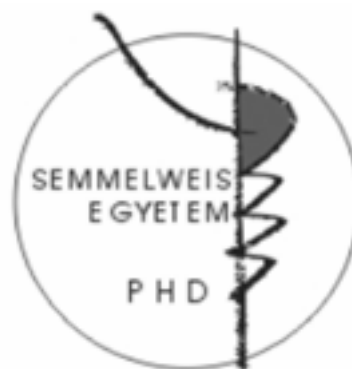# Investigation of personality traits, symptom dimensions, parental maltreatment and identification of latent vulnerability dimensions in different mental disorders

Summary of thesis

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I. INTRODUCTION

The basis of my approach lays in the fact that there is a great comorbidity among the illness categories described in current diagnostic systems (BNO, DSM), as well as there is a large overlap in the vulnerability factors of several illnesses (i.e.: genetic, neurobiological, childhood socialization). This fact -- supported by a large body of scientific evidence – suggests a mutual latent vulnerability dimension behind the high comorbidity of diagnostic categories. My thesis is focused on a study, in which vulnerability dimensions of psychiatric illnesses showing great comorbidity (depression, anxiety disorder, bulimia, alcohol dependence, borderline, and mixed personality disorder) are examined.

Extreme temperament traits, perceived parental maltreatment, early maladaptive cognitive schema are important vulnerability factors according to many studies. It is important to clarify which vulnerability factors are specific to single disorders and which are general factors, characteristic of most disorders.

Because of the large degree of comorbidity for a more exact description of psychopathological phenomena, there is a need for a structured clinical interview, which is able to measure more than one symptom dimensions.

In my thesis, I try to identify the latent symptom dimensions and vulnerability factors underlying various manifest psychopathological symptoms and diagnostic categories in normal and psychiatric population.

II. OBJECTIVES

In my thesis, I describe two independent studies. In the first, I examine the relationship between vulnerability dimensions and symptom dimensions on various illness groups and normal control group. In the second study, we examine the psychometric characteristic using the Current psychiatric State Interview (CPS-50) in the various patient groups.

I. Study of latent vulnerability dimensions.

1. First objective: to examine the mean differences among normal, depressive, anxiety, bulimic and borderline samples in their personality traits measured by the Temperament and Character Inventory (TCI). Then we measured each patient group's effect sizes that were adjusted to normal samples on each temperament and character dimension.

2. Second objective: to examine the mean differences among normal, depressive, anxiety, bulimic and borderline samples in childhood parental maltreatment, with regard to the normal group. Then we measured each patient group's effect sizes that were adjusted to normal samples on each subscales of the Young Parenting Inventory.

3. Third objective: to examine the mean differences among normal, depressive, anxiety, bulimic and borderline samples in their early maladaptive schemas. Then we measured each patient group's effect sizes that were adjusted to normal samples on each subscales of the Young Schema Questionnaire.

4. Fourth objective: to examine the mean differences among normal, depressive, anxiety, bulimic and borderline samples in their symptom dimensions measured by SCL-90. Then we measured each patient group's effect sizes that were adjusted to normal samples on each symptom dimension.

5. Fifth objective: To identify independent latent psychopathological dimensions between the set of vulnerability factors (early maladaptive schema, parental maltreatment total scores, temperament traits) and the set of diagnostic groups by canonical factor analysis on the normal, depressive, anxiety, bulimic, alcohol dependent, borderline, and mixed personality disordered groups. Then we examined the mean differences among normal, depressive, anxiety, bulimic and borderline samples in their vulnerability canonical factors. Then we measured depressive, anxiety, bulimic and borderline group's effect sizes that were adjusted to normal samples on each Vulnerability canonical factors.

II. International study of the Current Psychiatric State interview

6. Sixth objective: to study the interrater reliability and factor structure of the Current Psychiatric State interview, CPS-50, which has been developed by our international working-group.

III. METHODS

The participants and methods used in the first "Study of the Latent vulnerability dimensions" and the second "Study of the Current psychiatric State Interview" study are discussed separately. The Semmelweis Egyetem Regional, Institutional, Scientific and Research Ethics Comity approved the study and patient participation.

III. 1. Study samples

III. 1. 1. Description of the subjects participated in the study of Latent vulnerability dimensions: Total number of participants was 744 (565 female, 179 male). Participants were separated into two groups: 1) Normal control group: N = 157 (114 female; 43 male), the mean age was 28.9 years (SD = 11.57). 2) Patient group: patients were admitted to the Department of Psychiatry and Psychotherapy at the Semmelweis University, Faculty of General Medicine: N = 587 (451 female and 136 male), the mean age was 36.88 years (SD = 11.95). The patients were diagnosed by using the Diagnostic and Statistical Manual of Mental Disorders, Fourth

Edition (DSM-IV) criteria. They suffered from depression (395), anxiety disorders (138), bulimic disorders (79), alcohol dependence (50), borderline personality disorders (69), mixed personality disorders (60). Since the age and gender difference between the normal and patient samples reached the statistical significance in the further analyses we used them as covariates.

