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Predictors of Incidence, Remission and Relapse of Axis I Mental Disorders in Young Women: A Transdiagnostic Approach

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An understanding of etiological and maintaining factors of mental disorders is essential for the treatment of mental disorders, as well as mental health promotion and protection. The present study examines predictors of the incidence, remission and relapse of a wide range of Axis I mental disorders, using data from the Dresden Predictor Study. A sample of 1394 young German women completed questionnaires evaluating psychological factors (positive mental health, self-efficacy, life satisfaction, neuroticism, psychopathology and dysfunctional attitudes) and global assessment of functioning, as well as structured diagnostic interviews assessing incidence and change (remission, relapse) in mental disorders. Predictors were analysed using a multivariate logistic regression model. Significant factors for incidence of mental disorders included neuroticism and global functioning. A remitting course of mental disorders was predicted by positive mental health, self-efficacy and global assessment of functioning. Relapse was significantly predicted by neuroticism and dysfunctional attitudes. Results imply that mental health promotion is particularly important for women with high neuroticism and low functioning, as they tend to be at risk for incidence. Mental disorder treatment may benefit from strengthening positive mental health and functioning, as these factors promote remission. Relapse-prevention may benefit from attention to neuroticism and dysfunctional attitudes in order to reduce the likelihood of relapse.

Key Practitioner Message:

- Incidence of mental disorders in young women was predicted by neuroticism and low global functioning. There seems to be a need for preventive interventions addressing high neuroticism and low global functioning.
- Remission in young women was predicted by positive mental health. It may be helpful to include resource-based interventions, which can strengthen or support general positive mental health.
- Relapse in young women was predicted by two negative psychological factors: high neuroticism and reporting many dysfunctional attitudes. Psychotherapy addressing the characteristics and behaviour of neurotic patients might be beneficial. Interventions should also focus on addressing and changing dysfunctional attitudes.

Keywords: Positive Mental Health of Young Women, Psychological Factors, Transdiagnostic Approach, Incidence, Remission, Relapse

For the promotion of mental health, and the prevention and treatment of mental disorders, it is important to understand which psychological factors predict incidence, remission and relapse (Kraemer, Kazdin, Offord, Kessler, & Jensen, 2003). In practice, the identified predictors would enable us to identify those persons with a high risk and to apply tailored interventions. Targeting identified predictors could contribute to reduce incidence and relapse rates, as well as increase remission rates.

A plethora of studies have investigated the relationship between specific psychological factors and the incidence, remission or relapse of particular mental disorders (e.g., Carter & Garber, 2011; Flatten, Wälte, & Perlitz, 2008). Incidence and in some cases relapse have been predicted by risk factors such as high levels of preexisting

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psychopathology, higher avoidance behaviour, neuroticism, negative affectivity, dysfunctional attitudes and negative cognitive style or cognitive distortions as well as the absence of protective factors such as having a romantic partner, sufficient coping skills, high self-efficacy or being married (de Graaf, Bijl, Ravelli, Smit, & Vollebergh, 2002a; Harvey, 2004; Kendler, Gatz, Gardner, & Pedersen, 2006; Ormel *et al.*, 2013; Segal *et al.*, 2006; Trumpf, Margraf, Vriends, Meyer, & Becker, 2010a; Vriends, Becker, Meyer, & Margraf, 2012). In contrast, remission appears to be predicted by protective factors such as high self-esteem, self-efficacy, life satisfaction and positive mental health as well as being employed, but also by having less psychopathology, less anxiety sensitivity, and fewer daily hassles and better general psychosocial functioning, male sex and low diagnostic comorbidity (Markowitz, 2001; Rodriguez *et al.*, 2006; Trumpf, Becker, Vriends, Meyer, & Margraf, 2009; Vriends *et al.*, 2007).

