

The Cognitive Reflection Test Under Pressure

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Cognitive Reflection Test

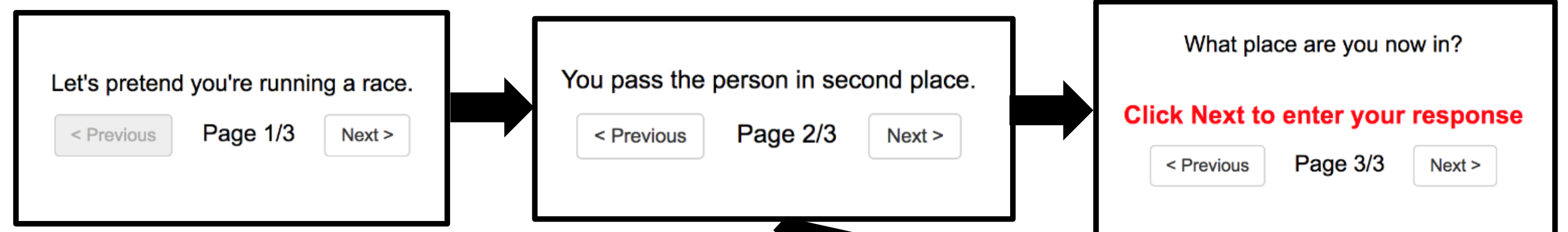
- The Cognitive Reflection Test (CRT) consists of word problems that often trigger an intuitive, but incorrect response
- **Research Question #1:** Are people even more likely to make intuitive and incorrect responses when interrupted or under time pressure?
- Previous research has shown that emergency physicians and interns are interrupted, on average, 7.1 times per hour (Westbrook, 2010)
- Working in a high-pressure and dynamic environment can greatly affect decision-making (Flowerdew, 2012)
- **Research Question #2:** How well calibrated are people?

