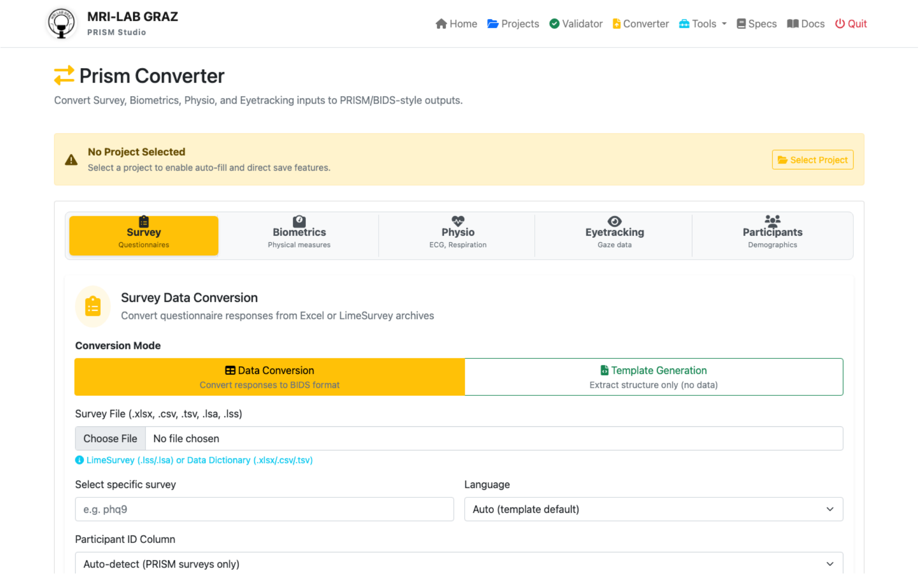
Exercise 1: Handling Raw Data

Time: 30 minutes
Goal: Transform unstructured CSV/TSV files into a valid BIDS/PRISM dataset



Prism Converter

Convert Survey, Biometrics, Physio, and Eyetracking inputs to PRISM/BIDS-style outputs.

No Project Selected

Select a project to enable auto-fill and direct save features.

Survey Data Conversion

Convert questionnaire responses from Excel or LimeSurvey archives

Conversion Mode

Survey File (.xlsx, .csv, .tsv, .lsa, .lss)

No file chosen

LimeSurvey (.lss/.lsa) or Data Dictionary (.xlsx/.csv/.tsv)

Select specific survey: e.g. phq9

Language: Auto (template default)

Participant ID Column: Auto-detect (PRISM surveys only)

Figure 1: Exercise 1 UI (Light Mode)

What You'll Learn

By the end of this exercise, you will: - Understand BIDS folder hierarchy (Dataset → Subject → Session → Modality) - Know BIDS file naming conventions - Use the GUI converter to create structured datasets - Recognize the importance of sidecar JSON files

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Starting Materials

Look in the `raw_data/` folder: - **`wellbeing.tsv`** - A survey about general wellness and life satisfaction. - **`fitness_data.tsv`** - Biometric measurements (heart rate, strength, etc.) from a physical fitness assessment.

These are typical "raw" data files - tab-delimited exports from your data collection tools.

Your Task

Convert both the Wellbeing and Fitness data into a proper BIDS/PRISM dataset with the correct folder structure and file naming.

Step-by-Step Instructions

Step 1: Launch PRISM Studio

1. Start PRISM Studio if it is not already running:
   - macOS/Linux: `source .venv/bin/activate` then `./prism-studio.py`
   - Windows (PowerShell): `.\.venv\Scripts\Activate.ps1` then `python prism-studio.py`
2. Open your web browser
3. Go to: **http://localhost:5001**
4. You should see the PRISM Studio home page

Step 2: Open the Converter Tool

1. Click on **"Converter"** in the navigation menu (top or sidebar)
2. Select **"Survey Data Converter"**

Step 3: Load Your Data (Wellbeing Survey)

1. Click **"Browse"** or **"Choose File"**
2. Navigate to: `examples/workshop/exercise_1_raw_data/raw_data/wellbeing.tsv`
3. Click **"Upload"** or **"Load File"**
4. Preview your data - you should see columns like `participant_id`, `session`, `age`, `WB01`, etc.

Step 4: Map Columns

The converter needs to know which column represents what:

Participant ID: - In the dropdown, select: **"This column represents → participant_id"**

Session: - Select: **"This column represents → session"**

Survey Name: - Enter: `wellbeing` - This will appear in your filenames as `task-wellbeing`

Modality: - Select: `survey`

Data Columns: - The columns `WB01` through `WB05` are your survey items. The demographic columns (`age`, `sex`, etc.) will be automatically handled.

Step 5: Configure Output

1. **Output Directory:**
   - Click **"Set Output Folder"**
   - Navigate to: `examples/workshop/exercise_1_raw_data/`
   - Create a new folder called: **`my_dataset`**
   - Select this folder
2. **Preview Filename:**
   - Check the preview: `sub-{id}_ses-{session}_task-wellbeing_survey.tsv`
   - This should look correct!
3. **Options to Enable:**
   - **Generate sidecars** (JSON files)
   - **Create participants.tsv**
   - **Create dataset_description.json**

Step 6: Convert!