A drawback of many studies on incidence, remission and relapse is that they used retrospective, instead of prospective longitudinal designs (i.e., Henderson, Andrews, & Hall, 2000; Kessler *et al.*, 2004). Retrospective designs yield less reliable and valid results. Furthermore, most studies of the course of mental disorders focus on one specific mental disorder ignoring comorbidity. But patients with just one disorder are the exception rather than the rule (Jacobi *et al.*, 2004; Kessler, Chiu, Demler, Merikangas, & Walters, 2005b). If more than one mental disorder is present we cannot know to which mental disorder the predictor is linked. Furthermore, mental disorders share core psychobiological personality traits (Fassino, Amianto, Sobrero, & Abbate Daga, 2013) and many risk factors (e.g., de Graaf *et al.*, 2002b). A transdiagnostic approach (Nolen-Hoeksema & Watkins, 2011) is therefore more appropriate.

The aim of this study is to assess which pattern of factors predicts incidence, remission and relapse across DSM-IV Axis I mental disorders (American Psychiatric Association, 2000) in young women using a prospective longitudinal design and a transdiagnostic approach. Predictors in the present study are positive mental health, self-efficacy, life satisfaction, neuroticism, psychopathology, dysfunctional attitudes, global functioning, partner and employment.

METHODS

Procedure

The Dresden Predictor Study (DPS) is a prospective epidemiological study on mental disorders and its risk factors among young women between 18 and 25 years old (Trumpf *et al.*, 2010b), the peak risk period for mental disorders (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Women were chosen for the study sample because prevalence and incidence rates of for example anxiety disorders and depressions in women are usually twice as high as in men (Kessler *et al.*, 2005a).

Participants were selected randomly from a government register including all residents of Dresden. Dresden is a city of 480 000 people with a large university, located in the former German Democratic Republic (GDR, or East Germany). In Germany, local registers include all residents. A total of 5203 eligible women were invited, between July 1996 and September 1997, to participate in the DPS. In total 3065 women participated in the first interview, resulting in a response rate of 58.9%. The second interview took place approximately 15 months later and 2118 women participated, resulting in a response rate of 74%. A comparison of completers (two interviews) and dropouts (one interview) shows that women with higher socioeconomic status were more likely to participate twice. However, there is no significant difference in the presence of mental disorders.

Eligible women received a letter with detailed information about the purpose, organization and design (interview, questionnaires and longitudinal survey) of the DPS. Interviewers made phone calls or personal visits to establish contact with the selected women. The interviewers were 80 psychologists, physicians or psychology students in their final year of study. All interviewers received one week of intensive training focusing on how to diagnose the selected participants. If the women decided to participate, the interviewers invited the participants to complete a face-to-face diagnostic interview. Written informed consent was obtained from the participants before the interview. After the interview, participants completed self-report questionnaires. At the end, the participants were asked if they were willing to take part in a second diagnostic interview 18 months later. An independent interviewer who was blind to the outcome of the first diagnostic interview conducted the second diagnostic interview.

In order to examine predictors of incidence, remission and relapse, mental disorders were measured twice: at baseline and at the follow-up. At baseline, any previous Axis I mental disorders, current Axis I mental disorders and predictors (psychological and demographic) were assessed. At follow-up, mental disorders since the baseline interview were assessed.

Participants

In this study we analysed only those participants who completed both the individual diagnostic interview and self-report questionnaires at both time points ($n = 1394$). Participants with missing data on the diagnostic interview or the questionnaires were not included. Of the 1394

participants, 61 (4.4%) women received psychotherapeutic treatment at baseline and 75 (5.4%) at follow-up. The average age at baseline of this sample was 22.7 years (SD = 1.8). Of the sample, 64.3% had completed the highest, 29.5% the middle, 2.2% the lowest educational level of school and 4% were still attending school. Regarding occupation, 48.6% of the women were employed and 51.4% were not employed. The socioeconomic status (SES) was high in 9.3%, middle in 62.5% and low in 28% of the women. More than half (64.3%) had a romantic partner, of which 4.4% were married, and 35.7% had no romantic partner, of which 0.1% were widowed.

