Effects of passenger and alcohol on the driving behaviour of young males and females

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INTRODUCTION

General context

- Young drivers at higher risk
  - Crashes = 1st cause of death for 15-29 years old
- Alcohol misuse
  - One of the important factors associated with fatal crash risk
- Passenger presence (young drivers)
  - ↑ risk (risky behavior, fatal crashes)
  - ↑ risk with male passengers
- Males vs. females
  - ↑ involvement in alcohol-related arrests and severe injury and fatal crashes

NHTSA, 2015; Ouimet et al., 2010, 2013, 2015, WHO, 2015

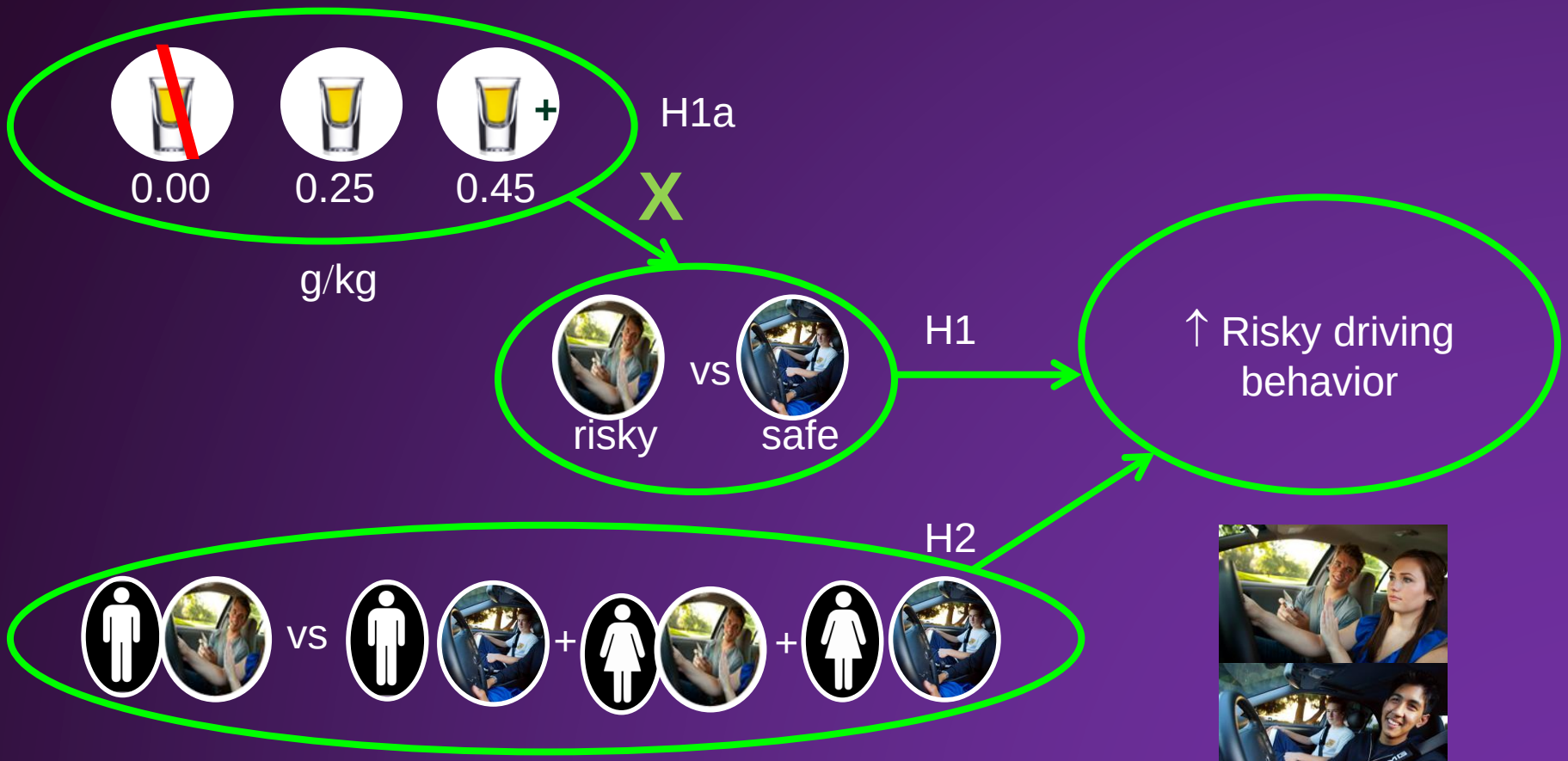
Peer influence and aims of the study

- Peer influence
  - One proposed mechanism to explain observed ↑ risk with passengers
    - More recently, some studies suggest ↑ risk as function of passenger characteristics

