recording	35-37 months	4.5% (3.64%)
Final milestones update**	36-39 months	31.17% (25%)
Learning how to talk – part 3	37-39 months	29.06% (24%)
Your child's temperament	39-41 months (currently available)	
Your child's play	40-42 months (currently available)	
Getting ready to learn!	41-43 months (currently available)	
Play at home	42-44 months (currently available)	

Video function in the app

Advantages
- Automatic secure storage of sensitive data
- Low-cost fine-grained data collection
- Can be done in multiple settings

Challenges
- Upload process
- Keeping app up to date on user's end
- Execute instructions
- Continuous software updates
  iOS and Android

Video function in the app

Independent research activity

You and your child chatting!
(Make a recording during snack time!)
Child age = 34-35 months

Chatting at home is a really crucial way that children learn language! Little moments during the day, like when having a snack, can be a great time for a chat!

To help us better understand children's language development we would like you to take a 5 MINUTE video recording of you and your child chatting while having a small snack. The snack can be as small as you like - we're just interested to hear children chat!

A copy of the video will be saved in your photo gallery for you to keep!

IMPORTANT: Please only do this in your own home, if you are the child's parent/legal guardian, and try not to include other children or people in the video.

STEP 1: Get ready!
- Grab a small snack
- Turn TV/radio off
- Sit on the floor or at a table with your child

STEP 2: Set up your device!
- Tap ‘Take a Video’
- Prop device up lengthways with the screen facing you
- Flip the camera to selfie mode
- Check you and your child can be seen

STEP 3: Record the video!
- Tap the blue 'record' button to start recording
- After five minutes, the ‘record’ button will turn green
- Tap the green 'record' button to stop

If needed, you can record the video outside of the app using your phone camera and upload using the “Attach video” button below.

Thank you! For the video to be saved it is important that, after you have pressed 'Submit', you leave the app open until the upload is complete.

Researcher-assisted research activity

Make a recording during snack time!
Child age = 36-38 months

PARENTS - PLEASE DO NOT COMPLETE THIS!

This activity is for when your Ipsos researcher comes to visit you for the Age 3 Children of the 2020s Study interview. Please DO NOT complete this without them. Like all aspects of the study, you can choose whether to do this task or not when our researcher comes to visit.

Please note that there are no reward points attached to this activity.

Independent research activity

You and your child chatting!
(Make a recording during snack time!)

341

72% valid duration videos
(>60 seconds & <400 seconds)
M = 4 min, 47 sec (min = 68 , max = 399)

Researcher-assisted research activity

Make a recording during snack time!

2990

> 80% agreed

95% valid duration videos
(>60 seconds & <400 seconds)
M = 4 min, 50 sec (min = 65 , max = 392)

Willingness and ability

2689 Only valid researcher assisted video

178 Invalid duration video(s) (either independent or with researcher)

145 2 valid videos

96 Only valid independent video*

* Unknown if they refused or if recording activity was taken out before their interview took place

Independent research activity

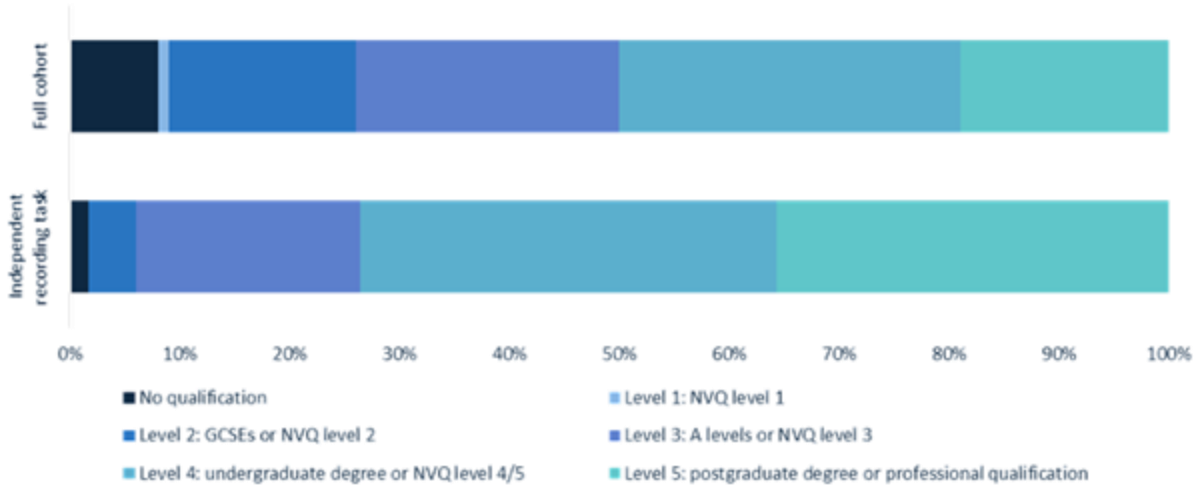
You and your child chatting!