Measures

Diagnosis

For the diagnostic assessments at baseline and follow-up we used the German version (F-DIPS; e.g., Schneider & Margraf, 2011) of the Anxiety Disorders Interview Schedule (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994). The F-DIPS is a structured interview for the diagnosis of a wide range of DSM-IV Axis I mental disorders. It is a valid and reliable instrument (Keller, 2000). Anxiety disorders, affective disorder, somatoform disorders, substance disorders and eating disorder can be diagnosed with the F-DIPS. Further, there is a sociodemographic section, a screening for psychosis, a screening for the general medical condition and medication, a short section on family history of psychological disorders and a section on treatment for psychological disorders.

Every diagnostic interview was proofread by one of the authors, and errors were discussed and corrected. For reliability purposes, a second interviewer reviewed the audiotapes of 43 interviews and made diagnoses. Diagnostic concordance was calculated by using Cohen's kappa (k) and Yule's Y (γ) agreement coefficients. The interrater-reliabilities for lifetime diagnoses in the current sample were between 0.58 and 1.0 (k) and 0.64 and 1.0 (γ). The interrater-reliability in a sample of 191 psychosomatic patients (Keller, 2000) was also good: between 0.64 and 0.89 (k), and 0.65 and 0.94 (γ) for current diagnoses.

Predictors

Positive Mental Health (PMH)

The 9-item Positive Mental Health scale (PMH-scale; Lukat, Margraf, Lutz, van der Veld, & Becker, 2016) assessed positive mental health (e.g., 'I enjoy my life.'). Higher scores indicate higher positive mental health. Internal consistency in the current sample was $\alpha = 0.87$.

Self-efficacy (SFE)

The 10-item General Self-Efficacy Scale (GKE; Jerusalem & Schwarzer, 1986) measured optimistic beliefs based on the concept of self-efficacy (e.g., 'I will find a solution for every problem'). Higher scores indicate higher self-efficacy. Internal consistency in the current sample was $\alpha = 0.87$.

Life Satisfaction (LSA)

The 12-item Life Satisfaction Questionnaire (LZH; Lutz, Heyn, Schmid, Sick, & Steinl, 1992) assessed general life satisfaction (e.g., 'I am satisfied with my health', 'I am satisfied with my partnership'). Higher scores indicate higher life satisfaction. Internal consistency in the current sample was $\alpha = 0.75$.

Neuroticism (NEU)

The 14-item modified version of the items on the emotionality scale from the revised Freiburg Personality Inventory (FPI-R; Fahrenberg, Hampel, & Selgl, 1989) assessed neuroticism (e.g., 'My mood often goes up and down'). The modified version scale has a 4-point rating scale, and the original scale has a 2-point rating scale. Higher scores indicate higher neuroticism. Internal consistency in the current sample was $\alpha = 0.85$.

Psychopathology (PSP)

The 90-item German version of the 'Symptom Checklist 90-Revised' (SCL-90-R; Franke, 1995) measured general psychopathology (e.g., 'How much were you bothered by crying easily'). High scores indicate high occurrence. Internal consistency in the current sample was $\alpha = 0.95$.

Dysfunctional Attitudes (DSA)

The 40-item German version of the 'Dysfunctional Attitude Scale' (DAS; Hautzinger, Luka, & Trautmann, 1985) assessed dysfunctional attitudes (e.g., 'I am nothing if a person I love doesn't love me.'). High scores indicate many or strong dysfunctional attitudes. Internal consistency in the current sample was $\alpha = 0.89$.

Global Functioning (FUN)

The Global Assessment of Functioning (GAF; American Psychiatric Association, 2000) scale is a numeric scale (0 through 100) used by mental health clinicians to rate the subjective social, occupational, and psychological functioning of adults and measured functioning. Low scores indicate low functioning and high scores indicate high functioning. The GAF scale is found to have satisfactory reliability (ICC = 0.81) and fair interrater reliability (overall kappa = 0.53) when categorizing the major diagnostic categories of the DSM-IV Axis I (Söderberg & Tungström, 2007).

