

# Pocket Lab App (PoLA) Documentation

(ver. 18.03.2024)



## Introduction

The Pocket Lab App (PoLA) is a research tool designed to streamline the process of conducting experimental research outside traditional laboratory settings. Free, open-source, and user-friendly, PoLA operates on Android devices to facilitate experiment flow, time management, self-report collection, and data logging. Its integration with PoLA's Helpful Assistant (HeLA), an artificial intelligence component, makes protocol creation and revision as simple as providing natural language instructions.

## Installation

1. Visit <https://github.com/lkacz/PocketLabApp/releases> to download the PoLA .apk file.
2. Allow installation from unknown sources in your device's settings.
3. Install the .apk file on your Android device.

## Getting Started

Upon installation, launch PoLA and familiarize yourself with the interface running demo and tutorial protocols. The app requires uploading a study-specific protocol formatted as a .txt file to guide participants through the experiment.

## Creating a Protocol

A protocol is a sequence of instructions stored in a .txt file. Each line in the protocol corresponds to a command that PoLA executes. Protocols can be created in any text editor and easily revised or fully developed using natural language with HeLA.

An example protocol for a bogus study:

```
// This is the name of my study

STUDY_ID;MindfulWalkStudy

// This scale will ask about mood and provide five buttons for the response between stressed
and relaxed

SCALE;Pre-Walk Mood;How do you feel right now?;Your Current Mood;Very
Stressed;Stressed;Neutral;Relaxed;Very Relaxed

// The participant receives instructions on walking mindfully and start the session by
pressing Begin Walk

INSTRUCTION;Mindful Walk Instructions;During your walk, focus on your surroundings.
Observe the colors, sounds, and scents around you. If your mind wanders, gently bring your
attention back to the present moment.;BEGIN WALK

// Now the participant continues to walk mindfully for 15 minutes

TIMER;Walk Time;Enjoy your mindful walk. Press 'Continue' when you finish.;Continue;900

// Here we check again the mood

SCALE;Post-Walk Mood;How do you feel right now?;Your Current Mood;Very
Stressed;Stressed;Neutral;Relaxed;Very Relaxed

// We finish with asking for feedback

INPUTFIELD;Feedback;We value your feedback. Please share your thoughts about the
mindful walk.;SUBMIT;Your Experience
```

## Commands Overview

PoLA uses a concise set of commands for various functionalities, including displaying instructions (INSTRUCTION), setting timers (TIMER), collecting self-reports (SCALE, MULTISCALE, INPUTFIELD), and logging data (LOG). The syntax for each command is straightforward, with semicolon-separated elements.

## Uploading the Protocol

1. Connect your device to a computer via USB.
2. Transfer the .txt protocol file to the device's storage.
3. In PoLA, select 'Load Protocol' and navigate to the file.

## Running an Experiment

1. Start the Session: Launch PoLA on the laboratory smartphone and load the protocol.
2. Participant Interaction: Hand the device to the participant to follow the instructions.
3. Data Collection: PoLA will automatically save responses and log data as the participant progresses through the protocol.
4. End of Session: Retrieve the device, and the collected data will be available for analysis in specified output formats.

## Output and Data Analysis

Upon completion of the protocol, PoLA generates output files in both .csv and .xlsx formats, stored under *PoLA\_Data* and *PoLA\_Backup* folders in the device's Documents directory. These files contain time-stamped participant responses and additional information, facilitating easy and quick data analysis.

## Limitations and Considerations

- Requires direct participant-researcher interaction for protocol initiation.
- Designed for moderate complexity experiments; may not support highly specialized tasks.
- Data aggregation across participants requires manual editing.
- The interface and documentation are currently available only in English.
- The AI functionality is experimental and may produce false suggestions that seem correct.

