

# Room Color and Aggression in A Criminal Detention Holding Cell: A Test of the "Tranquilizing Pink" Hypothesis

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## Abstract

*Incidence of aggressive officer-arrestee encounters was compared for the twelve months before and after changing the color of a county jail 13'4" by 15'6" strip search room from pale blue to hot pink. This size of holding room is much larger than those other jail or prison holding rooms which have reported success in curbing aggressive behavior among inmates. Relative frequency of such incidents did decrease for the first month following the color change, but subsequently increased, reaching peak levels during the last half of the pink year. Overall, little or no difference was found in incident rate for the pre- and post-pink months. The initial decline is seen as an intrinsically interesting artifact of the intervention, itself indicative of an economical approach to reducing aggression in volatile detention situations.*

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In historical perspective, scholarly interest in the psychological significance of color is nothing new. Artists from before the time of da Vinci, philosophers as far back as Aristotle in ancient Greece, the early 19th century German poet Goethe, and countless 20th century psychologists, anthropologists, biologists, etc., have theorized about and investigated the mysteries of human response to and use of color (Birren, 1978; Sharpe, 1978). But the current wave of enthusiasm for research into the applied psychology of color is largely attributable to the controversial hypotheses of Dr. John N. Ott, well-known for his elegant time-lapse photography (Ott, 1958).

Findings such as those indicating that the visual processing of light may affect neurological and endocrine functions (Hague, 1964; Wurtman, 1975; Kerenyi, 1977) have led Ott to believe that physical strength is influenced by electromagnetic properties of visual stimuli. With regard to particular colors, Ott claims that ". . .pink or orange cause greater loss of strength and blue the least" (Ott, 1979, p.9). Until recently, validation of this "kinesoid hypothesis" was based primarily on a dubious procedure in which a subject, staring at a blue or pink

card, tries to hold his arm out straight as a demonstrator attempts to push it downward toward the floor. Experimental studies have now shown small but statistically significant strength advantages associated with visual focusing on a blue as compared with a pink stimulus in two instances (Pellegrini and Schauss, 1980; Pellegrini, Schauss and Birk, 1980), and no significant differences at all in another (Pellegrini, Schauss, Kerr and Ah You, 1981).

So, the empirical status of hypothesized kinesiological effects of color is still very much in doubt. Nonetheless, working from Ott's rationale and observed outcomes of the arm push-down test, Schauss (1979) reasoned that the presumed calming influence of pink room coloration might successfully reduce aggression in criminal custody situations. This suggestion is congruent with the eyes-open meditation practices of Raja Yoga, wherein reddish pink light is used to promote relaxation. But the view that pink induces tranquility is contradicted by a consistently recurrent theme in the literature on the psychology of color—namely, the association of hues at the warm or long end of the visible spectrum (red, orange, pink) with excitation and emotional arousal, and those toward the cool or short end (green, blue, violet) with calm and relaxation (Goldstein, 1942; Alschuler and Hattwick, 1947; Gerard, 1957; Oyama, Tanaka and Chiba, 1962; Wilson, 1966).

Anecdotal reports from detention facilities where the pink room technique has already been tried with apparent success (Schauss, 1979), have generated widespread interest in the "tranquilizing" effects of pink. As with any informal testimonial, however, inferences based on these must be regarded cautiously. In most cases, after all, it was the institutional officials responsible for the decision to try out this highly unconventional idea who made the observations as to its efficacy. Under such circumstances, both the objective results and the subjective judgments by which they were evaluated could have been powerfully affected by administrative ego-involvement, and a priori confidence in the test procedure. Through a confluence of: (a) Hawthorne-type effects (Roethlisberger and Dickson, 1939); (b) ex-

PLICITLY- or implicitly-communicated staff awareness of the expected consequences; and (c) a belief in the method, spurious support for the tranquilizing hypothesis could well have emerged as a kind of self-fulfilling prophecy (Orne, 1966; Rosenthal, 1966, 1969). So, whatever actual decline in aggression did occur, may have derived as much from social-psychological aspects of the intervention as from pink-specific effects on human physiology and emotion.