Partner (PAR)

Participants were asked whether they have a partner and what type (i.e., romantic partner, divorced but new romantic partner, married, widowed but new romantic partner) or no partner (single, divorced, and widowed). Having a partner was coded 1 when the participant had a partner and 0 otherwise.

Employment (EMP)

Participants were asked whether and how they are employed (full-time, part-time) or not employed (students, no job, maternity protection). Employment was coded 1 when the participant had a job and 0 otherwise.

Statistical Analyses

All analyses were carried out with IBM SPSS Statistics Version 21.0 (IBM Corp, 2012). Prospective associations between predictor variables at baseline and incidence, remission and relapse were examined as descriptions of the bivariate relations using univariate logistic regression analyses. The dependent variables in the equations were incidence, remission or relapse. The operationalization of incidence, remission and relapse is explained in Table 1.

Table 1. Operationalization scheme of dependent variables

	Score	Before baseline[4]	Baseline[4]	Follow-up[4]
Incidence[1]	= 1 if	0	0	1
	= 0 if	0	0	0
Remission[2]	= 1 if	0	1	0
	= 1 if	1	0	0
	= 0 if	1	1	1
	= 0 if	0	1	1
Relapse[3]	= 1 if	1	0	1
	= 0 if	1	0	0

[1]A score of 1 = incidence and a score of 0 = stable (mentally) healthy.
[2]A score of 1 = remission and a score of 0 = stable (mentally) ill.
[3]A score of 1 = relapse and a score of 0 = not (mentally) ill again.
[4]0 = no mental disorder, 1 = mental disorder.

For the univariate logistic regression analyses we report the odds ratio (OR) and its 95% confidence interval (CI). All predictors, except partner and employment, were standardized to improve the interpretability of the ORs. We first estimated a series of univariate logistic regression models to assess that the independent variables are related, as mentioned in the literature, with incidence, remission or relapse. Second, we estimated a series of multivariate logistic regression models to assess which independent variables predict incidence, remission or relapse, when the effects of all variables are estimated simultaneously. All models were evaluated using the percentage of correctly classified outcomes, the Hosmer & Lemeshow test (Hosmer & Lemeshow, 2000), the omnibus test for the model parameters, Nagelkerke's R^2 and the significance of the parameter estimates. A model is rejected if the Hosmer & Lemeshow test is significant and if the omnibus test is not significant.

RESULTS

Table 2 presents the lifetime, point and period prevalence of mental disorders. Lifetime prevalence is operationalized as the proportion of participants who have experienced (until the baseline measure) a mental disorder. Point prevalence is operationalized as the proportion of participants affected by a mental disorder in the last seven days up to the diagnostic interview (at baseline or follow-up). Period prevalence is operationalized as the proportion of participants with a mental disorder between the baseline and follow-up assessment. The majority of the participants were mentally healthy at lifetime (61.1%), at baseline (80.5%), and at the follow-up (77.1%). The most common mental disorders in our study are anxiety disorders (between 17.3% and 26.5%), and the least common mental disorders were substance disorders (between 0.8% and 1.8%). Comorbidity varied between 24.6% and 59.3%.

Table 2. Lifetime, point and period prevalence of mental disorders and comorbidity among young women

	Lifetime prevalence at baseline[1]	Point prevalence at baseline[1]	Point prevalence at follow-up[1]	Period prevalence at follow-up[1]
Mentally healthy	852 (61.12)	1122 (80.49)	1075 (77.12)	993 (71.23)
Mental disorder	542 (38.88)	272 (19.51)	319 (22.88)	401 (28.77)
Anxiety disorder	370 (26.5)	241 (17.3)	283 (20.3)	316 (22.7)
Affective disorder	174 (12.5)	23 (1.6)	26 (1.9)	111 (8.0)
Somatoform disorder	37 (2.7)	13 (0.9)	20 (1.4)	29 (2.1)
Substance disorder	22 (1.6)	11 (0.8)	17 (1.2)	25 (1.8)
Eating disorder	50 (3.6)	13 (0.9)	15 (1.1)	21 (1.5)
Comorbidity present in	238 (43.91)	66 (24.6)	92 (28.84)	238 (59.35)

[1]Cells contain frequencies and between brackets the percentages.

