

# EFFECTS OF VERBAL CUE ON LANDING MECHANICS AND RELIABILITY

Mr. Christopher M. Puleston, Dr. Matthew Ellis, Dr. Lee A. Bridgeman,  
Dr. Matthew J. Handford, Dr. John Harry, Dr. Jonathon D. Hughes, Dr. Thomas E. Bright

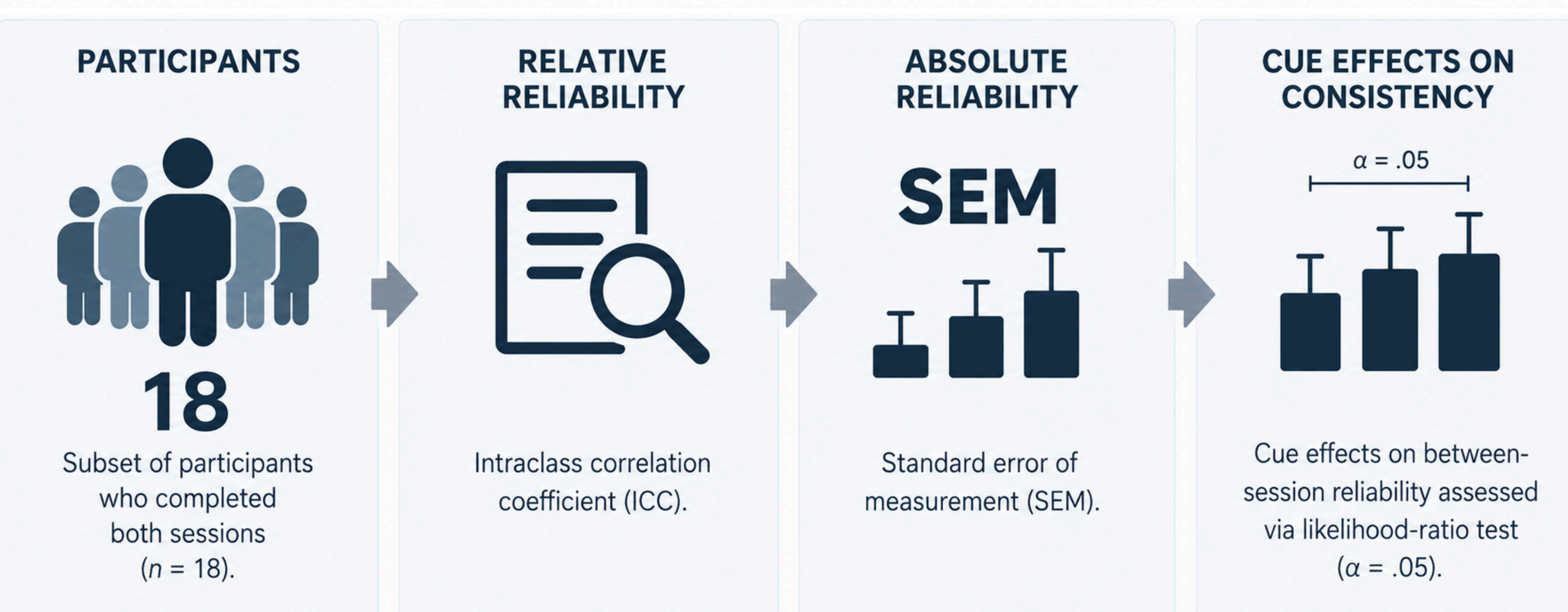
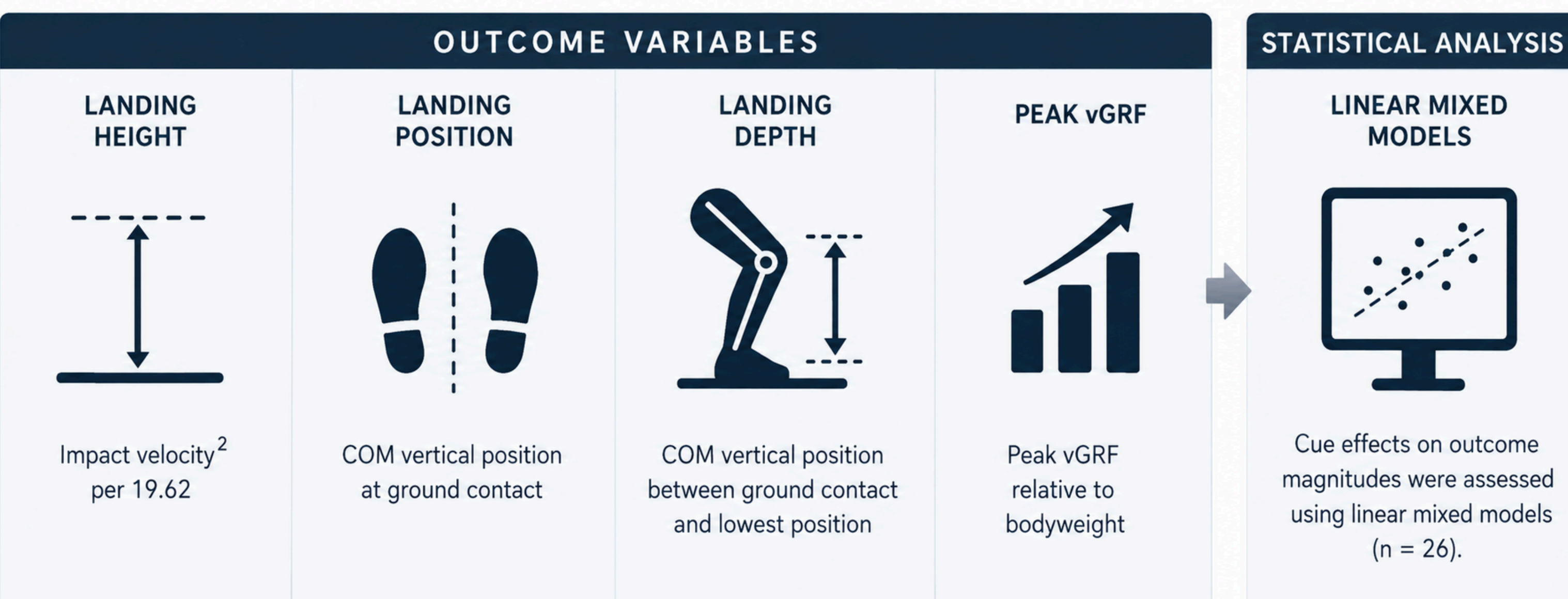
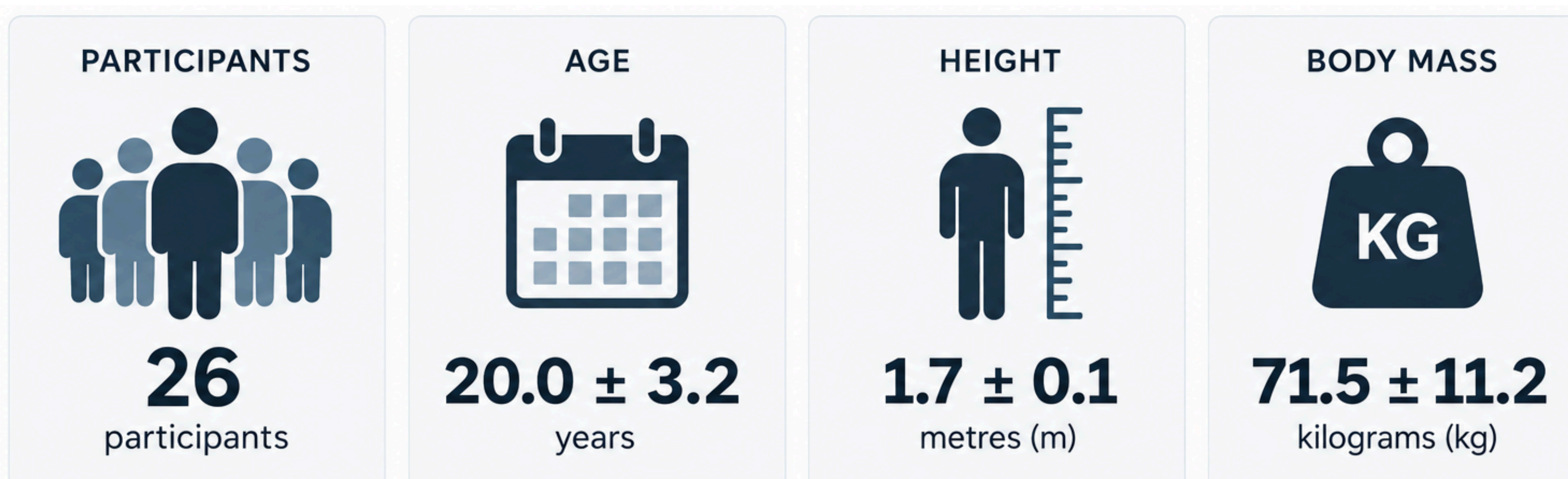
Plymouth Marjon University, Southampton Solent University, U7 Performance, Texas Tech University, Cardiff Metropolitan University