- Is there any interaction between different forms of peer influence and levels of alcohol dose on young males and females simulation driving performance?

Ouimet et al., 2013; Simons-Morton et al, 2014

Hypothesis


0.00
0.25
0.45
+
g/kg
H1a
X
risky
vs
safe
H1
↑ Risky driving behavior
H2
vs
+
+

METHODS

Participants

- Main inclusion criteria
  - 18-21 years old
  - Provisional or full driving licence
  - Experience drinking at least 2 drinks on same occasion
  - Driving at least one day per week in past months
- Main exclusion criteria
  - Alcohol dependance
  - Health problems
  - Consumption of alcohol or drugs (past 24 hrs)
  - Being pregnant or breastfeeding

Study design: Randomized controlled experiment

Tests and questionnaires

Random assignment to conditions

Driving behavior (solo vs. passenger presence counterbalanced)

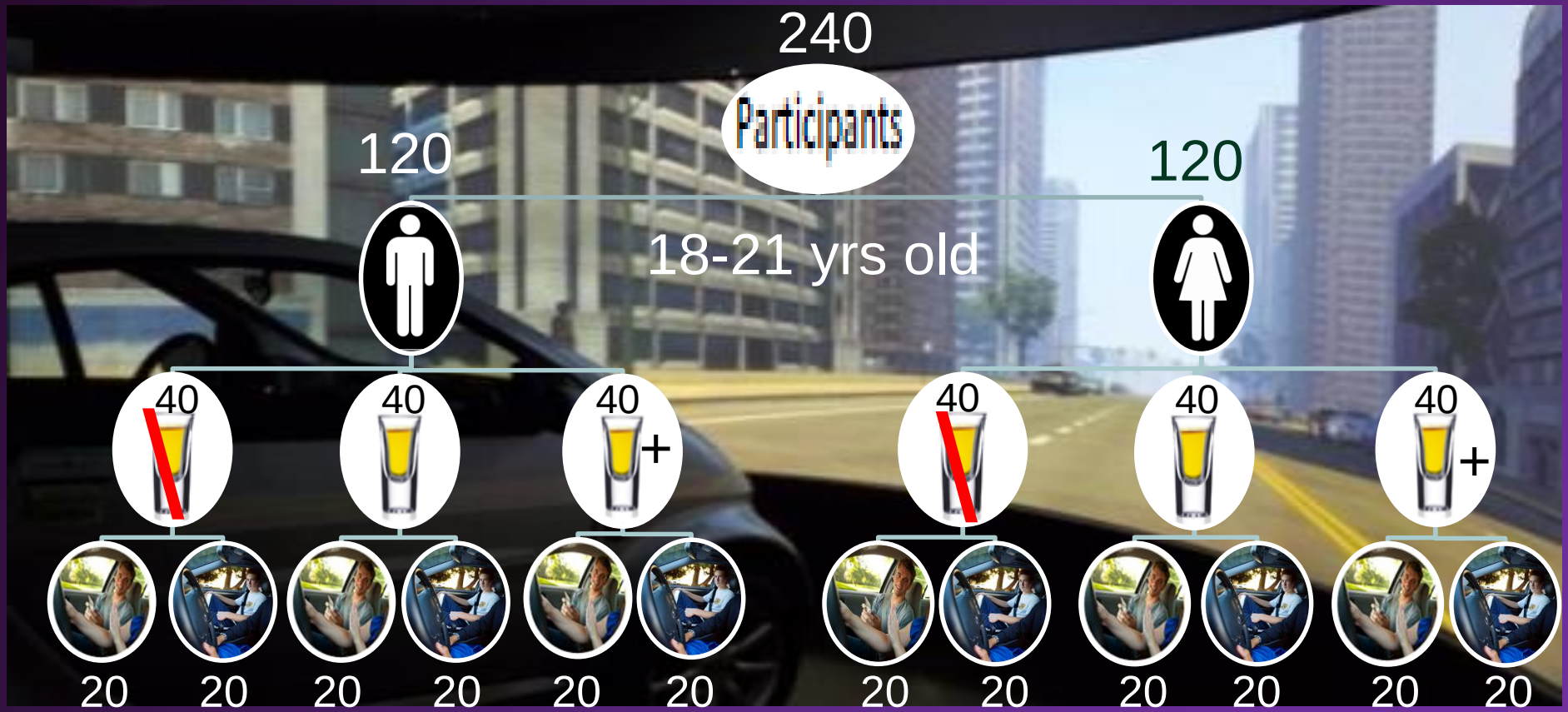
Lunch and rest until null blood alcohol concentration (BAC)