III. 1. 2. Description of the subjects participated in the International study of the Current Psychiatric State interview. 78 raters participated in this study and they assessed 237 cases: 122 (51%) psychotic disorders, 71(30%) major affective disorders, 29 (12%) anxiety disorders, 5 (2%) eating disorders, 6 (3%) somatization disorders, 4 (2%) other disorders. At the Budapest centre, two psychiatrists made the ratings and they assessed 46 patients.

III. 2. Measures

III. 2. 1. Measures used in the Study of Latent vulnerability dimensions: Temperament and Character Inventory (TCI – 240 item), Young Parenting Inventory (YPI – 72 item), Young Schema Questionnaire (YSQ – 244 item), SCL-90 (90 item).

III. 2. 2. The rating tool used in the International study of the Current Psychiatric State interview. The CPS-50 is a structured clinical interview and it measures 50 psychiatric symptoms.

III. 3. Statistical analysis:

III. 3. 1. Statistical methods used in the Study of Latent vulnerability dimensions: A mean difference among the diagnostic groups (normal, depressive, anxious, bulimic, and borderline) in terms of different variables was investigated by General Linear Model (GLM) analysis. Diagnostic groups was used as independent variable in the GLM model while in the first analysis TCI dimensions, in the second analysis YPI mother scales, in the third YPI father scales, in the forth early maladaptive schemas, in the fifth SCL-90 symptom dimensions, in the sixth Vulnerability canonical variates served as dependent variables and gender and age served as covariate. Relationship between vulnerability factors (early maladaptive schema, parenting experiences and temperaments) and diagnostic groups was analyzed using canonical correlation analysis, gender, and age served as covariate. SAS Software (Version 9.1) was used for the statistical analyses. Effect sizes for each variable and for each patient group from each study were calculated as the mean difference between the patient group's and healthy control's mean divided by the pooled standard deviation and adjusted for small sample bias (Hedges g).

III. 3. 2. Description of the statistic methods used in the International study of the Current Psychiatric State interview: The levels of agreement between each pair of rater were calculated. Categorical agreement (item present or absent) between raters was evaluated with Cohen's kappa; concordance on the severity of symptoms (0-3) was evaluated with the intraclass coefficient (ICC), using a one-way random effect model. A principal components analysis with varimax rotation was used to assess the factorial structure of the 50-items of the CPS-50. Chronbach's alpha was used to evaluate the internal consistency of the scales of symptom modules.

IV. RESULTS

IV. 1. First objective: General linear model (GLM) analysis indicated that diagnostic groups (normal, depression, anxiety disorders, bulimic disorders, borderline personality disorders), significantly ($p<0.5$) differed on temperament and character traits. The GLM results showed that on novelty seeking temperament the diagnostic groups characterized by impulsive symptoms (borderline, bulimic) had a significantly ($p<0.5$) higher mean score than the internalizing diagnostic groups (depression, anxiety disorders). The GLM results showed that on harm avoidance temperament all the diagnostic groups had a significantly ($p<0.5$) higher mean score than the Normal sample. The GLM results showed that on reward dependence temperament the depression and borderline personality group characterized by low positive affectivity had a significantly ($p<0.5$) lower mean score than the anxiety disorders and bulimic group. The GLM results showed that on self-directedness character trait the Normal sample had a significantly ($p<0.5$) higher mean score than the patient groups, and that on the cooperativeness character the borderline and the bulimic groups had a significantly lower scores than the Normal sample.

IV. 2. Second objective: The GLM results showed that on both the paternal and both the maternal maltreatment total score scale all the patient groups had a significantly ($p<0.5$) higher mean score (more severe maltreatment) than the normal sample. On these two parental total score scale the borderline group had a significantly higher mean score than the other three patient groups (depression, bulimic, anxiety disorders). The GLM results showed that on both the paternal and both the maternal maltreatment subscales of the Young Parenting Inventory there were specific significant differences between each diagnostic groups.

IV. 3. Third objective: The GLM results showed that on the entire early maladaptive schema all the diagnostic groups had a significantly ($p<0.5$) higher mean score than the Normal sample. These results are in concordance with the hypothesis of general cognitive vulnerability. The GLM results showed that on most of the early maladaptive schema the

borderline group had a significantly (p<0.5) higher mean score than all the other patient groups. Each patient group had a specific pattern of early maladaptive schema and this is in concordance with the hypothesis of the cognitive schema specificity.