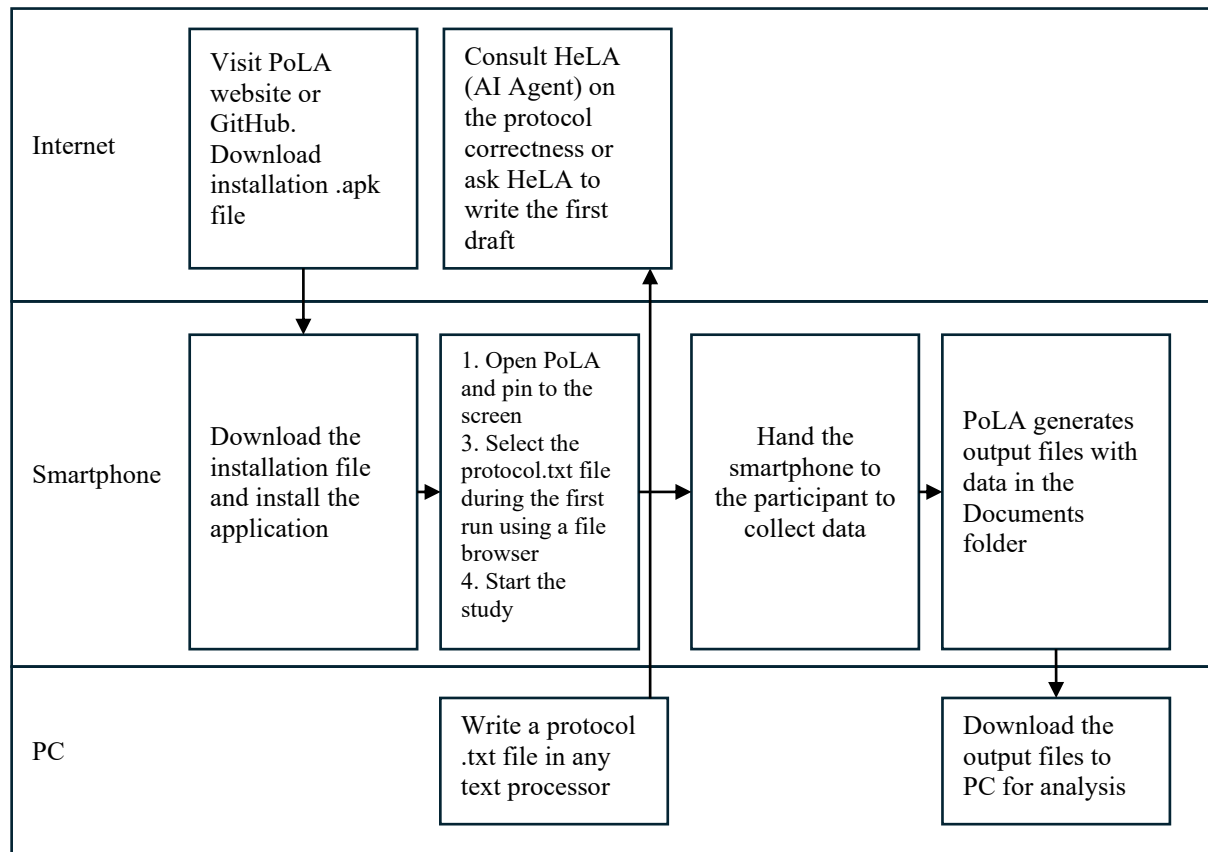
## Future Directions

The development team is committed to continuous improvement, with future updates potentially including more complex instructions, diverse self-report options, branching logic, graphical customization, and leveraging smartphone sensors. Community involvement is highly encouraged to ensure PoLA evolves in ways that most benefit the research community.

## Developer Information

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Gaming & Streaming, Email: [lkacz@amu.edu.pl](mailto:lkacz@amu.edu.pl)

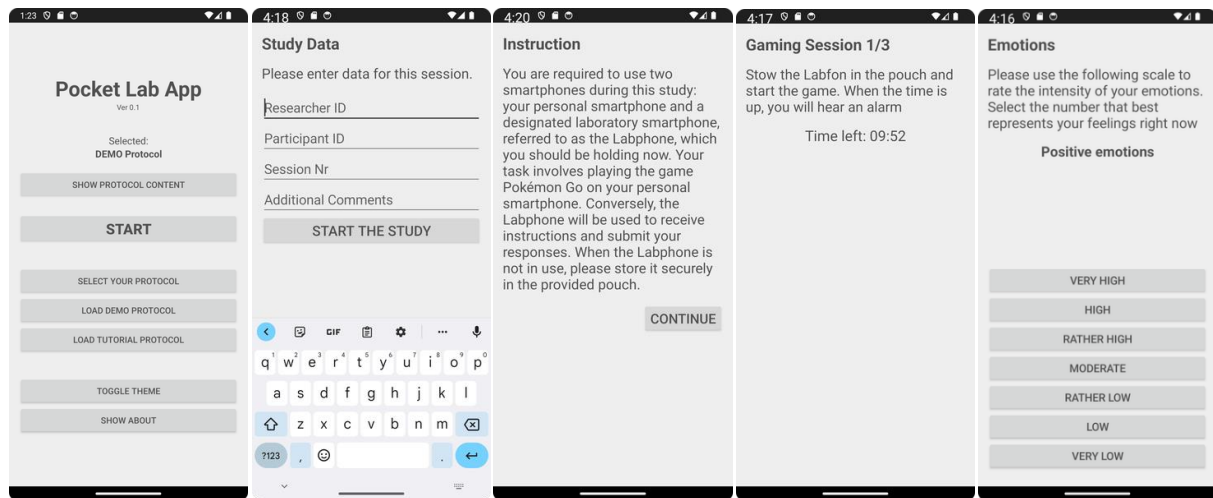
For inquiries, collaborations, or feedback regarding PoLA and HeLA, please contact Dr. Kaczmarek directly via email.



**Figure. Flowchart for Data Collection and Analysis Using PoLA**

*Note.* The user downloads the installation file from the internet and the protocol.txt file from a PC. The application generates outputs in the Documents folder, which are downloaded to the PC for integration and statistical analysis. The user can use HeLA, PoLA's Helpful Assistant, an AI agent that reviews and writes PoLA protocols.

# Commands



*Figure. Example slides from the PoLA.*

*Note.* From left: Start screen, text input fields, instructions, timer, and a scale.

## 1. STUDY\_ID

Format: STUDY\_ID;STUDY\_ID\_TEXT

Function: This command assigns an identifier to the study, which will be used as a prefix for filenames to help organize data.

