

Interview Guide - Measuring understanding of biological data models

Introduction

“Thank you for agreeing to participate in this study. The plan for today is to spend a little while talking about your background and trying to learn how you think about biological data and what your ‘mental model’ of it looks like.

I’m hoping to see whether or not people from different backgrounds think of biological data in different ways – with the end goal being that we might be able to use the mental model knowledge to present data to you in ways that make more sense – perhaps making biological software or data easier to use in the future.

I have some information sheets and a consent form – can I get you to read through them for me? You can ask questions if anything is unclear.”

Actions:

1. Present to participant:
 - a. GDPR notice,
 - b. Participant Information Sheet,
 - c. Consent Form.
2. Allow participant to read through in their own time, but answer any questions or queries they may have.
3. Make sure the Consent Form is signed before we continue.

Background Questionnaire

“Thanks! The next thing we’ll do is run through a few questions about your background – just questions regarding your personal experience and education in biology and computational subjects. This will help us to aggregate your results with those of other participants based on your background.”

Actions:

1. Present user with the background questionnaire, loaded on the computer.

“Could I get you to fill this in quickly for me? Thanks!”

If the participant looks hesitant:

“If it’s easier, I can ask you the questions and fill it out instead.”

Recording

“Perfect, thanks! Now I’ll set up the camera/audio recording (*choose appropriate phrase depending on the consent given by the participant*). This is mostly about getting an audio transcript so I don’t miss anything – we won’t be focusing on your face, just the table where we’ll be carrying out our tasks.”

Actions:

1. Set up camera to focus on the table, where the Tasks A and B (explained next) will be performed.

Tasks A and B

“Okay, thanks for filling that out! Next, we will...”

Participants will be asked to perform both Task A and Task B, with the starting task alternating between A and B in case one task affects performance in the other.

Task A

“... run through a card sorting task. I have a set of cards here with some biological data-related words on them. Can I get you to sort or arrange them in a way that makes sense to you? There aren’t any right or wrong answers here – I want to know what *you* think.

I also have some pens and paper – if you want to sketch, make notes, or create your own cards, feel free.”

Actions:

1. Provide participant with the cards, blank cards, paper, and pens.
2. Observe the participant for cues

Possible (contextual) prompts / discussion points during the card sort:

- “Are you looking for anything in particular?”
- “You can add your own cards if it helps”
- (*Explain what a certain card means, if the user is unfamiliar with it or asks questions – e.g. “What is a GO Term?”*)
 - o “You can put any cards you don’t understand to the side – that’s useful for me to know, too”
- “Do you think there are any relationships between the cards you’ve sorted?”
- “Why did you choose to group these together?”

Once the card sort appears to be nearing a final stage:

“Are there any cards (or piles/groups of cards) you think are more important or interesting than the others?”

“Okay, thanks – this was really interesting. I’m just going to take a few quick photos of this, if you don’t mind?”

If there were any hand-drawn cards or sketches: “Is it alright to photograph these too?
Thanks!”

Actions:

1. Photograph all outputs of the card sort, assuming the participant agrees.
 - a. If any cards are arranged in piles, make sure to photograph cards that are underneath the top layer.
 - b. If the participant has hand-written anything, make sure that their handwriting is clear enough to be read, or clarify anything that isn’t readable.
 - c. Ensure that the photographs are of sufficient quality / focus to be read later on.
2. Remove any hand-written cards or sketches. Ideally shred as soon as possible.

Task B

“Okay, nearly done now! One final thing left to do. I have some copies of biological files here, with a few sections highlighted. Can I get you to match the highlighted sections to items on the cards? Just write the card name (if any) on the paper.”

Actions:

1. Provide the participant with paper copies of common biological files such as:
 - a. FASTA
 - b. GFF3
2. Photograph all outputs, assuming the participant agrees.
 - a. If the participant has hand-written anything, make sure that their handwriting is clear enough to be read, or clarify anything that isn’t readable.

Wrap-up

“That was brilliant – thank you very much! That’s all I had to ask you today. Do you have any questions, or was there anything you’d like me to explain further?”

Once the participant has asked any questions they might have:

“Awesome. I still have some interviews left to do and some data analysis, but I’ll let you know when we get to the write-up stage and hopefully the publication. Thanks again for your great help!”