If the phenomenon is reliable, reduction in aggression through color manipulation could give impetus to development of important general principles applicable in the engineering of human environments. As things stand, however, controlled inquiry into the effects of environmental color on behavior has hardly begun. And the available data do not provide a credible basis for unqualified, situation-specific recommendations for the use of pink, or any other color. The present study was thus designed as a preliminary, objective assessment of the aggression-reducing value of pink in a criminal detention setting.

## METHOD

### Test Situation

As part of a program to minimize the risk of injury to inmates and officers, the Santa Clara County (California) Sheriffs Department decided in 1979 to test the "tranquilizing" effects of pink in the County Jail. The strip search room, a place which is often the scene of aggressive encounters between arrestees and officers, was chosen as the test area. The room is 13'4" x 15'6", lit by four fluorescent fixtures, with bench seats along the walls and safety glass windows all around looking onto adjoining rooms. It is here, as the first step in booking, where it is the arresting officer's job to conduct a thorough search of the naked arrestee, inclusive of body openings in which contraband might be concealed.

Aggressive incidents are common during the "skin search." The arrestee may become verbally abusive toward the officer, inviting a response, or refuse to cooperate, where-

upon it may be necessary to do the search coercively. Jail personnel typically come to assist the arresting officer when the arrestee resists physically, takes a threateningly combative stance, or becomes actively assaultive. Departmental policy demands that inmates be subdued in such altercations by the least forcible means required.

### **Evaluation Procedure**

On September 1, 1979, the paint in this strip search room (SSR) was changed from a pale blue to a moderately bright, hot pink. Incident report records were then compared for the 12 months prior to and following the color change. A 24-month time frame was adopted to allow for a balancing out of transient conditions (e.g., weather, season of the year) which might systematically affect the variables of interest.

Reports filed by arresting officers or Detention Division Deputies were tallied as data entries only if they involved some kind of physically combative encounter. An aggressive incident was thus defined operationally by the following behavioral criteria:

- (a) the use of any sort of physical restraint (e.g., wrist lock, arm bar, carotid hold) by the arresting officer(s) or Sheriffs Deputies;
- (b) taking the arrestee to a safety cell; and/or
- (c) conduct of the strip search by physical force.

Incident frequency was measured in three ways: (1) absolute number occurring in the SSR; (2) percentage of jail incidents occurring in the SSR; and (3) percentage of total bookings in which SSR incidents occur. The latter two indices were used to reference aggression in the SSR relative to prevailing "baseline" characteristics of the facility in which it is located.

## **RESULTS**

### **Absolute Number of Incidents**

As shown in Table and Figure 1, absolute number of SSR incidents did decline for the first pink month (September, 1979) as compared with the two months prior to the color change, and was lower for the first seven

months of the test period (September, 1979 to March, 1980) than for the corresponding months of the previous year. For all of the last five pink months (April to August, 1980), however, incident rate was consistently higher than for the same months of the previous year. In fact, for the last month (August, 1980), the number of incidents was higher than for any other month before or after the color change. The trends for the first seven and last five months just about cancelled each other out, so that overall, there were only nine fewer incidents for the twelve pink months than for the preceding twelve blue months.

But these absolute values are of limited utility for the purposes of this study, since they do not take into account characteristics of the whole facility which are likely to be correlated with the frequency of such incidents. Thus, it is noteworthy that there were 1537 more men booked and processed through the SSR for the 1978-79 (N=23,861) than for the 1979-80 (N=22,324) period. Both measures discussed below are oriented to such relevant demographics.

### **Comparison To Facility As A Whole**

As stated above, the SSR is one of the "hot spots" in the jail. So, it is of interest to know whether its relative "hotness" in the institution might have been altered by the color change. These data are given in Table and Figure 2, which summarize the monthly percentage of incidents in the jail comprised by those occurring in the SSR.

As indicated, during the first pink month (September, 1979), the relative frequency of SSR incidents **was** lower than for the previous twelve blue months. But thereafter, this figure increased steadily for the next three months, until by December, 1979, it was higher than for any of the twelve months prior to the paint change. There was then a decrease for the next three months, to a level in March, 1980 that was the low point in the two-year span. Subsequently, in a pattern consistent with that obtained on the "absolute number" index, there was a sharp and steady increase throughout the last five months, with levels reached in the last four months that were the highest recorded.