(Make a recording during snack time!)

N = 341

Primary caregiver ethnicity

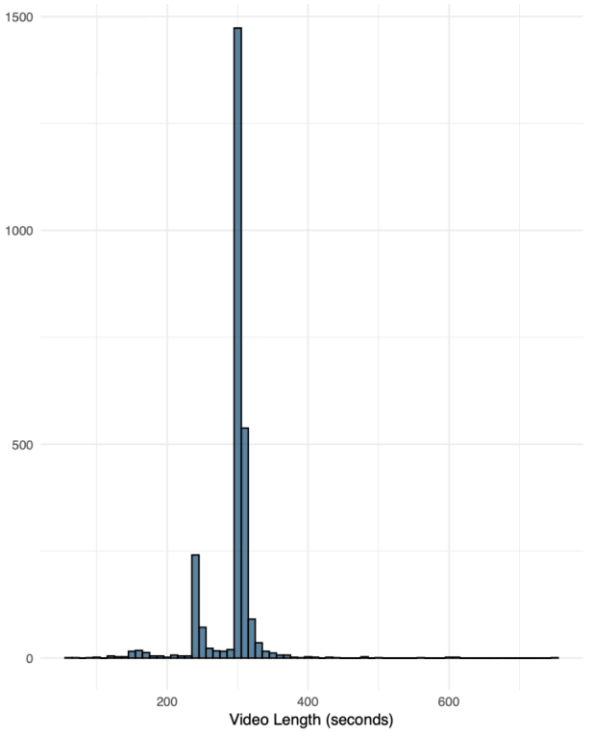
Primary caregiver highest qualification

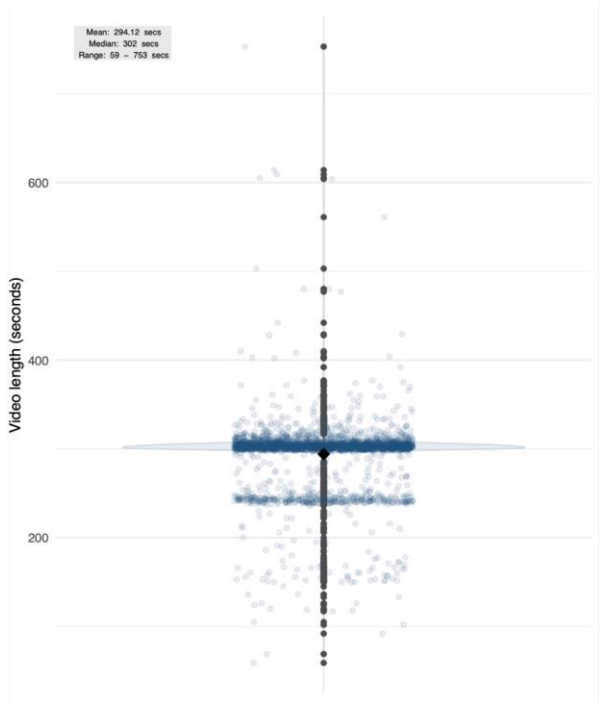


Researcher-assisted research activity

Make a recording during snack time!