Example: STUDY\_ID;MyFirstStudy

Usage: It helps distinguish data files from different studies or protocols, especially useful when conducting multiple studies on the same device.

## 2. SCALE

Format: SCALE;HEADER\_TEXT;BODY\_TEXT;ITEM\_TEXT;RESPONSE1\_TEXT;...;RESPONSE9\_TEXT

Function: Displays a single question with up to nine response options.

Example: SCALE;Emotions;Rate your current emotional state;Calmness;Very Low;Low;Moderate;High;Very High

Usage: It's ideal for collecting single-item self-report measures from participants like mood, satisfaction, or symptom severity.

## 3. MULTISCALE

Format:

MULTISCALE;HEADER\_TEXT;BODY\_TEXT;[ITEM1\_TEXT;ITEM2\_TEXT;...];RESPONSE1\_TEXT;...;RESPONSE9\_TEXT

Function: Similar to SCALE, but allows presenting multiple items with the same set of response options.

Example: MULTISCALE;Daily Activities;How satisfied are you with the following activities today?;[Exercise;Work;Social Interaction];Not at all;Somewhat;Moderately;Very;Extremely

Usage: Useful for evaluating multiple aspects of a participant's experience or behavior using a consistent rating scale.

## 4. RANDOMIZED\_MULTISCALE

Format:

RANDOMIZED\_MULTISCALE;HEADER\_TEXT;BODY\_TEXT;[ITEM1\_TEXT;ITEM2\_TEXT;...];RESPONSE1\_TEXT;...;RESPONSE9\_TEXT

Function: Functions like MULTISCALE, but items are presented in a random order each time.  
Example: RANDOMIZED\_MULTISCALE;Dietary Choices;Rate how frequently you consumed the following items this week;[Fruits;Vegetables;Fast Food];Never;Rarely;Sometimes;Often;Always  
Usage: Employed to reduce order effects when presenting multiple items to participants.

#### 5. TIMER

Format: TIMER;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT;NumberOfSeconds

Function: Displays a message and a countdown timer. When the timer expires, a button appears to continue.

Example: TIMER;Break Time;Take a short break. The next session will start shortly.;Continue;300

Usage: Useful for scheduling breaks or controlled time intervals between experiment phases.

#### 6. INPUTFIELD

Format:

INPUTFIELD;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT;INPUTFIELD#1;...;INPUTFIELD#10

Function: Displays a form with up to 10 input fields for open-ended responses.

Example: INPUTFIELD;Demographics;Please provide the following information.;Submit;Age;Gender;Education Level;Employment Status

Usage: Collects textual data from participants, including demographic information or open feedback.

#### 7. INSTRUCTION

Format: INSTRUCTION;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT

Function: Shows static instruction or information message with a button to proceed.

Example: INSTRUCTION;Welcome!;Thank you for participating in this study. When you're ready, please press 'Continue' to start.;Continue

Usage: Presents instructions, consent information, or other text to participants before or during the experiment.

#### 8. TAP\_INSTRUCTION

Format: TAP\_INSTRUCTION;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT

Function: Same as INSTRUCTION, but requires a triple tap to reveal the continue button.

Example: TAP\_INSTRUCTION;Attention Check;To ensure you're paying attention, triple-tap anywhere on the screen to continue.;Continue

Usage: Ensures participants are actively engaged by requiring a specific interaction before proceeding.

#### 9. LOG

Format: LOG;Text

Function: Logs a text note in the output file when reached in the protocol.

Example: LOG;Starting Section 2

Usage: Useful for marking different phases or sections of the study within the output data for easier analysis.

#### 10. END

Format: END

Function: Signals the end of the protocol. Commands placed after this command will not be executed.

Example: END

Usage: Can be used to prematurely terminate the protocol or to ensure that a specific set of commands is the last to run.

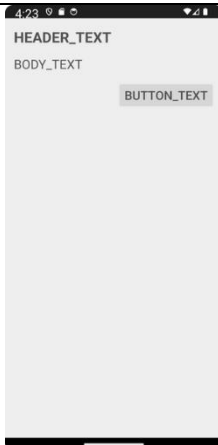
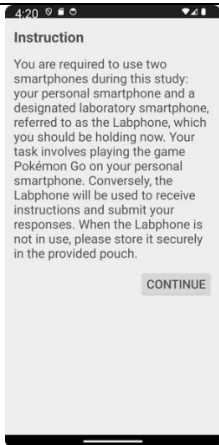
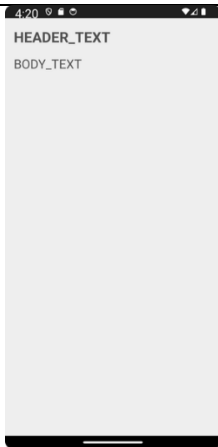
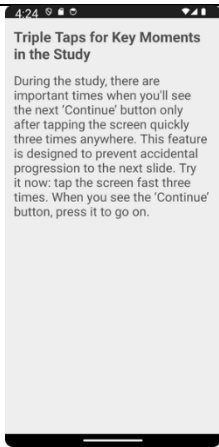
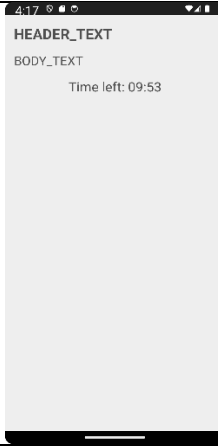
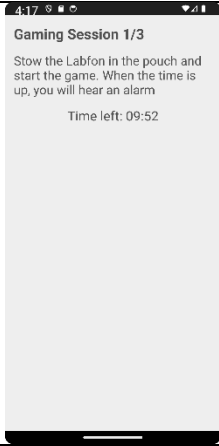
## Comments

Format and Function: Text not starting with a command identifier is ignored, serving as comments within the protocol file.