IV. 4. Fourth objective: The SCL-90 was proved a useful tool in differentiating the normal and the patient sample. The GLM results showed that each patient group had significantly different pattern of symptom dimensions. The GLM results showed that on the General Symptom Index the borderline group had a significantly (p<0.5) higher mean score than all the other patient groups.

IV. 5. Fifth objective: The findings of the canonical factor analysis showed that there were three canonical variate (factor) pairs of vulnerability factors and diagnostic groups, which displayed a significant association (Table 1.). The degree of relationship between the set of vulnerability factors (temperament traits, parental maltreatment and early maladaptive schema) and the set of diagnostic groups (normal, depressive, anxious, bulimic, alcohol dependent, borderline and mixed personality disorders) was measured by Wilk's lambda statistics and it was significant (F=2,98, df=175,3631, p<0,01).

Table 1. Correlations between pairs of canonical factors

	Canonical correlation coefficient	F-Value	df	p
V1-D1	0.59	2.98	175.3631	<0.00
V2-D2	0.41	1.87	144.3140	<0.00
V3-D3	0.30	1.42	115.2640	<0.00

Abbreviations: V, Vulnerability; D, diagnostic groups.

General linear model (GLM) analysis indicated that diagnostic groups (normal, depression, anxiety disorders, bulimic disorders, borderline personality disorders), differed on each Vulnerability canonical factors. The first canonical factor of the Vulnerability (V1) factors, characterized by high positive loadings of all the early maladaptive schema, the total score of paternal and maternal maltreatment, the temperament of harm avoidance. Specifically, the GLM results showed that on the first Vulnerability canonical factor (V1) all four patient group had a significantly (p<0.5) higher mean score than the normal sample. The increasing grade of the effect sizes (ES) adjusted to Normal sample of the patients groups are the followings: bulimic disorders (ES: 0.83), anxiety disorders (ES: 1.41), depression (ES: 1.5) and borderline personality disorders (ES: 2.3). The second canonical factor of the Vulnerability (V2) factors, characterized by the negatively loading Vulnerability to harm schema and harm avoidance temperament and the positively loading Defectiveness/Shame, Punitiveness, Insufficient Self-Control schema and novelty seeking temperament. The GLM

results showed that on the second Vulnerability canonical factor (V2) the bulimic (ES: 0.74) and the borderline (ES: 1.18) group had a significantly (p<0.5) higher mean score than the normal sample, the anxiety disorders (ES:-0.29) and the depression (ES: 0.14) group. The third canonical factor of the Vulnerability (V3) factors, characterized by the positively loading Self-Sacrifice schema, novelty seeking and reward dependence temperaments and the negatively loading Emotional Deprivation, Social Isolation/Alienation, Social Undesiredness, Failure schema and harm avoidance temperament. The GLM results showed that on the third Vulnerability canonical factor (V3) the borderline group (ES: 0.26) had a significantly (p<0.5) higher mean score than the depression group (ES: -0.25). The third canonical factor of the Diagnostic (D3) groups, characterized by the positively loading alcohol dependence and the negatively loading depression group

IV. 6. Sixth objective: **Study of the reliability of the CPS-50 interview**: 42 items (84%) had high levels of agreement ($\kappa > 0.70$; ICC > 0.80). Seven items had severity ratings that fell somewhat short of these standards, with ICC > 0.70. These included 6 Anorexia, 10 Early waking, 17 Guilt/Worthlessness, 24 Panic Disorder, 28 Obsessive Thoughts, 33 Disinhibited actions, 50 Screening for cognitive Deficits. Only the item assessing 'Reduced Need for Sleep' did not meet the accepted standards of inter-rater reliability for agreement on the presence or absence of the symptoms ($\kappa = 0.62$). In four centers that had completed 40 or more co-rated interviews, we made inter rater reliability analysis. Most centers showed high inter-rater agreement on almost all clinical scales (κ: 0.78-0.98).

Factor analysis of the items of CPS-50: it produced a solution in which items loaded on eight principal factors that together accounted for 47% of the variance. The eigenvalues of each factor ranged from 6.47 to 1.60. These factors were labeled: I Depression (13% total variance), II Psychosis (8%), III Manic Symptoms (7%), IV Anxiety Symptoms (5%), V Somatic Symptoms (4%), VI Sleep Loss (4 %), VII Early Psychosis (3%,), VIII Eating Disorder (3%). It was noted that there was a close association between the factors identified statistically and those selected for the clinical scales.

