

Stress-Activated Hormonal Systems and the Regulation of Memory Storage^a

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There is little doubt that all experiences are not equally well remembered. Most of our experiences are uneventful events that are generally quickly forgotten or, at best, poorly remembered. Extensive evidence indicates that experiences that are emotionally arousing tend to be well remembered. The strength of memories of events reflects the significance of the event. Although it might be argued that enhanced remembrance of emotionally arousing events results simply from increased attention to these situations or from subsequent thinking about or rehearsing the experiences, considerable evidence supports the hypothesis that emotional responses influence memory, at least in part, by modulating long-term memory storage.

Research in our laboratory has focused on the hormonal and brain systems that mediate the effects of emotional arousal on memory storage. This chapter reviews the findings of our experiments using laboratory animals to investigate the effects of stress-released hormones on memory storage. Our findings suggest that stress hormones influence memory storage by activating the amygdala, a brain system known to be involved in emotionally based memory (Davis, this volume; LeDoux, this volume). Furthermore, our findings suggest that the amygdala modulates memory storage in other brain regions. The findings have implications for understanding the role of emotional arousal, stress hormones, and brain systems in normal-human memory as well as pathological memory in patients with posttraumatic stress disorder (PTSD) (Cahill, this volume).¹

MODULATION OF MEMORY STORAGE

It is well established that recently acquired information is susceptible to modulating influences for a period of time after learning. The hypothesis that memory traces

^aThis research was supported by an R. W. and L. Gerard Trust Fellowship (B.R.), a DGAPA-UNAM grant (G.L.Q.), and NIMH/NIDA research grant MH12526 (J.L.M.).