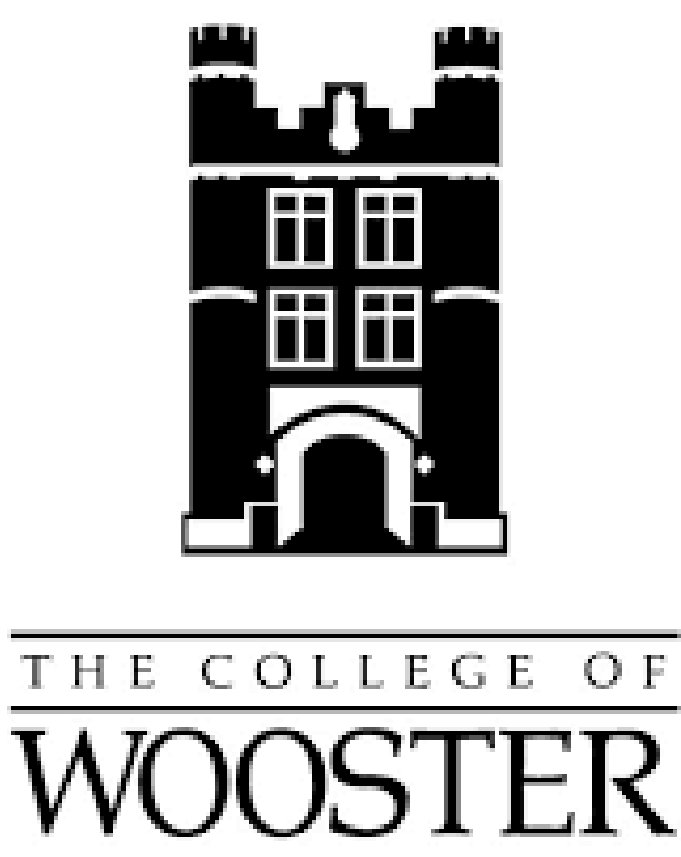


# Head Games: Exploring Sex Differences in Decision-Making Following a Concussion



## Among Collegiate Athletes

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### Introduction

- An estimated 3.8 million concussions occur per year in athletes (Mullally, 2017).
- Impaired decision-making is common after TBI (Wood and Worthington, 2017).
- It is known that there are sex differences in concussions.
- Females have prolonged recovery and worse outcomes compared to males (Koerte et al., 2021)
- The Cambridge Gambling Task has no sex differences when accounting for no concussion (Van den Bos et al., 2012)

### Research Question

- Are there sex differences in decision-making abilities following a concussion?