Table 3 displays the frequencies and means of the predictors, broken down by the values of the outcome variables. One can see that stable healthy (incidence = 0) participants more often have a job (47%) than stable ill (remission = 0) participants (40.5%). Furthermore, participants who are stable ill (remission = 0) scored, at average, the lowest on positive mental health (M = 2.88) and highest on neuroticism (M = 2.48).

The correlations between the predictors, except partner and employment, are shown in Table 4. The correlations between positive mental health, life satisfaction, self-efficacy and functioning are positive. The correlations between dysfunctional attitudes, neuroticism and psychopathology are also positive. Between these two sets of variables the correlations are negative.

The results of the univariate logistic regressions indicate that, in agreement with the literature, positive mental health, life-satisfaction, self-efficacy, functioning, neuroticism, psychopathology and dysfunctional attitudes are significantly related to incidence, remission and relapse. Neither the relation between self-efficacy and remission is significant nor were the relations between partner or employment related to the course of mental disorders.

Table 5 displays the results of three multivariate logistic regression analyses. The percentage of correctly classified cases is fairly high, i.e., between 66.8% and 79.9%. The Hosmer & Lemeshow tests were not significant, indicating no differences between the observed and predicted classifications. The omnibus test is significant in each model, indicating that the predictors improve the prediction compared to a model with only the intercept. Overall, this indicates that the models are acceptable, and thus we can interpret the estimates of the ORs. The results of the multivariate logistic regression analysis show that a higher score on global functioning was associated with a decrease in the odds of becoming mentally ill (incidence) at the follow-up (while being mentally healthy before the baseline and at the baseline), with an odds ratio of 0.61 (95% CI, 0.00 to 0.61). In addition, a higher score on neuroticism was associated with an increase in the odds of becoming mentally ill (incidence) at the follow-up (while being mentally healthy before the baseline and at the baseline), with an odds ratio of 1.33 (95% CI, 0.04 to 1.33). A higher score on neuroticism was also associated with an increase in the odds of becoming mentally ill (relapse) at the follow-up (while being mentally ill before the baseline, but not at the baseline), with an odds ratio of 1.53 (95% CI, 1.06 to 2.21). A higher score on dysfunctional attitudes was associated with an increase in the odds of becoming mentally ill (relapse) at the follow-up (while being mentally ill before the baseline, but not at the baseline), with an odds ratio of 1.40 (95% CI, 1.03 to 1.91). A higher score on positive mental health is associated with an increase in the odds of becoming mentally healthy (remission) at the follow-up (while being mentally

Table 3. Frequencies and means of the predictors, broken down by the categories of the outcomes incidence, remission and relapse

	Total[1]	EMP[2]	PAR[2]	PMH[3]	LSA[3]	SFE[3]	DSA[3]	NEU[3]	PSP[3]	FUN[3]
Incidence = 1	*169 (12.1)*	71 (42)	101 (59.8)	3.27 (0.48)	3.63 (0.48)	27.87 (4.46)	117.30 (20.92)	2.13 (0.48)	0.36 (0.28)	86.86 (8.62)
Incidence = 0	*683 (49)*	321 (47)	443 (64.9)	3.42 (0.42)	3.77 (0.51)	28.96 (4.08)	112.39 (21.65)	1.90 (0.45)	0.24 (0.21)	90.97 (6.95)
Remission = 1	*124 (8.9)*	55 (44.4)	82 (66.1)	3.22 (0.47)	3.60 (0.45)	27.75 (3.92)	120.02 (25.44)	2.21 (0.46)	0.46 (0.34)	79.50 (11.00)
Remission = 0	*148 (10.6)*	60 (40.5)	95 (64.2)	2.88 (0.60)	3.40 (0.48)	26.78 (5.69)	129.24 (27.78)	2.48 (0.57)	0.56 (0.45)	75.35 (11.23)
Relapse = 1	*84 (6)*	40 (47.6)	50 (59.5)	3.11 (0.58)	3.47 (0.53)	27.80 (5.05)	125.40 (24.43)	2.41 (0.58)	0.50 (0.40)	82.71 (9.32)
Relapse = 0	*186 (13.3)*	63 (50.0)	119 (64.0)	3.32 (0.46)	3.67 (0.50)	29.29 (4.21)	112.53 (22.89)	2.07 (0.52)	0.33 (0.29)	85.78 (8.98)
Total	*1394 (100)*	*610 (43.76)*	*890 (63.8)*	*3.29 (0.50)*	*3.67 (0.51)*	*28.46 (4.46)*	*116.25 (23.65)*	*2.07 (0.53)*	*0.34 (0.31)*	*86.63 (10.03)*

