Bennett, J. M., Whetzel, C. A., Ritter, F. E., Reifers, A., & Klein, L. C. (2006 March). Effects of caffeine and stress on cortisol and serial subtraction performance in young healthy men. *Psychosomatic Medicine 68*(1). A-62. [abstract of poster presented at the annual meeting of the American Psychosomatic Society, Denver, CO.]



# EFFECTS OF CAFFEINE AND STRESS ON SALIVARY CORTISOL AND SERIAL SUBTRACTION PERFORMANCE IN YOUNG MEN

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Stress appears to degrade cognitive performance, perhaps through its effects on increased cortisol production. The effects of stress and caffeine on cognitive performance and cortisol production were examined in 45 healthy men aged 18-30 years (21.2 +/- 0.4 yrs). Subjects were daily caffeine consumers, were not using tobacco or nicotine products, were not taking over-the-counter or prescription medications, and did not have health conditions that would affect the dependent measures. Subjects arrived at the lab at 1 PM where they were administered one of three doses of caffeine: none (placebo), 200 mg caffeine (LOW; equivalent to 1-2, 8oz cups of coffee), or 400 mg caffeine (MOD; equivalent to 3-4, 8oz cups of coffee). Subjects then were asked to complete the mental arithmetic portion of the Trier Social Stress Task for 20 minutes, which included 4, 4-min blocks of counting backwards by 7's and 13's from 4-digit starting numbers. Saliva samples were collected during baseline (before caffeine and stress) and 15 mins after stress to determine cortisol responses to the challenge. Cognitive performance was determined by calculating accuracy and speed scores. Caffeine increased cortisol levels in a dose-dependent manner ($P<0.05$). The effects of caffeine on task performance differed by caffeine group. Higher cortisol levels were associated with increased error rates among the placebo and MOD caffeine group ($Ps<0.05$). However, cortisol levels among men administered a LOW dose of caffeine were not associated with error rates but were associated with the speed at which the task was performed ($P<0.05$). Specifically, task speed decreased as cortisol levels increased. These results suggest that low amounts of caffeine may improve concentration and protect men from the negative effects of stress on task performance.

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