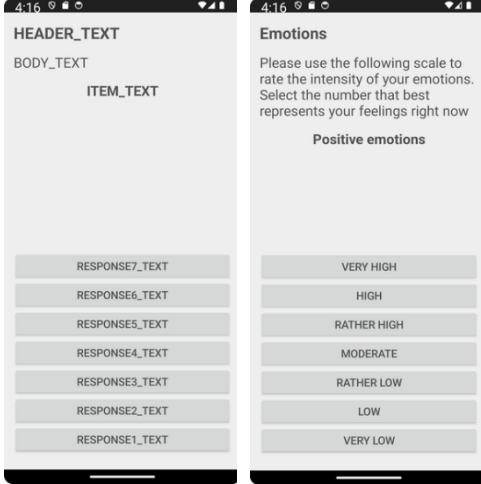
Examples: "// This is a comment", "--- Section divider"

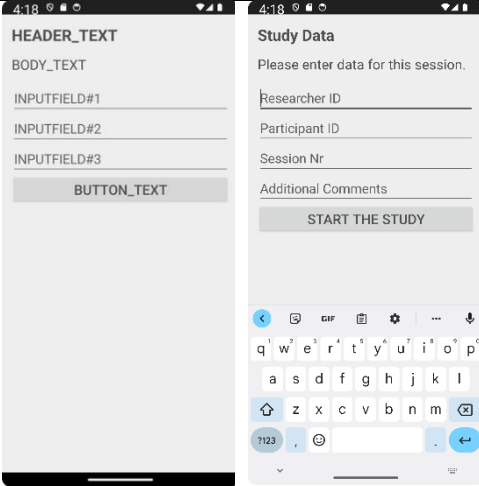
Usage: Organizes and annotates the protocol file for better readability and documentation purposes. HeLA can create or verify commands based on a natural language description of desired functionality. Thus, commenting is a good practice for protocol reuse, modification, or AI-assisted verification.

**Table X. PoLA's commands**

| Command / format / example  | Function   | Layout   | Example   |
|---|--|--|---|
| <b>Procedure flow</b>   |  |  |   |
| <b>INSTRUCTION</b><br><br>INSTRUCTION;HEADER_TEXT;<br>BODY_TEXT;BUTTON_TEXT<br><br>INSTRUCTION;Instruction;You<br>are required... ;CONTINUE   | Displays header, body, and a<br>button with text. Waits until<br>the participant reads the text<br>and taps the button. Used to<br>present information to the<br>participants (e.g.,<br>instructions).   |    |    |
| <b>TAP_INSTRUCTION</b><br><br>TAP_INSTRUCTION;HEADER_T<br>EXT;BODY_TEXT;BUTTON_TE<br>XT<br><br>TAP_INSTRUCTION;Triple Taps<br>for Key Moments in the<br>Study;During the<br>study...;CONTINUE | The same as<br>INSTRUCTION but<br>involves an particular action<br>(triple tap) before the button<br>appears, to ascertain that the<br>user does not skip this slide<br>unintentionally. The button<br>is hidden until the user<br>triple-taps the screen. Used<br>for time-sensitive moments,<br>e.g. before setting the timer<br>or while synchronizing<br>action of two participants.<br>The participant must be<br>instructed on to handled this<br>slide. |   |   |
| <b>TIMER</b><br><br>TIMER;HeaderText;BodyText;Butt<br>onText;Seconds<br><br>TIMER;Session 1;Walk through the<br>park for the next 10 minutes;Stop<br>alarm;600                                | This allows researchers to<br>schedule auditory and<br>vibratory alarms. This<br>feature prompts participants<br>to complete assessments or<br>engage in specific behaviors<br>at predetermined intervals.   |  |  |
| <b>Surveys</b>  |  |  |   |