N = 2990





Overview of researcher-assisted video length, average length median and range.

Extended validity measures for non-audio analysis

Play-interaction video task: good examples

Example removed for privacy reasons

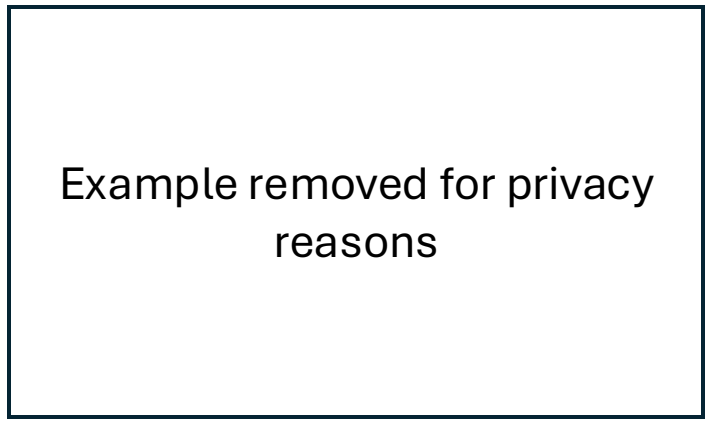
- ✓ Taken landscape
- ✓ Lots of room in camera's view around family (in case the child moves)

Example removed for privacy reasons

- ✓ Can see both of them, their faces, and toys/book clearly – on level with family
- ✓ Well lit

Extended validity measures for non-audio analysis

Play-interaction video task: bad examples



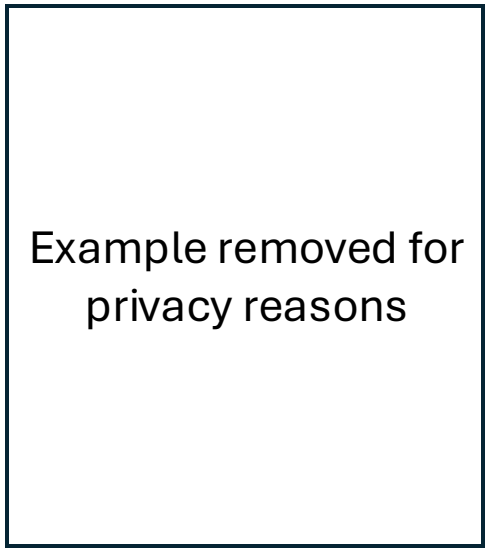
X Finger over lens

X Camera cutting out the face (too focused on the toys)

X portrait

X Bright light behind, makes it hard to see them clearly.

