

Research Seminar: Psychobiology of Anxiety and its Disorders

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Topic: Anxiety represents one of the most frequent psychopathological conditions why people seek help with psychiatrists and psychotherapists. Although research in psychology and psychiatry has generated a broad range of theories on its cognitive, affective, behavioral, and social concomitants, we still know only little about the major brain structures, biochemical processes and genetics involved in the generation and maintenance of anxiety and its different disorders. Among the cognitive peculiarities of anxious subjects, clinical observation and systematic experimental research have emphasized that anxious and threatening stimuli of personal concern are processed significantly faster by anxious subjects than any other type of stimuli. Furthermore, threatening stimuli seem to preattentively capture subjects' attention (attentional bias) and narrow subjects' attention to focal facets of the threatening situation (tunnel memory). On the subjective level bad feelings, ruminating and irrational thoughts emerge. When anxious subjects are asked to report about details of previous threat most of them seem to overestimate the frequency, amount, and intensity of previous threat and sometimes start to experience vivid negative flashbacks while memorizing. On the behavioral level anxious subjects show an increase of flight or fight responses (startle reflex, withdrawal or escape responses, fight responses) and at the autonomous level they become hyperaroused as expressed by an increase of cardiovascular responses, hormonal activity (stress hormones) and a suppression of immunological processes.

Method: During the first few meetings we will summarize and critically discuss the current literature and the most important experimental paradigms by which different research groups have addressed these cognitive, affective, behavioral, and social concomitants of the anxiety response. Course participants will be requested to present short oral PowerPoint presentations and written summaries on these issues and its neurophysiological basis. Then participants will be offered participation in a series of ongoing experimental studies at the Department on behavioral, brain electrical and neural aspects of this processing priority of threat in anxious subjects (subjects with high but pre-clinical trait anxiety scores, subjects with clinical spider phobia, blood phobia, social phobia, subjects with post traumatic stress disorder). Experimental methods will include controlled application of verbal or visual threatening stimuli, clinical interviews, questionnaires, and behavioral measures of anxiety, hormonal measures and dense array electroencephalography, event-related potentials, eye-movement recording, pupillometry, recording of the startle response and muscle activity of facial expressions, recording of electrodermal and cardiovascular responses in response to experimental stimuli. Additionally, we will also apply event-related or block-mode based functional magnetic resonance imaging techniques (fMRI). While course participants will share the whole group of the course during the initial theoretical part of the course participants will be split up into small groups of 2-3 students during active participation in ongoing studies. Active participation will include collaboration with senior researchers in the planning, conduction, analysis, and publication of single studies.

Target Group: Advanced BA students and students in a doctoral program. The course will include students from PennState and the FSU. Course language will be English. Participants should have some experience in experimental methods and some basic knowledge on the psychology of emotion, memory, and attention.

Main references

Dalgleish, T., Power, M. (eds) (1999). Handbook of Cognition and Emotion. New York: John Wiley & Sons.

Davidson, R. J., Scherer, Klaus, R., Goldsmith, H. H. (eds.) (2003). Handbook of Affective Sciences. Oxford: Oxford University Press.

Lewis, M., Haviland-Jones, J. M. (eds) (2004). Handbook of Emotions (2 nd edition). New York: Guilford Press.

Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1997). Cognitive psychology and emotional disorders (2nd ed.). Chichester: Wiley.

Grading: Active participation during theoretical work, 60 hours of presence in labs during experimental periods, one PowerPoint presentation and one written summary of presentation, at the end of course one oral test of 30 min. duration.