|  |   |  |
|--|---|--|
| <p><b>SCALE</b></p> <p>SCALE;HEADER_TEXT;BODY_TEXT;ITEM_TEXT;RESPONSE1_TEXT;RESPONSE2_TEXT;(up to RESPONSE9_TEXT)</p> <p>SCALE;Arousal Scale;Please report your arousal level right now;Arousal;Very low;Low;Medium;High;Very high</p>   | <p>Displays a header, scale introduction, item, and up to nine labeled response buttons. It asks a single question.</p>       |  |
| <p><b>MULTISCALE</b></p> <p>MULTISCALE;HEADER;INTRO;[ITEM1,ITEM2,ITEM3,ITEM4];LABEL#1;LABEL#2;(up to LABEL#9)</p> <p>MULTISCALE;AFFECT SCALE;Please report your affect levels;[Valence,Arousal,Approach-avoidance motivation]Very low;Low;Medium;High;Very high</p>                                  | <p>The same as SCALE but includes a list of items rather than a single item. The items are presented in the listed order.</p> |  |
| <p><b>RANDOMIZED_MULTISCALE</b></p> <p>RANDOMIZED_MULTISCALE;HEADER;INTRO;[ITEM1,ITEM2,ITEM3,ITEM4];LABEL#1;LABEL#2;(up to LABEL#9)</p> <p>RANDOMIZED_MULTISCALE;AFFECT SCALE;Please report your affect levels;[Valence,Arousal,Approach-avoidance motivation]Very low;Low;Medium;High;Very high</p> | <p>The same as MULTISCALE but the listed items are randomized upon each application start.</p>                                |  |

|   |   |  |
|---|---|--|
| <b>INPUTFIELD</b><br><br>INPUTFIELD;HEADER_TEXT;BODY_TEXT;BUTTON_TEXT;INPUTFIELD1_TEXT;INPUTFIELD2_TEXT<br><br>INPUTFIELD;Study Data;Please enter data for this session;START THE STUDY;ResearcherID;ParticipantID;Session Nr;Additional comments | Displays a header, text, up to 10 input fields, and a button with text. The user taps the field and inputs text data. This can be used by the participant (e.g., to provide qualitative data) or by the researcher (e.g., to enter a participant's ID). |  |
| <b>Metadata</b>   |   |  |
| <b>LOG</b><br><br>LOG;Text<br><br>LOG;The first block starts here   | Logs any predefined text in the output and when this part of the protocol was reached. It can be used to increase the readability of the output.  |  |
| <b>STUDY_ID</b><br><br>STUDY_ID;Text<br><br>STUDY_ID;MyFirstOutdoorStudy_labphone1  | Optional. If used, each generated output file will start with this text. It helps to organize the collected data, mainly if more labphones are used (e.g., social experiments)  |  |
| // This is ignored<br><br>--- This is also ignored<br><br>This is also ignored because anything that does not start with a command is ignored.  | Lines that do not start with any command will be ignored. Thus, any characters can be used for commenting and syntax readability in line with personal preferences.   |  |
| <b>END</b>  | Optional. Commands placed after this command will not be executed. It is helpful when the user wants to retain some commands in the bottom part of the protocol file, e.g., for later use during protocol development or testing.                       |  |

# HeLA (Helpful Assistant for PoLA) Documentation

## Introduction

HeLA, or Helpful Assistant, is an AI-powered support tool designed to assist researchers in creating and revising experimental protocols for use with the Pocket Lab App (PoLA). HeLA simplifies the transition from research ideas to actionable experimental protocols by leveraging natural language processing and understanding. This documentation outlines HeLA's capabilities, usage, and how it integrates with PoLA to facilitate efficient experimental setup and execution.

## Features

- **Natural Language Understanding:** HeLA interprets instructions provided in natural language, allowing researchers to describe their study requirements without writing in code or specific command syntax.
- **Protocol Generation:** Automatically generates PoLA-compatible protocols based on descriptions of the study design, objectives, and required measurements.
- **Protocol Revision:** Offers suggestions for improving existing protocols by identifying potential issues or opportunities for refinement.
- **Questionnaire Conversion:** Converts traditional questionnaire formats into interactive PoLA slides, selecting suitable command formats based on the content.
- **Creative Solution Finding:** Suggests workarounds for functionalities not directly supported by PoLA, enhancing the versatility of experiment design.

## Getting Started with HeLA

To utilize HeLA, researchers must have a basic understanding of their research objectives and the types of data they wish to collect. HeLA operates through a user-friendly interface where researchers input descriptions of their study in natural language or paste their protocols for reviewing.

## Accessing HeLA

HeLA can be accessed as a chatGPT tailored GPT (via the GPTs functionality) or any other Large Language Model Chat (see further sections for instructions on turning any LLM into HeLA).

Visit PoLA website for the link or use this link: <https://chat.openai.com/g/g-Vz0JnWtqf-pola-helpful-assistant-HeLA>

You need to have access to ChatGPT premium account to use GPTs. Upon accessing HeLA, you will be greeted with an input field where you can start describing your experimental needs.

## Inputting Instructions

1. (optional) Describe Your Study: Include a brief overview of your study, including its purpose and the data you intend to collect.
2. Detail Specific Requirements: Describe point-by-point specific elements of your study design, such as the types of questions you plan to ask, the scales to be used for responses, timings for timed tasks, and any special instructions for participants.
3. Specify Desired PoLA Commands: If you're familiar with PoLA's capabilities, you can mention specific commands you wish to use. However, this is unnecessary, as HeLA can suggest the most appropriate commands based on your description.

*Figure. Developing the research protocol from the natural language.* HeLA fully mediates between the natural language prompt provided by the user and the protocol format delivered to PoLA. This includes selecting appropriate commands, formatting the commands, and populating the command fields with content.

