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Running Speed, Power, and Aerobic Fitness relate to Work Sample Test Battery Performance in Deputy Sheriff Recruits

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ABSTRACT

Many law enforcement recruits complete a state-specific physical test before graduating from their respective academies. In California, this is known as the Work Sample Test Battery (WSTB). The WSTB is comprised of tests related to job-related tasks. Certain agencies also conduct assessments to measure physical fitness; one example is the Validated Physical Abilities Test+ (VPAT+). The VPAT+ was developed to measure a recruit's power as well as general fitness. This study aimed to identify relationships between VPAT+ and WSTB performance. Retrospective analysis on data from four academy classes (203 males, 35 females) from one law enforcement agency was conducted. The VPAT+ and WSTB were completed in the last weeks of a 22-week academy training program. The VPAT+ is comprised of: a vertical jump (VJ) and seated 2 kg medicine ball throw (MBT) to indirectly measure lower- and upper-body power, respectively; a 75-yard pursuit run (75PR), which was a simulated foot pursuit involving sprinting and direction changes; and the multi-stage fitness test (MSFT), where the number of shuttles indicated aerobic fitness. The WSTB comprised five tests completed for time: agility run around a 99-yard obstacle course (99OC); 32-foot body drag (BD) with a 165-lb dummy; climb over a six-foot chain link fence (CL) and six-foot solid wall (SW); and 500-yard run (500R). Partial correlations controlling for sex calculated relationships between the tests from the VPAT+ and WSTB. A greater VJ related to faster 99OC, CL, SW, and 500R scores (r = -0.23 to -0.38). Greater MBT distance correlated to quicker 99OC and CL performance (r = -0.21 to -0.27). Faster 75PR performance was associated with a faster 99OC, CL, SW, and 500R (r = -.025 to -0.50). A higher number of MSFT shuttles correlated to faster 99OC and 500R (r = -0.27 to -0.410). No VPAT+ tests related to the BD. The VJ and 75PR related to the running and barrier-clearing WSTB tests, which may display the need for lower-body power and high-intensity anaerobic performance in these tasks. Superior MSFT performance related to the OC99 and 500R times, which highlights high-intensity running capacity needs for law enforcement. Better MBT scores correlated with the 99OC and CL, which provide some indication of the value of upper-body power in occupational tasks. However, no VPAT+ tests related to the BD. The BD is strength-intensive, which is an attribute not usually tested in recruits. The use of strength testing in recruits should be explored, as this quality could relate to job-specific tasks.

INTRODUCTION

- Many law enforcement recruits complete a state-specific physical test before graduating from their respective academies. In California, this is known as the Work Sample Test Battery (WSTB).[4] The WSTB is comprised of tests resembling job-related tasks. For instance, the WSTB simulate situations in which an officer must chase a suspect; climb over a barrier; navigate obstacles while running; and drag an incapacitated person to safety.[2]
- Certain agencies also conduct assessments to measure physical fitness; one example is the Validated Physical Abilities Test+ (VPAT+). The VPAT+ was developed to measure a recruit's power, high-intensity running ability, and general fitness. Dawes et al.[1] has linked the physical qualities of power and high-intensity running to increased performance in law enforcement-specific physical abilities tests.
- As the VPAT+ has more power-based and high-intensity running tests than the WSTB, it may be a better indicator of future job performance, as officers frequently need to move quickly over and around barriers while pursuing fleeing suspects, amongst other anaerobically-based tasks.
- The purpose of this study was to document the relationships between VPAT+ and WSTB performance in deputy sheriff recruits.

METHODS

- Retrospective analysis on data from four academy classes (203 males: age= 26.42 ± 5.13 years, height= 1.77 ± 0.07 m, body mass= 83.12 ± 14.08 kg; 35 females: age= 26.87 ± 4.34 years, height= 1.65 ± 0.07 m, body mass= 70.42 ± 19.35 kg) from one law enforcement agency was conducted.
- The VPAT+ and WSTB were completed in the last weeks of a 22-week academy training program. The VPAT+ was comprised of: a vertical jump (VJ) and seated 2 kg medicine ball throw (MBT) to measure lower- and upper-body power, respectively; a 75-yard pursuit run (75PR), which was a simulated foot pursuit involving sprinting and direction changes (Figures 1 and 2); and the multi-stage fitness test (MSFT), where the number of shuttles indicated aerobic fitness.
- The WSTB comprised five tests completed for time: agility run around a 99-yard obstacle course (99OC; Figure 3); 32-foot body drag (BD) with a 165-lb dummy; climb over a six-foot chain link fence (CL) and six-foot solid wall (SW); and 500-yard run (500R).[4]
- Partial correlations ($p < 0.05$) controlling for sex calculated relationships between the tests from the VPAT+ and WSTB.