Overall, the average relative frequency of SSR incidents on this measure increased by 3.57 percent for the year the room was painted pink (M=25.10 percent), as compared with the previous year (M=21.53 percent). Monthly variability also increased from SD=3.76 percent for the preceding year to SD=7.05 percent for the pink year. The latter statistic reflects an 87.5 percent increase in month-to-month variability.

**Incidents Relative To Number Of Bookings**

In that it is referenced in terms of an objective, quantitative baseline directly relevant to the criterion behaviors, percentage of total bookings where SSR incidents occurred provides our clearest indicator of color change effects. As shown in Table and Figure 3, this measure yielded a now familiar pattern. For the first pink month (September, 1979), percentage of SSR altercations was lower than for any of the previous twelve blue months. This value then increased for each of the succeeding three months, at the end of which (December, 1979)

it was higher than for any month of the preceding year, declined sharply for each of the next three months, and by March, 1980, was at its low point. In the very next month, it reached the high point for any of these 24 months, dropped again in May and June of 1980, and continued thereafter to rise toward another peak in July and August, 1980, the last two months of the test period.

Overall, the average annual percentage of total bookings in which SSR incidents occurred was virtually identical for the pre-and post-pink years, with only a very slight (.02 percent) increase for the pink test period over the previous twelve months (M=.99 for 1978-79; M=1.01 for 1979-80). Throughout the entire 24 months then, there was an average of about one SSR incident in every 100 bookings, regardless of the room color. Much like what was found for frequency relative to the facility as a whole, month-to-month variability in this booking measure for the year following the color change (SP=.38 percent) was double that of the previous year (SD=.19 percent).

TABLE 1

ABSOLUTE NUMBER OF STRIP SEARCH ROOM INCIDENTS BEFORE (1978-79) AND AFTER (1979-80) COLOR CHANGE

	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	TOTAL
1978-79	27	21	25	28	25	15	18	17	16	10	16	19	237
1979-80	10	11	15	26	19	12	8	28	22	20	25	32	228

TABLE 2

PERCENTAGE OF JAIL INCIDENTS OCCURRING IN STRIP SEARCH ROOM BEFORE (1978 79) AND AFTER (1979-80) COLOR CHANGE

	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY
1978-79	24.55	21.21	26.32	20.90	25.51	21.43	27.27	21.79	17.20	16.67	16.49
1979-80	26.32	29.21	27.14	19.35	12.12	28.00	28.95	32.26	33.33	15.55	18.33

TABLE 3

PERCENTAGE OF BOOKINGS RESULTING IN STRIP SEARCH ROOM INCIDENTS BEFORE (1978-79) AND AFTER (1979-80) COLOR CHANGE

	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY
1978-79	1.11	.84	1.02	1.24	1.36	.89	.91	.99	.91	.65	.91
1979-80	.59	.66	.90	1.48	1.04	.71	.42	1.56	1.03	.98	1.26

