

PSYCH 10 Tutorial Session • Fall 2026

Week 5 • The Reaction Room • Sheet A: The Model Room

Full name (in CAPITAL
LETTERS)

SUNet ID (the part before @stanford.edu)

Section (e.g., TUES 9:30)

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

The situation

Q. Ledger has locked you in the Archive at **Strangeford University** with Dr. Truett's reaction-time file. "Somebody has to read that file before Monday," Ledger says through the door. "I have torn it in two: the numbers are in the Model Room, and the people are in the Records Room. The door between the rooms stays shut until my signal."

Work through your own room first. When the door opens, pair up with someone from the other room for the last door.

The file

You are in the Model Room, which holds the lab's numbers.

Two of Dr. Truett's research assistants disagree. The lab's computer has flagged four trials as "impossible." **Sam** wants all four trials deleted. **Mel** says that at least one of them came from a real person.

The task. A light turns on, and the participant presses a button as fast as possible: five trials each, timed in milliseconds (ms). In a harder **choice task**, the light is red or blue, and the participant presses the left button for red and the right button for blue.

Sam's note, clipped to the file: "Four SDs below the mean? On a normal curve, that is a few trials in a hundred thousand. P04's 180 and P07's 182 are either typos or numbers that somebody invented. I typed all two hundred trials into the spreadsheet myself last night, and I typed fast. Fast typing makes typos. Delete both trials."

Model Room, part 1 • Total error, and the typical miss

Before the study began, Dr. Truett ran five warm-up trials of the simple task. Jo used their mean, **260 ms**, as a one-number model for the five.

Jo's note: "I added up the errors from 260 and got 0. So 260 is a perfect model?" *Avi's note:* "The median, 250, sits closer to most of the trials. It has to be a better model."

Warm-up trial (ms)	240	250	250	270	290	Total
a. Error from 260 (trial - 260)						
b. Squared error						SS =

a. Fill in each trial's error from 260, then add up the errors.

b. Square each error, then add up the squares to get the SS around 260. Avi worked out the SS around 250: **2,100**. Circle the better model, justify your answer: **Jo's 260 • Avi's 250**

c. Use the formulas at the bottom of the back of this sheet. Variance = _____ SD = _____ ms. A typical warm-up trial lands about _____ ms from the mean.

The file, continued

The computer's flag rule is to flag any trial more than 75 ms from its task's mean. The four flagged trials are in the part 2 table; the rest of each participant's trials are in the Records Room. Below you will find a description of the total mean and SD of each task.

Task	Mean of all trials (ms)	SD of all trials (ms)
Simple (light on, press)	260	20
Choice (red or blue)	420	60

Model Room, part 2 • Far is relative

Fill in the two empty columns of the table. Which flagged trial is the least unusual for its own task? Justify your answer in terms of SDs. _____ Which flagged trials is Sam's note describing as "four SDs below the mean"? _____

Participant	Task	Flagged trial (ms)	Deviation from task mean (ms)	z-score (deviation in SDs)
P04	simple	180		
P07	simple	182		
P09	choice	330		
P11	simple	60		

The last door • What made each flagged trial?

Pair up with someone from the other room. Together you have the whole file. For each flagged trial, circle what produced it, say what Dr. Truett should do with it, and note your evidence.

Participant	Flagged trial (ms)	z-score (Model Room)	Typical of this participant? (Records Room)	What produced this trial? (circle one)	Keep, fix, or mark?	Evidence
P04	180			typo • genuinely fast • ordinary variation • pressed early • made up		
P07	182			typo • genuinely fast • ordinary variation • pressed early • made up		
P09	330			typo • genuinely fast • ordinary variation • pressed early • made up		
P11	60			typo • genuinely fast • ordinary variation • pressed early • made up		

Sam wanted to delete P04's 180 and P07's 182 because both are about four SDs below the mean. Was Sam right about both trials? If not, which one is a real trial, and what in the file shows it?

Formulas

Mean	$\bar{Y} = \sum Y_i / n$, where Y_i is one trial and n is the number of trials: add up the trials and divide by the number of trials.
Sum of squared errors (SS)	$SS = \sum (Y_i - \bar{Y})^2$, where a trial's error, $Y_i - \bar{Y}$, is its distance from the mean with its sign: square each error, then add up the squares.
Variance	$s^2 = SS / (n - 1)$: SS divided by one less than the number of trials.
Standard deviation (SD)	$s = \sqrt{SS / (n - 1)}$: the square root of the variance, in the same units as the trials, and roughly the size of a typical error.
Mean absolute deviation (MAD)	$MAD = \sum Y_i - \bar{Y} / n$: add up the errors without their signs and divide by the number of trials, which gives the average distance of a trial from the mean.

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Week 5 • The Reaction Room • Sheet B: The Records Room

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Work through your own room first. When the door opens, pair up with someone from the other room for the last door.

The file

You are in the Records Room, which holds the people.

Two of Dr. Truett's research assistants disagree. The lab's computer has flagged four trials as "impossible." **Sam** wants all four trials deleted. **Mel** says that at least one of them came from a real person.

The task. A light turns on, and the participant presses a button as fast as possible: five trials each, timed in milliseconds (ms). A research assistant types each printout into the spreadsheet. In a harder **choice task**, the light is red or blue, and the participant presses the left button for red and the right button for blue.

Each row holds one flagged participant's five trials (flagged trial in bold).

Participant	Task	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
P04	simple	281	276	180	288	279
P07	simple	186	190	182	192	190
P09	choice	348	360	330	352	356
P11	simple	255	262	60	248	270

Mel: "P07 is on the varsity fencing team. Ask P07 to do the task again, and you will get the same kind of numbers. Real people are weird."

Avi: "P11 was so ready. P11 had a finger on the button before I had finished saying 'go!'"

Records Room, part 1 • One person's typical miss

Is Mel right about P07? Check P07's own five trials.

a. P07's mean = _____ ms.

P07's trial (ms)	186	190	182	192	190	Total
b. Error from P07's mean						
c. Squared error						SS =

b. Fill in each trial's error from P07's mean, then add up the errors.

c. Square each error and add up the squares. Then use the formulas at the bottom of the back of this sheet: variance = _____ SD = _____ ms.

d. The flagged 182 is _____ ms below P07's mean, which is _____ of P07's own SDs. Circle one: **unusual for P07** • **ordinary for P07**. Justify your answer in terms of P07's SD.

Records Room, part 2 • In character?

Dr. Truett's rule of thumb. No one reacts to a light faster than about 100 ms: a faster press started before the light could be seen.

Compare each flagged trial with that participant's other four trials (front of this sheet). Circle one answer, and say why.

Participant	Flagged trial (ms)	Compared with this participant's other four trials, the flagged trial is (circle one)	Evidence (the other four trials, the rule of thumb, or a statement)
P04	180	in character • out of character • can't tell	
P07	182	in character • out of character • can't tell	
P09	330	in character • out of character • can't tell	
P11	60	in character • out of character • can't tell	

The last door • What made each flagged trial?

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