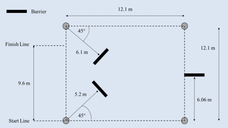

Figure 1: Set-up of the 75-yard Pursuit Run.

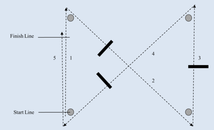

Figure 2: Running direction of the 75-yard Pursuit Run.

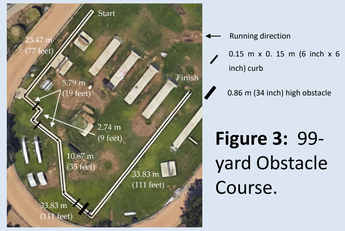

Figure 3: 99-yard Obstacle Course.

RESULTS

- Table 1 displays the correlation data. A greater VJ related to faster 99OC, CL, SW, and 500R scores. Greater MBT distance correlated to quicker 99OC and CL performance. Faster 75PR performance was associated with a faster 99OC, CL, SW, and 500R. A higher number of MSFT shuttles correlated to faster 99OC and 500R.
- No VPAT+ tests related to the BD.

Table 1. Correlation matrix showing relationships between VPAT+ and WSTB performance.

		99OC	BD	CL	SW	500R
Vertical Jump	*r*	-0.382*	-0.062	-0.232*	-0.243*	-0.242*
	p	<0.001	0.340	<0.001	<0.001	<0.001
Medicine Ball Throw	*r*	-0.207*	-0.068	-0.266*	-0.092	-0.096
	p	0.001	0.298	<0.001	0.158	0.142
75-yard Pursuit Run	*r*	0.498*	0.095	0.476*	0.254*	0.281*
	p	<0.001	0.146	<0.001	<0.001	<0.001
Multi-Stage Fitness Test	*r*	-0.274*	-0.085	-0.075	-0.080	-0.410*
	p	<0.001	0.194	0.249	0.222	<0.001

* Significant ($p < 0.05$) relationships between the two variables.

CONCLUSIONS

- The VJ and 75PR related to the running and barrier-clearing WSTB tests, which may display the need for lower-body power and high-intensity anaerobic performance in these tasks. Furthermore, these findings align with Dawes et al.,[1] who highlighted the need for these attributes in law enforcement officers.
- Superior MSFT performance related to the OC99 and 500R times, which highlights high-intensity running capacity needs for law enforcement; not only to score highly on physical testing, but this could crossover to job-specific tasks such as suspect pursuit.[1]
- Better MBT scores correlated with the 99OC and CL, which provide some indication of the value of upper-body power in occupational tasks, especially when an officer must pull themselves up and over a barrier. Previous research by Lockie et al.[3] has indicated the potential value of upper-body power for law enforcement officers.
- No VPAT+ tests related to the BD. The BD is strength-intensive, which is an attribute not usually tested in recruits. The use of strength testing in recruits should be explored, as this quality could relate to job-specific tasks such as jumping/climbing over obstacles, apprehending suspects, and dragging a person to safety.

References

1. Dawes, J.J, Lindsay, Keston, K., Bero, J., Elder, C., Kornhauser, C. & Holmes,. (2017). Physical fitness characteristics of high versus low performers on an occupationally specific Physical Agility Test (PAT) for patrol officers. *Journal of Strength and Conditioning Research*. 31(10): 2808-2815.
2. Lockie, R.G., Dawes, J.J., Balfany, K., Gonzales, C.E., Beitzel, M.M., Dulla, J.M. & Orr, R.M. (under review). Physical fitness characteristics that relate to Work Sample Test Battery performance in law enforcement recruits. *International Journal of Environmental Research and Public Health*.
3. Lockie, R.G., Dawes, J.J., Orr, R.M., Stierli, M., Dulla, J.M. & Orjalo, A.J. (2018). An analysis of the effects of sex and age on upper- and lower-body power for law enforcement agency recruits prior to academy training. *Journal of Strength and Conditioning Research*. 32(7): 1968-1974.
4. Peace Officer Standards and Training. (2012). Work Sample Test Battery Proctor Manual. Retrieved October 7, 2018, from: https://post.ca.gov/post_docs/regulationnotices/2012-05/WrkSmplTestBattryProctrMan.pdf.