

**I Can Run More but at What Cost: The Effects of Academy Training on High and Low Performing Law Enforcement Recruits**

Balfany, Katherine ; Dulla, Joseph; Dawes, James; Orr, Rob Marc; Lockie, Robert G.

*Licence:*  
CC BY-NC-ND

[Link to output in Bond University research repository.](#)

*Recommended citation(APA):*

Balfany, K., Dulla, J., Dawes, J., Orr, R. M., & Lockie, R. G. (2018). *I Can Run More but at What Cost: The Effects of Academy Training on High and Low Performing Law Enforcement Recruits*. Poster session presented at The 38th Annual Meeting of the Southwest Regional Chapter of the American College of Sports Medicine, Costa Mesa, California, United States.

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.



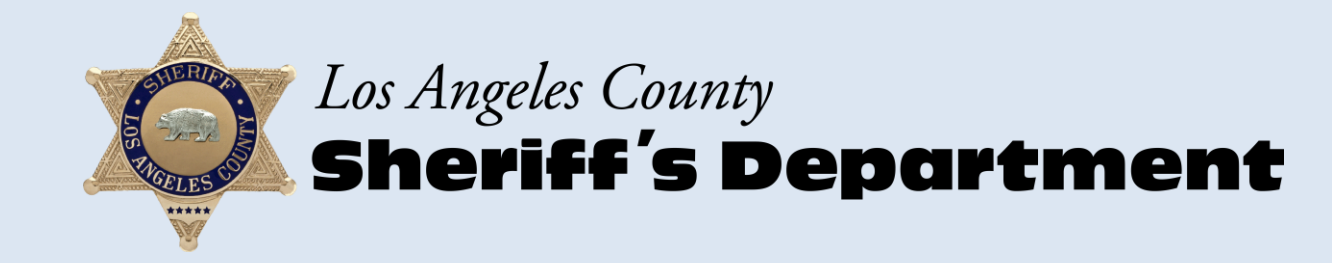
# I Can Run More but at What Cost: The Effects of Academy Training on High and Low Performing Law Enforcement Recruits

Katherine Balfany<sup>1</sup> ♦ Joseph M. Dulla<sup>2</sup> ♦ J. Jay Dawes<sup>3</sup> ♦ Robin M. Orr<sup>4</sup> ♦ Robert G. Lockie<sup>1</sup>

<sup>1</sup>Center for Sport Performance, Department of Kinesiology, California State University, Fullerton, CA, USA.

<sup>2</sup>Recruit Training Unit, Training Bureau, Los Angeles County Sheriff's Department, Los Angeles, CA, USA.

<sup>3</sup>Department of Health Sciences, University of Colorado-Colorado Springs, Colorado Springs, CO, USA. <sup>4</sup>Tactical Research Unit, Bond University, Robina, Qld, Australia.



## ABSTRACT

Academy training is utilized by staff to develop the physical abilities of recruits specific to law enforcement. However, academy training typically follows a paramilitary model with specific programming often left to the discretion of the staff, and long, slow distance (LSD) running is often emphasized. Further, due to large class sizes, adjusting training intensity specific to the individual is generally not considered. The goals for this study were to determine whether physical training during academy leads to changes in physical fitness; and to determine the effect of a 'one-size-fits-all' training modality on more and less fit recruits. Retrospective analysis was conducted on pooled recruit data from four academy classes (n=202) from one law enforcement agency. Recruits underwent pre and post-testing of physical assessments consisting of: vertical jump (VJ) (only measured in one class); 75-yard pursuit run (75PR); medicine ball throw (MBT); and multi-stage fitness test (MSFT). To measure training effects on more and less fit recruits, a tertile split was performed for each assessment, with the top third on each pre-test defined as high performers (HP), and the bottom third as low performers (LP). Multiple repeated measures analysis of variance was performed to determine any mean differences for the physical assessments between all recruits, and the HP and LP. Significance for all analyses was set at  $p < .05$ . Significant differences were found between pre- and post-test in select assessments for the combined recruit data, indicating improvements for MBT and MSFT, and a decline in 75PR performance. Further analysis showed significant interactions between time and the HP and LP for the 75PR, MBT, and MSFT. Both HP and LP improved in the MSFT, by 42.26% and 102.15%, respectively. For the 75PR, HP became 3.70% slower, while LP had no significant performance change. In the MBT, LP improved by 12.10%, while HP had no significant change. No significant interactions were found for the VJ when considering all recruits, HP, and LP. The data suggests that the current one-size-fits-all training approach may inhibit performance improvements in HP recruits during academy, especially limiting adaptations for upper-body power (MBT) and anaerobic performance (75PR, VJ). This is exacerbated by the current practice of emphasizing LSD running. While this approach greatly improves aerobic fitness in recruits, it appears to come at the cost of power and speed. Other modalities, such as strength and power training, should be explored in law enforcement academies, as well as ability-based training models.