Figure 1

Absolute Number of Strip Search Room Incidents

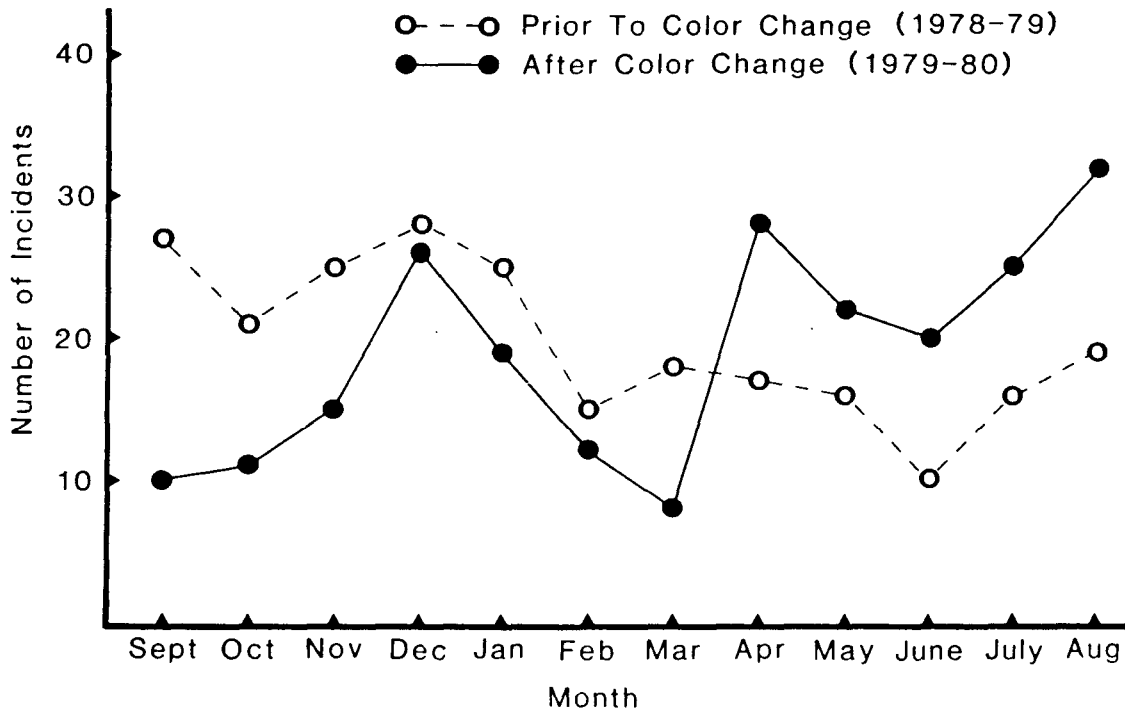


Figure 2

Percentage of Jail Incidents Occuring in Strip Search Room

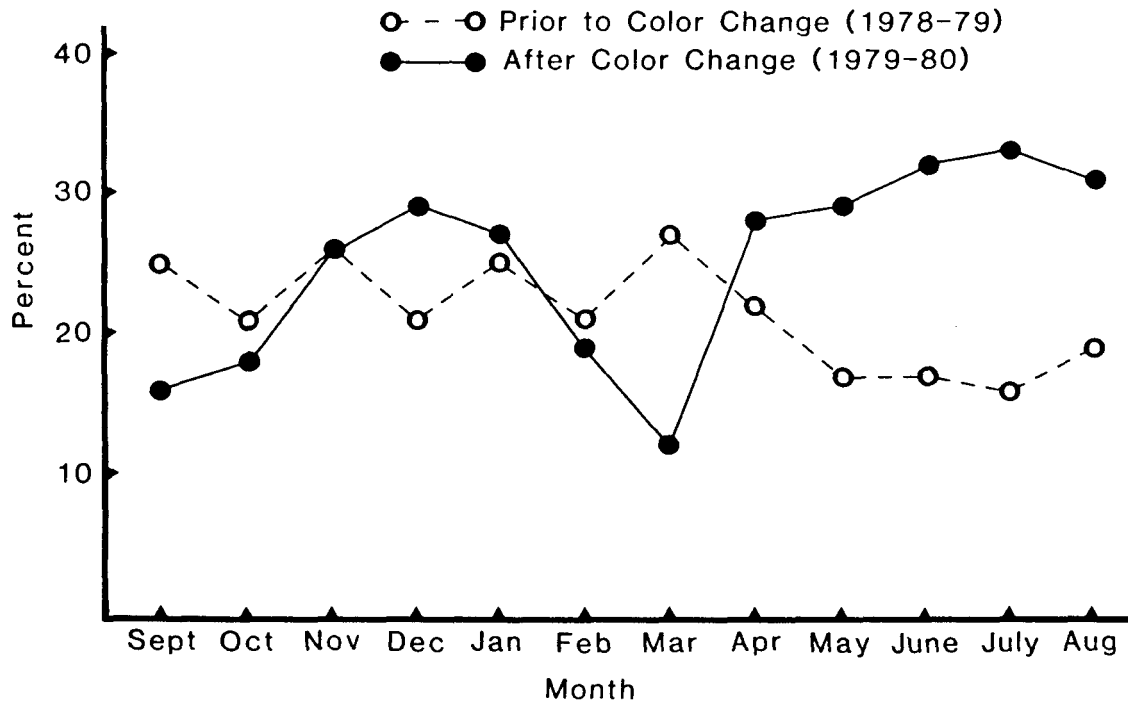
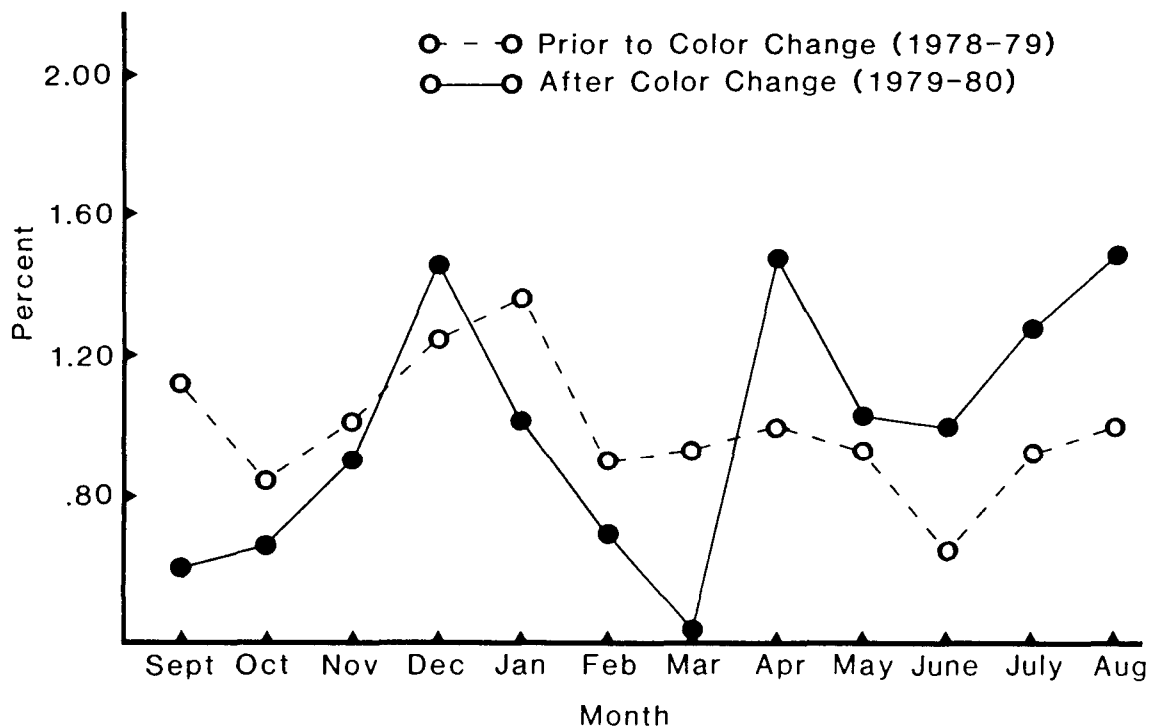