### Participants:

- 62 College of Wooster athletes
- 18-24 years of age

	Male	Female
Concussed	9	16
Non-concussed	15	22

### Conclusion

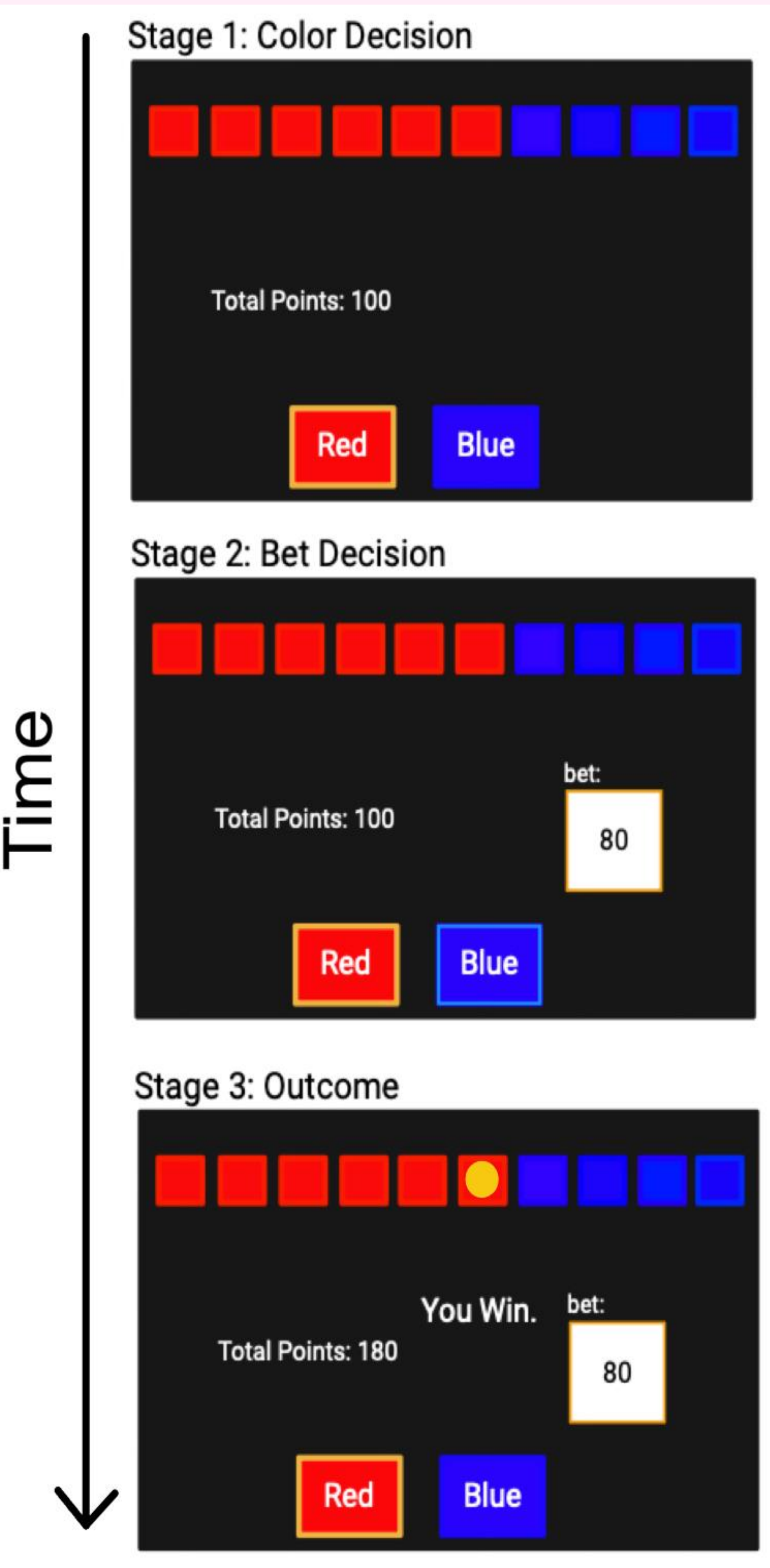
- Concussions affect decision-making in processing speed and risk-taking behavior, higher risk-taking suggests deficits in risk assessment and impulse control
- No sex-differences were found

### Future Work

- Further research should continue investigating sex differences in cognitive functions
- Exploring potential interventions to decrease concussion-related impairments to limit the risk of CTE