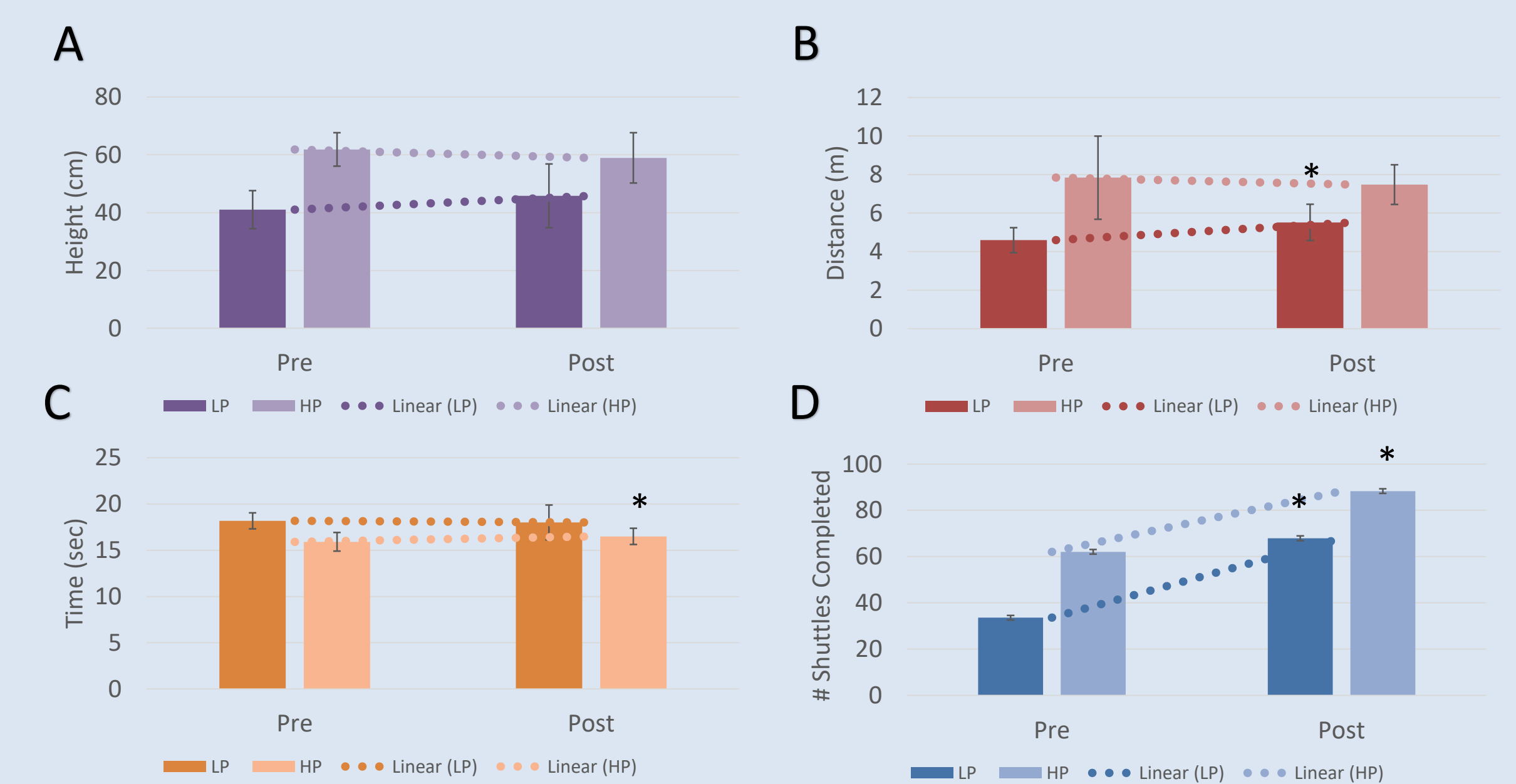
## INTRODUCTION

- Law enforcement agency (LEA) recruits in California must complete a training academy, often over a 22-week period, which includes a minimum of 36 scheduled physical training sessions. Academy training should ideally prepare recruits for their future physical work demands, which could include pushing, pulling, lifting, carrying, dragging, jumping, running, crawling, climbing and fighting.<sup>1</sup> These tasks ideally require training adaptations in aerobic capacity, muscular strength, power, and speed.
- Typically, the design for LEA academy training programs are based on a paramilitary, one-size-fits-all model, which favors interval running without evidence-based work: rest ratios, long slow distance (LSD) running, and local muscular endurance workouts.<sup>2</sup>
- Due to large class sizes and time constraints, training typically involves programming for large groups, and individualized ability-based training (ABT) is often not considered. However, recruits generally begin academy at various fitness levels.<sup>3</sup> With a one-size-fits-all training approach, however, higher performing recruits may not receive the necessary training stimulus to elicit adequate training adaptations for job performance.
- The purpose of this study was to determine whether physical training during academy leads to changes in physical fitness for recruits from one LEA. A secondary purpose was to determine the effect of a 'one-size-fits-all' training modality on more and less fit recruits.

