

18 May 1989

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MEMORANDUM FOR Commander, USARIEM

SUBJECT: Request for Clearance of Technical Paper (USARIEM)

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Title Farnsworth-Munsell 100-Hue Test and "Learning:" Re-establishing the Priority of a "Discovery"

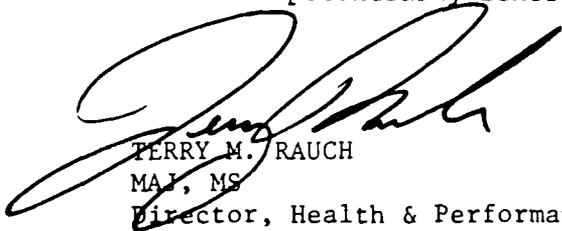
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Intended for publication in Applied Optics

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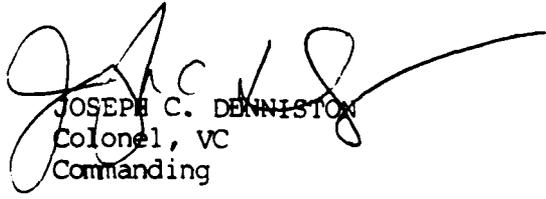
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FARNSWORTH-MUNSELL 100-HUE TEST AND "LEARNING:"

RE-ESTABLISHING THE PRIORITY OF A "DISCOVERY"

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Breton, Fletcher and Krupin¹ recently have provided interesting and important insights regarding the effect of learning on performance of the Farnsworth-Munsell 100-hue Test.² While I am pleased that they have validated the research results of John Kobrick and me,³ published eight years ago, it is somewhat disconcerting to find that no reference to our work was included, given that theirs is so similar to ours in so many ways.

Our study, like their recent one, was designed to examine systematically the continued improvement in performance that we had observed with repeated administrations of the Farnsworth-Munsell test to the same respondents. As did our study, theirs also examined the effects of reduced illumination on performance of the Farnsworth-Munsell test. And, as we did, they also expressed concern that use of the test in clinical settings might confound practice with treatment effects,

with possibly important consequences.

Breton, Fletcher and Krupin¹ also have observed that certain individuals tend to have initial scores on the Farnsworth-Munsell test which are substantially below the expected mean score for their age group. In addition to the paper by Fine and Koblrick cited above,³ two other papers^{4,5} have addressed this point directly. One, in particular,⁴ published 15 years ago, relates differences in color discrimination ability to hypothesized genetically-based differences in nervous system development. The construct "field-dependence" was conceptualized as tapping underlying differences between individuals in "sensitivity" of the nervous system. Differences in color discrimination ability between "field-independent" and "field-dependent" persons (relatively "sensitive" and "insensitive," respectively) were predicted and found. The relationship between field-dependence and color discrimination (measured by the Farnsworth-Munsell test) now has been replicated five times on different populations with different test administrators. Field-dependence also has been shown to be related to contrast sensitivity judgments.⁶

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Figure 1, taken from Fine and Kobrick³ is depicted below. It shows (1) a significant practice effect on the Farnsworth-Munsell test for the seven trials with 100 watt illumination, (2) performance differences for subgroups differentiated by the "field-dependence" construct (note that "good" performers and "poor" performers appear to learn at the same rate), and (3) the effects of different levels of illumination on performance. Interested readers should consult the original article since many details cannot be presented here.

I appreciate the opportunity to call to your readers attention the above error of omission and to commend Breton, Fletcher and Krupin for attempting to extend our earlier work. As both we and they have observed, the sizeable practice effects obtained with repeated administrations of the test should be noted, particularly by those using it as a standard against which to evaluate the status and/or progress of patients in clinical situations.

References

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1038 (1988).
2. D. Farnsworth, "Manual for the Farnsworth-Munsell
100-hue Test for the examination of color
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3. B. J. Fine, and J. L. Kobrick, "Field dependence,
practice, and low illumination as related to the
Farnsworth-Munsell 100-hue Test," *Percept. mot.
Skills* **51**, 1167 (1980).
4. B. J. Fine, "Field-dependence - independence as
"sensitivity" of the nervous system: supportive
evidence with color and weight discrimination,"
Percept. mot. Skills **37**, 287 (1973).
5. B. J. Fine, "Field-dependence and color
discrimination in females," *Percept. mot. Skills*,
57, 983 (1983).
6. B. J. Fine, and J. L. Kobrick, "Cigarette smoking,
field-dependence and contrast sensitivity," *Aviat.
Space Env. Med.* **58**, 777 (1987).

Figures

Figure 1: Total errors on the 100-Hue Test for all subjects and for personality sub-groups by trial and for the various illumination levels (from Fine & Kobrick, 1980, p. 1171)

The views, opinions, and/or findings contained in this letter are those of the author and should not be construed as an official Department of Defense or Department of the Army position, policy, or decision, unless so designated by other official documentation.