Alcohol (g/kg)

Passenger type

In role with passenger type:
- Introduction of confederate and participant; confederate answers questions about opinions on driving while impaired
- Consensus selection of trip
- Confederate expresses opinions at key locations during simulation

Study design: Randomized controlled experiment



Dependent variables

- Mean speed in km/h on highway drive
  - Including merging vehicles, slow and fast vehicles, work zones, speed zones of 70 and 100 km/h
- Time in seconds before passing stalled vehicle at intersection in urban drive

Driving simulator

- Driving simulation software developed at *Université de Sherbrooke* and implanted in our MamaSim
  - Smart Fortwo 2005
  - 150 degrees, semi-circular screen
  - 3 projectors
  - One computer: Intel Core i7 Quad-core i7-930 - 2.8GHz

MamaSim is located on the 13th floor of the Longueuil Campus, Université de Sherbrooke

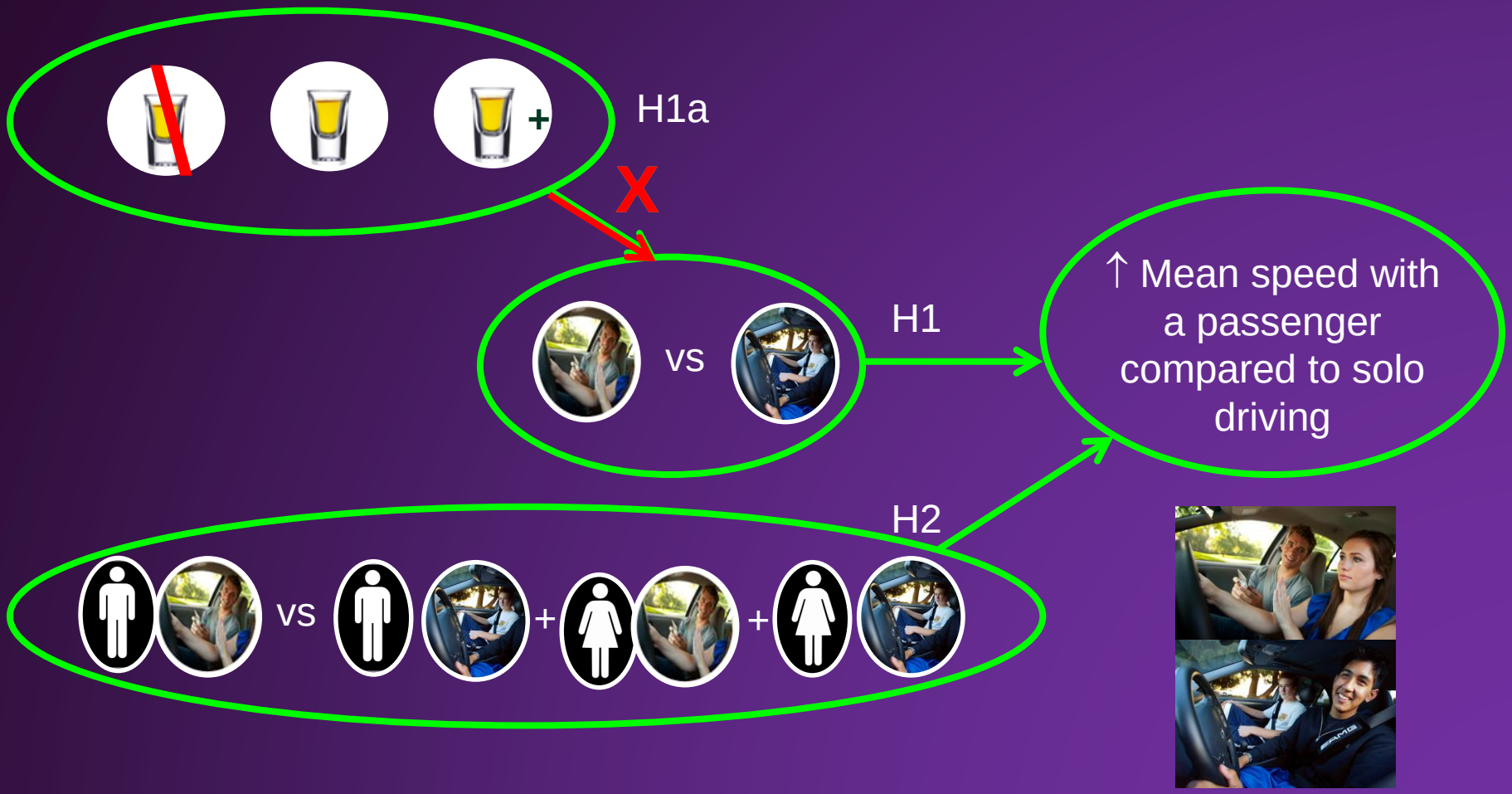
RESULTS

Participants

Variable	M or (%)	SD
Age	19.15	1.11
Age at provisional licencing[a]	17.70	0.86
Provisional licence	(58.80)	
Kilometers driven in past week	127.95[b]	165.84
Number of days driven in past week	3.77	2.43