## METHODS

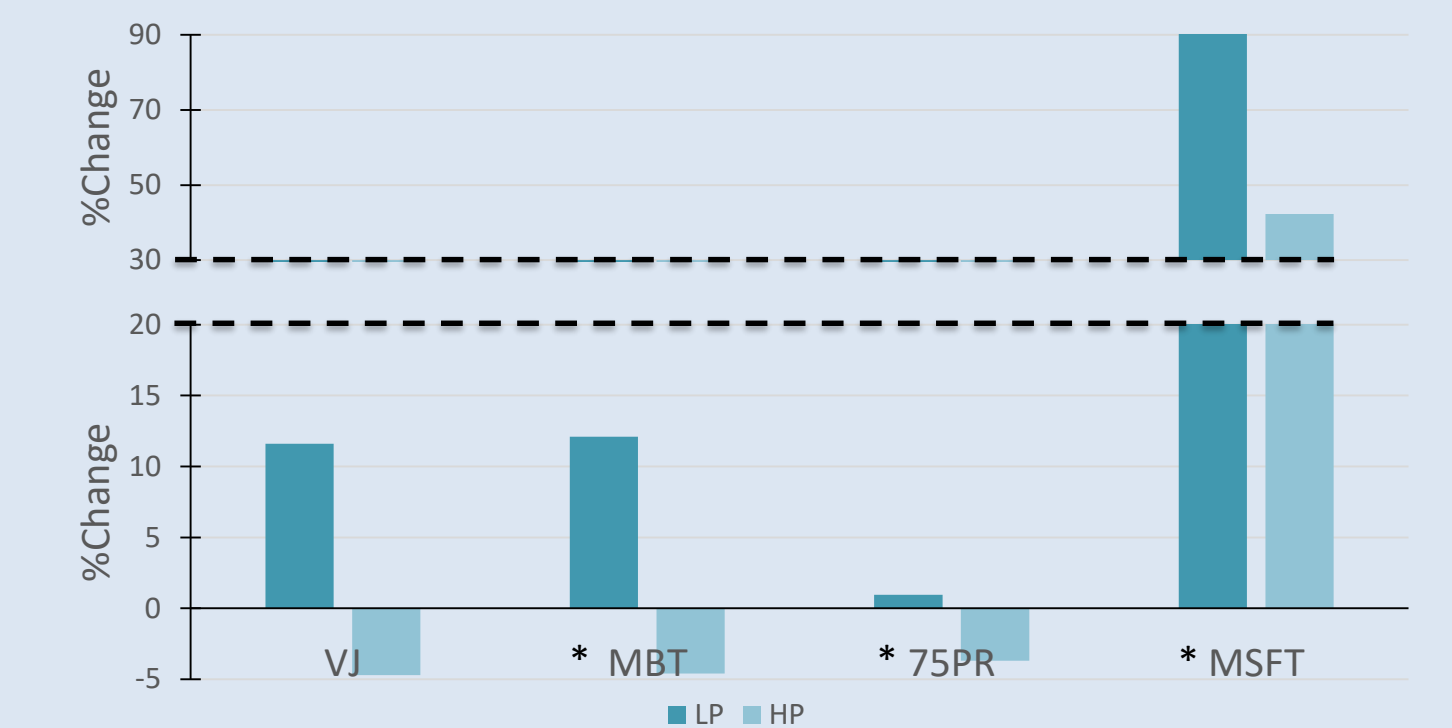
- A cross-sectional, retrospective analysis of data from one law enforcement agency was conducted. Pre- and post-testing academy data from four classes of recruits (174 males: age =  $26.38 \pm 5.02$  years, height =  $1.76 \pm 0.08$  m, body mass =  $82.25 \pm 11.23$  kg; 24 females: age =  $26.71 \pm 4.36$  years, height =  $1.65 \pm 0.08$  m, body mass =  $67.17 \pm 10.58$  kg) were analyzed across four performance tests.
- Recruits underwent pre-testing before the first week of academy training. Physical conditioning assessments consisted of: vertical jump (VJ) (only measured in one class), 75-yard pursuit run (75PR), medicine ball throw (MBT), and multi-stage fitness test (MSFT). Post-testing was performed in the last few weeks of the 22-week academy depending on class schedule.
- To measure training effects on more and less fit recruits, a tertile split was performed for each assessment, with the top third on each pre-test defined as high performers (HP), and the bottom third as low performers (LP). Multiple repeated measures analysis of variance were performed to determine any mean differences for the physical assessments between all recruits, and the HP and LP. Significance for all analyses was set at  $p < .05$ .