## INTRODUCTION

- Landing is central to many sporting actions, whether preparing for a subsequent movement or rapidly decelerating to a stop <sup>[2]</sup>.
- Verbal cueing may alter landing mechanics, with prior work suggesting that simple cues can reduce landing forces and change joint kinematics <sup>[3,4,5]</sup>.
- However, whether the cue influences the resulting landing height, position, depth and relative peak vertical ground reaction force (vGRF) is less clear.
- Separately, landing force-time reliability has been questioned <sup>[1]</sup>, yet whether the cue itself affects this is largely unknown - this exploratory study examined both.

## METHODS



## RESULTS

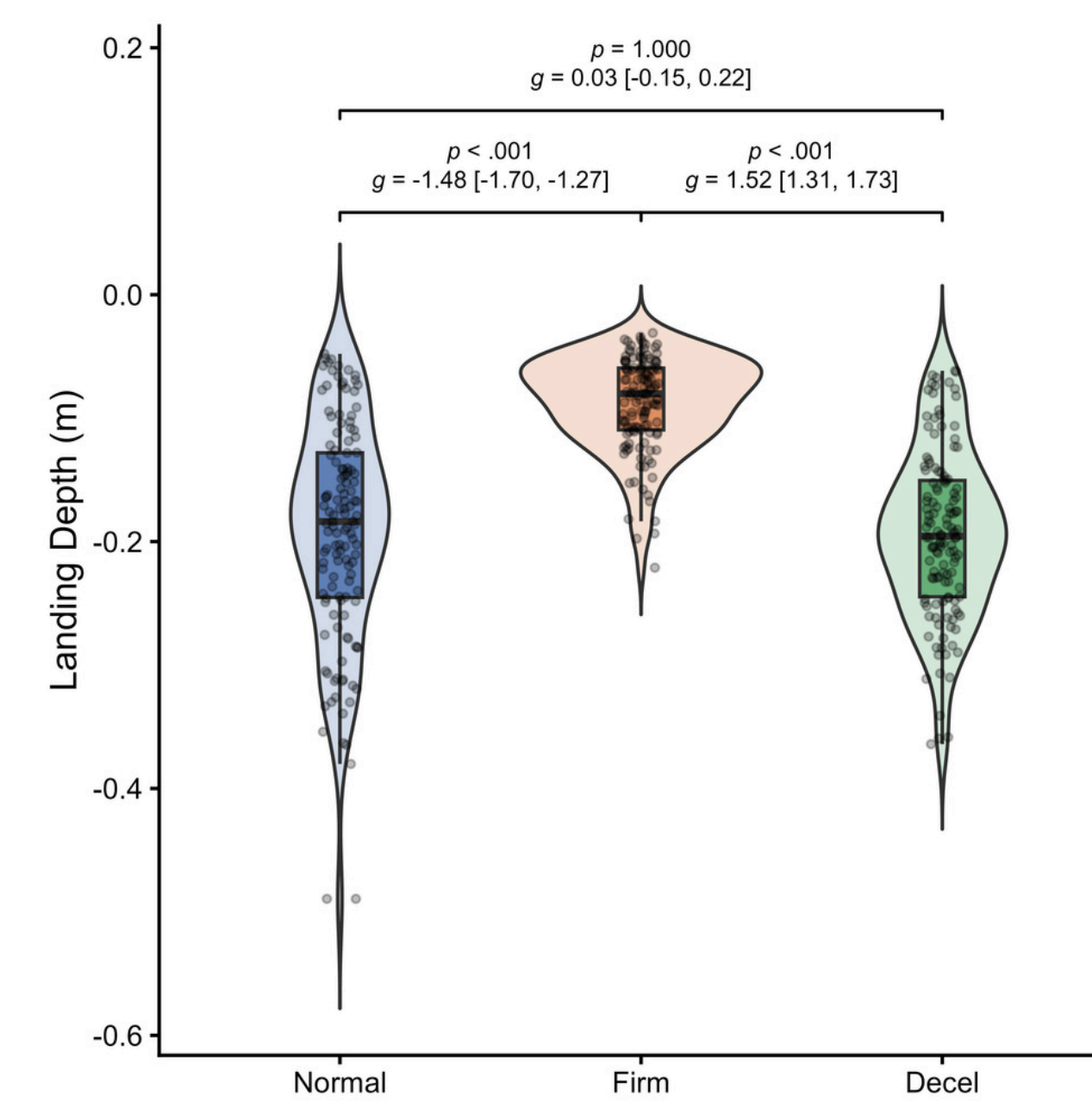


Figure 1. Landing depth, shallower with firm cueing.