Stimulus Type

Correct
Intuitive
Other

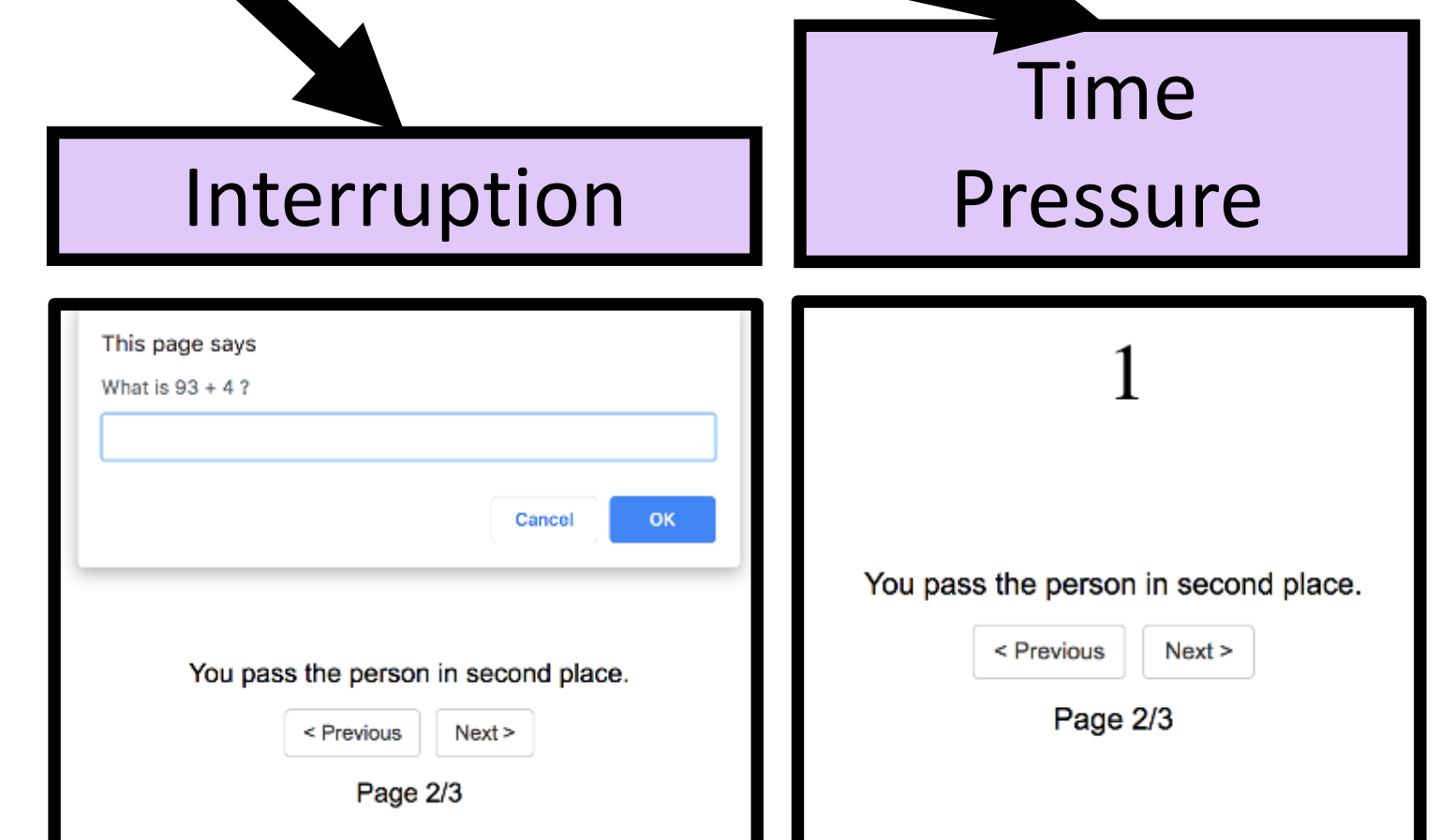
