

PSYCH 10 Tutorial Session · Fall 2026

Week 2 · The Sleep Lab Incident · Answer key

Full name (in CAPITAL LETTERS)

SUNet ID (the part before @stanford.edu)

Student ID number

Answer key

Please write legibly, in CAPITAL LETTERS, so the teaching team can log your attendance: if we can't read your name, we can't give you credit.

Turn this in to your tutorial leaders at the end of the session.

The situation

Welcome back to **Strangeford University** (motto: *Truth in Variation*), where the data are always a little strange. You are the campus's newest **data detectives**, and this morning you've been called to the Truett Sleep Lab.

It's 8:48 a.m., and lab meeting is at 9:00.

Four research assistants (RAs) each collected data from three participants: a wristband tracked each participant's sleep last night, and each participant answered a short survey this morning. Dr. Truett opened the data file and said only this:

"Something is wrong in this file. For each RA, tell me whether their rows have a problem, and back it up with specific cells from the table."

The protocol, the data table, and the four RAs' statements are on this sheet, front and back. Work through all four RAs together. You have twelve minutes.

Artifact 1 — the protocol

Truett Sleep Lab · Protocol 7 (the short version)

1. Each RA runs **three different people**. Enter exactly what the wristband shows and what the participant tells you.
2. **hours_slept**: from the wristband, to one decimal place (e.g., 7.2).
3. **chronotype**: ask "Are you a morning lark or a night owl?" Enter **1 for lark, 2 for owl**.
4. **mood**: a whole number from **1 (worst) to 5 (best)**.
5. If a participant declines to answer a question, **leave the cell blank**. Never enter a value in its place.

Artifact 2 — the data table

ID	RA	hours_slept	chronotype	mood
P01	Sam	6.4	2	2
P02	Sam	7.1	1	4
P03	Sam	5.8	2	0
P04	Jo	8.0	2	3
P05	Jo	8.0	2	3
P06	Jo	8.0	2	3
P07	Avi	7.2	1	5
P08	Avi	6.9	1.5	4
P09	Avi	8.3	2	3
P10	Mel	2.5	2	1
P11	Mel	10.5	1	5
P12	Mel	7.6	2	4

Artifact 3 — the four RAs' statements

SAM — the tidy one

"P01 through P03 are mine. All three slept under seven and a half hours, which seemed short to me, so I read each wristband twice. I hate loose ends, so there is not a single blank cell in my three rows. Every one is complete."

JO — the busy one

"P04 through P06. I had a chemistry midterm, but I ran all three, and honestly they were textbook sleepers — totally typical people. All three turned out to be owls, which is no surprise in a dorm. Nothing weird to report."

AVI — the enthusiast

"P07 through P09, all by the book. P07 woke up in a great mood and gave it a 5 without hesitating. P08 said they're kind of both a lark and an owl. Rule 1 says to enter exactly what the participant tells you, so I entered 1.5, halfway between 1 and 2. Math!"

MEL — the blunt one

"P10 through P12. P10 stayed up most of the night studying for a physics exam: two and a half hours of sleep, and they felt terrible this morning. P11 is on the crew team, and ten-plus hours on a rest day is normal for them. P12 wasn't sure "owl" fits someone who only stays up late on weekends, but they picked owl, so I entered a 2. I enter what the wristband shows and what the participant tells me. Read the protocol."

Your answer sheet (fill it in before the timer ends)

Here are four checks worth running on any data table. Each check is the most useful one for exactly one RA's rows, so each check number gets used once. For each RA, write the number of the check, circle yes or no under "Problem?", and list the cells that are your evidence.

#	Check		
1	Variation. Do the rows differ from one person to the next? If several people have exactly the same values in every column, ask how that could have happened.		
2	Range. Is every value inside the range the protocol sets for its column? Look at where each scale starts and ends, and at what the protocol says to do when someone doesn't answer.		
3	Categories. In some columns, each number is a label for a category and doesn't measure an amount. Are any of those labels being treated as amounts? A number that falls between two labels doesn't correspond to any category.		
4	Extreme values. An unusually large or small value isn't necessarily a mistake. Do the other values in that person's row make sense alongside it? Does anything in the RA's statement explain it? Answer both questions before you decide.		
RA	Check #	Problem?	Evidence (which cells)
Sam	2	yes	<i>P03 has a mood of 0. The protocol describes the mood scale as running from 1 to 5, so a 0 is not a value a participant could have given, and it asks that a declined question be recorded as an empty cell. The most likely account is that P03 declined the mood question and Sam entered a 0 in place of the empty cell, which fits Sam's remark that there is "not a single blank cell" in these rows. That matters for the analysis, because a 0 would be averaged in as the lowest possible mood instead of being left out as a non-response.</i>
Jo	1	yes	<i>P04, P05, and P06 have exactly the same values in all three columns (8.0 hours, chronotype 2, mood 3). Measurements of three different people vary, and the chance that three people would match to the decimal on hours slept and also on both survey answers is very small, so the more plausible account is that these three rows did not come from three separate measurements. Three owls on their own would not be surprising, since one column repeating happens all the time; it is the match across every column that calls for an explanation.</i>

RA	Check #	Problem?	Evidence (which cells)
Avi	3	yes	<i>P08 has a chronotype of 1.5. In this column the numbers 1 and 2 stand for the two answers to the lark-or-owl question, so they are labels rather than amounts, and a value halfway between them doesn't correspond to either answer. P08's actual response was "kind of both," which falls outside the protocol's instructions; a more faithful way to record it would have been to leave the cell empty and add a note for Dr. Truett, so that the 1.5 can't later be averaged as if it were a quantity.</i>
Mel	4	no	<i>P10 (2.5 hours, mood 1) and P11 (10.5 hours, mood 5) are far from the other values, but an unusual value is not by itself evidence of a recording error. Within each row the values are consistent with each other (very little sleep with a low mood, a long sleep with a high mood), neither value falls outside what the wristband or the survey could have produced, and Mel's statement gives a plausible account of both (an all-nighter before a physics exam, and a rower on a rest day). Nothing in the table or the statement suggests these are errors, so the reasonable decision is to keep both rows.</i>

An answer counts only if it names specific cells. If a protocol rule or an RA's statement is part of your evidence, name that too.

Four details in the statements may seem like evidence of a problem, but each of them describes a value that the measurement process in the protocol could have produced, so none of them, on its own, is evidence of an incorrect row: Sam's three participants all slept under 7.5 hours, which three people can easily do, and the protocol places no limit on the hours column; Jo's three participants are all owls, which is one column repeating, a common pattern; Avi's P07 reported a mood of 5, which is the top of the scale and an ordinary answer; and Mel's P12 hesitated over "owl" before choosing it, so recording a 2 is a faithful record of the participant's choice. As for what most plausibly produced each RA's rows: Jo appears to have entered one row three times rather than measuring three people, Sam appears to have entered a 0 where the protocol asks for an empty cell, Avi recorded an average of two labels, and Mel recorded the values from the wristband and the participants' answers. Sam and Avi both seem to have been trying to do the right thing and still entered values that would distort an analysis, which is why a data file gets checked against the way it was collected regardless of the care taken by the person doing the entry.