to perturbations of its environment. Current evidence suggests that the release of corticotropin-releasing factor (CRF) within the brain may permit the coordination of a whole body response in stress, thus reinforcing Selye's global stress concept. The evidence supporting such a role for CRF is summarized below. CRF administered intracerebroventricularly (ICV) elicits a number of behavioral, physiological, and neurochemical responses characteristic of stress. Behavioral effects include effects on locomotor activity, increased grooming, decreased feeding and sexual activity, decreased exploratory behavior and social interaction, an increased acoustic startle response and shock-induced fighting, and "anxiogenic" actions in conflict tests, and in the elevated +-maze. ICV CRF activates the sympathetic nervous system and the adrenal medulla, and has several effects on gastrointestinal function. Endocrine factors affected include an increase in ACTH secretion, and decreases in LHRH and growth hormone secretion. There is increased firing of noradrenergic neurons in the locus coeruleus, and increased production of the metabolites of norepinephrine (NE) and dopamine, suggesting increased release of these catecholamines. Where tested, these effects are independent of the pituitary, and hence ACTH or glucocorticoid secretion. Each of these effects could indicate merely that ICV administration of CRF is stressful. However, intracerebral administration of a CRF antagonist, α-helical CRF_{9-41} (ahCRF) has been reported to reverse or attenuate the effects of various stressors on LHRH secretion, plasma NE, feeding, exploratory behavior, and aggression. These observations may provide an explanation for the rather widespread distribution throughout the brain of CRF-like immunoreactivity, bioactivity, and CRF-binding sites. The demonstration that CRF can be released from excised brain regions by stimulation with high K^+ in a Ca^{2+}-dependent manner suggests that CRF may act as a neurotransmitter in the brain. Changes in the cerebral concentration of CRF in various brain regions during stress reinforce this idea. The above discussed results support the hypothesis that release of brain CRF may be both necessary and sufficient to characterize stress.

POSTER SESSION

Biological Bases of Behavior

THE CONTRIBUTION OF SUBJECT EXPECTATION ON ANALGESIC EFFICACY FOR CLINICAL AND EXPERIMENTAL PAIN.

Manon Houle, S. Kogon, P. A. McGrath and G. Moran. University of Western Ontario, London, Canada.

The study aims to quantify the contribution of expectation for pain relief on analgesic effectiveness for both experimental and clinical pain. One hundred patients scheduled for extraction of impacted third molars used visual analogue scales to rate the intensity and the unpleasantness of experimental pain (thermal stimuli 45–51°C) before and after double-blind administration of Tylenol 3 or placebo. Subjects were divided into four groups of a balanced placebo design in which the traditional placebo design—expect analgesic/receive placebo and expect analgesic/receive analgesic is complemented with two groups—expect placebo/receive analgesic and expect placebo/receive placebo. These expectancy manipulations allow for the determination of what portion of the overall experimental pain reduction (both intensity and unpleasantness) is due to the independent effects of the expectation of receiving an analgesic and what portion is due to the pharmacological effect of the analgesic. Subjects also used visual analogue scales to rate the intensity and unpleasantness of postsurgical dental pain both before and after treatment administration. Although all subjects received the analgesic for postsurgical pain, expectancy was manipulated by telling subjects that they received the same drug as they had received during the experimental session. It is expected that subjects' expectancy will be a major determinant of subjects' analgesic responses to placebo and significantly modulate subjects' ratings of the efficacy of the analgesic.

SENSORIMOTOR REPLACEMENT AS A STRATEGY FOR SMOKING CESSATION.

Jed E. Rose, F. Behm, C. Schur, N. Comfort, E. D. Levin and D. P. Tashkin. University of California, Los Angeles, CA.

In a three-week smoking cessation program, we tested an inhaler that delivered an aerosol containing citric acid and smoke flavor. The goal was to simulate the taste and tracheobronchial sensations produced by cigarette smoke. The active inhaler was compared with a placebo inhaler in a randomized double-blind design. Relative to placebo, this treatment significantly reduced smoking and self-reported craving for cigarettes in subjects with baseline CO values higher than the mean. These results suggest that sensorimotor replacement, alone or in combination with nicotine replacement treatments, may be useful as a smoking reduction or cessation aid.

SMOKELESS TOBACCO DEPRIVATION, NICOTINE AND PERFORMANCE.

Dorothy K. Hatsukami, Robert M. Keenan and Deborah J. Anton. University of Minnesota, Minneapolis, MN.

The purposes of this study were to 1) examine the effects of smokeless tobacco deprivation on performance, and 2) determine the effects of nicotine gum dose on performance during deprivation. Male Copenhagen smokeless tobacco users underwent 3 days of baseline measurement while continuing to use smokeless tobacco ad lib. They were then randomly assigned to one of five groups for the next five days: 1) continuous smokeless tobacco users; 2) discontinuous users; 3) 0 mg nicotine gum; 4) 2 mg nicotine gum; or 5) 4 mg nicotine gum. All groups except the continuous smokeless tobacco users were asked to quit using smokeless tobacco during this experimental period. The results were as follows: 1) There were significant increases in reaction time and variability of reaction time (S.D.) during the experimental period among the discontinuous users when compared to the continuous users group. 2) There were no nicotine gum dose-related effects on reaction time performance after smokeless tobacco deprivation. 3) There were significant increases in reaction time and variability of reaction time (S.D.) among the discontinuous users when compared to the placebo group. Those findings replicate previously published results regarding the effects of smokeless tobacco deprivation on performance. They also indicate that among smokeless tobacco users, there is a significant placebo effect which masks the effects of nicotine gum.

EFFECTS OF SMOKING AND SMOKING ABSTINENCE ON FINE MOTOR PERFORMANCE.

Michael J. Klitzke, Thomas W. Lombardo and Stephen C. Fowler. University of Mississippi, University, MS.

Data regarding the effect of smoking and abstinence from smoking on fine-motor task performance are rarely encountered in the literature. However, precise spatio-temporal force regulation is important for professionals such as pilots and surgeons. In a laboratory setting, the performance of nonsmokers, abstinent