Design

1. Read the Word Problem



2. Enter Your Response

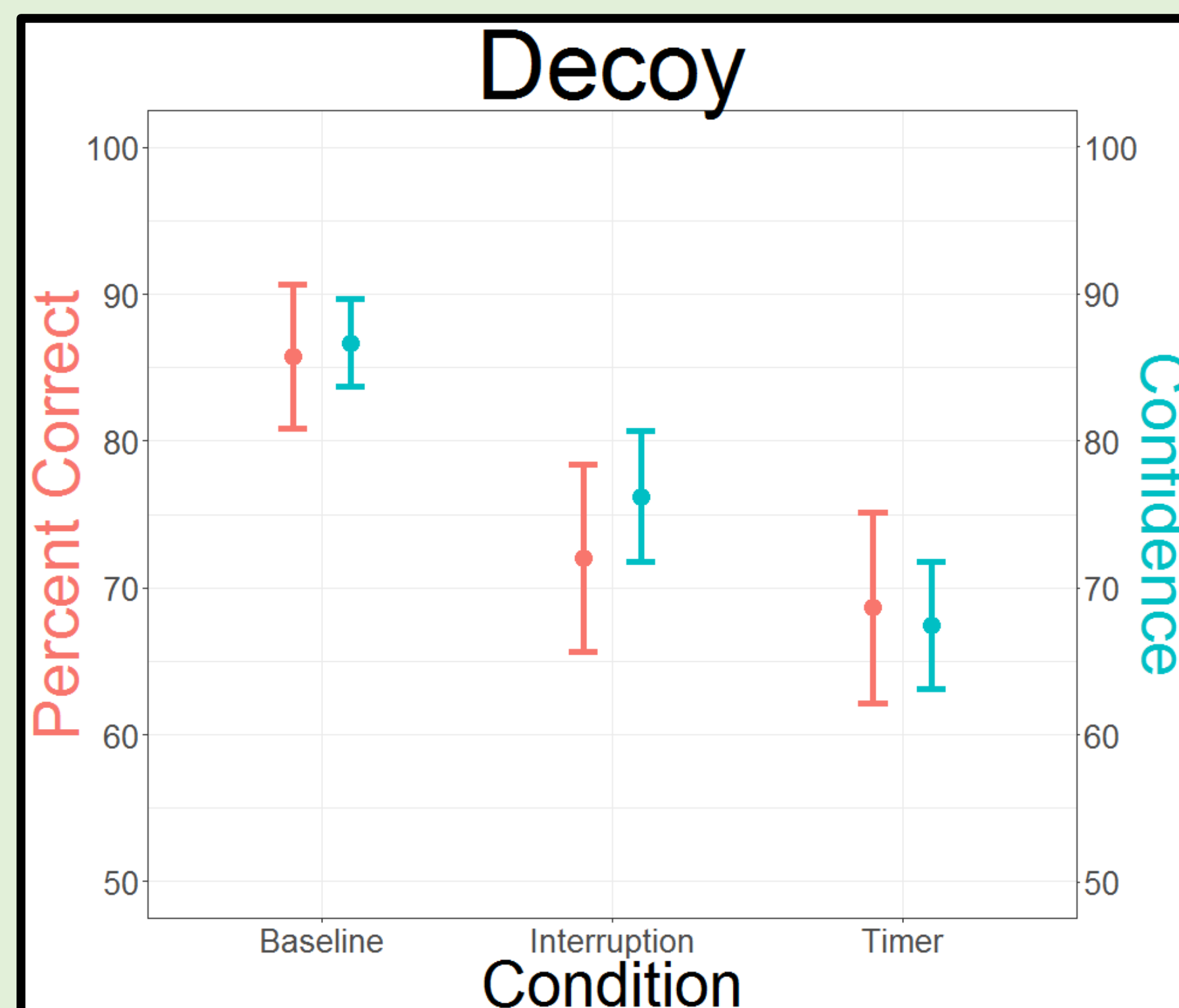