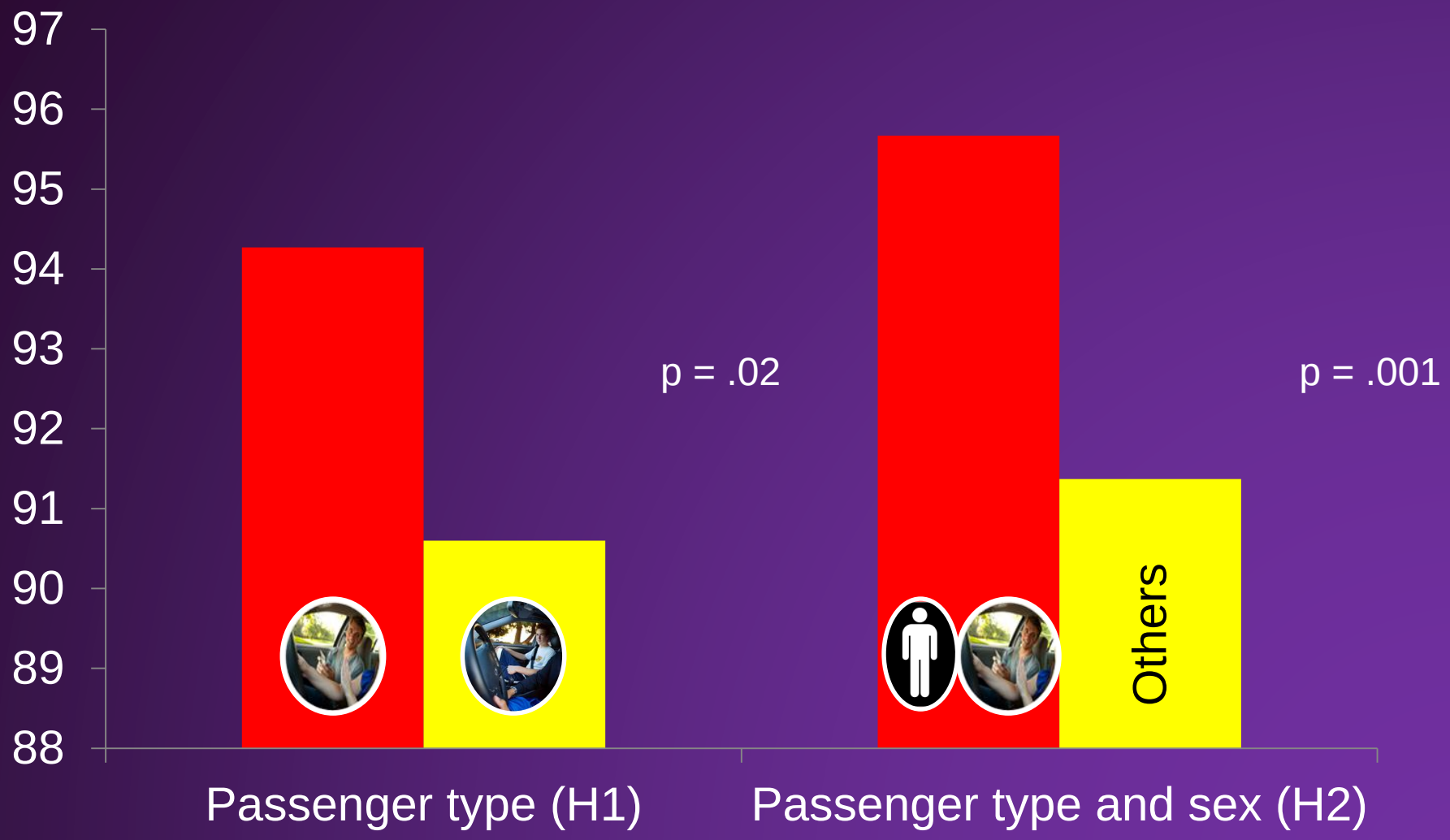
Note. [a]Minimal age for provisional licensing in Quebec = 17 years old; [b]Median = 50.0.