Note. *M* = Mean, *SD* = standard deviation. EMP = Employment, PAR = Partner, PMH = Positive mental health, LSA = Life satisfaction, SFE = Self-efficacy, DSA = Dysfunctional attitudes, NEU = Neuroticism, PSP = Psychopathology, FUN = Functioning.
[1]Cells contain frequencies and between brackets the percentages.
[2]Cells contain the number of employed and with a partner, percentages between brackets.
[3]Cells contain the means and between brackets the standard deviations.

Table 4. Correlations among predictors at baseline

Predictors at baseline	1	2	3	4	5	6	7
1. PMH	—						
2. LSA	0.57	—					
3. SFE	0.57	0.34	—				
4. DSA	−0.47	−0.39	−0.40	—			
5. NEU	−0.62	−0.46	−0.38	0.42	—		
6. PSP	−0.56	−0.39	−0.33	0.36	0.65	—	
7. FUN	0.34	0.28	0.18	−0.20	−0.39	−0.43	—

Note. $p < 0.01$ for all correlations. The sample size varied between 1394 and 1375.
PMH = Positive mental health, LSA = Life satisfaction, SFE = Self-efficacy, DSA = Dysfunctional attitudes, NEU = Neuroticism, PSP = Psychopathology, FUN = Functioning.

Table 5. Multiple logistic regression analyses with incidence, remission and relapse as outcomes

	Incidence[a]		Remission[b]		Relapse[c]	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI
EMP	1.17	0.38 – 1.17	0.99	0.58 – 1.70	1.11	0.69 – 1.96
PAR	1.13	0.50 – 1.13	1.02	0.58 – 1.79	1.07	0.59 – 1.94
PMH	1.00	0.99 – 1.00	**2.16****	1.40 – 3.32	1.29	0.82 – 2.01
LSA	0.98	0.85 – 0.98	1.08	0.74 – 1.57	0.89	0.63 – 1.26
SFE	0.96	0.74 – 0.96	**0.68***	0.49 – 0.94	0.87	0.63 – 1.21
FUN	**0.61****	0.00 – 0.61	**1.30***	1.01 – 1.67	0.87	0.62 – 1.22
NEU	**1.33***	0.04 – 1.33	0.83	0.57 – 1.21	**1.53***	1.06 – 2.21
PSP	1.18	0.25 – 1.18	1.30	0.99 – 1.71	1.13	0.78 – 1.60
DSA	1.03	0.80 – 1.03	0.90	0.68 – 1.19	**1.40***	1.03 – 1.91
Correctly classified	79.7%		66.8%		70.8%	
Omnibus test (df)	56.55 (9)		39.42 (9)		28.89 (9)	
Nagelkerke R^2	0.10		0.19		0.15	
H&L test (df)[d]	14.02 (8)		5.49 (8)		5.77 (8)	