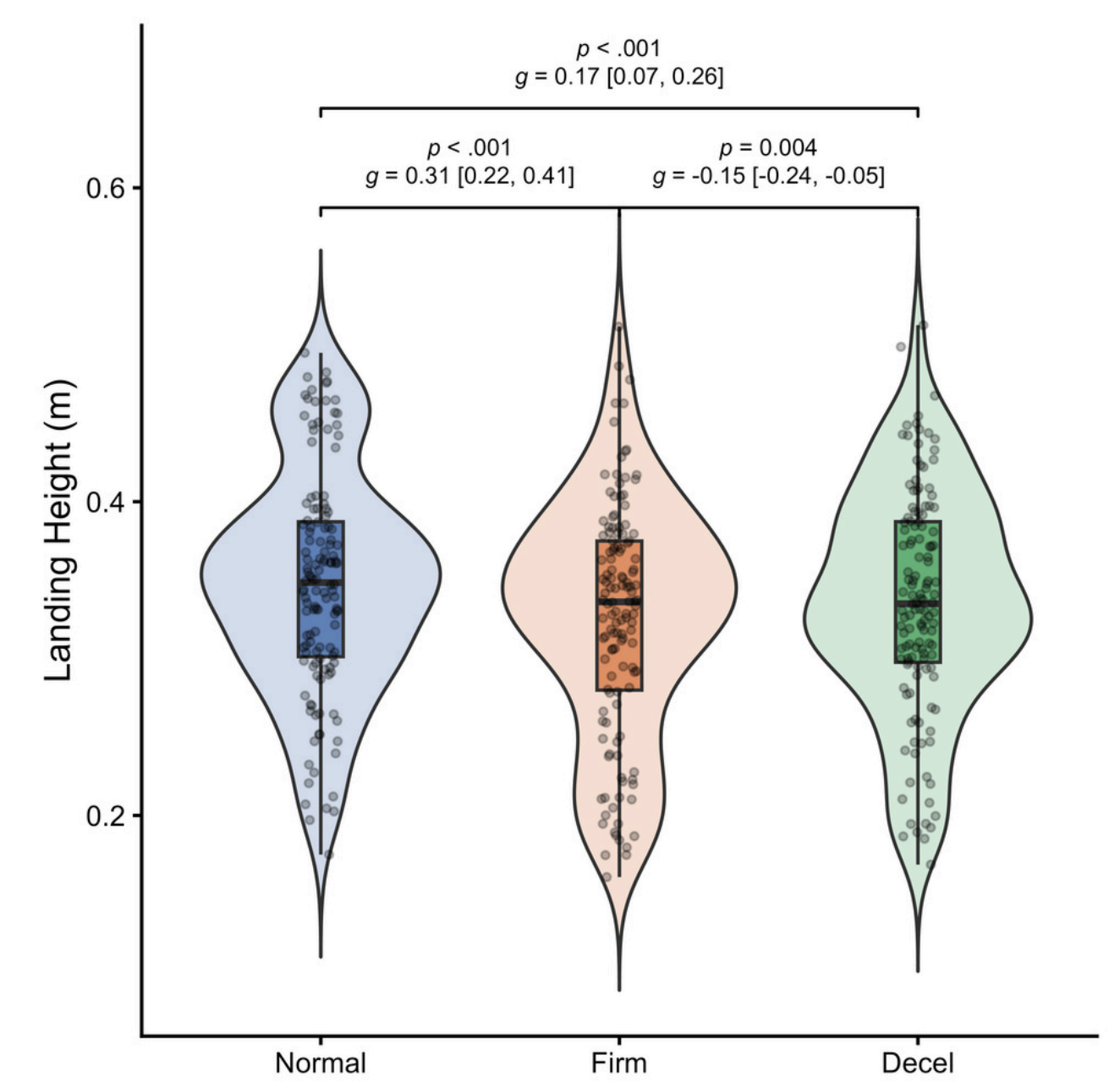


Figure 2. Landing height, lowest with firm cueing.