Mean speed

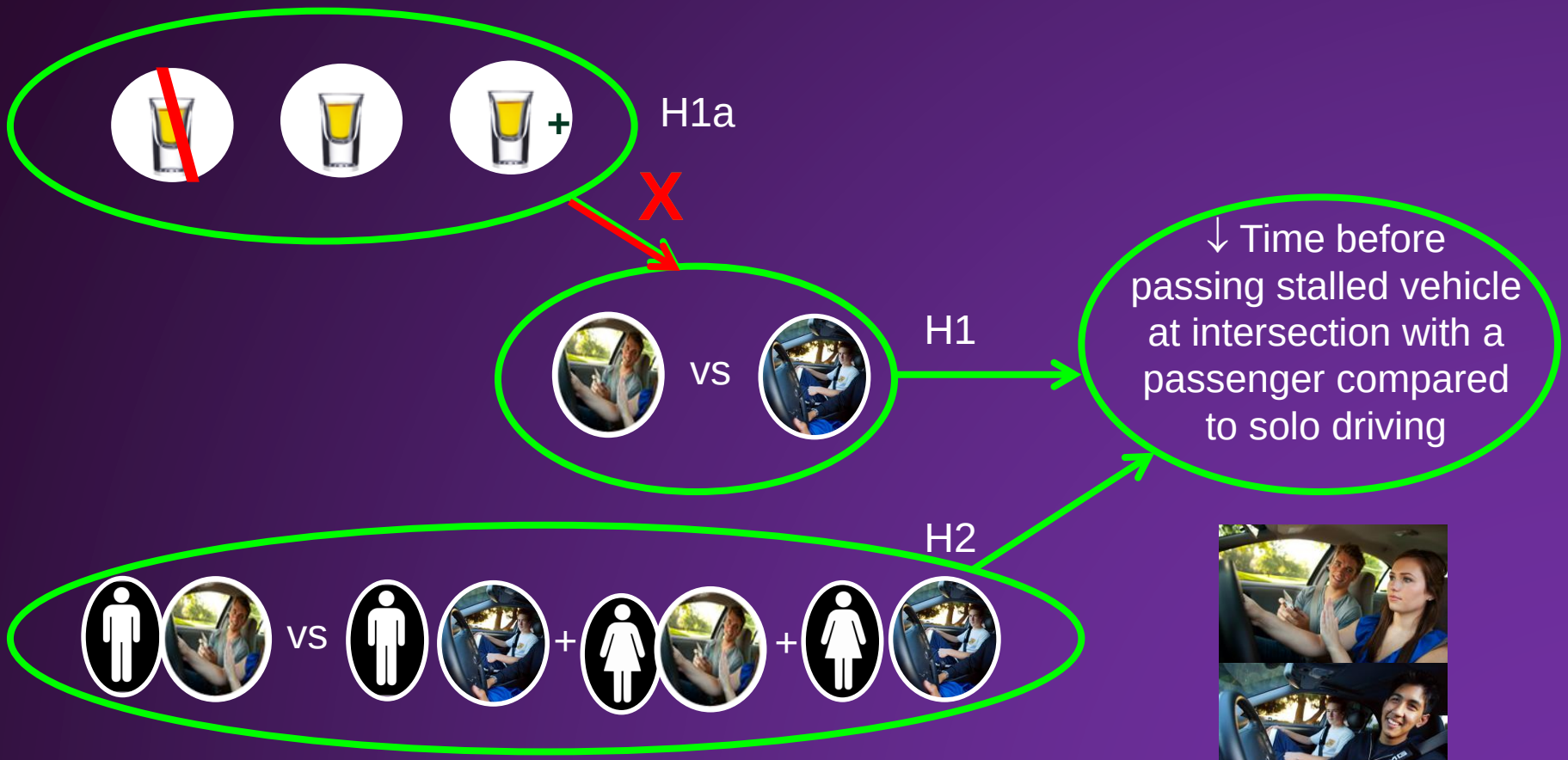


Planned comparisons accounting for drive presentation order (solo, with passenger)

Mean speed (H1, H2)