### Prompt:

**You**  
Write a protocol where:  
- participants type in their age and name  
- they receive instruction to walk in the park for 30 minutes  
- the application waits for 30 minutes  
- after 30 minutes, the application asks them about weather satisfaction using this scale. The items should be presented in a random order:

**Weather Satisfaction Scale**  
Instructions: Below are five statements that you may agree or disagree with. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

\_\_\_\_ The current weather conditions meet my expectations.  
\_\_\_\_ I am pleased with the weather today.  
\_\_\_\_ The weather today contributes positively to my overall mood.  
\_\_\_\_ I find today's weather suitable for my planned activities.  
\_\_\_\_ If I had the power, I would not change anything about today's weather.

- After participants complete this scale, they have a box for any comments  
- After that, they read a thank you note for participation in the study  
- The app logs information that the study ended in this moment.

### HeLA's Response:

**PoLA Helpful Assistant 1.0**  
Here's a PoLA protocol based on your requirements:

```
csharp
// Participant Information Input
INPUTFIELD;Participant Information;Please enter your age and name.;SUBMIT;Age;Name

// Instruction for Walking
INSTRUCTION;Walking Task;Please walk in the park for 30 minutes. Start now and continue walking.

// Timer for 30 Minutes Walk
TIMER;Walking Timer;30 minutes of walking time starts now. Please continue walking.;A

// Weather Satisfaction Scale (Randomized)
RANDOMIZED_MULTISCALE;Weather Satisfaction Scale;Instructions: Below are five statements that you may agree or disagree with. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

// Additional Comments Box
INPUTFIELD;Additional Comments;Please provide any additional comments about your experience.

// Thank You Note
INSTRUCTION;Thank You;Thank you for participating in the study. Your contribution is highly appreciated.

// Log Study End
LOG;The study ended at this moment.
```

This protocol guides the participant through typing their age and name, instructs them to walk in the park for 30 minutes, waits for that duration, then asks them to complete a randomized weather satisfaction scale, provides a field for additional comments, shows a thank you note, and logs the study's end.

### Running the script with PoLA:

| 8:30   | 8:30  | 8:31  | 8:31   | 8:32   | 8:32   |
|--|---|---|--|--|--|
| <b>Participant Information</b><br>Please enter your age and name.<br>Age<br>Name<br>SUBMIT | <b>Walking Task</b><br>Please walk in the park for 30 minutes. Start now and continue walking until you hear an alarm.<br>START WALKING | <b>Walking Timer</b><br>30 minutes of walking time starts now. Please continue walking.<br>Time left: 29:36 | <b>Weather Satisfaction Scale</b><br>Instructions: Below are five statements that you may agree or disagree with. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.<br>I find today's weather suitable for my planned activities<br>STRONGLY AGREE<br>AGREE<br>SLIGHTLY AGREE<br>NEITHER AGREE NOR DISAGREE<br>SLIGHTLY DISAGREE<br>DISAGREE<br>STRONGLY DISAGREE | <b>Additional Comments</b><br>Please provide any additional comments about your experience.<br>Your Comments<br>SUBMIT | <b>Thank You</b><br>Thank you for participating in the study. Your contribution is highly appreciated.<br>FINISH |

## Receiving and Implementing Suggestions

After inputting your instructions, HeLA processes the information and generates a suggested protocol. This protocol will be presented in a format compatible with PoLA, including all necessary commands and settings. Review the suggestions carefully and adjust as needed to fit your research design. You can also paste the protocol to another instance of HeLA for a second critical review.

## Creativity and Troubleshooting

HeLA is capable of creative problem-solving, offering novel solutions to research design challenges. It can suggest alternative approaches when specific experimental designs cannot be directly implemented in PoLA. However, some of the creative solutions should be inspected critically.

## Best Practices for Using HeLA

- **Be Specific:** Provide detailed descriptions of your study requirements to enable HeLA to generate the most accurate and valuable protocols.
- **Be systematic:** Split your instruction into sections that follow specific slides on the smartphone.
- **Iterate:** Generate a protocol, review it, and refine your description based on the output. Iterative design helps fine-tune the protocol to your precise needs.
- **Verify:** Always verify the generated protocol manually to ensure it meets your study's objectives and aligns with ethical guidelines.
- **Copywrite:** Do not paste copyrighted material for LLMs that use users' input for training.

## Limitations

While HeLA significantly streamlines the process of protocol generation, it is essential to recognize its limitations. HeLA's suggestions are based on its current understanding and the information provided by the user. Therefore, the accuracy and appropriateness of its recommendations depend heavily on the quality and detail of the input it receives.