Figure 3

Percentage of Bookings Resulting in Strip Search Room Incidents



## DISCUSSION

### Overview

The descriptive statistical data from all three measures employed thus showed a decline in incidents for the first month the test room was painted pink. Thereafter, the rate increased steadily over the next three or four months, declined for about four months, then increased sharply, reaching peak levels during the last four months. No overall aggression-reduction attributable to pink was indicated. In fact, the average relative frequency of incidents increased slightly, and their month-to-month variability was markedly greater, for the twelve post-as compared with the twelve pre-pink months.

In short, if there is a tranquilizing effect of pink on aggression, it was certainly not revealed here. For if even the initial drop were due to psychophysiological mechanisms as assumed by the kinesoid hypothesis (Ott, 1979; Schauss, 1979), why then the subsequent increase, decrease, and eventual rise to peak levels? Over the two years of this

evaluation, there were no alterations in the physical or psychosocial structure of the SSR, nor is there reason to believe there were any changes in the physiology of its human population. Given the foregoing considerations, the trends obtained are most plausibly and parsimoniously interpreted as reflecting artifacts of the color test intervention. There is no evidence that these outcomes were mediated by other than unintentional, social psychological processes such as those described in the introductory section of this paper.

### Psychodynamics of Incident Rate

Indeed, just the novelty of the color change may have generated a Hawthorne-type effect which, reinforced by expectations as to efficacy of the procedure, made the initial decline in aggressive incidents something of a self-fulfilling prophecy. As the novelty of the intervention (and probably the brightness of the paint as well)

began to wear off, and arresting officers and jail staff adapted to the "whacky" color, so too did the transitory incident-reduction wash-out.