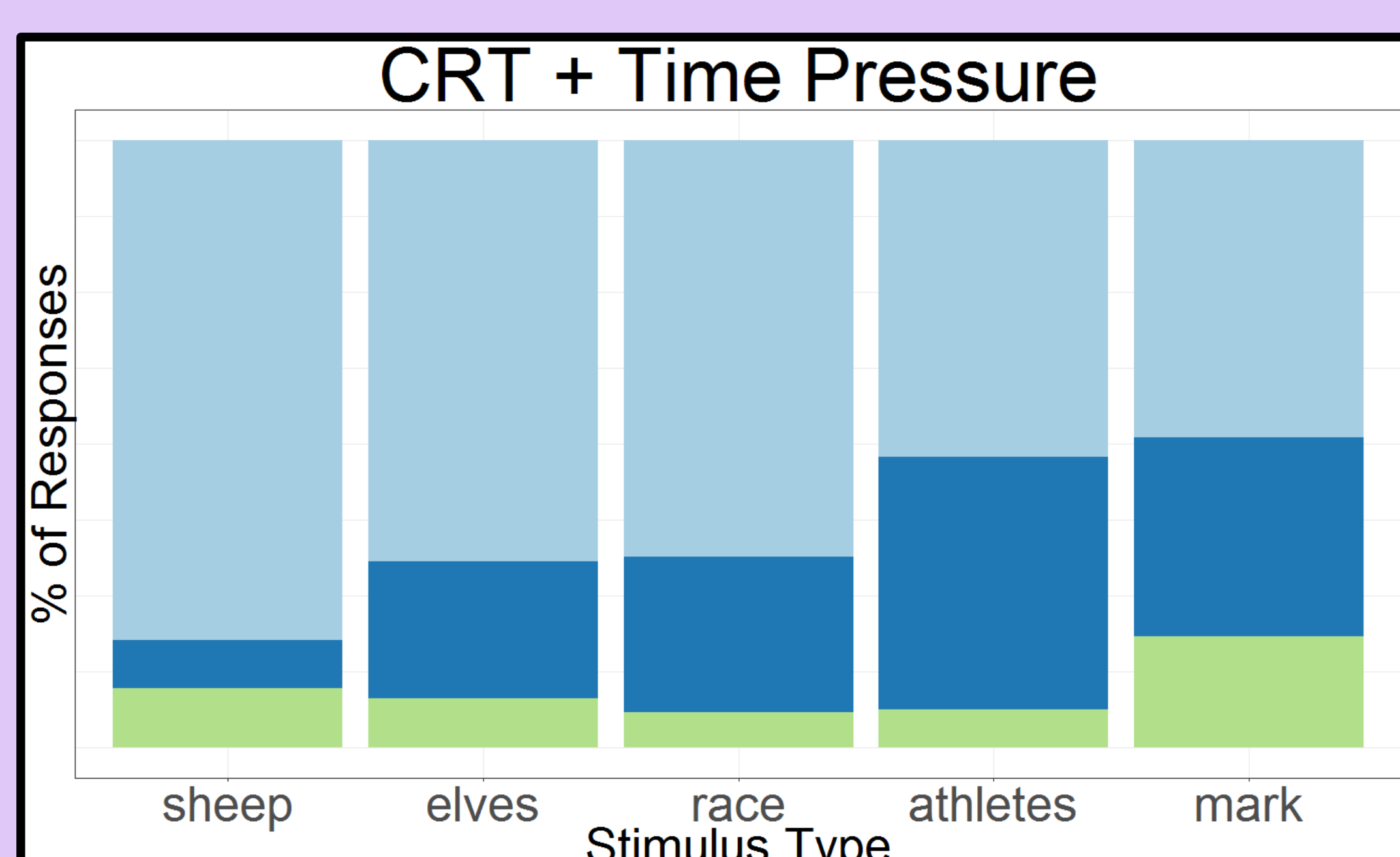
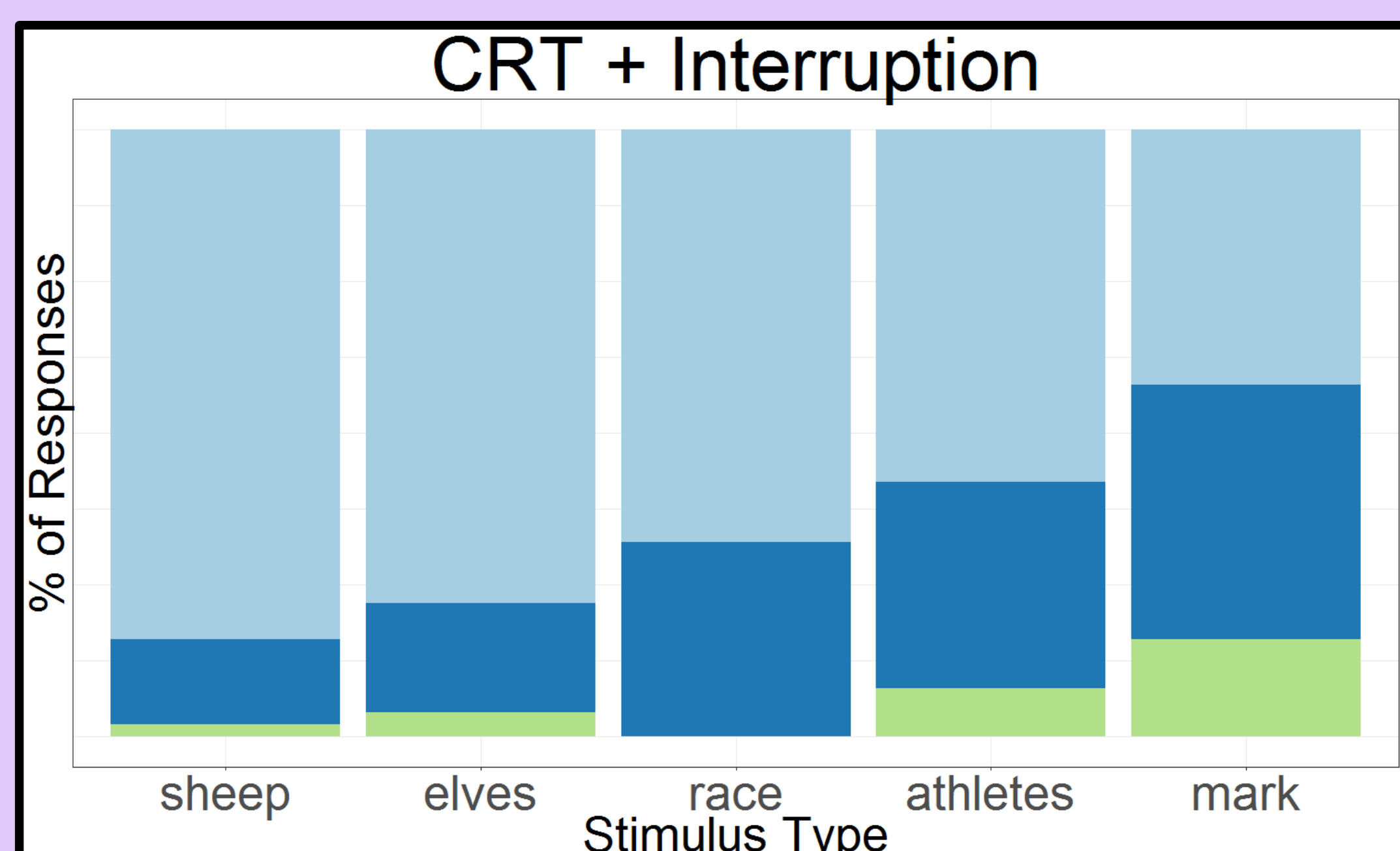