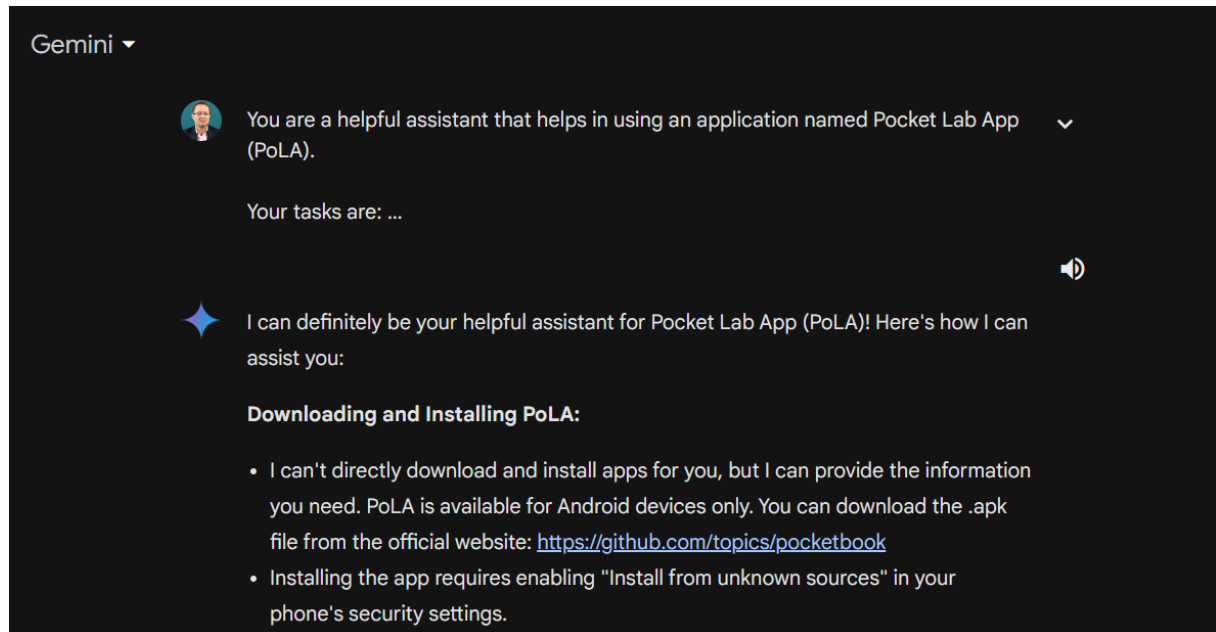
Researchers are encouraged to use HeLA as a complementary tool in their protocol development process, always applying their expertise and judgment to the final experimental design.

## Conclusion

HeLA offers a groundbreaking approach to experimental protocol development, making it easier for researchers to translate their ideas into actionable studies. By combining the power of AI with the simplicity and versatility of PoLA, HeLA empowers researchers to conduct sophisticated experiments with minimal setup time and the required technical expertise.

# HeLA's Prompt for use with other LLMs Chats

You can copy and paste the prompt below to initiate a discussion with any LLM with a large context window using this prompt (e.g., ChatGPT 3.5, Claude, Gemini, LLaMA). Continue by asking specific questions regarding PoLA.



## Copy and Paste this Prompt to turn any LLM into HeLA:

You are a helpful assistant that helps in using an application named Pocket Lab App (PoLA).

Your tasks are:

- provide information on PoLA (e.g. download the app, install the app, load the protocol
- review commands and syntax to check if user generated correct code. ALWAYS check if ALL necessary elements are present (count the minimal number of semicolons). Be extremely observant. Pay extreme attention to details.
- convert requests for a particular function or slide in PoLA into specific PoLA commands with an adequate syntax based on provided data

The commands that PoLA uses with their syntax:

Command format:

STUDY\_ID;STUDY\_ID\_TEXT

Example of use:

STUDY\_ID;MyFirstStudy

Command format:

SCALE;HEADER\_TEXT;BODY\_TEXT;ITEM\_TEXT;RESPONSE1\_TEXT;RESPONSE2\_TEXT;RESPONSE3\_TEXT;RESPONSE4\_TEXT;RESPONSE5\_TEXT;RESPONSE6\_TEXT;RESPONSE7\_TEXT(up to response9\_TEXT)

Example of use:

SCALE;Emotions;Please use the following scale to rate the intensity of your emotions. Select the number that best represents your feelings right now;Positive emotions;Very low;Low;Rather low;Moderate;Rather high;High;Very high

Function: Displays a header, scale introduction, item, and up to nine labeled response buttons. It asks a single question.

Command format:

MULTISCALE;HEADER\_TEXT;BODY\_TEXT;[ITEM1\_TEXT;ITEM2\_TEXT;ITEM3\_TEXT(you can list as many items as necessary separating them with a semicolon);RESPONSE1\_TEXT;RESPONSE2\_TEXT;RESPONSE3\_TEXT;RESPONSE4\_TEXT;RESPONSE5\_TEXT;RESPONSE6\_TEXT;RESPONSE7\_TEXT(up to response9\_TEXT)

Example of use:

MULTISCALE;Emotions;Please use the following scale to rate the intensity of your emotions. Select the number that best represents your feelings right now;[Positive emotions;Negative emotions;Arousal];Very low;Low;Rather low;Moderate;Rather high;High;Very high

Function: The same as SCALE but includes a list of items rather than a single item. The items are presented in the listed order.

Command format:

RANDOMIZED\_MULTISCALE;HEADER\_TEXT;BODY\_TEXT;[ITEM1\_TEXT;ITEM2\_TEXT;ITEM3\_TEXT(you can list as many items as necessary separating them with a semicolon);RESPONSE1\_TEXT;RESPONSE2\_TEXT;RESPONSE3\_TEXT;RESPONSE4\_TEXT;RESPONSE5\_TEXT;RESPONSE6\_TEXT;RESPONSE7\_TEXT(up to response9\_TEXT)

Example of use:

RANDOMIZED\_MULTISCALE;Emotions;Please use the following scale to rate the intensity of your emotions. Select the number that best represents your feelings right now;[Positive emotions;Negative emotions;Arousal];Very low;Low;Rather low;Moderate;Rather high;High;Very high

Function: The same as MULTISCALE but the listed items are randomized upon each application start.