One of the most puzzling findings is the recovery phase following the initial decline, where frequency levels surpassed all those for the preceding year. It is almost as if there were a compensatory period that made up for incidents missed! The provocative possibility thus arises that an "equilibrical level" of aggressive encounter frequency may evolve in such situations, and is then somehow maintained as a long-term norm from which there are short-term deviations. This problem is one we will address directly in a report of inquiry now in progress.

Whatever the reason for this first "recovery phase," the drop in incidents which followed it was probably due to a flurry of media coverage of the "pink room experiment" which coincided with the decrease through January, February, and March, 1980. It is not unlikely that publicity re-aroused the kind of dispositional sets which produced the low incident rate in the first month of the pink test period. Arresting officers and jail staff could well have been sensitized, consciously or unconsciously, to their role in an "important experiment" or the field test of a "new and proven scientific discovery," by seemingly ubiquitous and often wildly overstated press reports.

The second recovery, manifested in the strong upswing at the end of the pink test period, probably corresponded to another decrement in saliency of the color change intervention, and a re-adaptation to the pink room as part of the routine, business-as-usual environment of the facility. Whether the final increase was accelerated by an equilibrical rebound effect like the one described above, is difficult to say. But it is clear that all of this fluctuation made for considerably greater month-to-month instability in incident rate for the pink than for the previous (blue) year.

### **Inferential Restrictions And Issues**

These results failed to confirm hypothesized relationships between environmental pink and aggression. But they do not provide

definitive answers, for a number of reasons. To begin with, strictly speaking, inferences from this study are restricted to incident frequency. Quite different patterns might be found with measures of intensity or severity of violent behaviors.

Maybe more importantly, no attention was given here to individual differences in response to the test conditions. Did the "shock value" of the unusual color, for example, help to subdue rage reactions in people who would otherwise have acted them out? Does emotional state interact with environmental color in some way, so that tran-quilizing occurs only for those who are most (or only moderately) aroused? Still other questions left unanswered by this exploratory work, concern the effects of media coverage of the "pink room" on arrestees, at least some of whom must have seen or heard stories about it. Knowing its purpose would almost surely evoke different responses depending upon personality style. For those predisposed toward acquiescence, compliance with purported aggression-reduction would probably be facilitated. For those more strongly inclined toward autonomy, negativity, or reacting against authority, antagonistically aggressive responses would be more likely. In the latter case, acting out could serve as an assertion of independence and invulnerability to manipulation, and/or to invalidate the scientific wisdom of the idea and the administrative judgment whereby it was implemented. Individual differences in suggestibility, too, might affect response to prior knowledge of why the room was painted pink. Insofar as the color is believed to exert its influence inexorably, as if by a magically hypnotic spell against which there is no defense, relative docility would be expected.

Follow-up research is also needed to elucidate the role of situational factors such as physical characteristics (e.g., size, shape, lighting) and psychological atmosphere (furnishings, etc.) of the test setting, degree of malillumination, and amount of time spent within it by those whose behavior is assessed as the criterion measure. This is of critical importance since several other recent studies have not reported variations

in rates of aggression over time when utilizing smaller holding cells (i.e. 5' by 8', 5' by 5', etc.) painted Baker-Miller pink (Snyder, 1981; McDonald, 1982). Furthermore, only the hue dimension of the stimulus variable was considered, while brightness and saturation apparently influence whatever affective value accrues to colors (Guilford, 1934). These and related matters merit investigation in their own right.

### Artifact And Application

Finally, it should be noted that even if the color change effect was artifactual, it could still be an intrinsically meaningful finding. Serendipitously, we may have stumbled onto the fact that a fresh coat of paint, perhaps **any** fresh coat of paint, even a "crazy" color like hot pink, helps to minimize violent behaviors in volatile criminal detention settings. It is possible that the new paint elicits in inmates and officers alike, perceptions of the whole facility as one where administrators and staff really do care about the human ecology of the jail, and thus, the people who are detained and work in it. The more positively-valenced attitudes so induced might attenuate at least some altercations which develop out of escalating, reciprocally abrasive responses of officers and inmates to each other, thereby substantially reducing aggression in emotionally-charged circumstances like the strip search.

This ad hoc reasoning suggests that the decline in aggressive encounters following the paint change occurred in spite of the outlandish pink color, and not because of it. If, however, environmental modifications like that implied in the "fresh paint hypothesis" could effectively prevent even one percent of the dozens of incidents which erupt daily in situations similar to the one tested in the present study, an accessible and cost-efficient contribution to humane detention management would have been affirmed here after all. But the reliability and validity of such methods remain to be established through further research.