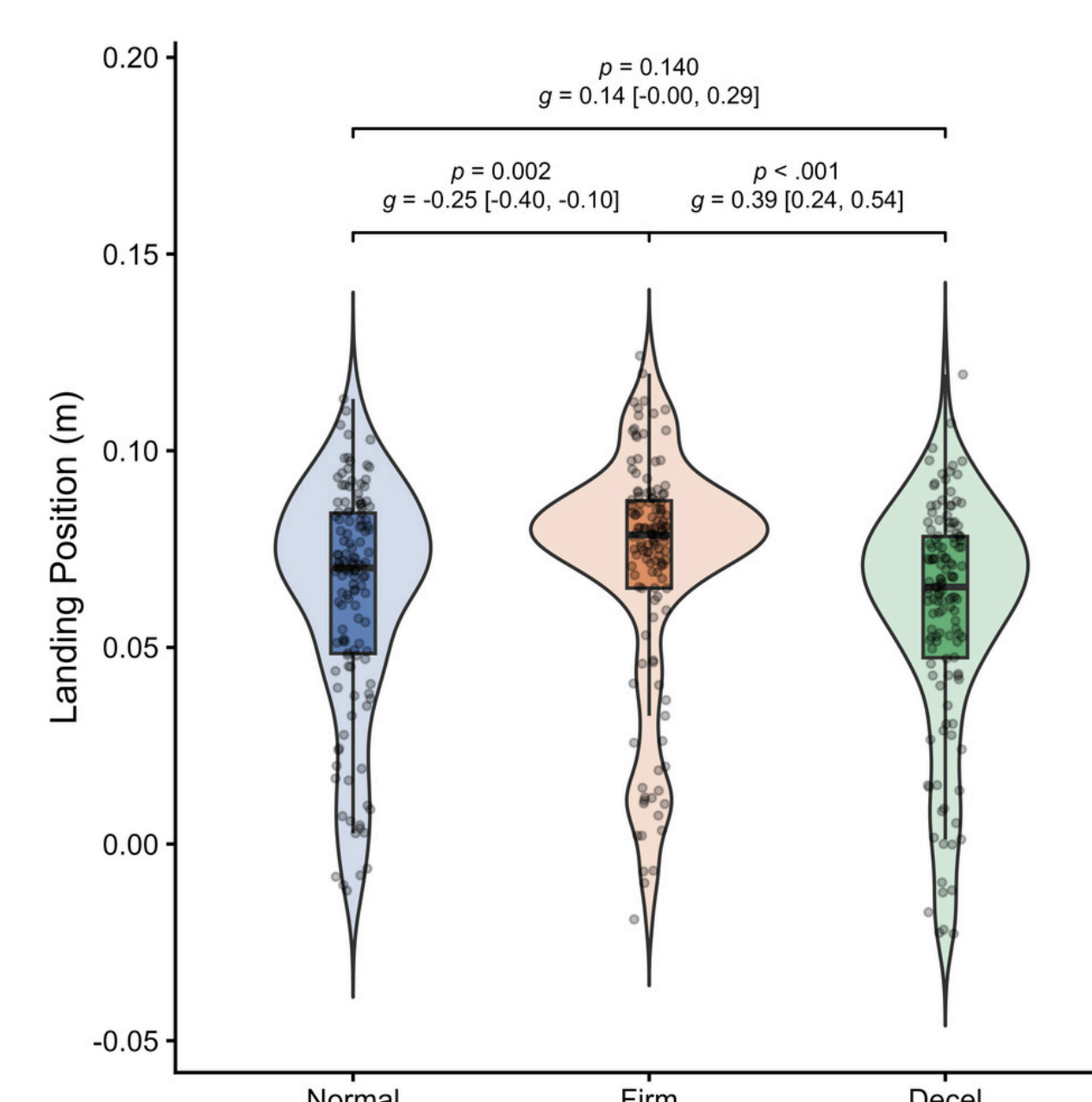


Figure 3. Landing position, most extended with firm cueing.