Note. OR = odds ratio; CI = confidence interval; odds ratios that are significant are denoted by bold typeface odds ratios and confidence intervals.
EMP = Employment, PAR = Partner, PMH = Positive mental health, LSA = Life satisfaction, SFE = Self-efficacy, FUN = Functioning, NEU = Neuroticism, PSP = Psychopathology, DSA = Dysfunctional attitudes.
*$p < 0.05$.
**$p < 0.01$.
[a]$n = 828$.
[b]$n = 265$.
[c]$n = 260$.
[d]H&L = Hosmer & Lemeshow.

ill at the baseline), with an odds ratio of 2.16 (95% CI, 1.40 to 3.32). A higher score on self-efficacy is associated with a decrease in the odds of becoming mentally healthy (remission) at the follow-up (while being mentally ill at the baseline), with an odds ratio of 0.68 (95% CI, 0.49 to 0.94). A higher score on global functioning is associated with an increase in the odds of becoming mentally healthy (remission) at the follow-up (while being mentally ill at the baseline), with an odds ratio of 1.30 (95% CI, 1.01 to 1.67).

DISCUSSION

To our knowledge, this is the first longitudinal prospective study to examine the prediction of incidence, remission and relapse of a wide range of DSM Axis I mental disorders in a single study of young women. Incidence was predicted by high neuroticism (a risk factor) and low global functioning. Remission was predicted by high positive mental health (a protective factor) and high global functioning. Finally, relapse was predicted by high neuroticism and many dysfunctional attitudes, two risk factors.

The findings that incidence and relapse of mental disorders are predicted by neuroticism are in line with prior research stressing the role of neuroticism in mood disorders (de Graaf *et al*., 2002a) and general severe mental disorders (Lahey, 2009). Neuroticism is considered to be a temperamental factor that predisposes individuals to a range of emotional psychopathologies and other aversive outcomes (i.e., Clark, Watson, & Mineka, 1994). As neuroticism predicted the two negative changes in mental

health in the present study, it may be an important factor in mental health care.

Incidence of mental disorders is found to be predicted by low global functioning. Other studies also indicate that global functional impairments are strongly associated with diagnoses and symptoms of multiple mental disorders (i.e., Bastin *et al.*, 2013). This is an indication that low global functioning is a precursor to, and not only a result of, mental disorders and has implications for prevention, care and treatment.

The finding that relapse is predicted by dysfunctional attitudes is in line with other studies on the predictors of eating disorder course (Rawal, Park, & Williams, 2010), depression relapse (e.g., Jarrett *et al.*, 2012; Segal *et al.*, 2006) and anxiety disorders relapse (Rodriguez *et al.*, 2006; Scholten *et al.*, 2013). An explanation for this important role of cognitions is that someone who had recovered from a mental disorder, but for whom some disorder-specific cognitions remain (e.g., cognitions harmful to self-esteem or anxious thoughts) becomes vulnerable to stressful life events, triggering a relapse of symptoms and mental disorder.

Remission is found to be predicted by positive mental health and better global functioning which is also in line with other studies of specific disorders (e.g., Bardone-Cone *et al.*, 2010; Rush *et al.*, 2006). For some disorders, improvement in symptomatic status is observed to correlate with improvement in global functioning (Miller *et al.*, 1998; Perugi, Maremmani, McNair, Cassano, & Akiskal, 1988). The strengthening of resources (e.g., relationship, friendships and hobbies) and the fulfilment of daily tasks (e.g., job, household) seem to be very important treatment goals for the remission of mental disorders in young women.

Self-efficacy was also a significant predictor for remission, but not in the expected direction (results indicated that low self-efficacy predicts remission). However, there is a statistical caveat: There is a suppressor effect between self-efficacy and positive mental health, as they are highly correlated (.57). As self-efficacy is not related to the dependent variable but is related to the other predictors, it helps to explain variance and increases the predictive value of the overall model (Dormann *et al.*, 2013), so self-efficacy is left in the analyses. We cannot find other reasons for this result.

Finally, the demographic variables were not predictors for incidence, remission and relapse. One explanation can be that the sample is relatively homogeneous, thus providing little variance.