### References

ALSCHULER, R. and HATTWICK, L.: *Painting and Personality*. University of Chicago Press, Chicago, 1947.

BIRREN, F.: *Color and Human Response*. Van Nostrand, Reinhold,

New York, 1978.

GERARD, R.: *The Differential Effects of Colored Lights on Physiological Functions*. Unpublished Doctoral Dissertation. University of California at Los Angeles, 1957.

GOLDSTEIN, K.: *Some Experimental Observations: The Influence of Colors on the Functions of the Organism*. *Occupational Therapy* 2, 147-151, 1942.

GUILFORD, J.P.: *The Affective Value of Color as a Function of Hue, Tint and Chroma*. *Journal of Experimental Psychology* 17, 342-370, 1934.

HAGUE, E.B. (Ed.): *Photo-neuro-endocrine Effects in Circadian Systems, with Particular Reference to the Eye*. *Annals of the New York Academy of Sciences* 117, 1-645, 1964.

KERENYI, N.A.: *The Pineal Gland: What is its True Importance?* *Modern Medicine*, 81-84, 1977.

MCDONALD, J.R.: *The Pink Room: a Color and Aggression Study in a Correctional Environment*. *Journal of Behavioral Ecology*, in press.

ORNE, M.T.: *On the Social Psychology of the Psychological Experiment: With Particular Reference to the Demand Characteristics and their Implications*. In: C.W. Backman and P.F. Secord (Eds.), *Problems in Social Psychology: Selected Readings*, McGraw-Hill, New York, pp. 14-21, 1966.

OTT, J.N.: *My Ivory Cellar*. Twentieth Century Press, Chicago, 1958.

OTT, J.N.: *The Dual Function of the Eyes*. *The Southern Journal of Optometry* 21, 8-13, 1979.

OYAMA, T., TANAKA, Y., and CHIBA, Y.: *Affective Dimensions of Color: A cross-cultural Study*. *Japanese Psychological Research* 4, 78-91, 1962.

PELLEGRINI, R.J. and SCHAUSS, A.G.: *Muscle Strength as a Function of Exposure to Hue Differences in Visual Stimuli: An Experimental Test of the Kinesoid Hypothesis*. *Journal of Orthomolecular Psychiatry* 9, 144-147, 1980.

PELLEGRINI, R.J., SCHAUSS, A.G. and BIRK, T.J.: *Leg Strength as a Function of Exposure to Visual Stimuli of Different Hues*. *Bulletin of the Psychonomic Society* 16, 111-112, 1980.

PELLEGRINI, R.J., SCHAUSS, A.G., KERR, T.J. and AH YOU, B.K.: *Grip Strength and Exposure to Hue Differences in Visual Stimuli: Is Postural Status a Factor?* *Bulletin of the Psychonomic Society* 17, 27-28, 1981.

ROETHLISBERGER, S.J. and DICKSON, W.J.: *Management and the Worker*, Harvard University Press, Cambridge, Ma., 1939.

ROSENTHAL, R.: *Experimenter Effects in Behavioral Research*. Appleton-Century-Crofts, New York, 1966.

ROSENTHAL, R.: *Interpersonal Expectations: Effects of the Experimenter's Hypothesis*. In: R. Rosenthal and R.L. Rosnow (Eds.), *Artifact in Behavioral Research*, Academic Press, New York, pp. 181-277, 1969.

SCHAUSS, A.G.: *Tranquilizing Effect of Color Reduces Aggressive Behavior and Potential Violence*. *Journal of Orthomolecular Psychiatry* 8, 218-220, 1979.

SHARPE, D.T.: *The Psychology of Color and Design*. Nelson-Hall, Chicago, 1978.

SNYDER, M.: *A Nursing Study on the Effect of Environmental Color on Behavior*. *Journal of Behavioral Ecology* 2, 5-6, pp. 1-8, 1981.

WILSON, G.D.: *Arousal Properties of Red Versus Green. Perceptual and Motor Skills* 23, 947-949, 1966.

WURTMAN, R.J.: *The Effects of Light on the Human Body*. *Scientific American* 233, 68-77, 1975.