INNOVATIVE APPROACHES TO ELUCIDATE OPTIMAL DEPLOYMENT OF CB SENSING ASSETS

Irondog: Introducing The Future Four-legged Warfighter

Michele Maughan DEVCOM CBC **Edgar Aviles** Texas Tech University **Joerg Schultz** Tier Wohl Team GbR **Eric Best** University at Albany **Jenna Gadberry** Intrinsic24, LLC **Caitlin Sharpes** Excet, Inc. **Dakota Discepolo** Oak Ridge Institute for Science Education (ORISE) **Erin Perry** Southern Illinois University **Patricia Buckley** DEVCOM CBC **Aleksandr Miklos** DEVCOM CBC **Debra Zoran** Texas A&M University **Dana DiPasquale** Valiant Harbor, Inc. **Brian Farr** DOD Military Working Dog Veterinary Services **Andrea Henderson** DOD Military Working Dog Veterinary Services **Nathaniel Hall** Texas Tech University

Detection canines serve critical roles to support the military, homeland security and border protection. Within the military, some explosive detection tasks are physically demanding for dogs, and prior research suggests this can lead to a reduction in olfactory detection sensitivity. To further evaluate the effect of exercise intensity on olfactory sensitivity, we developed a novel olfactory paradigm that allowed us to measure olfactory detection thresholds while dogs exercised on a treadmill at two different exercise intensities. Dogs showed a substantial decrement in olfactory detection for low odor concentrations under greater exercise intensity. Specifically, dogs hit rate for the lowest concentration dropped from 0.87 ± 0.04 when walking at low intensity to below 0.45 ± 0.06 when trotting at moderate intensity. This decline had an interaction with the duration of the session in moderate intensity exercise, whereby dogs performed near 100% detection in the first 10 min of the 8 km/h session, but showed 0% detection after 20 min. Interestingly, hit rates for high odor concentrations were relatively stable at both low (1 ± 0.00) and moderate (0.91 ± 0.04) exercise intensities. The paradigm and apparatus developed here may be useful to help further understand causes of operationally relevant olfactory detection threshold decline.

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