## RESULTS



\* Significant ( $p < 0.05$ ) interaction from pre to post test.  
**Figure 1.** Descriptive data (mean  $\pm$  SD) in the A. VJ, B. MBT, C. 75PR, and D. MSFT in LP and HP recruits

- Significant differences were found between pre- and post-tests for MBT ( $p = .004$ ), 75PR ( $p = .048$ ) and MSFT ( $p < .001$ ) in combined recruit data, with no significant changes in VJ.
- Significant interactions were found for pre- and post-tests with improvements in the MSFT for HP ( $p < .001$ ) and LP ( $p < .001$ ), performance decrements in HP ( $p < .001$ ) for the 75PR with no change for LP, and LP ( $p < .001$ ) improving in MBT, with no change for HP.



\* Significant ( $p < .05$ ) difference in pre- and post-testing performance for combined recruit data.  
**Figure 2.** % Change from pre- to post-test for LP and HP recruits in selected performance tests. Direction of %change indicates improvement or decrement in performance.

## CONCLUSIONS

- The data suggest that the current one-size-fits-all training approach may inhibit performance improvements in HP recruits during academy, especially limiting adaptations for upper-body power (MBT) and anaerobic performance (75PR, VJ).
- With the current training practices emphasizing interval running without evidence-based work: rest ratios and LSD running, aerobic fitness greatly improves in recruits (shown by the increase in completed MSFT shuttles), but at the cost of power and speed.
- High volumes of running and current paramilitary training practices that emphasize repetitive training in the sagittal plane (i.e. marching, running, push-ups) could lead to overtraining and injury.<sup>4</sup> In support of previous research, the data from this study reinforced that recruits do not all begin academy at the same fitness level.<sup>3,4</sup> With a one-size-fits-all training approach, intensities vary depending on the recruit's fitness level potentially resulting in over- or under-training.
- A greater prevalence of injury also tends to occur in LP tactical recruits, although the prevalence of overall injury and mean differences between HP and LP can be lessened if ABT is implemented.<sup>4</sup> This approach could also lead to fitness improvements in more fit recruits.
- LEA training staff should consider emphasizing other training modalities, such as strength and power training, as well as implementing ABT for recruits during academy to improve response to training and decrease the risk of injury.

**References**

- Anderson, GS, D Plecas, and T Segger. (2001). Police officer physical ability testing—Re-validating a selection criterion. *Policing: An International Journal of Police Strategies & Management*. 24(1), 8-31.
- Burley, S. D., Drain, J. R., Sampson, J. A., & Groeller, H. (In Press). Positive, limited and negative responders: The variability in physical fitness adaptation to basic military training. *Journal of science and medicine in sport*.
- Lockie, R. G., Stierli, M., Cesario, K. A., Moreno, M. R., Bloodgood, A. M., Orr, R. M., & Dulla, J. M. (2018). Are there similarities in physical fitness characteristics of successful candidates attending law enforcement training regardless of training cohort? *Journal of Trainology*, 7(1), 5-9.
- Orr, R. (2010). The Royal Military College of Duntroon. *Physical Conditioning Optimisation Review-Project Report*. Canberra: ACT: Department of Defence.