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ABSTRACT

The objective of this thesis was to apply an interactive sex-differentiated psychobiological vulnerability model in studying patterns of relationships within and between different types of psychological and biological indicators for vulnerability to psychosocial disturbances.

Studies in part I (papers I-IV) are partly prospective, based on data from a representative sample of male and female subjects collected within the framework of a developmental project 'Individual Development and Adjustment' at the age of 13 and age 27. Relationships were studied between teacher ratings of hyperactive, aggressive, and timid (shy) childhood behavior and adult personality factors (from the Karolinska Scales of Personality inventory, paper I), assumed to differentially reflect vulnerability to "externalizing" and "internalizing" psychosocial disturbances. In males, hyperactive behavior at age 13 was highly predictive of adult impulsivity (paper III) and of high scores in a psychopathy-related factor (paper II); childhood timidity was associated with two adult anxiety factors. There was a paucity of relationships between childhood behaviors and adult personality in the female group; however, motor restlessness was predictive of adult impulsivity (extended analyses, paper III) and of high scores in an extraversion factor (paper II). Females may have a later onset of problem behaviors or may be more susceptible to life changes, thus attenuating these relationships. Hyperactive behavior in boys at age 13 was strongly associated with low urinary adrenaline excretion in a stressful situation (paper IV), suggesting a low sympathetic-adrenal reactivity to situational demands, a possible risk factor; the association between hyperactive behavior and low adrenaline excretion persisted when aggressiveness was controlled. Configural frequency analysis confirmed the strong relationship between low adrenaline excretion and hyperactive behavior.

Studies in part II (papers V-VII) are based on data for male and female high-school students. A neurochemical marker for psychosocial vulnerability, monoamine oxidase (MAO) activity, was measured in platelets. Low MAO activity was associated with high extraversion-impulsivity personality scale scores in both male and female subjects (paper V), not only in males as in most earlier studies. Computerized neuropsychological tasks, reaction time (RT) and perceptual maze (PMT) tests, were applied (papers VI and VII). The aim was to link the MAO measures to RT and PMT indices of strategy, cerebral lateral organization, and hemispheric activation, which might contribute to the understanding of neuropsychological processes underlying the consistent MAO relationships with personality and sex. In the male group, low and high MAO activity was related to indices of motor "disinhibition". In both male and female subjects low MAO activity was associated with the use of an impulsive-global strategy on the PMT and good spatial skill (paper VII). Among sex differences obtained in the RT and PMT tasks (paper VI) were a female tendency toward left-hemisphere activation, regardless of task characteristics, and a male tendency to apply an impulsive-global "right-hemisphere" approach to the tasks and proficiency in spatial skill.

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