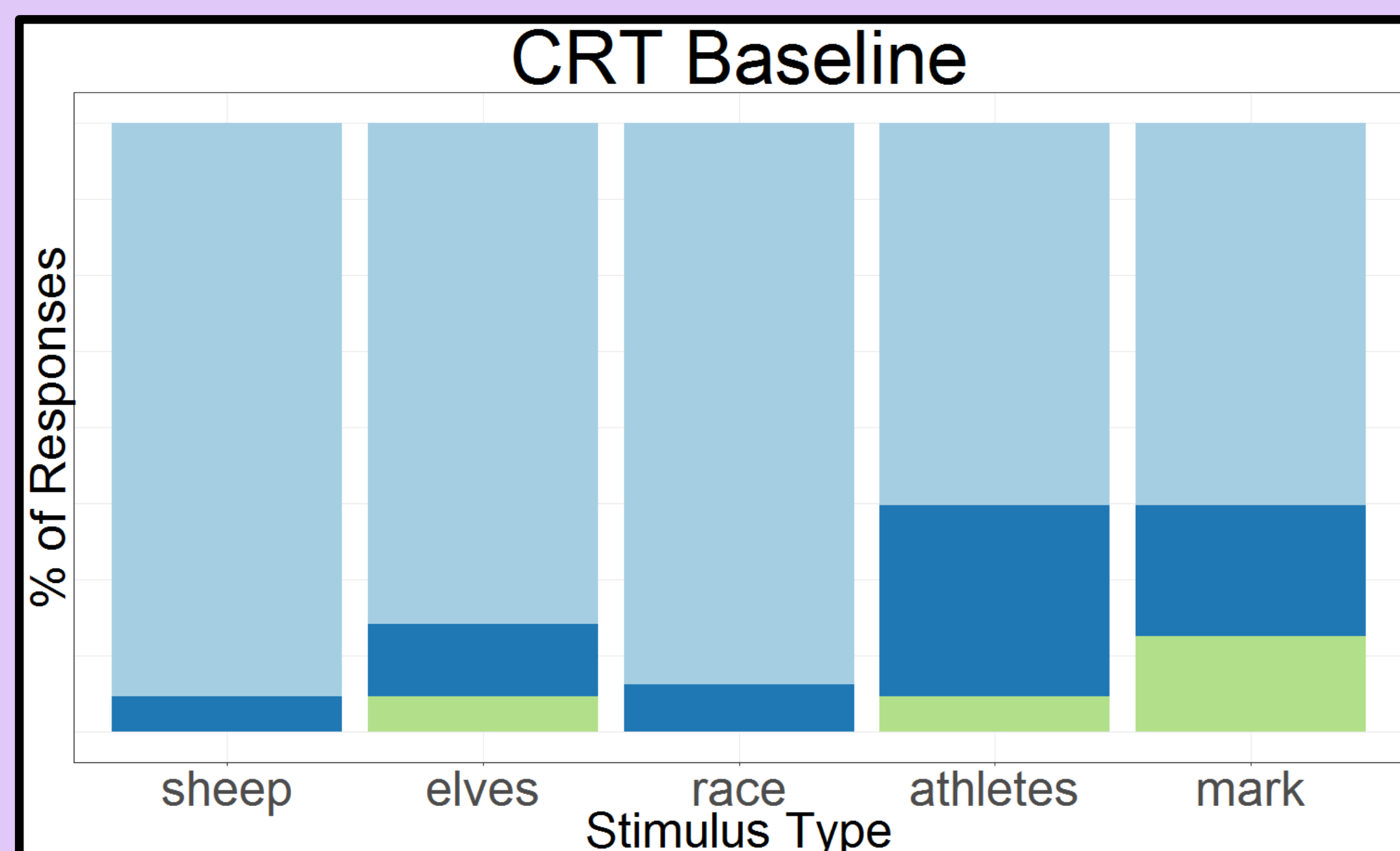
3. Rate Your Confidence