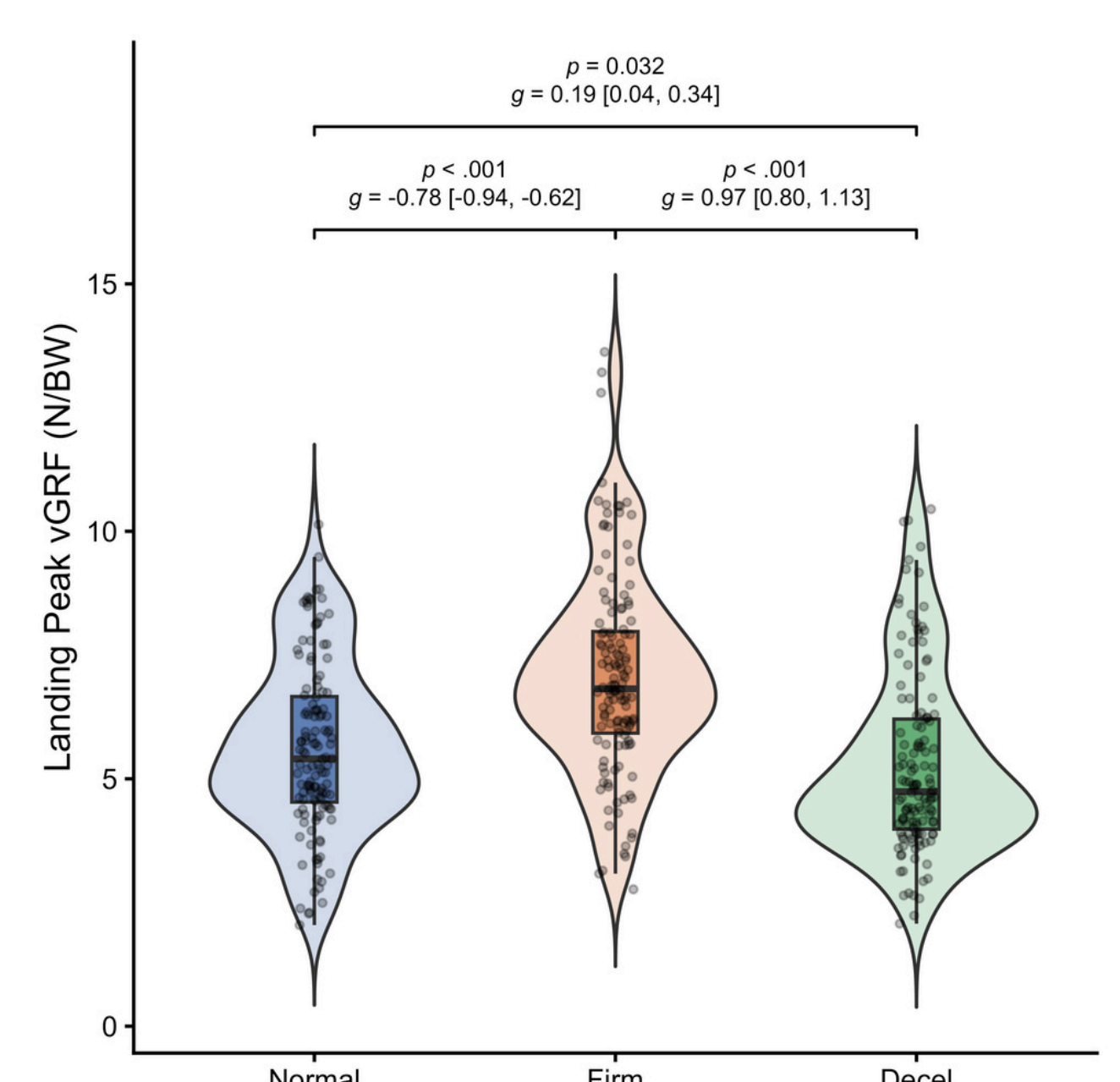


Figure 4. Landing peak vGRF, greatest with firm cueing.

- Reliability (lower ICC CI<sub>95</sub>) ranged from poor to good (0.26–0.88). Landing height was consistently good (0.80–0.88), landing position good-to-moderate (0.65–0.80), and peak vGRF moderate throughout (0.51–0.59).
- Landing depth was the least reliable variable (0.26–0.51) and the only one where between-session reliability varied by cue ( $p < .001$ ).
- Despite this, firm cueing still produced the smallest measurement error for landing depth (SEM = 1.6 cm vs 3.9 cm under normal and deceleration).

- Scan QR code (top right) for full tables.

## PRACTICAL APPLICATIONS

- Firm and deceleration cueing both reduced landing height relative to normal, possibly reflecting anticipatory adjustment.
- A firm cue produced a more extended position at ground contact, shallower landing depth and greater peak vGRF, possibly indicating a stiffer landing strategy.
- Deceleration cueing lowered peak vGRF relative to normal without altering landing position or depth.
- Future work should establish whether take-off and landing force-time data can be reliably extracted from a single CMJ trial, or require separate assessments.

