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# Personality and performance in military working dogs: Reliability and predictive validity of behavioral tests

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### Abstract

Quantification and description of individual differences in behavior, or personality differences, is now well-established in the working dog literature. What is less well-known is the predictive relationship between particular dog behavioral traits (if any) and important working outcomes. Here we evaluate the validity of a dog behavioral test instrument given to military working dogs (MWDs) from the 341st Training Squadron, USA Department of Defense (DoD); the test instrument has been used historically to select dogs to be trained for deployment. A 15-item instrument was applied on three separate occasions prior to training in patrol and detection tasks, after which dogs were given patrol-only, detection-only, or dual-certification status. On average, inter-rater reliability for all 15 items was high (mean  $\hat{r} = 0.77$ ), but within this overall pattern, some behavioral items showed lower inter-rater reliability at some time points ( $<0.40$ ).

Test “retest reliability for most (but not all) single item behaviors was strong ( $>0.50$ ) across shorter test intervals, but decreased with increasing test interval ( $<0.40$ ). Principal components analysis revealed four underlying dimensions that summarized test behavior, termed here “object focus”™, “sharpness”™, “human focus”™, and “search focus”™. These four aggregate behavioral traits also had the same pattern of short-, but not long-term test “retest reliability as that observed for single item behaviors. Prediction of certification outcomes using an independent test data set revealed that certification outcomes could not be predicted by breed, sex, or early test behaviors. However, prediction was improved by models that included two aggregate behavioral trait scores and three single item behaviors measured at the final test period, with 1 unit increases in these scores resulting in 1.7–2.8 increased odds of successful dual- and patrol-only certification outcomes. No improvements to odor-detection certification outcomes were made by any model. While only modest model improvements in prediction error were made by using behavioral parameters (2–7%), model predictions were based on data from dogs that had successfully completed all three test periods only, and therefore did not include data from dogs that were rejected during testing or training due to behavioral or medical reasons. Thus, future improvements to predictive models may be more substantial using independent predictors with less restrictions in range. Reports of the reliability and validity estimates of behavioral instruments currently used to select MWDs are scarce, and we discuss these results in terms of improving the efficiency by which working dog programs may select dogs for patrol and odor-detection duties using behavioral pre-screening instruments.



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## Keywords

Military dog; Personality; Reliability; Predictive validity; Behavioral instrument

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