1. Click **"Convert to BIDS"**
2. Wait for the progress bar
3. Success message should appear.

Step 7: Convert Biometrics (Bonus)

Repeat the process for **`fitness_data.tsv`**: 1. Load `fitness_data.tsv` 2. Map `participant_id` and `session` 3. Enter Survey/Task Name: **`fitness`** 4. **Change Modality to: `biometrics`** 5. Select the same **`my_dataset`** output folder 6. Click **"Convert to BIDS"**

Step 8: Explore Your Dataset

Navigate to `my_dataset/` and explore the structure:

```
my_dataset/
   dataset_description.json
   participants.tsv
   sub-DEMO001/
       ses-baseline/
           survey/
              sub-DEMO001_ses-baseline_task-wellbeing_survey.tsv
              sub-DEMO001_ses-baseline_task-wellbeing_survey.json
           biometrics/
               sub-DEMO001_ses-baseline_task-fitness_biometrics.tsv
               sub-DEMO001_ses-baseline_task-fitness_biometrics.json
```

Open some files and look inside!

Checkpoint: Did It Work?

You should have: - [ ] A `my_dataset/` folder with proper structure - [ ] `dataset_description.json` at the root - [ ] `participants.tsv` at the root - [ ] Folders named `sub-DEMO001/`, `sub-DEMO002/`, etc. - [ ] Inside each: `ses-baseline/survey/` (and `biometrics/` if you did the bonus) - [ ] `.tsv` data files with proper BIDS naming - [ ] `.json` sidecar files (one for each `.tsv`)

File naming should follow this pattern: - `sub-DEMO001` (with hyphen, not `subDEMO001`) - `ses-baseline` (with hyphen, not `sesbaseline`) - `task-wellbeing` (with hyphen, not `taskwellbeing`) - Underscores `_` separate the entities - Example: `sub-DEMO001_ses-baseline_task-wellbeing_survey.tsv`

Quick Validation Test

Let's check if your dataset is valid:

1. Go to **"Home"** or **"Validator"** in PRISM Studio
2. Click **"Select Dataset"**
3. Choose your `my_dataset/` folder
4. Click **"Validate Dataset"**

Expected Result: - Warnings about missing metadata (this is OK! We'll fix this in Exercise 2) - No critical errors about file structure or naming - All files detected correctly

If you see errors about file naming or structure: - Double-check the filename pattern - Make sure there are hyphens after `sub-`, `ses-`, `task-` - Ask your instructor for help!

What Just Happened?

You converted unstructured data into a standardized format!

Before: Just a CSV file sitting somewhere on your computer **After:** A properly structured dataset that: - Follows international standards (BIDS) - Can be understood by automated tools - Has a clear hierarchy (subject → session → modality) - Includes metadata files (JSON sidecars) - Is ready for sharing and archiving

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Key Concepts

BIDS Hierarchy

```
Dataset (study level)
```

```
Subject (participant level) - sub-DEMO001, sub-DEMO002, ...
    Session (visit level) - ses-baseline, ses-followup, ...
        Modality (data type) - survey, biometrics, ...
            Files (actual data)
```

File Naming Rules

- **Entities** are key-value pairs: `sub-DEMO001`, `ses-baseline`, `task-wellbeing`
- **Separator** between entities: underscore `_`
- **Separator** within entities: hyphen `-`
- **Suffix** describes the modality: `survey`, `biometrics`
- **Extension** is the file type: `.tsv`, `.json`

Sidecar Files

- Every data file (`.tsv`, `.json`, etc.) should have a `.json` sidecar
- The sidecar contains metadata about the data file
- Same filename, just different extension
- Example:
  - Data: `sub-DEMO001_ses-baseline_task-wellbeing_survey.tsv`
  - Sidecar: `sub-DEMO001_ses-baseline_task-wellbeing_survey.json`

Troubleshooting

Problem: "Invalid column mapping"

Solution: Make sure you selected a column for participant_id

Problem: "Invalid characters in filename"

Solution: Check that task name doesn't have spaces or special characters

Problem: "Output folder not found"

Solution: Make sure you created the `my_dataset/` folder first

Problem: "No data rows found"

Solution: Check that your CSV has data (not just headers)

Problem: "No survey item columns matched the selected templates"

Solution: - Make sure you loaded `wellbeing.tsv` from this exercise (`exercise_1_raw_data/raw_data/wellbeing.tsv`) - Ensure the file is tab-delimited TSV (not semicolon-separated) - Select the matching wellbeing template (`WB01-WB05`) or clear template filters and retry

Next Steps

Congratulations! Your data is now structured.

But wait - the JSON sidecars are mostly empty! They only have basic information.

In Exercise 2, you'll learn how to fill in the metadata to make your dataset truly self-documenting.

Bonus Challenge (If You Have Extra Time)

1. **Try with participants data:**
   - Load `participants_raw.tsv`
   - See if you can update the main `participants.tsv` file
2. **Add a second survey:**
   - If there's a `gad7_anxiety.csv` file, convert it too
   - It should go into the same dataset structure
   - Files will be named: `sub-01_ses-01_task-gad7_survey.tsv`
3. **Explore the converter settings:**
   - Can you change the file suffix from `survey` to `beh`?
   - What happens if you choose a different modality?

Ready for Exercise 2? → Go to `../exercise_2_hunting_errors/`