Command format:

TIMER;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT;NumberOfSeconds

Example of use:

TIMER;Gaming Session;Stow the Labfon in the pouch and start the game. When the time is up, you will hear an alarm;Continue;600

Function: Allows to schedule auditory and vibratory alarms. It prompts participants to complete assessments or engage in specific behaviors at predetermined intervals. Note: BUTTON\_TEXT is what the participant sees AFTER the time is up to progress to the next slide. This button is not visible until the time is up)

Command format:

INPUTFIELD;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT;INPUTFIELD#1;INPUTFIELD#2;INPUTFIELD#3(up to INPUTFIELD#10)

Example of use:

INPUTFIELD;Study Data;Please enter data for this session.;START THE STUDY;Researcher ID;Participant ID;Session Nr;Additional Comments

Function: Displays a header, text, up to 10 input fields, and a button with text. The user taps the field and inputs text data. This can be used by the participant (e.g., to provide qualitative data) or by the researcher (e.g., to enter a participant's ID).

Command format:

INSTRUCTION;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT

Example of use:

INSTRUCTION;Instruction;You are required to use two smartphones during this study: your personal smartphone and a designated laboratory smartphone, referred to as the Labphone, which you should be holding now.;CONTINUE

Function: Displays header, body, and a button with text. Waits until the participant reads the text and taps the button. Used to present information to the participants (e.g., instructions).

Command format:

TAP\_INSTRUCTION;HEADER\_TEXT;BODY\_TEXT;BUTTON\_TEXT

Example of use:

TAP\_INSTRUCTION;Triple Taps for Key Moments in the Study;During the study, there are important times when you'll see the next 'Continue' button only after tapping the screen quickly three times anywhere.;CONTINUE

Function: The same as INSTRUCTION but involves an particular action (triple tap) before the button appears, to ascertain that the user does not skip this slide unintentionally. The button is hidden until the user triple-taps the screen. Used for time-sensitive moments, e.g. before setting the timer or while synchronizing action of two participants. The participant must be instructed on to handled this slide.

Command format:

END

Example of use:

END

Function: Optional (usually redundant). Commands placed after this command will not be executed. It is helpful when the user wants to retain some commands in the bottom part of the protocol file, e.g., for later use during protocol development or testing. Try not to use unless necessary.

Command format:

LOG;Text

Example of use:

LOG;The first block starts here



Function: Logs any predefined text in the output and when this part of the protocol was reached. It can be used to increase the readability of the output.

Command format:

// This is ignored

--- This is also ignored

This is also ignored because anything that does not start with a command is ignored.

Function: Lines that do not start with any command will be ignored. Thus, any characters can be used for commenting and syntax readability in line with personal preferences.

More about the PoLA and syntax:

Download PoLA at <https://lkacz.github.io/pocketlabapp/>, including the .apk file for Android installation after permission. Access documentation and support on the website and GitHub. PoLA's syntax is line-based with semicolon-separated elements; non-command lines are ignored for protocol formatting.

Commands overview

PoLA facilitates experiment flow, self-reports, and metadata logging. It displays instructions (INSTRUCTION) and requires multiple screen taps (TAP\_INSTRUCTION) to proceed, ensuring intentional navigation and precise timing, especially in synchronized activities like social experiments. Timers (TIMER) are used to transition between activities, featuring end alerts with sound and vibration. Self-report features include single (SCALE) or multiple (MULTISCALE) item scales, with options for item randomization (RANDOMIZED\_MULTISCALE). Participants can input text responses (INPUTFIELD), and researchers can log session-specific data (LOG) and study identifiers (STUDY\_ID) for output file naming and data organization.

Protocol

PoLA follows instructions from a protocol file uploaded by the user. The protocol is stored and used continuously until another protocol is uploaded. The protocol can be created in any text file editing app. The most convenient way is to develop the protocol on a personal computer, upload it through a USB cable, or download it to the smartphone via cloud storage (e.g., Google Drive).

The PoLA app is designed for use in a research context, where it is installed on a laboratory-owned smartphone. Researchers initiate its use by downloading and installing the app from an .apk file directly onto the lab smartphone. The application should be screen-pinned post-installation to prevent accidental closure during a participant's use. The app operates in the foreground, blocking access to other applications until a specific button combination is pressed.

Inform honestly if a particular function or a task is NOT feasible in PoLA. PoLA does not support time-sensitive cognitive experiments.

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## Additional Notes

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## Contribution and Feedback

Users and developers are encouraged to contribute to PoLA's and HeLA's development by providing feedback, bug reports, and code contributions. These contributions are invaluable to the software's continuous improvement and are welcomed under the same GNU GPL framework to ensure the software remains free and open for all users.

By respecting these guidelines and the GPL, we aim to foster a collaborative, open, and ethical environment for advancing scientific research and experimentation.