V. CONCLUSION

In our temperament and character trait study, we were able to identify those personality traits that characterize all patient groups, as well as those that help to differentiate them. According to our results of temperament traits, all patient groups are characterized by increased sensitivity towards aversive stimuli, harm avoidance, and overall negative affect, in contrast to the normal group, which corresponds to findings described in the literature. The temperament dimension of novelty seeking divided the patient group impulsive symptom axis

(bulimic, borderline versus depression, and anxiety disorder). Sensitivity towards positive rewarding stimuli or positive affect axis divided the sample into two groups: normal, anxious, and bulimic groups with intact positive affectivity and the depressive and borderline group had a lower positive affectivity. Character dimensions measuring maturity of personality the learnt functions under conscious control based on long term planning, and delayed gratification (self-directedness) showed all patient groups to be significantly lower than normal, and with those groups there was increasing grade of complex self-control ability from the impulsive borderline to bulimic to depressed and to anxious group. In terms of cooperativeness, first of all the borderline sample was distinguishable with its primary relationship problematic. These findings support the hypothesis that the disorders examined in our study are distinct along personality dimensions as well.

Abusive parental behavior on the part of both parents shows a close relationship with patient samples. Those in the normal group recalled less cases of parental abuse than those in patient groups. The gender of abuse parent the degree and form of abuse showed great variations among patient groups. It is important to mention that those considering themselves most abused were in the borderline group, next to depressive, finally anxious and bulimic, which two groups considered receiving about equally abusive parental behavior. However, we must keep in mind that retrospective questionnaires related to childhood abuse have great limitations regarding their validity and thus, must be interpreted with caution. Based on our results we can claim that in the patient group, parental representations recalled from autobiographical memory are more abusive than in the normal group. Such results are harmonious with findings according to which those suffering from mental illnesses perceive their parents as more abusive than those who do not suffer from such problems.

The increasing number of early maladaptive schemas in patient groups relative to normal supports the general cognitive diathesis hypothesis. It seems that early maladaptive schemas are closely related to all four disorders we examined. As described by the hypothesis of content specificity of early maladaptive schemas, specific differences may be observed with regard to maladaptive schema types in the various patient groups. The cognitive content specificity hypothesis described by Beck was only partially supported by our findings. The depressed group indeed showed a larger deficit in terms of relationship and achievement failure schemas, compared to the anxious group; however, schemas measuring vulnerability showed no difference between them. Several studies examining Beck's hypothesis came up with similar findings with regard to vulnerability.

Results of the borderline group are in agreement with Young's concept, according to which borderline personality disorder is often characterized by high scores on all 19 maladaptive

schema scales. Since early maladaptive schemas may be altered substantially by focused therapeutic intervention, and schema modification and substantial improvement of functioning may result from this, identifying such schemas with a questionnaire method prior to treatment is considered important from a clinical point of view. We suggest to include the use of Young Schema Questionnaire in case formulation and therapeutic planning.

With the help of SCL-90, a broad spectrum of symptoms may be identified using questionnaire method. It has proved to be a fruitful tool to identify patient and healthy groups, and to differentiate between groups based on the distribution of symptom dimensions and severity of symptoms. As we expected based on our Three-partite model, the depressed group based on the SCL-90 depression dimension – which corresponds to low positive affectivity – has scored significantly higher than the anxiety group. Whereas the higher arousal level and excitability based on anxiety and phobia scale of SCL-90, the anxiety group scored higher than the depressed. At the same time, both groups scored high on the GSI scale, measuring global distress, which is conceptually related to all symptom scales and negative affectivity.

The bulimic group had relatively high GSI scores, and our results suggest that the mostly secret activities of bulimic episodes and self-induced vomiting coincide with a high degree of paranoia and interpersonal sensitivity. All symptom dimensions in the borderline group showed a relatively higher score, even within the patient group, which is in agreement with the severe negative affectivity described in this patient group.

The interconnections between vulnerability factors (extreme temperament features, parental maltreatment, early maladaptive schema) and constellation of diagnostic categories revealed latent dimensions, which help understanding the relations and differences between individual disorders, and these in turn, help to separate subcategories of the various patient groups (see IV.5.). The first of such vulnerability dimensions (V1), which help separating the normal group from patient group, the second (V2), separating the impulsive group from the non-impulsive, the third (V3), separating a specific temperament and schema dimensions of depression from alcohol dependency. The independent dimensions related to identical patient groups suggest that in the background of single illnesses, several independent vulnerability dimensions may play a significant role, or alternatively, this suggests the possibility of separating several subgroups within one illness category.

The structured clinical interviews have an important role in facilitating reliable assessment of psychiatric symptoms in clinical research. The assessment tool (CPS-50) developed by our international research group proved to be a reliable standardized assessment psychiatric symptom dimensions.

In summary, we can tell that common latent vulnerability factors must play an important role in dividing the psychopathological area we are investigating, especially with regard to the common vulnerability factors we have found in our study: negative affectivity, parental maltreatment, and early maladaptive schemas. Another important conclusion is that since early maladaptive schemas are in important relation to the patient groups we studied, the Young Schema Questionnaire should play an important role in the psychopathological assessment of those patient groups, in their case conceptualization and the therapeutic planning.

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