### Methods

#### Cambridge Gambling Task:

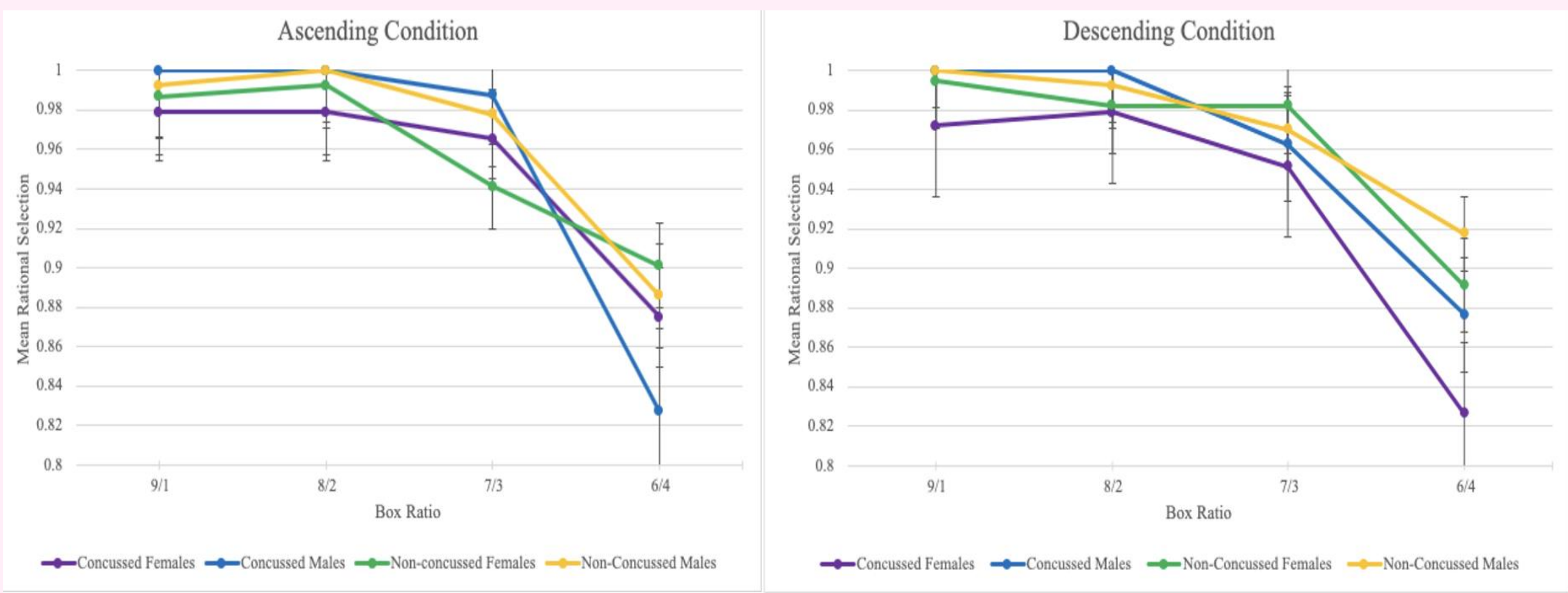


- Participants are presented with ten colored boxes of different ratios 6:4, 7:3, 8:2, 9:1
- The bets either ascend or descend in amount
- The points waged are then either added or subtracted

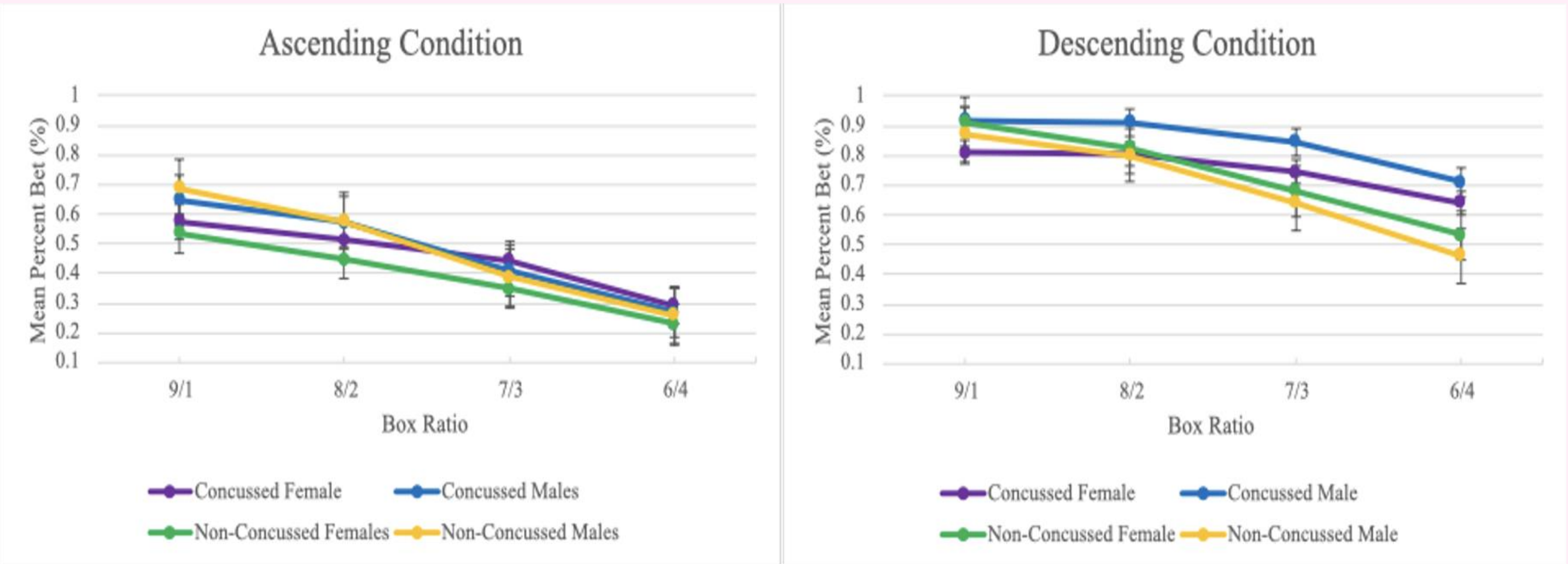
#### Concussion Questionnaire:

- Information about sex, sport, and age
- Concussion history including; how many, time since last, who diagnosed it, how it occurred, length of recovery, and symptomatology.

