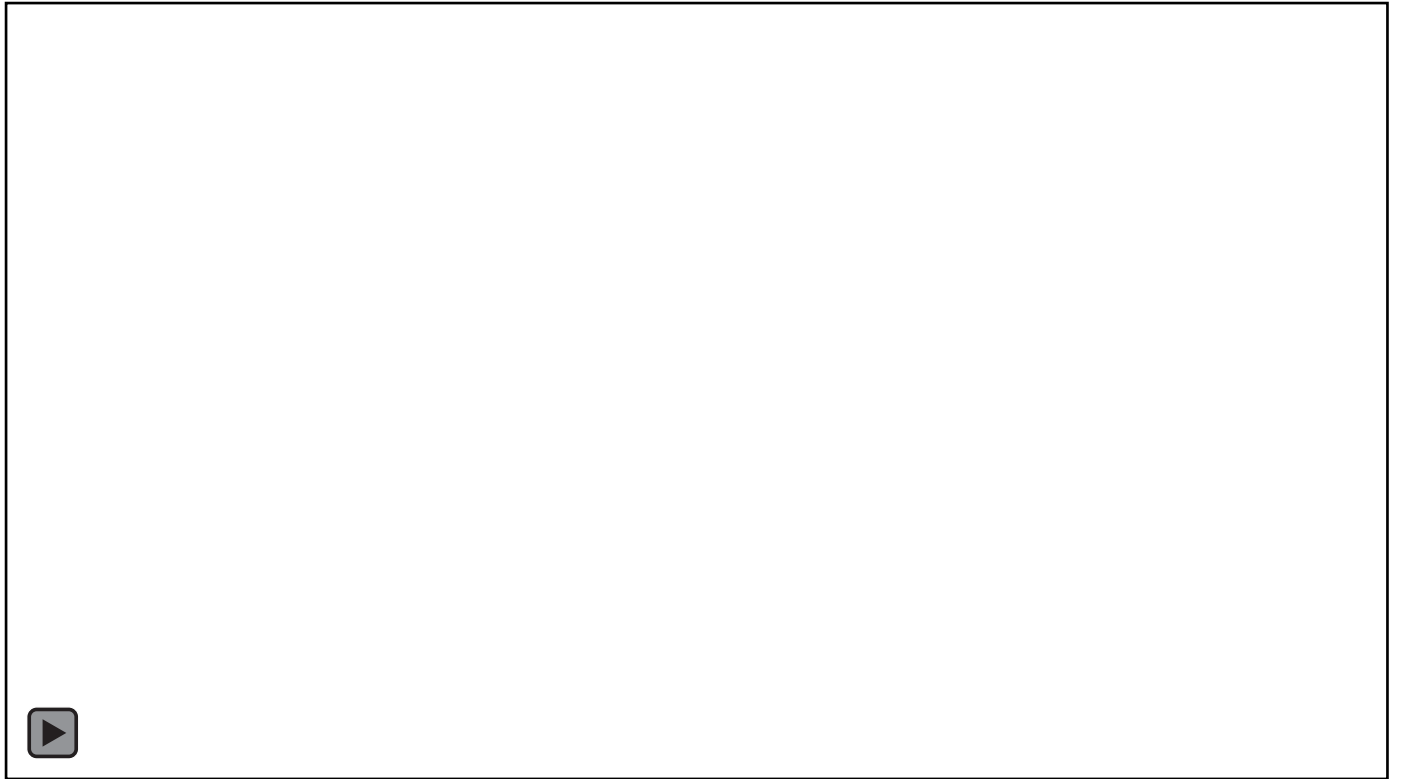


Utilization of safe-landing strategies in mountain biking

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Background & Aims

Mountain bike (MTB) riding:
inherently challenging!

- Speed! Heights! Rough surfaces!^{1,2}
- Falls are very common³

MTB falls: most do not lead
to serious injuries

- Protective mechanisms?
- Effectiveness of fall responses: validated in other contexts ^{4, 5, 6, 7, 8, 9, 10}