**Acknowledgements.** This study received no external funding. The authors thank Leo Sinclair, Jeremy Willis, Ollie Pead and Lola Mitchell for their assistance with data collection.

### REFERENCES

- Anicic, Z., Janicijevic, D., Knezevic, O. M., Garcia-Ramos, A., Petrovic, M. R., Cabarkapa, D., & Mirkov, D. M. (2023). Assessment of countermovement jump: what should we report? Life, 13(1), 190.
- Harry, J. R., Simms, A., & Hite, M. (2024). Establishing phase definitions for jump and drop landings and an exploratory assessment of performance-related metrics to monitor during testing. The Journal of Strength & Conditioning Research, 38(2), e62-e71.
- Khuu, S., Musalem, L. L., & Beach, T. A. (2015). Verbal instructions acutely affect drop vertical jump biomechanics—implications for athletic performance and injury risk assessments. The Journal of Strength & Conditioning Research, 29(10), 2816-2826.
- McNair, P. J., Prapavessis, H., & Callender, K. (2000). Decreasing landing forces: effect of instruction. British journal of sports medicine, 34(4), 293-296.
- Milner, C. E., Fairbrother, J. T., Srivatsan, A., & Zhang, S. (2012). Simple verbal instruction improves knee biomechanics during landing in female athletes. The Knee, 19(4), 399-403.