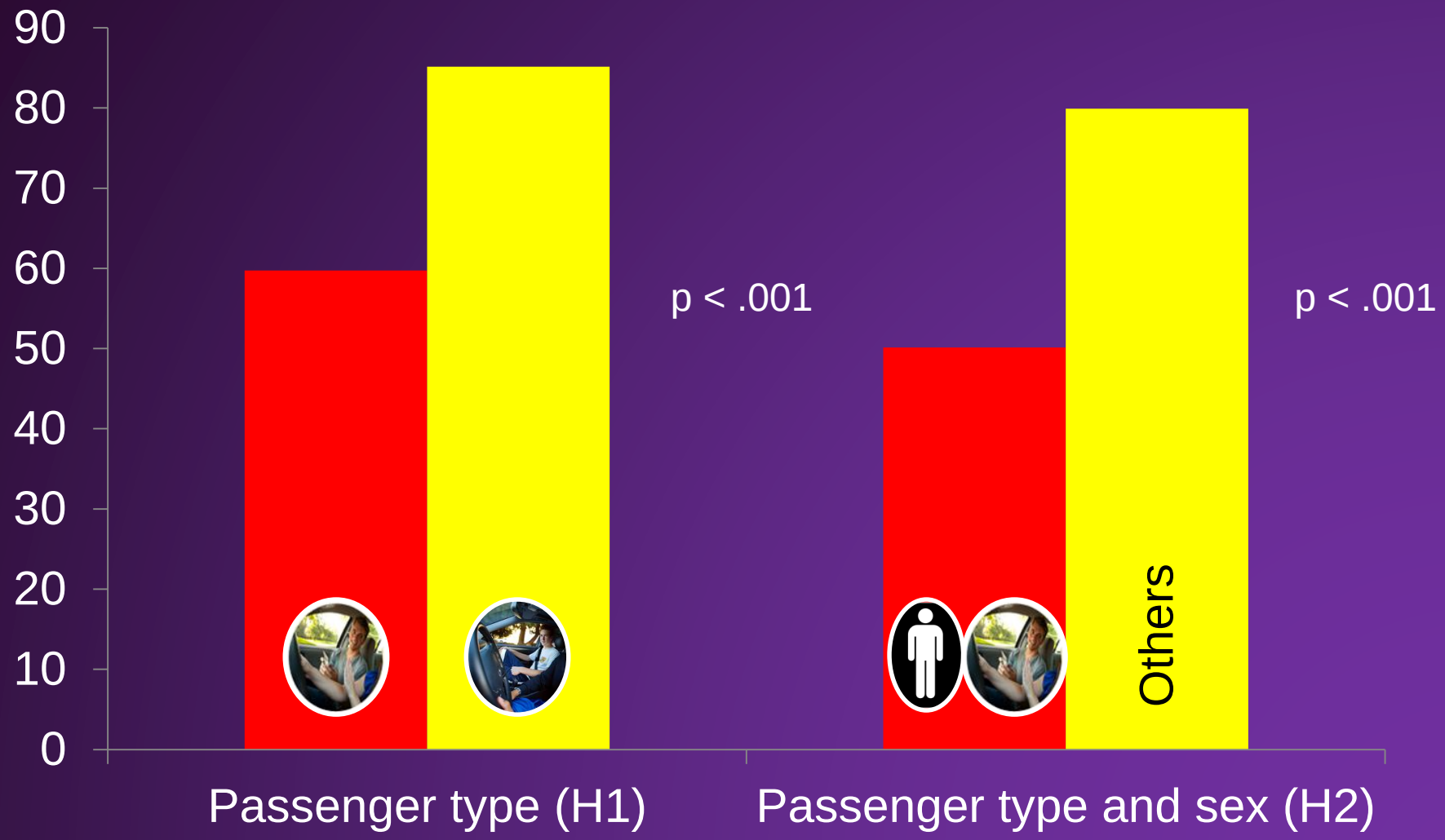


Time before passing vehicle



Planned comparisons accounting for drive presentation order (solo, with passenger)

Time before passing vehicle (H1, H2)



DISCUSSION

Implications of the study

- Study showed that
  - Social context exerts significant effects on driving behavior
  - Effects were not altered by alcohol intake

- As found in epidemiological studies, effects of one passenger were found in drivers > 19 years old with more than one year of driving experience
  - Results could guide evidence-informed policy-making
  - Refinement of prevention programs (e.g., parent-focused prevention programs)

Strengths of the study

- Randomized controlled experiment
  - causal inferences
- Large sample of males and females
- Planned comparisons

Limitations

- Simulation
  - Generalizability of simulation findings to the road?
    - Shown in several past studies
    - Past study our simulator: behavior similar to driving record
  - Optimal balance of safety, experimental control allowing causal inferences, and ecological validity when conducting driving experiments involving alcohol
- Confederate vs. friend
  - More control
  - Introduction of a new person in young people's life represents one kind of important interaction

Brown, Ouimet et al., 2017

Next analysis

- Examine other variables
  - Risk: e.g., time before left turn
  - ‘Skills’: lateral position
  - Eyeglance
- Examine how individual characteristics moderate the effect of peer influence
  - e.g., sensation seeking, impulsivity, susceptibility to peer pressure

Granting agencies

Thank you! Merci! Questions?

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Internship, M.Sc., Ph.D. and post-doc opportunities at the Faculty of Medicine and Health Sciences

Available funding?

Scholarships
Internship: according to duration
M.Sc.: $15 000/year for 2 years
Ph.D.: $19 000/year for 3 years

VDES-Med@USherbrooke.ca

Post-doc: to be determined

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Two projects for graduate studies are available: marie.claude.ouimet@usherbrooke.ca

- ADHD and driving environment
- Driving while impaired by cannabis and other drugs: development of a monitoring system