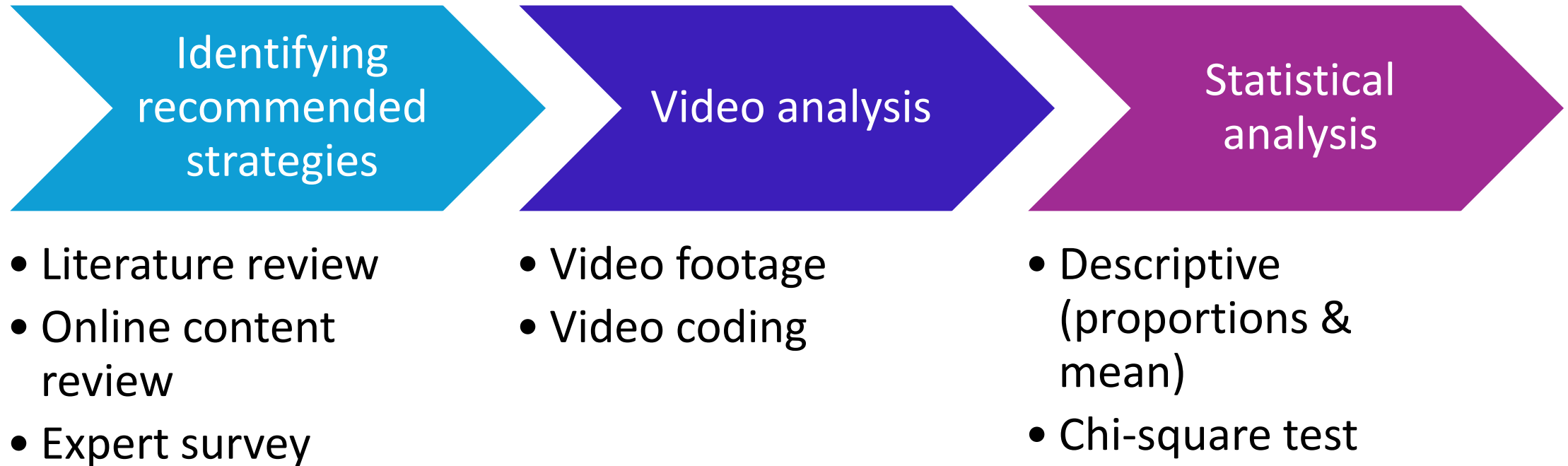
Safe-landing strategies and
its use in MTB

- Many studies on MTB injury but not fall responses ^{1, 2, 3}
- High interests among MTB communities

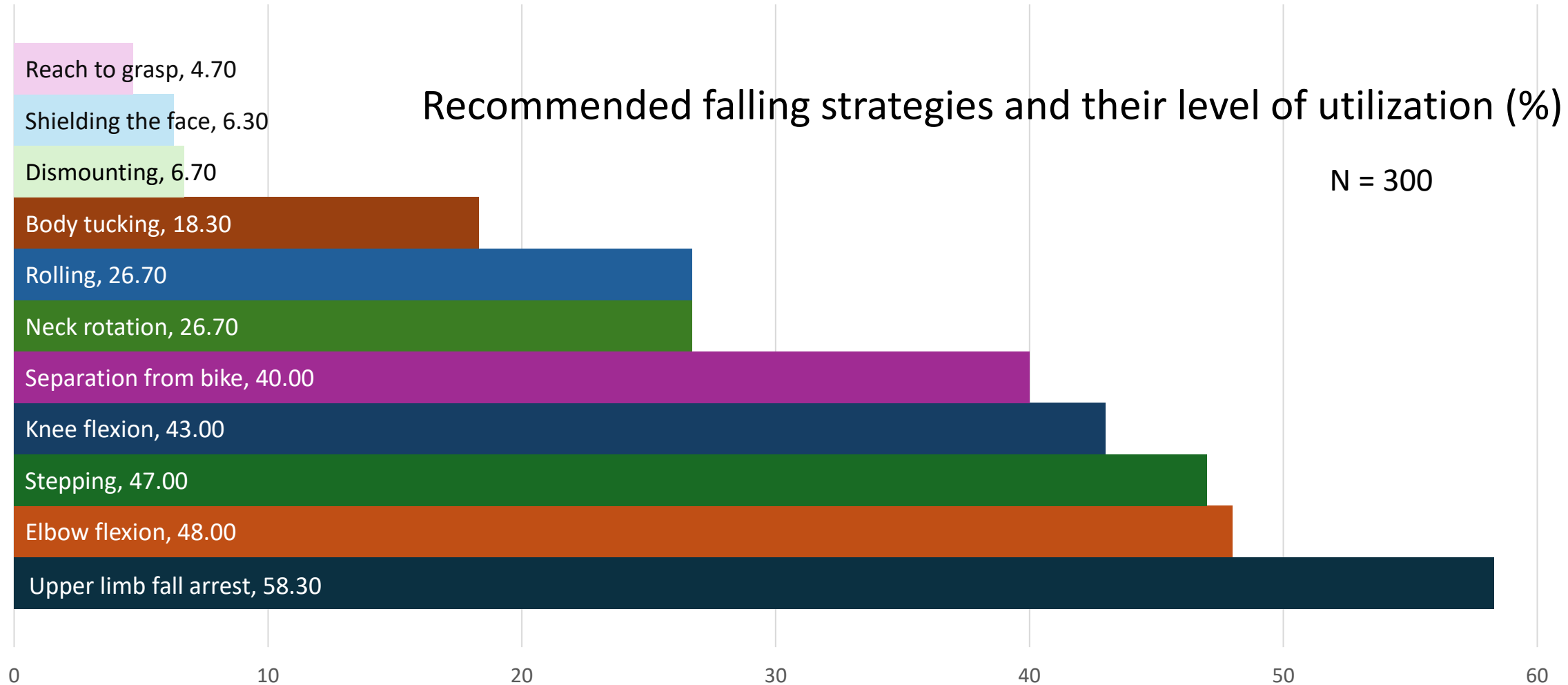
Aims

- Identify and synthesize recommended safe landing strategies
- Determine their level of utilization