There are limitations of the study. First, the lifetime disorders at baseline presented here are based on retrospective self-reports and could be affected by biassed recall (Wittchen, Nelson, & Lachner, 1998). In a study by Moffitt *et al.* (2010) the prevalence of lifetime disorders was almost doubled in prospective data as compared with retrospective data. Second, a limitation of the DPS is the rather low response rate of 58.9% at the baseline investigation. Somewhat higher response rates have been reported in other epidemiological studies (e.g., Kessler *et al.*, 2004), but prevalence rates vary across cities (Boyd *et al.*, 1990). There is some evidence that citizens of the former German Democratic Republic (East Germany) tend to be less willing to participate in research probably because of the general mistrust in this population regarding the recording of personal data (Maercker & Herrle, 2003). Another important point is that participants could not be reimbursed for their time. Unfortunately, there are no data available for the census of our target population (i.e., women aged 18-25 years living in Dresden in 1996). However, there were no major political or social changes since 1996; thus, we do not have an indication that the data is not valid anymore. Third, the present study did not assess personality although it appears to be predictive of the course of mental health (i.e., Ansell *et al.*, 2011; Hasin *et al.*, 2011). Fourth, our relatively short follow-up period of 17 months can be viewed as a limitation because it fails to cover the entire risk period for the first onset of anxiety disorders and depression. In contrast, the longer the follow-up period is, the more likely the incident cases are to be affected by recall bias. Also, extended follow-up periods may lead to higher attrition rates. Fifth, it is possible that findings from this urban sample, which consisted of well-educated young women with predominately average and higher SES, may not generalize to other populations (e.g., men, older populations) or regions. In both the current Dresden sample and in the German study of Jacobi *et al*. (2014), there were more anxiety disorders and fewer affective disorders diagnosed than in other studies (e.g., Lewinsohn *et al.*, 1993; Wittchen *et al.*, 1998). One possible explanation could be that symptoms of depression that took longer than two weeks but less than a month were due to 'heartbreak' and are not diagnosed as a depression in present study. Sixth, it may be that some predictor variables measured at baseline have been influenced by women's disorder at baseline. For example, baseline depression may have impacted baseline life satisfaction, or dysfunctional beliefs. Additionally, some studied predictors have a great overlap in definition to mental disorders, for example, neuroticism and internalizing disorders (Ormel *et al.*, 2013). There is high conceptual overlap between outcomes, and it is not entirely possible to specify direction of effects in the present study.

The present study has also a number of strengths, including the large sample size, thorough assessments using standardized instruments, and follow-up interviews over a period of 17 months. Further, we investigated psychological predictors of incidence, relapse, and remission within a longitudinal, naturalistic cohort, and thus produced one of the rare studies to do so. Finally,

considering the diagnostic instability of many mental disorders (e.g., Moffitt *et al.*, 2007), the transdiagnostic approach to defining remission and relapse in the present study is a strength.

The present findings suggest some future directions for therapeutic practice if the findings can be confirmed in further experimental and intervention studies. Screening for neuroticism and special attention to persons high in neuroticism and low functioning might help prevention efforts. Interventions for the treatment of mental disorders in young women may benefit from addressing global positive mental health and functioning to promote full remission from all mental disorders. The importance of focusing on patients' resources and strengths within therapy has been increasingly emphasized in various studies (i.e., Kuyken, Padesky, & Dudley, 2011). Finally, interventions reducing dysfunctional cognitions could be included during the treatment in the acute phase of many mental disorders, or after the regular treatment, as a specific intervention for relapse prevention in young women of Axis I mental disorders, or they could become part of a specific relapse prevention programme. With the limitations in mind, we conclude that it is important to know that recurrence may not only involve recurrence of the same mental disorder, but also of a different mental disorder (Scholten *et al.*, 2013). Intervening in relevant predictor variables in prevention and relapse prevention programmes and in regular cognitive behavioural therapy may contribute to decreasing incidence and relapse rates and increasing remising rates, and is a topic worthy of future exploration.

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