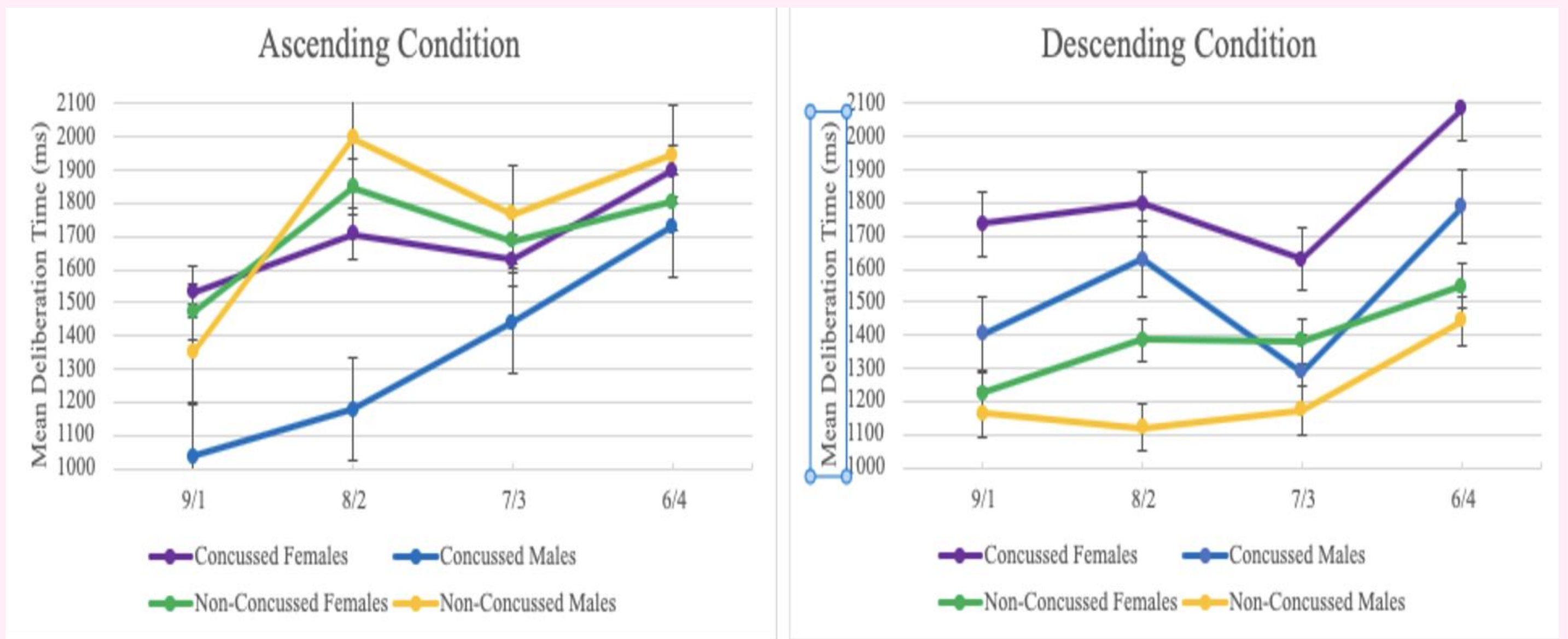
### Results



- This figure illustrates the quality of decision-making. All groups declined in performance in the 6:4 ratio.



- This figure illustrates risk-taking behavior. Concussed individuals placed higher bets in the riskier 6:4 ratio compared to controls in the Descending Condition.



- This figure illustrates deliberation time. In the Descending Condition concussed individuals had a slower response time compared to controls. Concussed individual's response time was consistent across ratios in both conditions