Methods



Recommended falling strategies and their level of utilization (%)



Results

- Mean number of responses per fall: **3.1**
- Proportion of falls displaying at least one response: **96.1**

| Demographics | Strategies |
|----------------------------|-------------------------------|
| Competitive > Recreational | Stepping, knee flexion |
| Recreational > Competitive | Face shielding, neck rotation |
| Male > Female | Stepping, bike separation |

Discussion

Consistent with previous studies

- Dismounting ¹¹
- Separation from bike ^{12, 13, 14}
- Stepping ⁹
- Reach-to-grasp ^{15, 16}
- Upper-limb-fall-arrest: debate ^{9, 17, 18, 19, 20, 21, 22}
- Squatting/rolling/tucking: energy dispersion ^{23, 24}

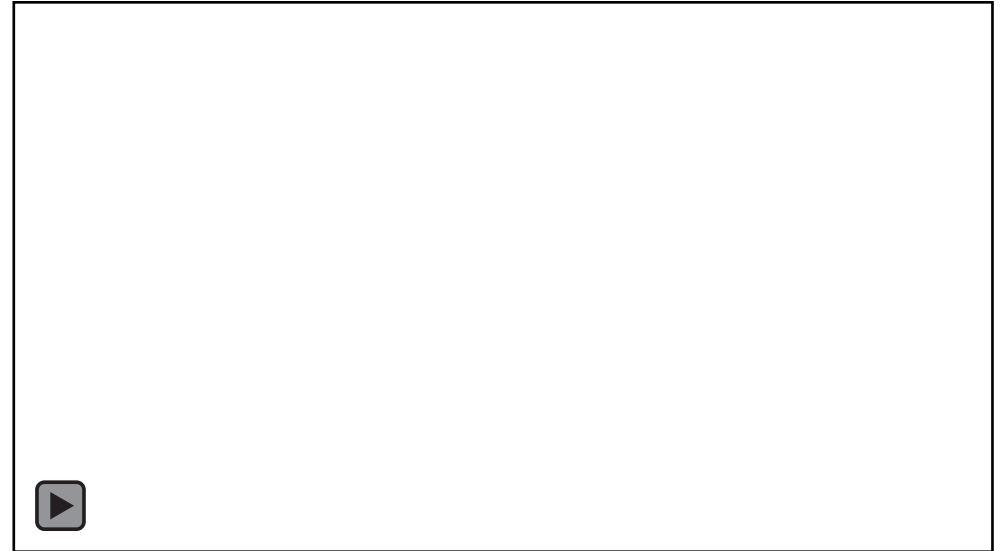
High utilization of fall responses

- Potential explanation for low prevalence of serious injury in MTB

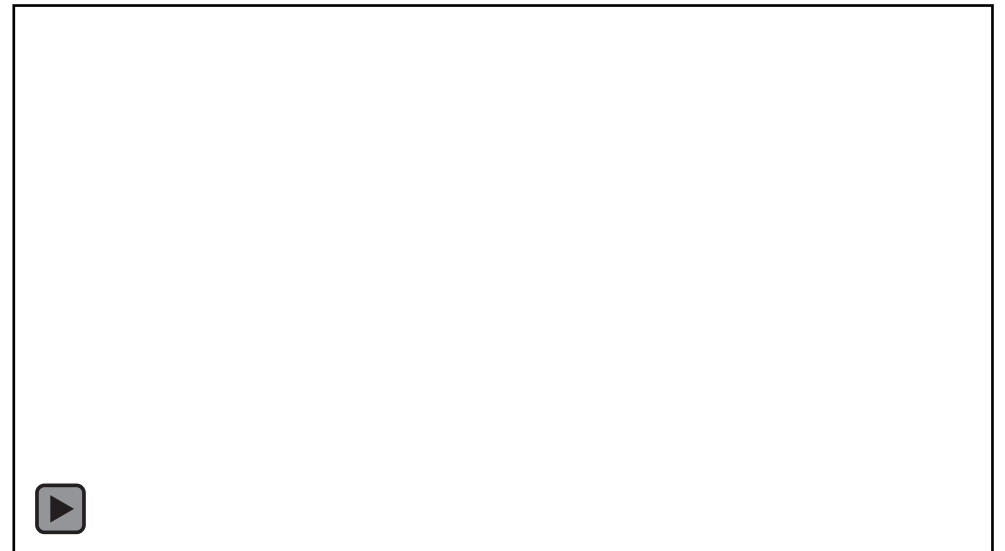
Limitations, future work & significance

- Observation only
- In-vivo experimental validation
- Applications: education, trail/park design, protective gears

Video 1: displaying stepping, upper limb fall arrest, and rolling



Video 2: displaying upper limb fall arrest, elbow flexion



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