- 5 CRT and 4 decoy questions
- 3 conditions: baseline, interruption, time pressure
- ~50 Mturkers per condition

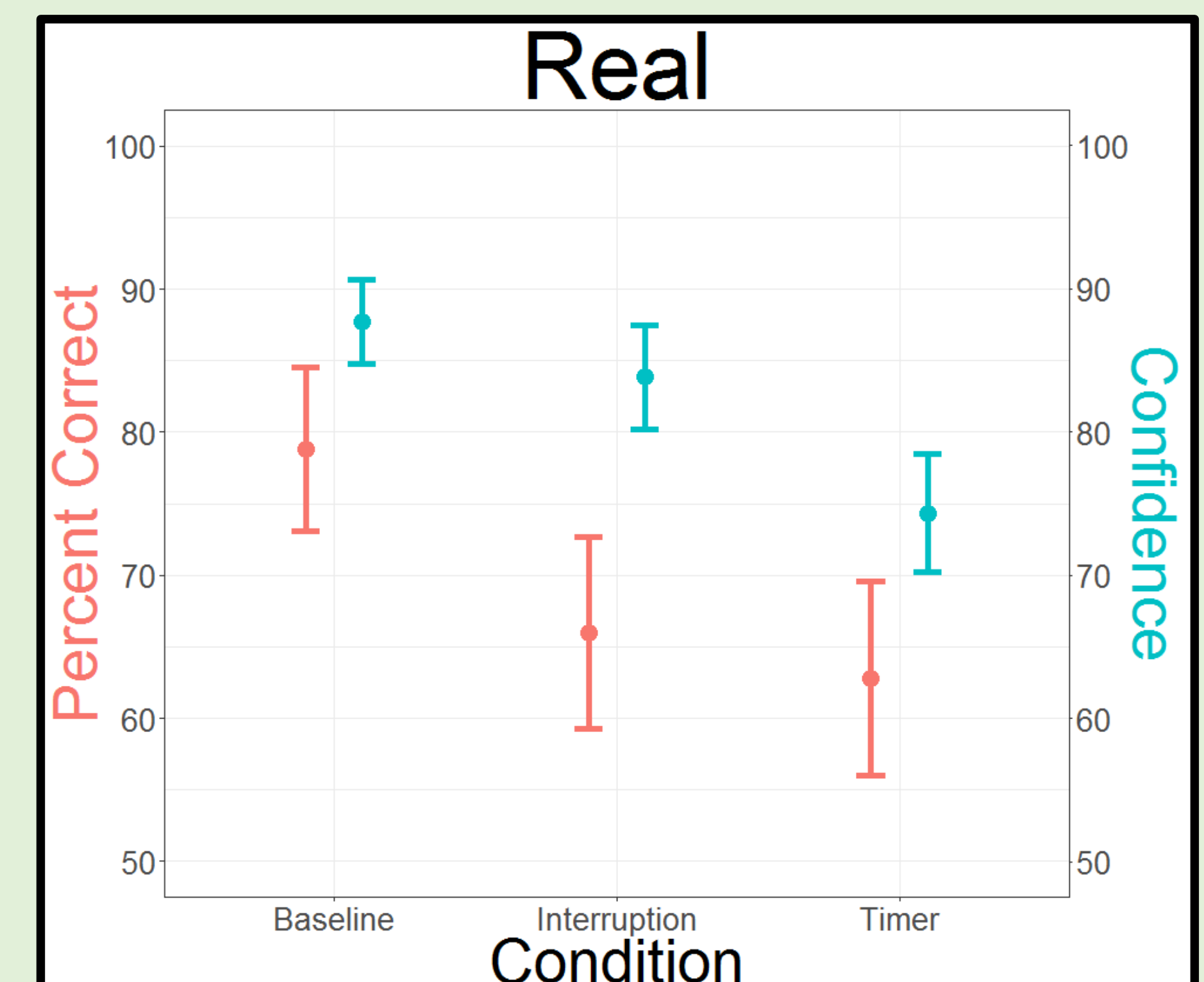
Results

Percent Correct
Confidence



Example of a decoy item:

"A ship had 500 crates of oranges. At the first stop, 100 crates were unloaded. At the second stop, 200 more were unloaded. How many crates of oranges were left after the second stop?"



Example of a "real" CRT item:

"A farmer had 15 sheep. Many of the sheep got very sick. All but 8 died. How many sheep are left?" (Thomson & Oppenheimer, 2016)

Intuitive Answer: 7

Correct Answer: 8

Discussion

- People made more incorrect and intuitive responses (and more mistakes in general) when interrupted and under time pressure
- **Decoy questions:** Interruptions and time pressure resulted in lower accuracy and lower confidence compared to baseline
- **CRT questions:** Accuracy, but not confidence, decreased when interrupted while both accuracy and confidence decreased when under time pressure
- Interruptions and time pressure influence the processing of information and give us insight into the type and incidence of errors in decision making

References

Flowerdew, L., Brown, R., Russ, S., Vincent, C., & Woloshynowych, M. (2012). Teams under pressure in the emergency department: an interview study. *Emerg Med J*, 29(12), e2-e2.
Thomson, K. S., & Oppenheimer, D. M. (2016). Investigating an alternate form of the cognitive reflection test. *Judgment and Decision making*, 11(1), 99.
Westbrook, J. I., Coiera, E., Dunsmuir, W. T., Brown, B. M., Kelk, N., Paoloni, R., & Tran, C. (2010). The impact of interruptions on clinical task completion. *BMJ Quality & Safety*, 19(4), 284-289.