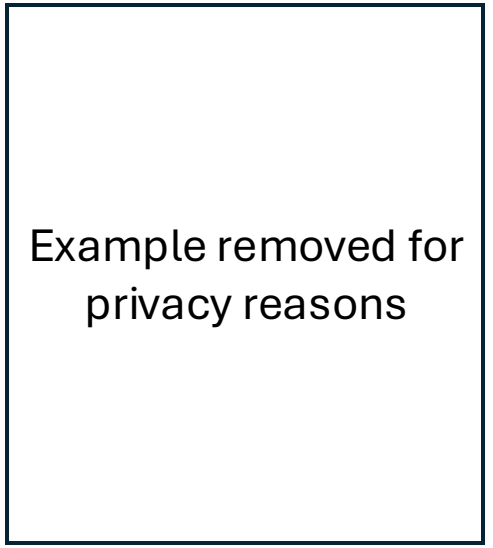
X Someone else in the background



X portrait

X Furniture in the way

X positioned to the side



X portrait

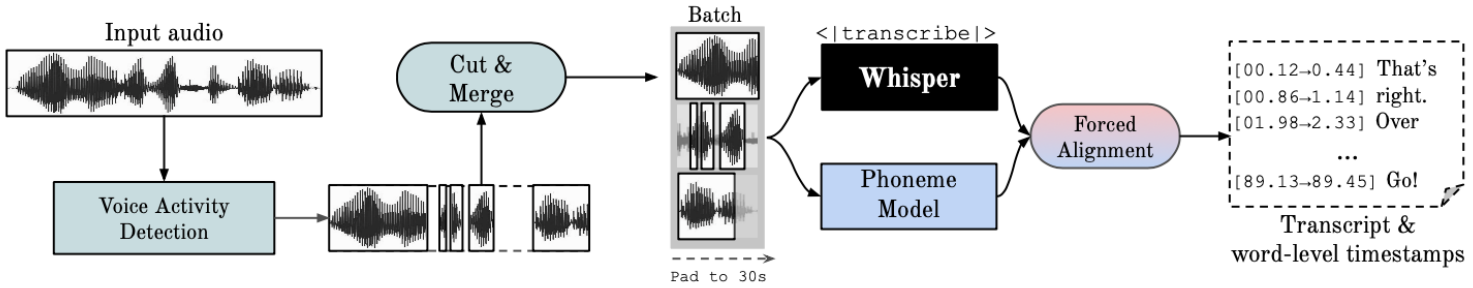
X Positioned to the side – cannot see faces clearly

Future analysis

Specific to large-scale child development studies

- Require programming knowledge
- Application in secure research environments

Whisperx[1]



⊕ Transcription + translation

⊕ Word-level timestamps

⊖ Speaker diarization

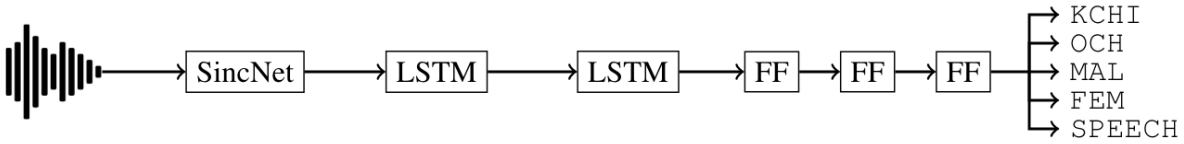
[1]Bain et al., 2023
[2]Lavechin et al., 2023

Future analysis

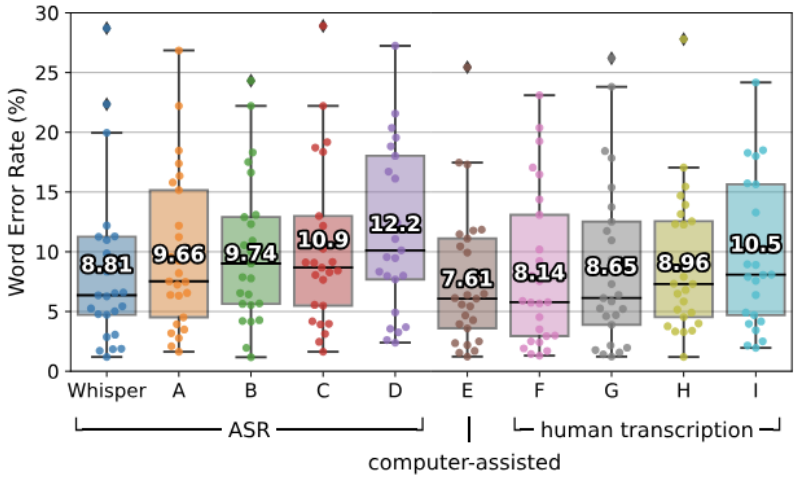
Specific to large-scale child development studies

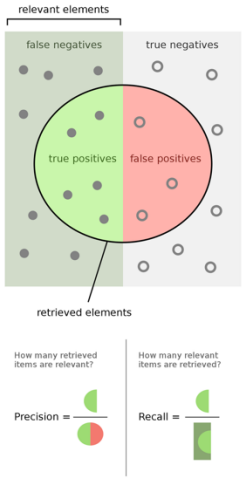
- Require programming knowledge
- Application in secure research environments

Voice type classifier[1]



- ⊕ Child vocalizations categories
- ⊕ Conversational turns and back and forth alternations
- ⊖ Precision vs recall





[1]Lavechin et al., 2023

Children of the 2020s

Thank you!